



## **COG Operating LLC**

**Lea County, NM (NAD27 NME)**

**Tin Foil Federal Com**

**604H**

**ST01 / 65848**

**Design: Surveys (McVay 8)**

## **Standard Survey Report**

**15 January, 2020**



<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	USA Compass

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

<b>Site</b>	Tin Foil Federal Com				
<b>Site Position:</b>		<b>Northing:</b>	405,011.10 usft	<b>Latitude:</b>	32° 6' 34.454410 N
<b>From:</b>	Map	<b>Easting:</b>	808,555.50 usft	<b>Longitude:</b>	103° 20' 12.519903 W
<b>Position Uncertainty:</b>	1.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.53 °

<b>Well</b>	604H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	405,011.10 usft	<b>Latitude:</b>	32° 6' 34.454410 N
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	808,555.50 usft	<b>Longitude:</b>	103° 20' 12.519903 W
<b>Position Uncertainty</b>		1.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	3,153.80 usft

<b>Wellbore</b>	ST01 / 65848				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	MVHD	12/18/2019	6.53	59.71	47,689.04274372

<b>Design</b>	Surveys (McVay 8)				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	11,565.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		359.51

<b>Survey Program</b>	<b>Date</b>	1/15/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.00	10,736.00	SDI - Gyro Surveys (OH / 65848)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
10,803.00	11,565.00	Gordon MWD Surveys - SQC (OH / 65848)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction	
11,565.00	22,475.00	Gordon MWD (ST01 / 65848)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.13	88.04	100.00	0.00	0.11	0.00	0.13	0.13	0.00	
125.00	0.04	123.22	125.00	0.00	0.15	0.00	0.40	-0.36	140.72	
150.00	0.13	126.43	150.00	-0.02	0.18	-0.02	0.36	0.36	12.84	
175.00	0.09	90.32	175.00	-0.04	0.22	-0.04	0.31	-0.16	-144.44	
200.00	0.13	71.94	200.00	-0.03	0.27	-0.03	0.21	0.16	-73.52	
225.00	0.05	9.12	225.00	-0.01	0.30	-0.01	0.46	-0.32	-251.28	
250.00	0.11	281.90	250.00	0.01	0.28	0.00	0.47	0.24	-348.88	
275.00	0.22	280.18	275.00	0.02	0.20	0.02	0.44	0.44	-6.88	

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<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
300.00	0.26	299.19	300.00	0.06	0.11	0.05	0.35	0.16	76.04	
325.00	0.33	305.24	325.00	0.12	0.00	0.12	0.31	0.28	24.20	
350.00	0.33	300.92	350.00	0.20	-0.12	0.20	0.10	0.00	-17.28	
375.00	0.38	298.74	375.00	0.28	-0.26	0.28	0.21	0.20	-8.72	
400.00	0.41	286.65	400.00	0.35	-0.41	0.35	0.35	0.12	-48.36	
425.00	0.33	290.99	425.00	0.40	-0.57	0.40	0.34	-0.32	17.36	
450.00	0.55	280.72	450.00	0.44	-0.75	0.45	0.93	0.88	-41.08	
475.00	0.58	277.73	475.00	0.48	-1.00	0.49	0.17	0.12	-11.96	
500.00	0.65	310.65	499.99	0.59	-1.23	0.60	1.42	0.28	131.68	
525.00	0.48	282.20	524.99	0.71	-1.44	0.72	1.29	-0.68	-113.80	
550.00	0.55	269.99	549.99	0.73	-1.66	0.74	0.52	0.28	-48.84	
575.00	0.59	278.28	574.99	0.75	-1.91	0.76	0.37	0.16	33.16	
600.00	0.56	283.63	599.99	0.80	-2.15	0.81	0.25	-0.12	21.40	
625.00	0.56	289.35	624.99	0.87	-2.39	0.89	0.22	0.00	22.88	
650.00	0.55	270.61	649.99	0.91	-2.62	0.93	0.72	-0.04	-74.96	
675.00	0.58	282.48	674.99	0.94	-2.87	0.96	0.48	0.12	47.48	
700.00	0.45	283.03	699.98	0.98	-3.09	1.01	0.52	-0.52	2.20	
725.00	0.40	264.95	724.98	1.00	-3.27	1.03	0.57	-0.20	-72.32	
750.00	0.38	266.22	749.98	0.99	-3.44	1.02	0.09	-0.08	5.08	
775.00	0.38	285.03	774.98	1.00	-3.60	1.03	0.50	0.00	75.24	
800.00	0.37	270.98	799.98	1.03	-3.76	1.06	0.37	-0.04	-56.20	
825.00	0.23	263.62	824.98	1.02	-3.89	1.05	0.58	-0.56	-29.44	
850.00	0.30	261.26	849.98	1.01	-4.01	1.04	0.28	0.28	-9.44	
875.00	0.36	264.81	874.98	0.99	-4.15	1.02	0.25	0.24	14.20	
900.00	0.27	246.11	899.98	0.96	-4.28	0.99	0.54	-0.36	-74.80	
925.00	0.16	305.73	924.98	0.95	-4.36	0.99	0.94	-0.44	238.48	
950.00	0.19	325.46	949.98	1.01	-4.42	1.05	0.27	0.12	78.92	
975.00	0.17	329.41	974.98	1.07	-4.46	1.11	0.09	-0.08	15.80	
1,000.00	0.17	304.34	999.98	1.13	-4.51	1.17	0.30	0.00	-100.28	
1,025.00	0.09	285.66	1,024.98	1.15	-4.56	1.19	0.36	-0.32	-74.72	
1,050.00	0.14	358.63	1,049.98	1.19	-4.58	1.23	0.57	0.20	291.88	
1,075.00	0.11	348.52	1,074.98	1.24	-4.58	1.28	0.15	-0.12	-40.44	
1,100.00	0.09	28.02	1,099.98	1.28	-4.58	1.32	0.28	-0.08	158.00	
1,125.00	0.08	29.20	1,124.98	1.32	-4.56	1.36	0.04	-0.04	4.72	
1,150.00	0.30	22.77	1,149.98	1.39	-4.53	1.43	0.88	0.88	-25.72	
1,175.00	0.21	45.06	1,174.98	1.49	-4.47	1.52	0.53	-0.36	89.16	
1,200.00	0.31	44.93	1,199.98	1.57	-4.39	1.60	0.40	0.40	-0.52	
1,225.00	0.32	30.74	1,224.98	1.67	-4.31	1.71	0.31	0.04	-56.76	
1,250.00	0.31	42.39	1,249.98	1.78	-4.22	1.82	0.26	-0.04	46.60	
1,275.00	0.45	32.57	1,274.98	1.92	-4.13	1.95	0.62	0.56	-39.28	
1,300.00	0.42	46.11	1,299.98	2.06	-4.01	2.10	0.43	-0.12	54.16	
1,325.00	0.34	41.77	1,324.98	2.18	-3.89	2.21	0.34	-0.32	-17.36	
1,350.00	0.38	39.18	1,349.98	2.30	-3.79	2.33	0.17	0.16	-10.36	

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<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
1,375.00	0.39	37.19	1,374.98	2.43	-3.69	2.46	0.07	0.04	-7.96	
1,400.00	0.47	44.75	1,399.98	2.57	-3.56	2.60	0.39	0.32	30.24	
1,425.00	0.48	57.81	1,424.97	2.70	-3.40	2.73	0.43	0.04	52.24	
1,450.00	0.53	54.44	1,449.97	2.83	-3.22	2.85	0.23	0.20	-13.48	
1,475.00	0.63	61.05	1,474.97	2.96	-3.00	2.98	0.48	0.40	26.44	
1,500.00	0.63	64.26	1,499.97	3.08	-2.76	3.11	0.14	0.00	12.84	
1,525.00	0.79	68.82	1,524.97	3.21	-2.48	3.23	0.68	0.64	18.24	
1,550.00	0.87	69.83	1,549.97	3.33	-2.14	3.35	0.33	0.32	4.04	
1,575.00	0.99	69.26	1,574.96	3.48	-1.76	3.49	0.48	0.48	-2.28	
1,600.00	1.00	76.81	1,599.96	3.60	-1.34	3.61	0.53	0.04	30.20	
1,625.00	1.25	68.39	1,624.95	3.75	-0.88	3.76	1.20	1.00	-33.68	
1,650.00	1.14	82.56	1,649.95	3.89	-0.38	3.89	1.26	-0.44	56.68	
1,675.00	1.34	78.58	1,674.94	3.98	0.16	3.97	0.87	0.80	-15.92	
1,700.00	1.48	81.95	1,699.94	4.08	0.76	4.07	0.65	0.56	13.48	
1,725.00	1.56	86.43	1,724.93	4.15	1.42	4.13	0.57	0.32	17.92	
1,750.00	1.52	78.89	1,749.92	4.23	2.09	4.21	0.83	-0.16	-30.16	
1,775.00	1.50	84.50	1,774.91	4.33	2.74	4.30	0.60	-0.08	22.44	
1,800.00	1.50	85.87	1,799.90	4.38	3.39	4.35	0.14	0.00	5.48	
1,825.00	1.63	86.24	1,824.89	4.43	4.07	4.39	0.52	0.52	1.48	
1,850.00	1.74	87.22	1,849.88	4.47	4.81	4.43	0.45	0.44	3.92	
1,875.00	1.78	88.93	1,874.87	4.49	5.57	4.45	0.26	0.16	6.84	
1,900.00	1.90	85.35	1,899.86	4.54	6.37	4.48	0.66	0.48	-14.32	
1,925.00	1.88	86.96	1,924.84	4.59	7.20	4.53	0.23	-0.08	6.44	
1,950.00	2.00	87.29	1,949.83	4.63	8.04	4.56	0.48	0.48	1.32	
1,975.00	1.92	88.92	1,974.81	4.66	8.90	4.59	0.39	-0.32	6.52	
2,000.00	1.90	85.79	1,999.80	4.70	9.73	4.62	0.42	-0.08	-12.52	
2,025.00	2.21	88.21	2,024.78	4.75	10.62	4.65	1.29	1.24	9.68	
2,050.00	2.26	84.19	2,049.76	4.81	11.60	4.71	0.66	0.20	-16.08	
2,075.00	2.27	94.13	2,074.74	4.82	12.58	4.72	1.57	0.04	39.76	
2,100.00	2.41	86.79	2,099.72	4.82	13.60	4.70	1.32	0.56	-29.36	
2,125.00	2.55	85.59	2,124.70	4.89	14.68	4.77	0.60	0.56	-4.80	
2,150.00	2.55	87.96	2,149.68	4.95	15.79	4.82	0.42	0.00	9.48	
2,175.00	2.70	83.86	2,174.65	5.04	16.93	4.89	0.96	0.60	-16.40	
2,200.00	2.91	87.22	2,199.62	5.13	18.15	4.97	1.07	0.84	13.44	
2,225.00	2.88	88.20	2,224.59	5.18	19.41	5.01	0.23	-0.12	3.92	
2,250.00	3.10	87.69	2,249.55	5.23	20.71	5.05	0.89	0.88	-2.04	
2,275.00	3.18	87.29	2,274.52	5.29	22.08	5.10	0.33	0.32	-1.60	
2,300.00	3.27	84.48	2,299.48	5.39	23.48	5.19	0.73	0.36	-11.24	
2,325.00	3.31	87.29	2,324.44	5.49	24.91	5.28	0.66	0.16	11.24	
2,350.00	3.46	88.20	2,349.39	5.55	26.39	5.32	0.64	0.60	3.64	
2,375.00	2.87	91.59	2,374.35	5.56	27.77	5.32	2.47	-2.36	13.56	
2,400.00	2.29	105.81	2,399.33	5.40	28.88	5.15	3.44	-2.32	56.88	
2,425.00	1.84	122.45	2,424.31	5.05	29.69	4.80	2.98	-1.80	66.56	

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<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	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)	
2,450.00	1.87	122.85	2,449.30	4.61	30.38	4.35	0.13	0.12	1.60	
2,475.00	1.83	117.31	2,474.29	4.21	31.07	3.94	0.73	-0.16	-22.16	
2,500.00	1.83	118.71	2,499.27	3.83	31.78	3.56	0.18	0.00	5.60	
2,525.00	1.84	120.63	2,524.26	3.44	32.47	3.16	0.25	0.04	7.68	
2,550.00	1.76	118.43	2,549.25	3.05	33.16	2.77	0.42	-0.32	-8.80	
2,575.00	0.97	114.86	2,574.24	2.78	33.69	2.49	3.18	-3.16	-14.28	
2,600.00	0.31	14.49	2,599.24	2.76	33.90	2.47	4.28	-2.64	-401.48	
2,625.00	0.37	343.78	2,624.24	2.90	33.89	2.61	0.76	0.24	-122.84	
2,650.00	0.43	340.35	2,649.24	3.06	33.84	2.78	0.26	0.24	-13.72	
2,675.00	0.39	342.23	2,674.24	3.23	33.78	2.95	0.17	-0.16	7.52	
2,700.00	0.58	5.12	2,699.24	3.44	33.76	3.15	1.07	0.76	91.56	
2,725.00	0.47	14.79	2,724.24	3.67	33.80	3.38	0.56	-0.44	38.68	
2,750.00	0.52	14.77	2,749.23	3.88	33.86	3.59	0.20	0.20	-0.08	
2,775.00	0.52	36.37	2,774.23	4.08	33.95	3.79	0.78	0.00	86.40	
2,800.00	0.67	37.48	2,799.23	4.28	34.11	3.99	0.60	0.60	4.44	
2,825.00	0.73	38.76	2,824.23	4.52	34.30	4.23	0.25	0.24	5.12	
2,850.00	0.64	45.96	2,849.23	4.75	34.50	4.45	0.50	-0.36	28.80	
2,875.00	0.74	42.77	2,874.23	4.96	34.71	4.66	0.43	0.40	-12.76	
2,900.00	0.66	42.44	2,899.23	5.19	34.91	4.89	0.32	-0.32	-1.32	
2,925.00	0.71	39.41	2,924.22	5.41	35.11	5.11	0.25	0.20	-12.12	
2,950.00	0.73	169.25	2,949.22	5.37	35.24	5.07	5.22	0.08	519.36	
2,975.00	1.82	208.78	2,974.22	4.87	35.08	4.57	5.36	4.36	158.12	
3,000.00	2.13	209.97	2,999.20	4.12	34.65	3.82	1.25	1.24	4.76	
3,025.00	2.08	206.70	3,024.18	3.31	34.22	3.02	0.52	-0.20	-13.08	
3,050.00	2.06	208.46	3,049.17	2.51	33.80	2.22	0.27	-0.08	7.04	
3,075.00	2.13	209.57	3,074.15	1.71	33.36	1.43	0.32	0.28	4.44	
3,100.00	2.10	207.58	3,099.13	0.90	32.91	0.62	0.32	-0.12	-7.96	
3,125.00	1.98	197.15	3,124.12	0.08	32.57	-0.19	1.56	-0.48	-41.72	
3,150.00	1.98	207.01	3,149.10	-0.71	32.25	-0.99	1.36	0.00	39.44	
3,175.00	1.96	204.47	3,174.09	-1.49	31.88	-1.76	0.36	-0.08	-10.16	
3,200.00	1.90	206.66	3,199.07	-2.25	31.52	-2.52	0.38	-0.24	8.76	
3,225.00	1.79	207.85	3,224.06	-2.96	31.15	-3.23	0.47	-0.44	4.76	
3,250.00	1.89	208.08	3,249.05	-3.67	30.77	-3.93	0.40	0.40	0.92	
3,275.00	1.75	212.42	3,274.04	-4.36	30.37	-4.62	0.79	-0.56	17.36	
3,300.00	1.70	211.30	3,299.03	-5.00	29.97	-5.25	0.24	-0.20	-4.48	
3,325.00	1.78	213.66	3,324.01	-5.64	29.57	-5.89	0.43	0.32	9.44	
3,350.00	1.63	217.59	3,349.00	-6.24	29.13	-6.49	0.76	-0.60	15.72	
3,375.00	1.65	228.96	3,373.99	-6.76	28.65	-7.00	1.30	0.08	45.48	
3,400.00	1.72	226.74	3,398.98	-7.25	28.10	-7.49	0.38	0.28	-8.88	
3,425.00	1.77	231.41	3,423.97	-7.75	27.53	-7.99	0.60	0.20	18.68	
3,450.00	1.78	234.16	3,448.96	-8.22	26.91	-8.45	0.34	0.04	11.00	
3,475.00	1.87	238.08	3,473.95	-8.66	26.25	-8.89	0.62	0.36	15.68	
3,500.00	2.00	241.39	3,498.93	-9.09	25.52	-9.30	0.69	0.52	13.24	
3,525.00	2.12	245.09	3,523.91	-9.49	24.72	-9.70	0.72	0.48	14.80	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
3,550.00	2.40	246.80	3,548.90	-9.89	23.82	-10.09	1.15	1.12	6.84	
3,575.00	2.70	244.64	3,573.87	-10.35	22.80	-10.54	1.26	1.20	-8.64	
3,600.00	2.72	246.54	3,598.84	-10.84	21.73	-11.02	0.37	0.08	7.60	
3,625.00	3.01	245.00	3,623.81	-11.35	20.59	-11.53	1.20	1.16	-6.16	
3,650.00	2.91	248.34	3,648.78	-11.86	19.40	-12.03	0.80	-0.40	13.36	
3,675.00	2.94	247.44	3,673.75	-12.34	18.22	-12.50	0.22	0.12	-3.60	
3,700.00	3.03	244.12	3,698.71	-12.88	17.04	-13.02	0.78	0.36	-13.28	
3,725.00	3.01	246.40	3,723.68	-13.43	15.84	-13.56	0.49	-0.08	9.12	
3,750.00	2.88	237.71	3,748.64	-14.03	14.71	-14.15	1.86	-0.52	-34.76	
3,775.00	2.89	234.84	3,773.61	-14.73	13.66	-14.84	0.58	0.04	-11.48	
3,800.00	2.34	222.93	3,798.59	-15.46	12.80	-15.57	3.08	-2.20	-47.64	
3,825.00	1.80	184.58	3,823.57	-16.23	12.42	-16.33	5.81	-2.16	-153.40	
3,850.00	1.93	169.53	3,848.56	-17.03	12.46	-17.14	2.02	0.52	-60.20	
3,875.00	2.19	142.00	3,873.54	-17.82	12.83	-17.93	4.05	1.04	-110.12	
3,900.00	2.77	121.78	3,898.52	-18.52	13.64	-18.63	4.16	2.32	-80.88	
3,925.00	3.54	111.49	3,923.48	-19.12	14.87	-19.25	3.81	3.08	-41.16	
3,950.00	4.26	105.02	3,948.42	-19.64	16.49	-19.78	3.37	2.88	-25.88	
3,975.00	4.66	101.87	3,973.35	-20.09	18.38	-20.25	1.88	1.60	-12.60	
4,000.00	5.07	99.52	3,998.26	-20.48	20.46	-20.66	1.82	1.64	-9.40	
4,025.00	5.18	99.08	4,023.16	-20.84	22.67	-21.04	0.47	0.44	-1.76	
4,050.00	5.22	99.01	4,048.05	-21.20	24.90	-21.41	0.16	0.16	-0.28	
4,075.00	5.15	98.61	4,072.95	-21.55	27.14	-21.78	0.32	-0.28	-1.60	
4,100.00	4.10	103.27	4,097.87	-21.92	29.12	-22.17	4.46	-4.20	18.64	
4,125.00	2.92	108.58	4,122.82	-22.33	30.59	-22.59	4.89	-4.72	21.24	
4,150.00	2.62	111.53	4,147.79	-22.74	31.72	-23.01	1.33	-1.20	11.80	
4,175.00	2.66	113.72	4,172.77	-23.18	32.79	-23.46	0.43	0.16	8.76	
4,200.00	2.53	110.94	4,197.74	-23.61	33.83	-23.90	0.72	-0.52	-11.12	
4,225.00	2.67	113.32	4,222.72	-24.04	34.88	-24.34	0.71	0.56	9.52	
4,250.00	2.67	112.25	4,247.69	-24.49	35.96	-24.80	0.20	0.00	-4.28	
4,275.00	2.14	118.49	4,272.67	-24.94	36.91	-25.25	2.36	-2.12	24.96	
4,300.00	1.25	142.70	4,297.66	-25.38	37.48	-25.69	4.49	-3.56	96.84	
4,325.00	0.98	174.47	4,322.65	-25.80	37.67	-26.13	2.65	-1.08	127.08	
4,350.00	0.96	173.69	4,347.65	-26.23	37.71	-26.55	0.10	-0.08	-3.12	
4,375.00	0.99	172.45	4,372.64	-26.65	37.76	-26.97	0.15	0.12	-4.96	
4,400.00	1.00	174.51	4,397.64	-27.08	37.81	-27.40	0.15	0.04	8.24	
4,425.00	1.09	173.21	4,422.64	-27.53	37.86	-27.86	0.37	0.36	-5.20	
4,450.00	0.83	172.32	4,447.63	-27.95	37.91	-28.27	1.04	-1.04	-3.56	
4,475.00	0.97	173.24	4,472.63	-28.34	37.96	-28.66	0.56	0.56	3.68	
4,500.00	1.04	170.70	4,497.63	-28.77	38.02	-29.10	0.33	0.28	-10.16	
4,525.00	1.12	164.02	4,522.62	-29.23	38.13	-29.56	0.60	0.32	-26.72	
4,550.00	1.03	161.88	4,547.62	-29.68	38.27	-30.01	0.39	-0.36	-8.56	
4,575.00	1.15	157.70	4,572.61	-30.12	38.43	-30.45	0.58	0.48	-16.72	
4,600.00	1.07	152.72	4,597.61	-30.56	38.63	-30.89	0.50	-0.32	-19.92	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
4,625.00	1.02	149.73	4,622.60	-30.96	38.85	-31.30	0.30	-0.20	-11.96	
4,650.00	0.84	154.05	4,647.60	-31.32	39.04	-31.65	0.77	-0.72	17.28	
4,675.00	0.19	158.71	4,672.60	-31.52	39.14	-31.86	2.60	-2.60	18.64	
4,700.00	0.28	328.01	4,697.60	-31.51	39.12	-31.84	1.87	0.36	677.20	
4,725.00	0.38	332.75	4,722.60	-31.39	39.05	-31.72	0.41	0.40	18.96	
4,750.00	0.46	337.31	4,747.60	-31.22	38.98	-31.55	0.35	0.32	18.24	
4,775.00	0.54	331.30	4,772.60	-31.02	38.88	-31.35	0.38	0.32	-24.04	
4,800.00	0.60	324.87	4,797.60	-30.81	38.75	-31.14	0.35	0.24	-25.72	
4,825.00	0.45	340.18	4,822.60	-30.61	38.64	-30.94	0.82	-0.60	61.24	
4,850.00	0.58	339.46	4,847.59	-30.40	38.56	-30.73	0.52	0.52	-2.88	
4,875.00	0.54	328.55	4,872.59	-30.18	38.46	-30.51	0.45	-0.16	-43.64	
4,900.00	0.48	317.69	4,897.59	-30.01	38.32	-30.33	0.45	-0.24	-43.44	
4,925.00	0.49	322.77	4,922.59	-29.84	38.19	-30.17	0.18	0.04	20.32	
4,950.00	0.42	335.68	4,947.59	-29.67	38.09	-30.00	0.49	-0.28	51.64	
4,975.00	0.60	333.30	4,972.59	-29.47	37.99	-29.80	0.72	0.72	-9.52	
5,000.00	0.49	326.46	4,997.59	-29.27	37.87	-29.59	0.51	-0.44	-27.36	
5,025.00	0.53	327.51	5,022.59	-29.08	37.75	-29.40	0.16	0.16	4.20	
5,050.00	0.58	331.06	5,047.59	-28.87	37.63	-29.19	0.24	0.20	14.20	
5,075.00	0.61	336.00	5,072.58	-28.64	37.51	-28.96	0.24	0.12	19.76	
5,100.00	0.59	333.75	5,097.58	-28.40	37.40	-28.72	0.12	-0.08	-9.00	
5,125.00	0.58	339.94	5,122.58	-28.17	37.30	-28.49	0.26	-0.04	24.76	
5,150.00	0.62	335.86	5,147.58	-27.93	37.20	-28.24	0.23	0.16	-16.32	
5,175.00	0.56	333.44	5,172.58	-27.69	37.09	-28.01	0.26	-0.24	-9.68	
5,200.00	0.60	338.92	5,197.58	-27.46	36.99	-27.78	0.27	0.16	21.92	
5,225.00	0.86	315.82	5,222.58	-27.21	36.81	-27.52	1.55	1.04	-92.40	
5,250.00	1.24	300.69	5,247.57	-26.93	36.45	-27.24	1.87	1.52	-60.52	
5,275.00	1.21	298.57	5,272.57	-26.67	35.98	-26.98	0.22	-0.12	-8.48	
5,300.00	1.49	298.75	5,297.56	-26.39	35.47	-26.69	1.12	1.12	0.72	
5,325.00	1.54	286.57	5,322.55	-26.13	34.86	-26.43	1.30	0.20	-48.72	
5,350.00	1.54	270.39	5,347.54	-26.04	34.20	-26.33	1.73	0.00	-64.72	
5,375.00	1.57	270.08	5,372.53	-26.03	33.52	-26.32	0.12	0.12	-1.24	
5,400.00	1.60	269.81	5,397.52	-26.03	32.83	-26.31	0.12	0.12	-1.08	
5,425.00	1.60	274.31	5,422.51	-26.01	32.14	-26.28	0.50	0.00	18.00	
5,450.00	1.63	269.21	5,447.50	-25.99	31.43	-26.26	0.59	0.12	-20.40	
5,475.00	1.62	268.39	5,472.49	-26.00	30.72	-26.27	0.10	-0.04	-3.28	
5,500.00	1.54	270.15	5,497.48	-26.01	30.03	-26.27	0.37	-0.32	7.04	
5,525.00	1.52	248.80	5,522.48	-26.13	29.39	-26.38	2.27	-0.08	-85.40	
5,550.00	1.55	243.83	5,547.47	-26.40	28.78	-26.65	0.55	0.12	-19.88	
5,575.00	1.54	243.25	5,572.46	-26.70	28.17	-26.94	0.07	-0.04	-2.32	
5,600.00	1.68	238.08	5,597.45	-27.05	27.56	-27.28	0.81	0.56	-20.68	
5,625.00	2.10	218.50	5,622.43	-27.60	26.97	-27.83	3.06	1.68	-78.32	
5,650.00	2.54	211.83	5,647.41	-28.43	26.39	-28.65	2.06	1.76	-26.68	
5,675.00	2.27	214.02	5,672.39	-29.31	25.82	-29.53	1.14	-1.08	8.76	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
5,700.00	2.94	209.64	5,697.37	-30.28	25.23	-30.49	2.79	2.68	-17.52	
5,725.00	2.83	209.70	5,722.33	-31.37	24.60	-31.58	0.44	-0.44	0.24	
5,750.00	2.66	207.27	5,747.30	-32.42	24.03	-32.63	0.82	-0.68	-9.72	
5,775.00	2.70	210.60	5,772.28	-33.44	23.47	-33.64	0.64	0.16	13.32	
5,800.00	2.69	210.71	5,797.25	-34.45	22.87	-34.65	0.05	-0.04	0.44	
5,825.00	2.76	209.79	5,822.22	-35.48	22.27	-35.67	0.33	0.28	-3.68	
5,850.00	2.87	195.63	5,847.19	-36.61	21.80	-36.79	2.81	0.44	-56.64	
5,875.00	2.75	211.04	5,872.16	-37.72	21.32	-37.90	3.05	-0.48	61.64	
5,900.00	2.81	210.16	5,897.13	-38.77	20.70	-38.94	0.29	0.24	-3.52	
5,925.00	2.83	210.83	5,922.10	-39.83	20.08	-40.00	0.15	0.08	2.68	
5,950.00	2.79	208.44	5,947.07	-40.89	19.47	-41.06	0.50	-0.16	-9.56	
5,975.00	2.76	209.07	5,972.04	-41.95	18.89	-42.11	0.17	-0.12	2.52	
6,000.00	2.79	209.67	5,997.01	-43.01	18.30	-43.16	0.17	0.12	2.40	
6,025.00	2.73	208.46	6,021.98	-44.06	17.71	-44.21	0.33	-0.24	-4.84	
6,050.00	2.62	207.37	6,046.96	-45.09	17.17	-45.24	0.48	-0.44	-4.36	
6,075.00	2.63	205.34	6,071.93	-46.12	16.66	-46.26	0.37	0.04	-8.12	
6,100.00	2.57	204.00	6,096.91	-47.15	16.19	-47.28	0.34	-0.24	-5.36	
6,125.00	2.65	202.83	6,121.88	-48.19	15.73	-48.32	0.38	0.32	-4.68	
6,150.00	2.56	203.47	6,146.85	-49.24	15.29	-49.36	0.38	-0.36	2.56	
6,175.00	2.53	203.71	6,171.83	-50.25	14.84	-50.38	0.13	-0.12	0.96	
6,200.00	2.54	199.39	6,196.80	-51.28	14.44	-51.40	0.77	0.04	-17.28	
6,225.00	2.51	201.49	6,221.78	-52.31	14.05	-52.43	0.39	-0.12	8.40	
6,250.00	2.49	199.34	6,246.76	-53.33	13.67	-53.45	0.38	-0.08	-8.60	
6,275.00	2.45	197.85	6,271.73	-54.36	13.33	-54.47	0.30	-0.16	-5.96	
6,300.00	2.54	196.61	6,296.71	-55.40	13.01	-55.50	0.42	0.36	-4.96	
6,325.00	2.49	197.36	6,321.69	-56.44	12.69	-56.55	0.24	-0.20	3.00	
6,350.00	2.41	199.40	6,346.66	-57.46	12.35	-57.56	0.47	-0.32	8.16	
6,375.00	2.41	193.35	6,371.64	-58.47	12.05	-58.57	1.02	0.00	-24.20	
6,400.00	2.43	193.85	6,396.62	-59.49	11.81	-59.59	0.12	0.08	2.00	
6,425.00	2.45	193.93	6,421.60	-60.52	11.55	-60.62	0.08	0.08	0.32	
6,450.00	2.50	190.29	6,446.57	-61.58	11.32	-61.67	0.66	0.20	-14.56	
6,475.00	2.40	188.55	6,471.55	-62.63	11.15	-62.73	0.50	-0.40	-6.96	
6,500.00	2.38	186.38	6,496.53	-63.67	11.01	-63.76	0.37	-0.08	-8.68	
6,525.00	2.44	186.79	6,521.51	-64.71	10.89	-64.80	0.25	0.24	1.64	
6,550.00	2.35	184.68	6,546.48	-65.75	10.79	-65.84	0.50	-0.36	-8.44	
6,575.00	2.44	184.47	6,571.46	-66.79	10.70	-66.88	0.36	0.36	-0.84	
6,600.00	2.39	183.93	6,596.44	-67.84	10.63	-67.93	0.22	-0.20	-2.16	
6,625.00	2.46	183.80	6,621.42	-68.90	10.56	-68.99	0.28	0.28	-0.52	
6,650.00	2.55	180.94	6,646.39	-69.99	10.51	-70.08	0.62	0.36	-11.44	
6,675.00	2.79	179.03	6,671.37	-71.15	10.51	-71.24	1.02	0.96	-7.64	
6,700.00	3.02	178.33	6,696.33	-72.42	10.54	-72.51	0.93	0.92	-2.80	
6,725.00	3.04	178.84	6,721.30	-73.74	10.57	-73.83	0.13	0.08	2.04	
6,750.00	3.05	179.25	6,746.26	-75.07	10.60	-75.16	0.10	0.04	1.64	
6,775.00	2.97	176.33	6,771.23	-76.38	10.65	-76.47	0.69	-0.32	-11.68	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
6,800.00	3.02	177.97	6,796.20	-77.69	10.71	-77.77	0.40	0.20	6.56	
6,825.00	3.00	178.67	6,821.16	-79.00	10.75	-79.09	0.17	-0.08	2.80	
6,850.00	3.04	177.65	6,846.13	-80.31	10.79	-80.40	0.27	0.16	-4.08	
6,875.00	3.04	177.85	6,871.09	-81.64	10.84	-81.73	0.04	0.00	0.80	
6,900.00	3.05	176.75	6,896.06	-82.97	10.91	-83.06	0.24	0.04	-4.40	
6,925.00	3.16	168.70	6,921.02	-84.31	11.08	-84.40	1.80	0.44	-32.20	
6,950.00	3.07	176.75	6,945.98	-85.65	11.25	-85.74	1.78	-0.36	32.20	
6,975.00	3.02	175.66	6,970.95	-86.97	11.34	-87.07	0.31	-0.20	-4.36	
7,000.00	2.93	174.71	6,995.91	-88.27	11.45	-88.36	0.41	-0.36	-3.80	
7,025.00	2.94	175.21	7,020.88	-89.54	11.56	-89.64	0.11	0.04	2.00	
7,050.00	2.79	173.76	7,045.85	-90.79	11.68	-90.88	0.67	-0.60	-5.80	
7,075.00	2.82	171.58	7,070.82	-92.00	11.84	-92.10	0.44	0.12	-8.72	
7,100.00	2.78	171.76	7,095.79	-93.21	12.01	-93.31	0.16	-0.16	0.72	
7,125.00	2.72	174.16	7,120.76	-94.40	12.16	-94.50	0.52	-0.24	9.60	
7,150.00	2.81	172.60	7,145.73	-95.60	12.30	-95.70	0.47	0.36	-6.24	
7,175.00	2.80	173.41	7,170.70	-96.81	12.45	-96.91	0.16	-0.04	3.24	
7,200.00	2.72	172.53	7,195.67	-98.00	12.60	-98.11	0.36	-0.32	-3.52	
7,225.00	3.54	178.89	7,220.64	-99.36	12.69	-99.47	3.56	3.28	25.44	
7,250.00	4.44	180.57	7,245.57	-101.10	12.69	-101.21	3.63	3.60	6.72	
7,275.00	4.61	181.44	7,270.50	-103.08	12.66	-103.18	0.73	0.68	3.48	
7,300.00	4.64	181.38	7,295.42	-105.09	12.61	-105.19	0.12	0.12	-0.24	
7,325.00	4.70	181.44	7,320.33	-107.13	12.56	-107.23	0.24	0.24	0.24	
7,350.00	4.73	180.88	7,345.25	-109.18	12.52	-109.28	0.22	0.12	-2.24	
7,375.00	4.72	180.67	7,370.16	-111.24	12.49	-111.34	0.08	-0.04	-0.84	
7,400.00	4.66	180.65	7,395.08	-113.28	12.47	-113.39	0.24	-0.24	-0.08	
7,425.00	4.65	180.99	7,420.00	-115.31	12.44	-115.41	0.12	-0.04	1.36	
7,450.00	4.62	180.66	7,444.91	-117.33	12.41	-117.43	0.16	-0.12	-1.32	
7,475.00	4.59	180.00	7,469.83	-119.34	12.40	-119.44	0.24	-0.12	-2.64	
7,500.00	4.73	177.68	7,494.75	-121.37	12.44	-121.47	0.94	0.56	-9.28	
7,525.00	4.59	181.12	7,519.67	-123.40	12.46	-123.50	1.25	-0.56	13.76	
7,550.00	4.53	179.92	7,544.59	-125.39	12.44	-125.49	0.45	-0.24	-4.80	
7,575.00	4.57	179.98	7,569.51	-127.37	12.44	-127.47	0.16	0.16	0.24	
7,600.00	4.62	179.74	7,594.43	-129.37	12.45	-129.47	0.21	0.20	-0.96	
7,625.00	4.57	179.52	7,619.35	-131.38	12.46	-131.48	0.21	-0.20	-0.88	
7,650.00	4.63	179.98	7,644.27	-133.38	12.47	-133.48	0.28	0.24	1.84	
7,675.00	4.53	179.20	7,669.19	-135.38	12.49	-135.48	0.47	-0.40	-3.12	
7,700.00	4.42	178.68	7,694.11	-137.33	12.52	-137.43	0.47	-0.44	-2.08	
7,725.00	4.35	177.69	7,719.04	-139.24	12.58	-139.34	0.41	-0.28	-3.96	
7,750.00	4.35	177.03	7,743.97	-141.13	12.67	-141.23	0.20	0.00	-2.64	
7,775.00	4.18	176.39	7,768.90	-142.99	12.78	-143.09	0.71	-0.68	-2.56	
7,800.00	3.91	175.14	7,793.84	-144.75	12.91	-144.85	1.14	-1.08	-5.00	
7,825.00	3.78	173.85	7,818.78	-146.41	13.07	-146.52	0.62	-0.52	-5.16	
7,850.00	3.63	172.94	7,843.73	-148.02	13.25	-148.13	0.64	-0.60	-3.64	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
7,875.00	3.70	167.12	7,868.68	-149.59	13.53	-149.70	1.51	0.28	-23.28	
7,900.00	3.37	168.57	7,893.63	-151.10	13.85	-151.21	1.37	-1.32	5.80	
7,925.00	3.20	166.89	7,918.59	-152.50	14.16	-152.61	0.78	-0.68	-6.72	
7,950.00	3.06	164.53	7,943.55	-153.82	14.49	-153.94	0.76	-0.56	-9.44	
7,975.00	3.00	164.44	7,968.52	-155.09	14.85	-155.22	0.24	-0.24	-0.36	
8,000.00	2.90	163.29	7,993.48	-156.33	15.20	-156.45	0.46	-0.40	-4.60	
8,025.00	2.90	163.30	8,018.45	-157.54	15.57	-157.67	0.00	0.00	0.04	
8,050.00	2.92	163.74	8,043.42	-158.76	15.93	-158.89	0.12	0.08	1.76	
8,075.00	2.92	170.61	8,068.39	-160.00	16.21	-160.13	1.40	0.00	27.48	
8,100.00	2.82	180.64	8,093.36	-161.24	16.31	-161.37	2.05	-0.40	40.12	
8,125.00	2.91	180.82	8,118.32	-162.49	16.29	-162.62	0.36	0.36	0.72	
8,150.00	2.88	179.70	8,143.29	-163.75	16.29	-163.89	0.26	-0.12	-4.48	
8,175.00	2.78	178.37	8,168.26	-164.99	16.31	-165.12	0.48	-0.40	-5.32	
8,200.00	2.67	176.18	8,193.23	-166.17	16.36	-166.31	0.61	-0.44	-8.76	
8,225.00	2.72	176.57	8,218.21	-167.35	16.44	-167.48	0.21	0.20	1.56	
8,250.00	2.77	177.60	8,243.18	-168.54	16.50	-168.68	0.28	0.20	4.12	
8,275.00	3.67	192.56	8,268.14	-169.93	16.35	-170.06	4.90	3.60	59.84	
8,300.00	3.89	195.04	8,293.08	-171.53	15.95	-171.66	1.10	0.88	9.92	
8,325.00	3.86	195.10	8,318.03	-173.16	15.52	-173.29	0.12	-0.12	0.24	
8,350.00	3.84	194.95	8,342.97	-174.78	15.08	-174.90	0.09	-0.08	-0.60	
8,375.00	3.64	195.51	8,367.92	-176.35	14.65	-176.47	0.81	-0.80	2.24	
8,400.00	3.50	194.62	8,392.87	-177.86	14.25	-177.97	0.60	-0.56	-3.56	
8,425.00	3.32	194.39	8,417.82	-179.30	13.87	-179.41	0.72	-0.72	-0.92	
8,450.00	3.15	193.38	8,442.78	-180.67	13.54	-180.77	0.72	-0.68	-4.04	
8,475.00	3.15	192.90	8,467.75	-182.00	13.22	-182.11	0.11	0.00	-1.92	
8,500.00	2.96	191.11	8,492.71	-183.31	12.95	-183.41	0.85	-0.76	-7.16	
8,525.00	2.95	190.22	8,517.68	-184.57	12.71	-184.67	0.19	-0.04	-3.56	
8,550.00	2.82	190.16	8,542.65	-185.81	12.48	-185.91	0.52	-0.52	-0.24	
8,575.00	2.78	186.85	8,567.62	-187.02	12.30	-187.12	0.67	-0.16	-13.24	
8,600.00	2.66	185.40	8,592.59	-188.20	12.18	-188.30	0.55	-0.48	-5.80	
8,625.00	2.67	187.61	8,617.56	-189.35	12.05	-189.45	0.41	0.04	8.84	
8,650.00	3.11	189.23	8,642.53	-190.60	11.86	-190.69	1.79	1.76	6.48	
8,675.00	3.49	188.93	8,667.49	-192.02	11.63	-192.11	1.52	1.52	-1.20	
8,700.00	3.43	190.56	8,692.44	-193.51	11.38	-193.60	0.46	-0.24	6.52	
8,725.00	3.46	188.52	8,717.40	-194.99	11.13	-195.08	0.50	0.12	-8.16	
8,750.00	3.06	187.84	8,742.36	-196.40	10.93	-196.48	1.61	-1.60	-2.72	
8,775.00	2.86	185.56	8,767.32	-197.68	10.77	-197.76	0.93	-0.80	-9.12	
8,800.00	2.71	184.39	8,792.29	-198.89	10.67	-198.97	0.64	-0.60	-4.68	
8,825.00	2.48	183.03	8,817.27	-200.02	10.59	-200.10	0.95	-0.92	-5.44	
8,850.00	2.10	181.32	8,842.25	-201.01	10.56	-201.10	1.54	-1.52	-6.84	
8,875.00	2.05	180.90	8,867.23	-201.92	10.54	-202.00	0.21	-0.20	-1.68	
8,900.00	2.02	176.62	8,892.22	-202.81	10.56	-202.89	0.62	-0.12	-17.12	
8,925.00	2.19	178.50	8,917.20	-203.72	10.60	-203.81	0.73	0.68	7.52	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
8,950.00	2.41	181.09	8,942.18	-204.73	10.60	-204.81	0.97	0.88	10.36	
8,975.00	2.46	181.18	8,967.16	-205.79	10.58	-205.87	0.20	0.20	0.36	
9,000.00	2.47	181.61	8,992.13	-206.86	10.55	-206.95	0.08	0.04	1.72	
9,025.00	2.40	179.84	9,017.11	-207.93	10.54	-208.01	0.41	-0.28	-7.08	
9,050.00	2.40	176.93	9,042.09	-208.97	10.57	-209.05	0.49	0.00	-11.64	
9,075.00	2.40	177.11	9,067.07	-210.02	10.62	-210.10	0.03	0.00	0.72	
9,100.00	2.38	176.91	9,092.04	-211.06	10.68	-211.14	0.09	-0.08	-0.80	
9,125.00	3.30	181.00	9,117.01	-212.30	10.69	-212.38	3.77	3.68	16.36	
9,150.00	3.78	183.05	9,141.97	-213.84	10.63	-213.92	1.99	1.92	8.20	
9,175.00	3.79	183.30	9,166.91	-215.49	10.54	-215.57	0.08	0.04	1.00	
9,200.00	3.79	182.93	9,191.86	-217.14	10.45	-217.22	0.10	0.00	-1.48	
9,225.00	3.67	183.27	9,216.80	-218.76	10.37	-218.84	0.49	-0.48	1.36	
9,250.00	3.44	182.51	9,241.76	-220.31	10.29	-220.39	0.94	-0.92	-3.04	
9,275.00	3.21	182.64	9,266.71	-221.76	10.22	-221.84	0.92	-0.92	0.52	
9,300.00	3.02	184.60	9,291.68	-223.11	10.14	-223.19	0.87	-0.76	7.84	
9,325.00	2.96	184.83	9,316.64	-224.41	10.03	-224.49	0.24	-0.24	0.92	
9,350.00	2.93	185.55	9,341.61	-225.69	9.91	-225.77	0.19	-0.12	2.88	
9,375.00	2.72	186.73	9,366.58	-226.92	9.78	-226.99	0.87	-0.84	4.72	
9,400.00	2.48	188.11	9,391.55	-228.04	9.64	-228.12	0.99	-0.96	5.52	
9,425.00	2.21	192.91	9,416.53	-229.05	9.45	-229.12	1.33	-1.08	19.20	
9,450.00	2.27	193.22	9,441.51	-230.00	9.23	-230.07	0.24	0.24	1.24	
9,475.00	1.90	197.10	9,466.50	-230.88	9.00	-230.95	1.58	-1.48	15.52	
9,500.00	1.88	196.75	9,491.48	-231.67	8.76	-231.73	0.09	-0.08	-1.40	
9,525.00	1.74	193.13	9,516.47	-232.43	8.55	-232.49	0.72	-0.56	-14.48	
9,550.00	1.65	198.56	9,541.46	-233.14	8.35	-233.20	0.74	-0.36	21.72	
9,575.00	1.63	200.50	9,566.45	-233.81	8.11	-233.87	0.24	-0.08	7.76	
9,600.00	1.55	199.37	9,591.44	-234.46	7.88	-234.52	0.34	-0.32	-4.52	
9,625.00	1.52	202.77	9,616.43	-235.09	7.63	-235.15	0.38	-0.12	13.60	
9,650.00	1.51	203.46	9,641.42	-235.70	7.38	-235.75	0.08	-0.04	2.76	
9,675.00	1.49	206.75	9,666.41	-236.29	7.10	-236.34	0.35	-0.08	13.16	
9,700.00	1.52	197.23	9,691.40	-236.90	6.85	-236.95	1.01	0.12	-38.08	
9,725.00	1.46	204.00	9,716.40	-237.50	6.63	-237.55	0.74	-0.24	27.08	
9,750.00	1.52	210.98	9,741.39	-238.08	6.33	-238.13	0.76	0.24	27.92	
9,775.00	1.47	215.39	9,766.38	-238.63	5.97	-238.67	0.50	-0.20	17.64	
9,800.00	1.56	224.00	9,791.37	-239.13	5.55	-239.17	0.98	0.36	34.44	
9,825.00	1.41	224.36	9,816.36	-239.60	5.10	-239.63	0.60	-0.60	1.44	
9,850.00	1.38	222.31	9,841.35	-240.04	4.68	-240.07	0.23	-0.12	-8.20	
9,875.00	1.34	224.47	9,866.35	-240.47	4.27	-240.50	0.26	-0.16	8.64	
9,900.00	1.33	224.94	9,891.34	-240.88	3.86	-240.91	0.06	-0.04	1.88	
9,925.00	1.61	226.41	9,916.33	-241.33	3.40	-241.35	1.13	1.12	5.88	
9,950.00	1.81	235.49	9,941.32	-241.80	2.82	-241.81	1.34	0.80	36.32	
9,975.00	1.91	241.33	9,966.31	-242.22	2.13	-242.23	0.86	0.40	23.36	
10,000.00	2.05	242.98	9,991.29	-242.62	1.37	-242.63	0.60	0.56	6.60	
10,025.00	2.38	248.65	10,016.28	-243.02	0.49	-243.01	1.58	1.32	22.68	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
10,050.00	2.43	247.45	10,041.25	-243.41	-0.49	-243.40	0.28	0.20	-4.80	
10,075.00	2.57	251.58	10,066.23	-243.79	-1.51	-243.77	0.91	0.56	16.52	
10,100.00	2.62	251.49	10,091.20	-244.15	-2.58	-244.12	0.20	0.20	-0.36	
10,125.00	2.64	254.80	10,116.18	-244.48	-3.68	-244.44	0.61	0.08	13.24	
10,150.00	2.63	254.14	10,141.15	-244.79	-4.79	-244.74	0.13	-0.04	-2.64	
10,175.00	2.66	254.95	10,166.12	-245.09	-5.90	-245.04	0.19	0.12	3.24	
10,200.00	2.45	256.81	10,191.10	-245.37	-6.98	-245.30	0.90	-0.84	7.44	
10,225.00	2.22	259.35	10,216.08	-245.58	-7.98	-245.50	1.01	-0.92	10.16	
10,250.00	2.03	260.96	10,241.06	-245.74	-8.89	-245.65	0.80	-0.76	6.44	
10,275.00	1.87	263.66	10,266.05	-245.85	-9.73	-245.76	0.74	-0.64	10.80	
10,300.00	1.77	262.58	10,291.03	-245.95	-10.52	-245.85	0.42	-0.40	-4.32	
10,325.00	1.71	262.07	10,316.02	-246.05	-11.27	-245.94	0.25	-0.24	-2.04	
10,350.00	1.46	242.17	10,341.01	-246.25	-11.92	-246.14	2.40	-1.00	-79.60	
10,375.00	1.85	192.63	10,366.00	-246.79	-12.29	-246.68	5.72	1.56	-198.16	
10,400.00	2.13	186.48	10,390.99	-247.65	-12.43	-247.53	1.41	1.12	-24.60	
10,425.00	2.26	183.64	10,415.97	-248.60	-12.52	-248.48	0.68	0.52	-11.36	
10,450.00	2.77	177.84	10,440.95	-249.70	-12.53	-249.58	2.28	2.04	-23.20	
10,475.00	3.33	171.99	10,465.91	-251.02	-12.40	-250.90	2.56	2.24	-23.40	
10,500.00	3.50	172.92	10,490.87	-252.49	-12.21	-252.38	0.72	0.68	3.72	
10,525.00	3.52	171.60	10,515.82	-254.01	-12.00	-253.90	0.33	0.08	-5.28	
10,550.00	3.56	170.32	10,540.77	-255.54	-11.76	-255.43	0.35	0.16	-5.12	
10,575.00	3.52	167.75	10,565.72	-257.05	-11.47	-256.94	0.65	-0.16	-10.28	
10,600.00	3.51	165.06	10,590.68	-258.54	-11.10	-258.44	0.66	-0.04	-10.76	
10,625.00	3.54	163.31	10,615.63	-260.02	-10.69	-259.92	0.45	0.12	-7.00	
10,650.00	3.53	163.08	10,640.58	-261.49	-10.24	-261.40	0.07	-0.04	-0.92	
10,675.00	3.45	160.38	10,665.54	-262.94	-9.76	-262.85	0.73	-0.32	-10.80	
10,700.00	3.40	157.57	10,690.49	-264.33	-9.23	-264.24	0.70	-0.20	-11.24	
10,725.00	3.45	156.41	10,715.45	-265.71	-8.64	-265.62	0.34	0.20	-4.64	
10,736.00	3.34	154.94	10,726.43	-266.30	-8.38	-266.22	1.28	-1.00	-13.36	
10,803.00	3.08	153.05	10,793.32	-269.67	-6.73	-269.61	0.42	-0.39	-2.82	
10,898.00	2.80	155.33	10,888.20	-274.06	-4.61	-274.01	0.32	-0.29	2.40	
10,992.00	3.00	191.44	10,982.08	-278.56	-4.14	-278.51	1.92	0.21	38.41	
11,086.00	3.79	210.16	11,075.92	-283.65	-6.19	-283.59	1.44	0.84	19.91	
11,181.00	4.16	202.35	11,170.69	-289.55	-9.07	-289.47	0.69	0.39	-8.22	
11,275.00	4.78	176.18	11,264.42	-296.62	-10.11	-296.52	2.25	0.66	-27.84	
11,369.00	5.23	175.20	11,358.06	-304.79	-9.49	-304.70	0.49	0.48	-1.04	
11,463.00	4.77	183.24	11,451.70	-312.96	-9.35	-312.87	0.89	-0.49	8.55	
11,555.00	4.43	186.38	11,543.41	-320.31	-9.96	-320.22	0.46	-0.37	3.41	
11,565.00	4.40	186.96	11,553.38	-321.08	-10.05	-320.98	0.54	-0.30	5.80	
<b>Tie In - ST01</b>										
11,675.00	3.40	195.41	11,663.12	-328.41	-11.43	-328.30	1.05	-0.91	7.68	
<b>First Gordon MWD Survey - ST01</b>										
11,764.00	2.06	209.84	11,752.02	-332.34	-12.93	-332.22	1.68	-1.51	16.21	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)
11,802.00	4.17	356.38	11,789.99	-331.56	-13.36	-331.43	15.78	5.55	385.63
11,833.00	9.44	4.04	11,820.76	-327.89	-13.25	-327.77	17.21	17.00	24.71
11,865.00	15.24	2.21	11,852.01	-321.07	-12.90	-320.95	18.16	18.13	-5.72
11,896.00	20.27	0.35	11,881.52	-311.62	-12.71	-311.50	16.33	16.23	-6.00
11,927.00	24.12	0.34	11,910.22	-299.91	-12.64	-299.79	12.42	12.42	-0.03
<b>FTP: 11927' MD</b>									
11,959.00	27.02	0.71	11,939.08	-286.10	-12.51	-285.99	9.08	9.06	1.16
12,007.00	31.45	3.00	11,980.96	-262.68	-11.72	-262.57	9.52	9.23	4.77
12,053.00	35.72	2.60	12,019.27	-237.27	-10.48	-237.17	9.30	9.28	-0.87
12,101.00	40.66	0.91	12,056.99	-207.62	-9.60	-207.53	10.52	10.29	-3.52
12,147.00	44.48	0.32	12,090.86	-176.51	-9.27	-176.42	8.35	8.30	-1.28
12,195.00	48.95	359.51	12,123.76	-141.58	-9.33	-141.49	9.39	9.31	-1.69
12,242.00	53.34	358.94	12,153.24	-104.99	-9.83	-104.90	9.39	9.34	-1.21
12,290.00	56.15	0.12	12,180.94	-65.80	-10.15	-65.71	6.19	5.85	2.46
12,336.00	59.03	359.15	12,205.60	-26.97	-10.40	-26.88	6.51	6.26	-2.11
12,384.00	65.60	358.52	12,227.89	15.50	-11.27	15.60	13.74	13.69	-1.31
12,430.00	73.27	359.52	12,244.03	58.53	-12.00	58.63	16.80	16.67	2.17
12,478.00	78.80	359.41	12,255.61	105.09	-12.43	105.19	11.52	11.52	-0.23
12,524.00	82.10	359.03	12,263.24	150.44	-13.05	150.55	7.22	7.17	-0.83
12,559.00	84.86	359.26	12,267.22	185.21	-13.57	185.32	7.91	7.89	0.66
12,654.00	86.95	359.96	12,274.00	279.96	-14.21	280.07	2.32	2.20	0.74
12,749.00	89.97	0.62	12,276.55	374.91	-13.73	375.02	3.25	3.18	0.69
12,843.00	93.42	1.60	12,273.77	468.84	-11.91	468.92	3.82	3.67	1.04
12,937.00	90.82	6.88	12,270.29	562.48	-4.97	562.50	6.26	-2.77	5.62
13,032.00	94.99	4.55	12,265.48	656.85	4.48	656.79	5.03	4.39	-2.45
13,127.00	94.46	4.85	12,257.65	751.21	12.24	751.08	0.64	-0.56	0.32
13,222.00	92.35	1.64	12,252.01	845.88	17.60	845.69	4.04	-2.22	-3.38
13,317.00	91.89	358.86	12,248.50	940.80	18.02	940.61	2.96	-0.48	-2.93
13,411.00	94.94	357.44	12,242.90	1,034.57	14.99	1,034.40	3.58	3.24	-1.51
13,505.00	95.25	357.63	12,234.55	1,128.11	10.96	1,127.98	0.39	0.33	0.20
13,599.00	93.98	356.52	12,226.99	1,221.68	6.18	1,221.58	1.79	-1.35	-1.18
13,694.00	94.48	358.89	12,219.98	1,316.34	2.39	1,316.27	2.54	0.53	2.49
13,788.00	94.94	358.49	12,212.26	1,410.00	0.25	1,409.94	0.65	0.49	-0.43
13,884.00	93.39	358.51	12,205.29	1,505.71	-2.26	1,505.67	1.61	-1.61	0.02
13,979.00	92.03	358.37	12,200.79	1,600.56	-4.84	1,600.55	1.44	-1.43	-0.15
14,074.00	90.46	359.93	12,198.73	1,695.53	-6.25	1,695.52	2.33	-1.65	1.64
14,168.00	89.23	359.45	12,198.98	1,789.52	-6.76	1,789.51	1.40	-1.31	-0.51
14,263.00	88.48	358.90	12,200.88	1,884.49	-8.13	1,884.49	0.98	-0.79	-0.58
14,358.00	89.91	0.11	12,202.22	1,979.48	-8.95	1,979.48	1.97	1.51	1.27
14,453.00	93.90	1.01	12,199.06	2,074.40	-8.02	2,074.39	4.31	4.20	0.95
14,548.00	94.13	0.29	12,192.41	2,169.16	-6.95	2,169.14	0.79	0.24	-0.76
14,642.00	92.44	357.65	12,187.02	2,262.98	-8.64	2,262.97	3.33	-1.80	-2.81
14,737.00	86.64	357.29	12,187.78	2,357.84	-12.83	2,357.86	6.12	-6.11	-0.38
14,832.00	91.58	3.61	12,189.26	2,452.75	-12.08	2,452.76	8.44	5.20	6.65

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
14,927.00	89.97	8.41	12,187.97	2,547.19	-2.13	2,547.11	5.33	-1.69	5.05	
15,021.00	85.44	3.62	12,191.74	2,640.54	7.71	2,640.38	7.01	-4.82	-5.10	
15,116.00	86.65	1.25	12,198.29	2,735.22	11.73	2,735.02	2.80	1.27	-2.49	
15,212.00	88.21	359.84	12,202.60	2,831.12	12.64	2,830.90	2.19	1.63	-1.47	
15,306.00	93.87	359.49	12,200.89	2,925.06	12.10	2,924.85	6.03	6.02	-0.37	
15,401.00	93.13	358.73	12,195.09	3,019.87	10.62	3,019.67	1.12	-0.78	-0.80	
15,495.00	93.86	358.45	12,189.36	3,113.67	8.31	3,113.48	0.83	0.78	-0.30	
15,590.00	90.36	354.76	12,185.86	3,208.40	2.69	3,208.26	5.35	-3.68	-3.88	
15,685.00	88.76	356.58	12,186.59	3,303.12	-4.48	3,303.04	2.55	-1.68	1.92	
15,780.00	88.35	358.17	12,188.99	3,397.99	-8.83	3,397.94	1.73	-0.43	1.67	
15,875.00	88.37	357.42	12,191.71	3,492.88	-12.48	3,492.86	0.79	0.02	-0.79	
15,969.00	87.84	358.30	12,194.82	3,586.76	-15.99	3,586.77	1.09	-0.56	0.94	
16,063.00	92.25	0.61	12,194.74	3,680.73	-16.89	3,680.74	5.30	4.69	2.46	
16,159.00	92.70	0.39	12,190.60	3,776.63	-16.05	3,776.63	0.52	0.47	-0.23	
16,253.00	90.54	358.85	12,187.94	3,870.59	-16.67	3,870.59	2.82	-2.30	-1.64	
16,348.00	90.93	358.18	12,186.72	3,965.55	-19.14	3,965.56	0.82	0.41	-0.71	
16,449.00	93.31	358.11	12,182.99	4,066.42	-22.40	4,066.46	2.36	2.36	-0.07	
16,544.00	91.94	0.01	12,178.63	4,161.30	-23.96	4,161.35	2.46	-1.44	2.00	
16,638.00	90.12	359.40	12,176.94	4,255.28	-24.44	4,255.33	2.04	-1.94	-0.65	
16,733.00	88.41	357.00	12,178.16	4,350.21	-27.43	4,350.29	3.10	-1.80	-2.53	
16,828.00	88.24	357.18	12,180.94	4,445.05	-32.25	4,445.16	0.26	-0.18	0.19	
16,922.00	87.71	359.63	12,184.26	4,538.95	-34.86	4,539.08	2.67	-0.56	2.61	
17,017.00	87.57	1.01	12,188.17	4,633.86	-34.33	4,633.99	1.46	-0.15	1.45	
17,112.00	89.53	0.45	12,190.58	4,728.82	-33.12	4,728.93	2.15	2.06	-0.59	
17,206.00	92.42	359.58	12,188.98	4,822.79	-33.10	4,822.90	3.21	3.07	-0.93	
17,300.00	90.20	1.22	12,186.83	4,916.76	-32.44	4,916.86	2.94	-2.36	1.74	
17,395.00	89.92	0.10	12,186.73	5,011.75	-31.35	5,011.83	1.22	-0.29	-1.18	
17,490.00	88.69	359.38	12,187.88	5,106.74	-31.78	5,106.82	1.50	-1.29	-0.76	
17,585.00	86.48	358.97	12,191.89	5,201.64	-33.14	5,201.73	2.37	-2.33	-0.43	
17,680.00	90.60	357.55	12,194.31	5,296.54	-36.03	5,296.66	4.59	4.34	-1.49	
17,774.00	91.91	358.22	12,192.25	5,390.45	-39.49	5,390.59	1.57	1.39	0.71	
17,869.00	90.82	357.40	12,189.98	5,485.35	-43.12	5,485.52	1.44	-1.15	-0.86	
17,963.00	85.24	357.66	12,193.21	5,579.17	-47.17	5,579.37	5.94	-5.94	0.28	
18,057.00	84.45	357.53	12,201.66	5,672.71	-51.10	5,672.94	0.85	-0.84	-0.14	
18,152.00	85.83	359.05	12,209.71	5,767.32	-53.92	5,767.57	2.16	1.45	1.60	
18,246.00	85.05	0.19	12,217.18	5,861.02	-54.55	5,861.27	1.47	-0.83	1.21	
18,341.00	85.27	359.73	12,225.20	5,955.68	-54.61	5,955.93	0.54	0.23	-0.48	
18,436.00	86.79	359.15	12,231.77	6,050.44	-55.54	6,050.70	1.71	1.60	-0.61	
18,531.00	90.68	358.29	12,233.87	6,145.38	-57.66	6,145.65	4.19	4.09	-0.91	
18,626.00	91.86	359.61	12,231.77	6,240.34	-59.40	6,240.62	1.86	1.24	1.39	
18,720.00	90.49	0.18	12,229.84	6,334.31	-59.57	6,334.59	1.58	-1.46	0.61	
18,816.00	88.42	1.97	12,230.75	6,430.28	-57.77	6,430.54	2.85	-2.16	1.86	
18,910.00	87.13	4.67	12,234.40	6,524.04	-52.33	6,524.25	3.18	-1.37	2.87	

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	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)	
19,005.00	87.80	4.74	12,238.60	6,618.63	-44.55	6,618.77	0.71	0.71	0.07	
19,099.00	90.66	3.39	12,239.87	6,712.37	-37.89	6,712.45	3.36	3.04	-1.44	
19,194.00	86.57	2.70	12,242.16	6,807.19	-32.84	6,807.22	4.37	-4.31	-0.73	
19,288.00	88.28	3.75	12,246.39	6,900.94	-27.56	6,900.93	2.13	1.82	1.12	
19,383.00	87.88	3.17	12,249.57	6,995.72	-21.83	6,995.65	0.74	-0.42	-0.61	
19,478.00	88.95	0.93	12,252.20	7,090.61	-18.43	7,090.51	2.61	1.13	-2.36	
19,573.00	89.54	359.39	12,253.45	7,185.60	-18.17	7,185.49	1.74	0.62	-1.62	
19,667.00	87.69	357.23	12,255.72	7,279.52	-20.94	7,279.43	3.02	-1.97	-2.30	
19,761.00	89.87	356.06	12,257.72	7,373.33	-26.44	7,373.29	2.63	2.32	-1.24	
19,856.00	90.15	356.44	12,257.71	7,468.13	-32.65	7,468.13	0.50	0.29	0.40	
19,950.00	90.66	357.72	12,257.04	7,562.00	-37.44	7,562.04	1.47	0.54	1.36	
20,044.00	93.46	358.45	12,253.66	7,655.88	-40.58	7,655.95	3.08	2.98	0.78	
20,139.00	92.56	359.05	12,248.67	7,750.72	-42.65	7,750.80	1.14	-0.95	0.63	
20,234.00	90.01	358.32	12,246.54	7,845.67	-44.83	7,845.76	2.79	-2.68	-0.77	
20,329.00	88.16	358.66	12,248.06	7,940.62	-47.33	7,940.73	1.98	-1.95	0.36	
20,424.00	86.76	358.86	12,252.27	8,035.50	-49.39	8,035.63	1.49	-1.47	0.21	
20,519.00	87.54	358.01	12,256.99	8,130.34	-51.98	8,130.49	1.21	0.82	-0.89	
20,614.00	91.97	357.96	12,257.40	8,225.26	-55.32	8,225.43	4.66	4.66	-0.05	
20,709.00	89.22	359.07	12,256.41	8,320.21	-57.78	8,320.40	3.12	-2.89	1.17	
20,803.00	91.16	358.87	12,256.10	8,414.19	-59.47	8,414.39	2.07	2.06	-0.21	
20,898.00	87.80	0.22	12,256.96	8,509.17	-60.22	8,509.37	3.81	-3.54	1.42	
20,992.00	89.11	359.57	12,259.50	8,603.13	-60.39	8,603.33	1.56	1.39	-0.69	
21,086.00	88.69	0.73	12,261.30	8,697.11	-60.15	8,697.31	1.31	-0.45	1.23	
21,181.00	88.58	1.40	12,263.57	8,792.07	-58.38	8,792.25	0.71	-0.12	0.71	
21,276.00	90.29	1.22	12,264.50	8,887.04	-56.21	8,887.19	1.81	1.80	-0.19	
21,370.00	93.34	1.64	12,261.53	8,980.95	-53.87	8,981.08	3.28	3.24	0.45	
21,465.00	92.56	0.82	12,256.64	9,075.80	-51.83	9,075.91	1.19	-0.82	-0.86	
21,559.00	93.51	1.72	12,251.66	9,169.64	-49.75	9,169.73	1.39	1.01	0.96	
21,654.00	93.54	359.67	12,245.82	9,264.45	-48.60	9,264.53	2.15	0.03	-2.16	
21,749.00	90.65	358.96	12,242.35	9,359.37	-49.74	9,359.45	3.13	-3.04	-0.75	
21,843.00	91.32	357.89	12,240.73	9,453.32	-52.32	9,453.42	1.34	0.71	-1.14	
21,937.00	94.22	357.54	12,236.19	9,547.12	-56.06	9,547.25	3.11	3.09	-0.37	
22,032.00	93.26	357.77	12,229.99	9,641.84	-59.94	9,642.00	1.04	-1.01	0.24	
22,126.00	92.23	358.59	12,225.49	9,735.68	-62.92	9,735.87	1.40	-1.10	0.87	
22,221.00	87.97	358.42	12,225.32	9,830.63	-65.40	9,830.83	4.49	-4.48	-0.18	
22,316.00	86.90	359.00	12,229.57	9,925.51	-67.54	9,925.72	1.28	-1.13	0.61	
22,407.00	88.16	358.10	12,233.50	10,016.39	-69.84	10,016.62	1.70	1.38	-0.99	
<b>Final Gordon MWD Survey - ST01</b>										
22,450.00	88.16	358.10	12,234.88	10,059.35	-71.26	10,059.59	0.00	0.00	0.00	
<b>LTP: 22450' MD</b>										
22,475.00	88.16	358.10	12,235.68	10,084.32	-72.09	10,084.57	0.00	0.00	0.00	
<b>Projection to TD</b>										

<b>Company:</b>	COG Operating LLC	<b>Local Co-ordinate Reference:</b>	Well 604H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Site:</b>	Tin Foil Federal Com	<b>MD Reference:</b>	KB @ 3179.80usft (McVay 8)
<b>Well:</b>	604H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	ST01 / 65848	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (McVay 8)	<b>Database:</b>	USA Compass

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,565.00	11,553.38	-321.08	-10.05	Tie In - ST01
11,675.00	11,663.12	-328.41	-11.43	First Gordon MWD Survey - ST01
11,927.00	11,910.22	-299.91	-12.64	FTP: 11927' MD
22,407.00	12,233.50	10,016.39	-69.84	Final Gordon MWD Survey - ST01
22,450.00	12,234.88	10,059.35	-71.26	LTP: 22450' MD
22,475.00	12,235.68	10,084.32	-72.09	Projection to TD