COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Gettysburg State COM
#13H

OH

Design: OH

Standard Survey Report

10 April, 2018

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

Project Lea County, NM (NAD27) NMEZ

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 Gettysburg State COM

Site Position:		**Northing:**	477,942.30 usft	**Latitude:**	32° 18' 39.898 N
From:	Map	**Easting:**	764,187.30 usft	**Longitude:**	103° 28' 41.576 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.46 °

Well #13H

Well Position	**+N/-S**	0.00 usft	**Northing:**	477,942.90 usft	**Latitude:**	32° 18' 39.899 N
	+E/-W	0.00 usft	**Easting:**	764,247.30 usft	**Longitude:**	103° 28' 40.877 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,424.80 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	03/13/18	6.84	60.15	47,923.81034838

Design OH

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	179.47

Survey Program **Date** 04/10/18

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	10,535.00	Survey #1 - Gyro (OH)	GYD_DP_MS	Gyrodata gyro-compassing and drop
10,596.00	18,677.00	Survey #2 - VON MWD (OH)	MWD	MWD v3:standard declination
18,730.00	18,730.00	Survey #3 - PTB (OH)	Projection	Projection

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.02	20.74	5.00	0.00	0.00	0.00	0.38	0.38	0.00
SHL(GSC#13H)									
23.48	0.09	20.74	23.48	0.02	0.01	-0.02	0.38	0.38	0.00
SHL(GB#1H)									
32.80	0.12	20.74	32.80	0.03	0.01	-0.03	0.38	0.38	0.00
SHL(VSC#2H)									
35.11	0.13	20.74	35.11	0.04	0.01	-0.04	0.38	0.38	0.00
SHL(GB#2H)									

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100.00	0.38	20.74	100.00	0.31	0.12	-0.31	0.38	0.38	0.00
125.00	0.47	10.52	125.00	0.49	0.17	-0.49	0.47	0.36	-40.88
150.00	0.45	11.05	150.00	0.69	0.20	-0.68	0.08	-0.08	2.12
175.00	0.41	23.14	175.00	0.86	0.26	-0.86	0.40	-0.16	48.36
200.00	0.36	37.91	200.00	1.01	0.34	-1.01	0.44	-0.20	59.08
225.00	0.41	57.93	225.00	1.12	0.46	-1.11	0.57	0.20	80.08
250.00	0.49	74.87	250.00	1.19	0.64	-1.19	0.62	0.32	67.76
275.00	0.57	86.75	274.99	1.23	0.87	-1.22	0.54	0.32	47.52
300.00	0.59	84.74	299.99	1.25	1.12	-1.24	0.11	0.08	-8.04
325.00	0.63	82.64	324.99	1.28	1.39	-1.26	0.18	0.16	-8.40
350.00	0.57	85.10	349.99	1.30	1.65	-1.29	0.26	-0.24	9.84
375.00	0.59	82.54	374.99	1.33	1.90	-1.31	0.13	0.08	-10.24
400.00	0.60	81.89	399.99	1.37	2.16	-1.35	0.05	0.04	-2.60
425.00	0.56	84.02	424.99	1.40	2.41	-1.38	0.18	-0.16	8.52
450.00	0.58	81.89	449.98	1.43	2.65	-1.40	0.12	0.08	-8.52
475.00	0.60	86.88	474.98	1.45	2.91	-1.43	0.22	0.08	19.96
500.00	0.61	90.86	499.98	1.46	3.17	-1.43	0.17	0.04	15.92
525.00	0.56	95.45	524.98	1.45	3.43	-1.41	0.27	-0.20	18.36
550.00	0.57	88.64	549.98	1.44	3.67	-1.40	0.27	0.04	-27.24
575.00	0.59	88.04	574.98	1.44	3.93	-1.41	0.08	0.08	-2.40
600.00	0.70	85.72	599.98	1.46	4.21	-1.42	0.45	0.44	-9.28
625.00	0.87	81.11	624.97	1.50	4.55	-1.46	0.72	0.68	-18.44
650.00	1.10	76.08	649.97	1.59	4.97	-1.54	0.98	0.92	-20.12
675.00	1.16	74.44	674.97	1.71	5.45	-1.66	0.27	0.24	-6.56
700.00	1.26	73.67	699.96	1.86	5.95	-1.80	0.41	0.40	-3.08
725.00	1.49	71.96	724.95	2.04	6.53	-1.98	0.93	0.92	-6.84
750.00	1.78	71.31	749.94	2.26	7.20	-2.19	1.16	1.16	-2.60
775.00	2.11	71.99	774.93	2.53	8.01	-2.45	1.32	1.32	2.72
800.00	2.33	73.85	799.91	2.81	8.93	-2.73	0.93	0.88	7.44
825.00	2.41	75.37	824.89	3.09	9.93	-2.99	0.41	0.32	6.08
850.00	2.42	79.64	849.87	3.31	10.96	-3.21	0.72	0.04	17.08
875.00	2.39	89.65	874.84	3.41	12.00	-3.30	1.68	-0.12	40.04
900.00	2.42	101.27	899.82	3.31	13.04	-3.19	1.95	0.12	46.48
925.00	2.43	106.85	924.80	3.06	14.06	-2.92	0.94	0.04	22.32
950.00	2.45	109.16	949.78	2.73	15.07	-2.59	0.40	0.08	9.24
975.00	2.47	111.16	974.75	2.36	16.08	-2.21	0.35	0.08	8.00
1,000.00	2.43	112.46	999.73	1.96	17.07	-1.80	0.27	-0.16	5.20
1,025.00	2.53	114.84	1,024.71	1.53	18.06	-1.36	0.57	0.40	9.52
1,050.00	2.66	117.51	1,049.68	1.03	19.08	-0.85	0.71	0.52	10.68
1,075.00	2.74	123.59	1,074.65	0.43	20.09	-0.24	1.19	0.32	24.32
1,100.00	2.84	131.26	1,099.63	-0.31	21.06	0.51	1.54	0.40	30.68
1,125.00	2.94	140.87	1,124.59	-1.22	21.93	1.42	1.98	0.40	38.44
1,150.00	3.08	150.85	1,149.56	-2.30	22.66	2.51	2.17	0.56	39.92

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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)
1,175.00	3.06	154.03	1,174.52	-3.49	23.28	3.70	0.69	-0.08	12.72
1,200.00	3.08	155.40	1,199.49	-4.70	23.85	4.92	0.30	0.08	5.48
1,225.00	3.11	155.83	1,224.45	-5.93	24.41	6.15	0.15	0.12	1.72
1,250.00	3.11	156.18	1,249.41	-7.17	24.96	7.40	0.08	0.00	1.40
1,275.00	3.15	157.80	1,274.38	-8.42	25.49	8.66	0.39	0.16	6.48
1,300.00	3.06	157.90	1,299.34	-9.68	26.00	9.92	0.36	-0.36	0.40
1,325.00	3.06	158.56	1,324.30	-10.92	26.50	11.16	0.14	0.00	2.64
1,350.00	3.25	164.33	1,349.27	-12.22	26.93	12.47	1.48	0.76	23.08
1,375.00	3.45	169.80	1,374.22	-13.64	27.26	13.89	1.51	0.80	21.88
1,400.00	3.63	171.79	1,399.18	-15.17	27.50	15.42	0.87	0.72	7.96
1,425.00	3.68	172.19	1,424.13	-16.75	27.72	17.00	0.22	0.20	1.60
1,450.00	3.72	172.59	1,449.07	-18.34	27.94	18.60	0.19	0.16	1.60
1,475.00	3.86	172.68	1,474.02	-19.98	28.15	20.24	0.56	0.56	0.36
1,493.00	3.91	172.89	1,491.98	-21.19	28.30	21.45	0.29	0.28	1.17
Last MWD Survey: 1493.00' MD, 4.14°INC, 175.18°AZ									
1,500.00	3.93	172.97	1,498.96	-21.67	28.36	21.93	0.29	0.28	1.15
1,525.00	3.91	172.94	1,523.90	-23.36	28.57	23.63	0.08	-0.08	-0.12
1,550.00	3.84	171.41	1,548.85	-25.04	28.80	25.30	0.50	-0.28	-6.12
1,575.00	3.71	168.56	1,573.79	-26.66	29.09	26.93	0.91	-0.52	-11.40
1,600.00	3.79	166.43	1,598.74	-28.25	29.44	28.53	0.64	0.32	-8.52
1,625.00	3.79	163.68	1,623.68	-29.85	29.87	30.13	0.73	0.00	-11.00
1,650.00	3.62	159.52	1,648.63	-31.38	30.38	31.66	1.27	-0.68	-16.64
1,675.00	3.57	156.21	1,673.58	-32.83	30.97	33.12	0.85	-0.20	-13.24
1,700.00	3.57	154.67	1,698.53	-34.25	31.61	34.54	0.38	0.00	-6.16
1,725.00	3.46	148.90	1,723.49	-35.60	32.34	35.90	1.48	-0.44	-23.08
1,750.00	3.46	138.23	1,748.44	-36.81	33.23	37.11	2.57	0.00	-42.68
1,775.00	3.56	126.25	1,773.39	-37.83	34.36	38.15	2.96	0.40	-47.92
1,800.00	3.74	118.57	1,798.34	-38.68	35.70	39.01	2.08	0.72	-30.72
1,825.00	3.97	108.19	1,823.29	-39.34	37.24	39.68	2.93	0.92	-41.52
1,850.00	4.35	99.04	1,848.22	-39.76	38.99	40.12	3.05	1.52	-36.60
1,875.00	4.69	93.42	1,873.14	-39.97	40.95	40.35	2.23	1.36	-22.48
1,900.00	4.79	91.28	1,898.06	-40.05	43.02	40.45	0.81	0.40	-8.56
1,925.00	4.84	90.38	1,922.97	-40.08	45.11	40.50	0.36	0.20	-3.60
1,950.00	4.87	89.01	1,947.88	-40.07	47.23	40.51	0.48	0.12	-5.48
1,975.00	4.82	86.20	1,972.79	-39.98	49.34	40.44	0.97	-0.20	-11.24
2,000.00	4.85	80.80	1,997.70	-39.74	51.43	40.22	1.82	0.12	-21.60
2,025.00	4.79	78.31	2,022.61	-39.36	53.49	39.86	0.87	-0.24	-9.96
2,050.00	4.64	79.39	2,047.53	-38.97	55.51	39.48	0.70	-0.60	4.32
2,075.00	4.45	83.03	2,072.45	-38.66	57.47	39.19	1.38	-0.76	14.56
2,100.00	4.44	86.16	2,097.38	-38.48	59.40	39.03	0.97	-0.04	12.52
2,125.00	4.55	87.28	2,122.30	-38.37	61.35	38.93	0.56	0.44	4.48
2,150.00	4.50	87.41	2,147.22	-38.28	63.32	38.86	0.20	-0.20	0.52
2,175.00	4.45	85.49	2,172.14	-38.16	65.27	38.76	0.63	-0.20	-7.68

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2,200.00	4.36	78.18	2,197.07	-37.89	67.17	38.51	2.27	-0.36	-29.24
2,225.00	4.42	69.65	2,222.00	-37.36	69.00	37.99	2.62	0.24	-34.12
2,250.00	4.46	65.57	2,246.92	-36.62	70.79	37.27	1.27	0.16	-16.32
2,275.00	4.50	65.00	2,271.85	-35.80	72.56	36.47	0.24	0.16	-2.28
2,300.00	4.55	63.82	2,296.77	-34.95	74.34	35.64	0.42	0.20	-4.72
2,325.00	4.63	63.64	2,321.69	-34.06	76.13	34.77	0.33	0.32	-0.72
2,350.00	4.73	64.08	2,346.61	-33.17	77.96	33.89	0.42	0.40	1.76
2,375.00	4.75	64.26	2,371.52	-32.27	79.82	33.00	0.10	0.08	0.72
2,400.00	4.72	64.39	2,396.43	-31.37	81.68	32.13	0.13	-0.12	0.52
2,425.00	4.77	64.50	2,421.35	-30.48	83.55	31.25	0.20	0.20	0.44
2,450.00	4.77	64.35	2,446.26	-29.58	85.43	30.37	0.05	0.00	-0.60
2,475.00	4.83	64.21	2,471.17	-28.67	87.31	29.48	0.24	0.24	-0.56
2,500.00	4.79	64.91	2,496.09	-27.77	89.20	28.60	0.28	-0.16	2.80
2,525.00	4.85	64.92	2,521.00	-26.88	91.11	27.73	0.24	0.24	0.04
2,550.00	4.94	64.68	2,545.91	-25.98	93.04	26.83	0.37	0.36	-0.96
2,575.00	4.95	64.15	2,570.81	-25.04	94.98	25.92	0.19	0.04	-2.12
2,600.00	4.93	64.22	2,595.72	-24.11	96.92	25.00	0.08	-0.08	0.28
2,625.00	4.80	62.37	2,620.63	-23.15	98.81	24.07	0.81	-0.52	-7.40
2,650.00	4.67	59.67	2,645.55	-22.16	100.62	23.09	1.03	-0.52	-10.80
2,675.00	4.58	58.17	2,670.46	-21.12	102.34	22.06	0.60	-0.36	-6.00
2,700.00	4.60	56.90	2,695.38	-20.04	104.03	21.00	0.41	0.08	-5.08
2,725.00	4.68	57.12	2,720.30	-18.94	105.73	19.92	0.33	0.32	0.88
2,750.00	4.77	58.00	2,745.22	-17.84	107.46	18.83	0.46	0.36	3.52
2,775.00	4.95	56.94	2,770.13	-16.70	109.25	17.71	0.80	0.72	-4.24
2,800.00	5.18	57.68	2,795.03	-15.50	111.11	16.53	0.96	0.92	2.96
2,825.00	5.35	58.31	2,819.92	-14.29	113.05	15.33	0.72	0.68	2.52
2,850.00	5.44	58.35	2,844.81	-13.06	115.05	14.12	0.36	0.36	0.16
2,875.00	5.47	59.34	2,869.70	-11.83	117.09	12.91	0.40	0.12	3.96
2,900.00	5.40	59.59	2,894.59	-10.62	119.13	11.72	0.30	-0.28	1.00
2,925.00	5.21	60.35	2,919.48	-9.47	121.13	10.59	0.81	-0.76	3.04
2,950.00	4.99	61.38	2,944.38	-8.38	123.07	9.52	0.95	-0.88	4.12
2,975.00	4.76	63.28	2,969.29	-7.40	124.95	8.55	1.12	-0.92	7.60
3,000.00	4.60	66.10	2,994.21	-6.52	126.79	7.70	1.12	-0.64	11.28
3,025.00	4.45	69.33	3,019.13	-5.78	128.62	6.96	1.18	-0.60	12.92
3,050.00	4.39	71.05	3,044.06	-5.12	130.43	6.33	0.58	-0.24	6.88
3,075.00	4.41	70.85	3,068.98	-4.50	132.24	5.72	0.10	0.08	-0.80
3,100.00	4.48	71.22	3,093.91	-3.87	134.07	5.11	0.30	0.28	1.48
3,125.00	4.54	72.41	3,118.83	-3.25	135.94	4.51	0.44	0.24	4.76
3,150.00	4.56	72.44	3,143.75	-2.65	137.83	3.93	0.08	0.08	0.12
3,175.00	4.61	71.84	3,168.67	-2.04	139.74	3.33	0.28	0.20	-2.40
3,200.00	4.46	68.15	3,193.59	-1.37	141.59	2.68	1.31	-0.60	-14.76
3,225.00	4.23	60.07	3,218.52	-0.54	143.29	1.87	2.61	-0.92	-32.32
3,250.00	4.13	54.85	3,243.45	0.43	144.83	0.91	1.57	-0.40	-20.88
3,275.00	4.19	54.97	3,268.39	1.48	146.31	-0.12	0.24	0.24	0.48

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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)
3,300.00	4.21	54.69	3,293.32	2.53	147.81	-1.16	0.11	0.08	-1.12
3,325.00	4.22	55.00	3,318.25	3.59	149.31	-2.21	0.10	0.04	1.24
3,350.00	4.20	56.81	3,343.19	4.62	150.83	-3.22	0.54	-0.08	7.24
3,375.00	4.25	58.05	3,368.12	5.61	152.38	-4.20	0.42	0.20	4.96
3,400.00	4.29	58.30	3,393.05	6.59	153.96	-5.17	0.18	0.16	1.00
3,425.00	4.29	57.97	3,417.98	7.58	155.55	-6.14	0.10	0.00	-1.32
3,450.00	4.33	57.20	3,442.91	8.59	157.14	-7.13	0.28	0.16	-3.08
3,475.00	4.27	59.12	3,467.84	9.57	158.73	-8.11	0.62	-0.24	7.68
3,500.00	4.09	58.33	3,492.77	10.52	160.29	-9.04	0.76	-0.72	-3.16
3,525.00	4.08	57.13	3,517.71	11.47	161.79	-9.97	0.34	-0.04	-4.80
3,550.00	4.10	56.87	3,542.64	12.44	163.29	-10.93	0.11	0.08	-1.04
3,575.00	4.10	57.36	3,567.58	13.41	164.79	-11.89	0.14	0.00	1.96
3,600.00	4.09	56.94	3,592.52	14.38	166.29	-12.84	0.13	-0.04	-1.68
3,625.00	4.06	56.56	3,617.45	15.35	167.78	-13.80	0.16	-0.12	-1.52
3,650.00	4.10	56.97	3,642.39	16.33	169.26	-14.76	0.20	0.16	1.64
3,675.00	4.15	57.34	3,667.33	17.30	170.77	-15.72	0.23	0.20	1.48
3,700.00	4.12	57.71	3,692.26	18.27	172.30	-16.68	0.16	-0.12	1.48
3,725.00	4.07	57.43	3,717.20	19.23	173.80	-17.62	0.22	-0.20	-1.12
3,750.00	4.09	57.67	3,742.13	20.18	175.30	-18.56	0.11	0.08	0.96
3,775.00	4.10	57.45	3,767.07	21.14	176.81	-19.51	0.07	0.04	-0.88
3,800.00	4.12	57.67	3,792.00	22.10	178.32	-20.45	0.10	0.08	0.88
3,825.00	4.05	57.05	3,816.94	23.06	179.82	-21.40	0.33	-0.28	-2.48
3,850.00	3.95	57.07	3,841.88	24.01	181.29	-22.33	0.40	-0.40	0.08
3,875.00	3.91	57.30	3,866.82	24.94	182.73	-23.25	0.17	-0.16	0.92
3,900.00	3.83	57.41	3,891.76	25.85	184.15	-24.15	0.32	-0.32	0.44
3,925.00	3.79	58.17	3,916.71	26.74	185.55	-25.02	0.26	-0.16	3.04
3,950.00	3.56	59.45	3,941.66	27.57	186.92	-25.84	0.98	-0.92	5.12
3,975.00	3.42	61.09	3,966.61	28.32	188.24	-26.58	0.69	-0.56	6.56
4,000.00	3.36	61.74	3,991.57	29.03	189.54	-27.27	0.29	-0.24	2.60
4,025.00	3.22	63.78	4,016.53	29.69	190.82	-27.92	0.73	-0.56	8.16
4,050.00	3.12	67.88	4,041.49	30.25	192.08	-28.47	0.99	-0.40	16.40
4,075.00	3.01	72.21	4,066.45	30.71	193.33	-28.92	1.02	-0.44	17.32
4,100.00	2.94	73.01	4,091.42	31.10	194.57	-29.30	0.33	-0.28	3.20
4,125.00	2.80	74.05	4,116.39	31.45	195.77	-29.64	0.60	-0.56	4.16
4,150.00	2.84	67.55	4,141.36	31.86	196.93	-30.03	1.29	0.16	-26.00
4,175.00	2.94	63.85	4,166.33	32.38	198.08	-30.54	0.85	0.40	-14.80
4,200.00	3.00	60.86	4,191.29	32.98	199.22	-31.13	0.66	0.24	-11.96
4,225.00	3.10	59.10	4,216.26	33.64	200.38	-31.79	0.55	0.40	-7.04
4,250.00	3.23	59.22	4,241.22	34.35	201.56	-32.48	0.52	0.52	0.48
4,275.00	3.42	60.09	4,266.18	35.08	202.81	-33.20	0.79	0.76	3.48
4,300.00	3.67	60.89	4,291.13	35.84	204.16	-33.95	1.02	1.00	3.20
4,325.00	3.95	59.68	4,316.07	36.67	205.60	-34.76	1.17	1.12	-4.84
4,350.00	4.24	58.25	4,341.01	37.59	207.13	-35.67	1.23	1.16	-5.72

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
4,375.00	4.57	57.45	4,365.94	38.61	208.76	-36.68	1.34	1.32	-3.20
4,400.00	4.74	57.01	4,390.85	39.71	210.46	-37.76	0.69	0.68	-1.76
4,425.00	4.77	56.53	4,415.77	40.84	212.19	-38.88	0.20	0.12	-1.92
4,450.00	4.89	56.04	4,440.68	42.01	213.95	-40.03	0.51	0.48	-1.96
4,475.00	4.86	55.99	4,465.59	43.20	215.71	-41.20	0.12	-0.12	-0.20
4,500.00	4.70	56.37	4,490.50	44.36	217.44	-42.35	0.65	-0.64	1.52
4,525.00	4.22	56.57	4,515.42	45.43	219.06	-43.41	1.92	-1.92	0.80
4,550.00	3.60	57.17	4,540.37	46.37	220.49	-44.32	2.49	-2.48	2.40
4,575.00	3.33	56.70	4,565.32	47.19	221.75	-45.14	1.09	-1.08	-1.88
4,600.00	3.36	55.49	4,590.28	48.00	222.96	-45.94	0.31	0.12	-4.84
4,625.00	3.41	55.86	4,615.23	48.84	224.18	-46.76	0.22	0.20	1.48
4,650.00	3.46	55.64	4,640.19	49.68	225.42	-47.59	0.21	0.20	-0.88
4,675.00	3.47	56.00	4,665.14	50.53	226.67	-48.43	0.10	0.04	1.44
4,700.00	3.52	55.23	4,690.10	51.39	227.93	-49.28	0.27	0.20	-3.08
4,725.00	3.49	56.29	4,715.05	52.25	229.19	-50.13	0.29	-0.12	4.24
4,750.00	3.48	56.93	4,740.00	53.09	230.46	-50.95	0.16	-0.04	2.56
4,775.00	3.48	56.90	4,764.96	53.91	231.73	-51.77	0.01	0.00	-0.12
4,800.00	3.52	56.59	4,789.91	54.75	233.01	-52.59	0.18	0.16	-1.24
4,825.00	3.54	55.38	4,814.86	55.61	234.28	-53.44	0.31	0.08	-4.84
4,850.00	3.57	55.02	4,839.82	56.50	235.56	-54.32	0.15	0.12	-1.44
4,875.00	3.58	55.28	4,864.77	57.39	236.84	-55.19	0.08	0.04	1.04
4,900.00	3.59	54.94	4,889.72	58.28	238.12	-56.08	0.09	0.04	-1.36
4,925.00	3.56	55.13	4,914.67	59.17	239.39	-56.96	0.13	-0.12	0.76
4,950.00	3.45	57.20	4,939.62	60.03	240.66	-57.80	0.67	-0.44	8.28
4,975.00	3.38	57.26	4,964.58	60.83	241.92	-58.59	0.28	-0.28	0.24
5,000.00	3.32	57.36	4,989.54	61.62	243.15	-59.37	0.24	-0.24	0.40
5,025.00	3.42	56.65	5,014.49	62.42	244.38	-60.16	0.43	0.40	-2.84
5,050.00	3.38	56.99	5,039.45	63.23	245.62	-60.96	0.18	-0.16	1.36
5,075.00	3.36	57.51	5,064.41	64.03	246.86	-61.74	0.15	-0.08	2.08
5,100.00	3.36	57.56	5,089.36	64.81	248.09	-62.52	0.01	0.00	0.20
5,125.00	3.33	57.15	5,114.32	65.60	249.32	-63.29	0.15	-0.12	-1.64
5,150.00	3.28	59.05	5,139.28	66.36	250.54	-64.04	0.48	-0.20	7.60
5,175.00	3.34	59.41	5,164.24	67.10	251.78	-64.77	0.25	0.24	1.44
5,200.00	3.33	60.02	5,189.19	67.83	253.04	-65.49	0.15	-0.04	2.44
5,225.00	3.38	60.05	5,214.15	68.57	254.31	-66.21	0.20	0.20	0.12
5,250.00	3.43	60.45	5,239.11	69.30	255.60	-66.94	0.22	0.20	1.60
5,275.00	3.39	60.07	5,264.06	70.04	256.89	-67.66	0.18	-0.16	-1.52
5,300.00	3.36	59.35	5,289.02	70.78	258.16	-68.39	0.21	-0.12	-2.88
5,325.00	3.37	60.39	5,313.98	71.52	259.43	-69.12	0.25	0.04	4.16
5,350.00	3.42	60.02	5,338.93	72.25	260.71	-69.84	0.22	0.20	-1.48
5,375.00	3.39	60.16	5,363.89	72.99	262.00	-70.57	0.12	-0.12	0.56
5,400.00	3.37	60.42	5,388.85	73.73	263.28	-71.29	0.10	-0.08	1.04
5,425.00	3.37	59.97	5,413.80	74.46	264.55	-72.01	0.11	0.00	-1.80

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
5,450.00	3.48	61.71	5,438.76	75.18	265.86	-72.72	0.61	0.44	6.96
5,475.00	3.89	66.09	5,463.71	75.89	267.30	-73.41	1.99	1.64	17.52
5,500.00	4.17	67.84	5,488.64	76.57	268.92	-74.08	1.22	1.12	7.00
5,525.00	4.23	69.15	5,513.58	77.24	270.62	-74.74	0.45	0.24	5.24
5,550.00	4.29	69.86	5,538.51	77.89	272.36	-75.37	0.32	0.24	2.84
5,575.00	4.29	70.20	5,563.44	78.53	274.12	-75.99	0.10	0.00	1.36
5,600.00	4.31	70.36	5,588.37	79.17	275.88	-76.61	0.09	0.08	0.64
5,625.00	4.35	70.03	5,613.30	79.80	277.66	-77.23	0.19	0.16	-1.32
5,650.00	4.34	70.38	5,638.22	80.45	279.44	-77.86	0.11	-0.04	1.40
5,675.00	4.28	70.14	5,663.15	81.08	281.21	-78.48	0.25	-0.24	-0.96
5,700.00	4.24	69.92	5,688.08	81.72	282.96	-79.09	0.17	-0.16	-0.88
5,725.00	4.16	69.62	5,713.02	82.35	284.67	-79.71	0.33	-0.32	-1.20
5,750.00	4.05	70.56	5,737.95	82.96	286.36	-80.31	0.52	-0.44	3.76
5,775.00	3.93	71.25	5,762.89	83.53	288.00	-80.86	0.52	-0.48	2.76
5,800.00	3.98	70.26	5,787.83	84.10	289.63	-81.41	0.34	0.20	-3.96
5,825.00	3.96	70.07	5,812.77	84.68	291.26	-81.98	0.10	-0.08	-0.76
5,850.00	3.99	70.46	5,837.71	85.27	292.89	-82.56	0.16	0.12	1.56
5,875.00	3.89	71.43	5,862.65	85.83	294.51	-83.10	0.48	-0.40	3.88
5,900.00	3.80	70.53	5,887.60	86.38	296.10	-83.63	0.43	-0.36	-3.60
5,925.00	3.83	70.22	5,912.54	86.93	297.66	-84.18	0.15	0.12	-1.24
5,950.00	3.83	70.25	5,937.49	87.50	299.23	-84.73	0.01	0.00	0.12
5,975.00	3.80	69.59	5,962.43	88.07	300.80	-85.28	0.21	-0.12	-2.64
6,000.00	3.78	69.88	5,987.38	88.64	302.35	-85.84	0.11	-0.08	1.16
6,025.00	3.74	70.38	6,012.32	89.20	303.89	-86.38	0.21	-0.16	2.00
6,050.00	3.80	70.39	6,037.27	89.75	305.44	-86.92	0.24	0.24	0.04
6,075.00	3.88	70.54	6,062.21	90.31	307.01	-87.47	0.32	0.32	0.60
6,100.00	3.97	70.58	6,087.15	90.88	308.63	-88.02	0.36	0.36	0.16
6,125.00	4.02	71.18	6,112.09	91.45	310.27	-88.58	0.26	0.20	2.40
6,150.00	4.09	72.03	6,137.03	92.01	311.95	-89.12	0.37	0.28	3.40
6,175.00	4.22	72.92	6,161.96	92.55	313.68	-89.65	0.58	0.52	3.56
6,200.00	4.28	73.54	6,186.90	93.09	315.45	-90.17	0.30	0.24	2.48
6,225.00	4.32	73.98	6,211.83	93.61	317.25	-90.67	0.21	0.16	1.76
6,250.00	4.43	73.22	6,236.75	94.15	319.08	-91.20	0.50	0.44	-3.04
6,275.00	4.46	72.53	6,261.68	94.72	320.93	-91.75	0.25	0.12	-2.76
6,300.00	4.45	72.83	6,286.60	95.30	322.79	-92.31	0.10	-0.04	1.20
6,325.00	4.45	73.28	6,311.53	95.86	324.64	-92.86	0.14	0.00	1.80
6,350.00	4.49	74.21	6,336.45	96.41	326.51	-93.39	0.33	0.16	3.72
6,375.00	4.45	73.25	6,361.37	96.96	328.38	-93.91	0.34	-0.16	-3.84
6,400.00	4.49	72.34	6,386.30	97.53	330.24	-94.47	0.33	0.16	-3.64
6,425.00	4.48	72.59	6,411.22	98.12	332.11	-95.05	0.09	-0.04	1.00
6,450.00	4.43	72.54	6,436.15	98.70	333.96	-95.61	0.20	-0.20	-0.20
6,475.00	4.40	72.86	6,461.07	99.28	335.80	-96.17	0.16	-0.12	1.28
6,500.00	4.41	72.72	6,486.00	99.84	337.63	-96.72	0.06	0.04	-0.56
6,525.00	4.49	72.53	6,510.92	100.42	339.48	-97.28	0.33	0.32	-0.76

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
6,550.00	4.38	73.22	6,535.85	100.99	341.33	-97.83	0.49	-0.44	2.76
6,575.00	4.31	73.27	6,560.78	101.54	343.15	-98.36	0.28	-0.28	0.20
6,600.00	4.32	73.03	6,585.71	102.08	344.95	-98.89	0.08	0.04	-0.96
6,625.00	4.27	73.14	6,610.64	102.63	346.74	-99.42	0.20	-0.20	0.44
6,650.00	4.27	73.92	6,635.57	103.16	348.52	-99.93	0.23	0.00	3.12
6,675.00	4.18	74.29	6,660.50	103.66	350.29	-100.42	0.38	-0.36	1.48
6,700.00	4.12	74.90	6,685.43	104.14	352.04	-100.88	0.30	-0.24	2.44
6,725.00	4.00	74.48	6,710.37	104.61	353.74	-101.33	0.49	-0.48	-1.68
6,750.00	4.01	74.95	6,735.31	105.07	355.43	-101.78	0.14	0.04	1.88
6,775.00	4.00	76.25	6,760.25	105.50	357.12	-102.20	0.37	-0.04	5.20
6,800.00	3.87	77.09	6,785.19	105.90	358.79	-102.58	0.57	-0.52	3.36
6,825.00	3.76	77.97	6,810.13	106.26	360.41	-102.92	0.50	-0.44	3.52
6,850.00	3.72	78.07	6,835.08	106.60	362.01	-103.24	0.16	-0.16	0.40
6,875.00	3.63	78.74	6,860.03	106.92	363.58	-103.55	0.40	-0.36	2.68
6,900.00	3.51	80.06	6,884.98	107.21	365.11	-103.82	0.58	-0.48	5.28
6,925.00	3.47	79.54	6,909.93	107.47	366.61	-104.08	0.20	-0.16	-2.08
6,950.00	3.52	76.55	6,934.89	107.79	368.10	-104.38	0.76	0.20	-11.96
6,975.00	3.66	70.45	6,959.84	108.24	369.59	-104.81	1.63	0.56	-24.40
7,000.00	3.74	64.72	6,984.79	108.85	371.08	-105.41	1.51	0.32	-22.92
7,025.00	3.78	62.60	7,009.73	109.58	372.55	-106.13	0.58	0.16	-8.48
7,050.00	3.76	63.83	7,034.68	110.32	374.02	-106.86	0.33	-0.08	4.92
7,075.00	3.64	63.75	7,059.63	111.03	375.47	-107.55	0.48	-0.48	-0.32
7,100.00	3.50	63.49	7,084.58	111.72	376.86	-108.23	0.56	-0.56	-1.04
7,125.00	3.48	64.38	7,109.53	112.39	378.23	-108.89	0.23	-0.08	3.56
7,150.00	3.46	63.80	7,134.49	113.05	379.59	-109.54	0.16	-0.08	-2.32
7,175.00	3.47	63.94	7,159.44	113.72	380.95	-110.19	0.05	0.04	0.56
7,200.00	3.49	64.77	7,184.39	114.38	382.31	-110.83	0.22	0.08	3.32
7,225.00	3.42	63.91	7,209.35	115.03	383.67	-111.47	0.35	-0.28	-3.44
7,250.00	3.32	62.43	7,234.30	115.69	384.98	-112.13	0.53	-0.40	-5.92
7,275.00	3.22	62.76	7,259.26	116.35	386.25	-112.77	0.41	-0.40	1.32
7,300.00	3.16	63.74	7,284.23	116.97	387.49	-113.38	0.32	-0.24	3.92
7,325.00	3.01	64.66	7,309.19	117.56	388.70	-113.96	0.63	-0.60	3.68
7,350.00	2.92	65.61	7,334.16	118.10	389.88	-114.49	0.41	-0.36	3.80
7,375.00	2.80	66.47	7,359.12	118.61	391.02	-114.99	0.51	-0.48	3.44
7,400.00	2.72	68.00	7,384.10	119.08	392.13	-115.44	0.43	-0.32	6.12
7,425.00	2.67	67.53	7,409.07	119.52	393.21	-115.88	0.22	-0.20	-1.88
7,450.00	2.68	67.83	7,434.04	119.96	394.29	-116.31	0.07	0.04	1.20
7,475.00	2.69	67.40	7,459.01	120.41	395.38	-116.75	0.09	0.04	-1.72
7,500.00	2.87	66.97	7,483.98	120.88	396.49	-117.21	0.72	0.72	-1.72
7,525.00	3.36	66.37	7,508.95	121.42	397.74	-117.73	1.96	1.96	-2.40
7,550.00	3.77	66.26	7,533.90	122.04	399.17	-118.35	1.64	1.64	-0.44
7,575.00	3.87	66.20	7,558.84	122.71	400.69	-119.00	0.40	0.40	-0.24
7,600.00	3.85	66.94	7,583.79	123.38	402.23	-119.66	0.21	-0.08	2.96

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
7,625.00	3.71	67.54	7,608.73	124.02	403.75	-120.28	0.58	-0.56	2.40
7,650.00	3.46	68.18	7,633.68	124.61	405.20	-120.86	1.01	-1.00	2.56
7,675.00	3.40	67.88	7,658.64	125.17	406.59	-121.40	0.25	-0.24	-1.20
7,700.00	3.36	67.43	7,683.59	125.73	407.95	-121.95	0.19	-0.16	-1.80
7,725.00	3.29	68.34	7,708.55	126.28	409.29	-122.49	0.35	-0.28	3.64
7,750.00	3.31	67.15	7,733.51	126.82	410.63	-123.02	0.29	0.08	-4.76
7,775.00	3.38	67.95	7,758.47	127.38	411.97	-123.56	0.34	0.28	3.20
7,800.00	3.50	70.24	7,783.42	127.91	413.38	-124.08	0.73	0.48	9.16
7,825.00	3.72	71.26	7,808.37	128.43	414.86	-124.59	0.92	0.88	4.08
7,850.00	3.79	73.10	7,833.32	128.93	416.42	-125.08	0.56	0.28	7.36
7,875.00	3.78	72.83	7,858.27	129.42	418.00	-125.54	0.08	-0.04	-1.08
7,900.00	3.71	73.14	7,883.21	129.89	419.56	-126.01	0.29	-0.28	1.24
7,925.00	3.57	74.34	7,908.16	130.34	421.08	-126.44	0.64	-0.56	4.80
7,950.00	3.48	73.88	7,933.11	130.76	422.56	-126.85	0.38	-0.36	-1.84
7,975.00	3.66	75.44	7,958.07	131.17	424.06	-127.24	0.82	0.72	6.24
8,000.00	3.89	77.11	7,983.01	131.56	425.66	-127.62	1.02	0.92	6.68
8,025.00	4.22	78.87	8,007.95	131.93	427.39	-127.97	1.41	1.32	7.04
8,050.00	4.25	78.27	8,032.88	132.29	429.20	-128.32	0.21	0.12	-2.40
8,075.00	4.28	77.67	8,057.81	132.68	431.02	-128.69	0.22	0.12	-2.40
8,100.00	4.16	78.27	8,082.74	133.06	432.82	-129.06	0.51	-0.48	2.40
8,125.00	3.83	77.71	8,107.68	133.43	434.52	-129.40	1.33	-1.32	-2.24
8,150.00	3.66	76.58	8,132.63	133.79	436.11	-129.75	0.74	-0.68	-4.52
8,175.00	3.57	75.74	8,157.58	134.17	437.64	-130.11	0.42	-0.36	-3.36
8,200.00	3.49	74.97	8,182.53	134.56	439.13	-130.49	0.37	-0.32	-3.08
8,225.00	3.44	73.59	8,207.49	134.96	440.59	-130.88	0.39	-0.20	-5.52
8,250.00	3.54	72.15	8,232.44	135.41	442.04	-131.32	0.53	0.40	-5.76
8,275.00	4.08	69.09	8,257.39	135.97	443.61	-131.86	2.31	2.16	-12.24
8,300.00	4.82	66.65	8,282.31	136.70	445.40	-132.57	3.05	2.96	-9.76
8,325.00	4.87	66.75	8,307.22	137.54	447.34	-133.39	0.20	0.20	0.40
8,350.00	4.89	66.83	8,332.13	138.37	449.30	-134.21	0.08	0.08	0.32
8,375.00	4.88	66.75	8,357.04	139.21	451.25	-135.03	0.05	-0.04	-0.32
8,400.00	4.73	65.14	8,381.95	140.07	453.17	-135.87	0.81	-0.60	-6.44
8,425.00	4.51	63.90	8,406.87	140.93	454.98	-136.72	0.97	-0.88	-4.96
8,450.00	4.30	63.70	8,431.80	141.78	456.71	-137.55	0.84	-0.84	-0.80
8,475.00	4.17	62.37	8,456.73	142.62	458.35	-138.37	0.65	-0.52	-5.32
8,500.00	4.08	61.15	8,481.66	143.47	459.94	-139.21	0.50	-0.36	-4.88
8,525.00	4.06	60.49	8,506.60	144.33	461.49	-140.06	0.20	-0.08	-2.64
8,550.00	4.15	60.61	8,531.54	145.21	463.04	-140.92	0.36	0.36	0.48
8,575.00	4.35	64.91	8,556.47	146.06	464.69	-141.75	1.50	0.80	17.20
8,600.00	4.66	69.74	8,581.39	146.81	466.50	-142.49	1.96	1.24	19.32
8,625.00	4.67	69.98	8,606.31	147.51	468.41	-143.17	0.09	0.04	0.96
8,650.00	4.71	70.07	8,631.22	148.21	470.33	-143.85	0.16	0.16	0.36
8,675.00	4.72	69.46	8,656.14	148.92	472.26	-144.55	0.20	0.04	-2.44

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
8,700.00	4.63	68.75	8,681.06	149.65	474.16	-145.26	0.43	-0.36	-2.84
8,725.00	4.55	69.01	8,705.98	150.37	476.03	-145.96	0.33	-0.32	1.04
8,750.00	4.51	68.21	8,730.90	151.09	477.87	-146.66	0.30	-0.16	-3.20
8,775.00	4.38	67.26	8,755.82	151.82	479.66	-147.38	0.60	-0.52	-3.80
8,800.00	4.22	65.77	8,780.75	152.57	481.38	-148.11	0.78	-0.64	-5.96
8,825.00	4.10	64.61	8,805.69	153.33	483.03	-148.85	0.59	-0.48	-4.64
8,850.00	4.14	65.19	8,830.62	154.09	484.65	-149.60	0.23	0.16	2.32
8,875.00	4.10	64.59	8,855.56	154.85	486.28	-150.35	0.24	-0.16	-2.40
8,900.00	4.01	63.17	8,880.49	155.63	487.87	-151.11	0.54	-0.36	-5.68
8,925.00	3.83	63.29	8,905.44	156.40	489.39	-151.87	0.72	-0.72	0.48
8,950.00	3.15	65.93	8,930.39	157.06	490.77	-152.51	2.79	-2.72	10.56
8,975.00	2.62	68.40	8,955.36	157.55	491.92	-152.99	2.18	-2.12	9.88
9,000.00	2.66	63.98	8,980.33	158.01	492.98	-153.45	0.83	0.16	-17.68
9,025.00	2.31	64.12	9,005.31	158.49	493.95	-153.91	1.40	-1.40	0.56
9,050.00	2.15	58.04	9,030.29	158.95	494.80	-154.37	1.14	-0.64	-24.32
9,075.00	2.17	52.70	9,055.27	159.49	495.58	-154.90	0.81	0.08	-21.36
9,100.00	2.29	51.58	9,080.25	160.09	496.35	-155.49	0.51	0.48	-4.48
9,125.00	2.75	47.93	9,105.23	160.80	497.18	-156.19	1.95	1.84	-14.60
9,150.00	3.55	45.04	9,130.19	161.75	498.17	-157.13	3.26	3.20	-11.56
9,175.00	4.06	45.94	9,155.13	162.91	499.36	-158.28	2.05	2.04	3.60
9,200.00	4.42	48.27	9,180.07	164.17	500.71	-159.53	1.60	1.44	9.32
9,225.00	4.97	55.31	9,204.98	165.42	502.32	-160.77	3.18	2.20	28.16
9,250.00	5.78	62.35	9,229.87	166.63	504.33	-161.95	4.17	3.24	28.16
9,275.00	5.98	64.51	9,254.74	167.77	506.62	-163.08	1.19	0.80	8.64
9,300.00	5.71	67.29	9,279.61	168.81	508.94	-164.10	1.56	-1.08	11.12
9,325.00	5.15	74.36	9,304.50	169.59	511.17	-164.86	3.49	-2.24	28.28
9,350.00	4.63	82.82	9,329.41	170.02	513.25	-165.27	3.55	-2.08	33.84
9,375.00	4.50	83.84	9,354.33	170.25	515.23	-165.48	0.61	-0.52	4.08
9,400.00	4.42	84.35	9,379.25	170.45	517.16	-165.66	0.36	-0.32	2.04
9,425.00	4.40	83.31	9,404.18	170.66	519.07	-165.85	0.33	-0.08	-4.16
9,450.00	4.33	82.45	9,429.11	170.90	520.96	-166.07	0.38	-0.28	-3.44
9,475.00	4.18	83.39	9,454.04	171.12	522.80	-166.28	0.66	-0.60	3.76
9,500.00	3.97	82.22	9,478.97	171.35	524.56	-166.49	0.90	-0.84	-4.68
9,525.00	3.72	80.78	9,503.92	171.59	526.22	-166.72	1.07	-1.00	-5.76
9,550.00	3.72	80.80	9,528.87	171.85	527.82	-166.96	0.01	0.00	0.08
9,575.00	3.93	80.10	9,553.81	172.13	529.47	-167.22	0.86	0.84	-2.80
9,600.00	4.48	78.32	9,578.74	172.47	531.27	-167.55	2.26	2.20	-7.12
9,625.00	5.12	77.01	9,603.65	172.92	533.31	-167.98	2.60	2.56	-5.24
9,650.00	5.23	77.05	9,628.55	173.43	535.51	-168.47	0.44	0.44	0.16
9,675.00	5.25	77.19	9,653.45	173.94	537.73	-168.96	0.09	0.08	0.56
9,700.00	5.08	77.27	9,678.35	174.44	539.93	-169.43	0.68	-0.68	0.32
9,725.00	4.91	78.17	9,703.25	174.90	542.06	-169.88	0.75	-0.68	3.60
9,750.00	4.83	77.73	9,728.16	175.34	544.13	-170.30	0.35	-0.32	-1.76
9,775.00	4.73	76.90	9,753.07	175.80	546.16	-170.74	0.49	-0.40	-3.32

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
9,800.00	4.65	78.00	9,777.99	176.24	548.16	-171.17	0.48	-0.32	4.40
9,825.00	4.54	77.18	9,802.91	176.67	550.11	-171.58	0.51	-0.44	-3.28
9,850.00	4.37	75.76	9,827.83	177.13	552.00	-172.01	0.81	-0.68	-5.68
9,875.00	4.22	73.97	9,852.76	177.62	553.81	-172.49	0.80	-0.60	-7.16
9,900.00	4.00	71.59	9,877.70	178.15	555.52	-173.00	1.11	-0.88	-9.52
9,925.00	3.79	70.37	9,902.64	178.70	557.13	-173.54	0.90	-0.84	-4.88
9,950.00	3.60	67.20	9,927.59	179.28	558.63	-174.11	1.12	-0.76	-12.68
9,975.00	3.29	62.98	9,952.55	179.91	559.99	-174.72	1.60	-1.24	-16.88
10,000.00	3.13	60.61	9,977.51	180.57	561.22	-175.37	0.83	-0.64	-9.48
10,025.00	3.05	58.98	10,002.47	181.25	562.39	-176.04	0.48	-0.32	-6.52
10,050.00	3.10	55.91	10,027.43	181.97	563.52	-176.75	0.69	0.20	-12.28
10,075.00	3.20	57.17	10,052.40	182.73	564.67	-177.50	0.49	0.40	5.04
10,100.00	3.36	59.33	10,077.36	183.48	565.88	-178.24	0.81	0.64	8.64
10,125.00	3.41	62.03	10,102.31	184.20	567.17	-178.95	0.67	0.20	10.80
10,150.00	3.65	64.09	10,127.26	184.90	568.54	-179.63	1.09	0.96	8.24
10,175.00	3.93	66.69	10,152.21	185.59	570.04	-180.30	1.31	1.12	10.40
10,200.00	4.22	69.13	10,177.15	186.25	571.69	-180.96	1.35	1.16	9.76
10,225.00	4.26	69.99	10,202.08	186.90	573.42	-181.59	0.30	0.16	3.44
10,250.00	4.14	69.65	10,227.01	187.53	575.14	-182.20	0.49	-0.48	-1.36
10,275.00	3.92	68.20	10,251.95	188.16	576.78	-182.82	0.97	-0.88	-5.80
10,300.00	3.77	68.69	10,276.89	188.78	578.34	-183.42	0.61	-0.60	1.96
10,325.00	3.68	67.72	10,301.84	189.38	579.85	-184.01	0.44	-0.36	-3.88
10,350.00	3.63	67.62	10,326.79	189.98	581.32	-184.60	0.20	-0.20	-0.40
10,375.00	3.59	68.09	10,351.74	190.58	582.78	-185.18	0.20	-0.16	1.88
10,400.00	3.59	68.92	10,376.69	191.15	584.24	-185.74	0.21	0.00	3.32
10,425.00	3.61	68.98	10,401.64	191.72	585.70	-186.29	0.08	0.08	0.24
10,450.00	3.69	68.81	10,426.59	192.29	587.19	-186.85	0.32	0.32	-0.68
10,475.00	3.79	68.42	10,451.54	192.88	588.70	-187.43	0.41	0.40	-1.56
10,500.00	3.85	67.08	10,476.48	193.51	590.25	-188.05	0.43	0.24	-5.36
10,525.00	3.71	66.63	10,501.43	194.16	591.76	-188.68	0.57	-0.56	-1.80
10,535.00	3.77	64.79	10,511.41	194.43	592.36	-188.94	1.34	0.60	-18.40
10,596.00	3.65	57.49	10,572.28	196.33	595.81	-190.81	0.80	-0.20	-11.97
10,627.00	3.79	55.60	10,603.21	197.44	597.48	-191.90	0.60	0.45	-6.10
10,690.00	3.53	93.67	10,666.09	198.49	601.14	-192.92	3.81	-0.41	60.43
10,721.00	8.11	129.23	10,696.93	197.04	603.79	-191.45	18.14	14.77	114.71
KOP: 10721.00' MD, 10696.93' TVD									
10,753.00	13.03	140.15	10,728.38	192.84	607.85	-187.21	16.53	15.38	34.13
10,784.00	15.22	146.92	10,758.45	186.75	612.31	-181.08	8.84	7.06	21.84
10,816.00	15.72	152.14	10,789.29	179.40	616.63	-173.69	4.62	1.56	16.31
10,847.00	17.03	152.88	10,819.03	171.64	620.66	-165.90	4.28	4.23	2.39
10,879.00	18.05	152.35	10,849.54	163.08	625.10	-157.29	3.23	3.19	-1.66
10,910.00	19.29	152.73	10,878.91	154.28	629.67	-148.44	4.02	4.00	1.23
10,942.00	23.01	153.32	10,908.75	143.99	634.91	-138.11	11.64	11.63	1.84

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
10,973.00	26.82	153.26	10,936.86	132.32	640.77	-126.39	12.29	12.29	-0.19
11,004.00	31.43	155.38	10,963.93	118.72	647.29	-112.73	15.24	14.87	6.84
11,036.00	35.05	157.18	10,990.69	102.66	654.33	-96.60	11.72	11.31	5.63
11,067.00	36.26	158.25	11,015.88	85.94	661.18	-79.82	4.39	3.90	3.45
11,098.00	37.16	159.13	11,040.73	68.68	667.92	-62.50	3.36	2.90	2.84
11,130.00	37.96	160.02	11,066.10	50.40	674.72	-44.15	3.02	2.50	2.78
11,161.00	40.12	161.12	11,090.18	31.98	681.21	-25.68	7.32	6.97	3.55
11,193.00	44.10	161.11	11,113.91	11.68	688.16	-5.32	12.44	12.44	-0.03
11,224.00	48.15	161.31	11,135.39	-9.47	695.35	15.90	13.07	13.06	0.65
11,255.00	50.81	160.72	11,155.53	-31.75	703.02	38.25	8.70	8.58	-1.90
11,287.00	53.16	159.74	11,175.24	-55.47	711.55	62.05	7.73	7.34	-3.06
11,318.00	56.13	161.14	11,193.18	-79.29	720.01	85.95	10.26	9.58	4.52
11,318.32	56.14	161.16	11,193.36	-79.54	720.09	86.20	6.47	4.68	5.37
Cross 330' Offset:11318.32' MD, 11193.35' TVD, 56.14° INC									
11,350.00	57.64	162.83	11,210.66	-104.78	728.29	111.51	6.47	4.72	5.28
11,381.00	60.04	167.84	11,226.71	-130.43	734.99	137.22	15.85	7.74	16.16
11,391.71	60.41	169.22	11,232.02	-139.54	736.84	146.35	11.68	3.42	12.86
FTP(GSC#13H)									
11,412.00	61.14	171.80	11,241.93	-157.00	739.76	163.84	11.68	3.61	12.73
11,444.00	61.53	175.43	11,257.29	-184.90	742.88	191.77	10.03	1.22	11.34
11,475.00	63.95	180.38	11,271.49	-212.43	743.87	219.30	16.20	7.81	15.97
11,507.00	65.15	181.34	11,285.24	-241.32	743.44	248.18	4.63	3.75	3.00
11,538.00	67.58	182.56	11,297.67	-269.70	742.47	276.55	8.63	7.84	3.94
11,569.00	72.70	181.47	11,308.20	-298.83	741.45	305.67	16.84	16.52	-3.52
11,601.00	75.63	179.00	11,316.93	-329.60	741.33	336.45	11.79	9.16	-7.72
11,632.00	77.12	177.60	11,324.23	-359.72	742.22	366.57	6.51	4.81	-4.52
11,726.00	79.92	178.96	11,342.94	-451.78	744.98	458.66	3.30	2.98	1.45
11,821.00	82.41	181.94	11,357.53	-545.64	744.23	552.50	4.06	2.62	3.14
11,866.00	83.74	182.08	11,362.96	-590.28	742.67	597.12	2.97	2.96	0.31
11,929.00	83.89	182.07	11,369.75	-652.87	740.40	659.69	0.24	0.24	-0.02
12,023.00	85.69	182.00	11,378.28	-746.42	737.08	753.21	1.92	1.91	-0.07
12,117.00	88.68	182.61	11,382.90	-840.22	733.30	846.97	3.25	3.18	0.65
12,211.00	89.41	182.35	11,384.47	-934.12	729.23	940.82	0.82	0.78	-0.28
EOC: 12211.00' MD, 11384.47' TVD, 89.41° INC, 182.35° AZ, 940.82' VS									
12,306.00	87.02	182.38	11,387.42	-1,028.98	725.32	1,035.65	2.52	-2.52	0.03
12,400.00	86.95	180.79	11,392.37	-1,122.81	722.72	1,129.45	1.69	-0.07	-1.69
12,494.00	86.93	180.90	11,397.39	-1,216.67	721.33	1,223.29	0.12	-0.02	0.12
12,588.00	86.81	180.18	11,402.52	-1,310.52	720.45	1,317.13	0.78	-0.13	-0.77
12,683.00	87.33	178.46	11,407.38	-1,405.39	721.58	1,412.00	1.89	0.55	-1.81
12,777.00	87.31	178.43	11,411.77	-1,499.25	724.12	1,505.89	0.04	-0.02	-0.03
12,871.00	88.51	178.05	11,415.20	-1,593.14	727.01	1,599.80	1.34	1.28	-0.40
12,966.00	88.71	178.05	11,417.50	-1,688.06	730.24	1,694.74	0.21	0.21	0.00
13,060.00	87.73	177.46	11,420.42	-1,781.94	733.92	1,788.65	1.22	-1.04	-0.63
13,154.00	89.01	178.10	11,423.10	-1,875.83	737.56	1,882.57	1.52	1.36	0.68

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,249.00	89.06	178.83	11,424.70	-1,970.78	740.11	1,977.54	0.77	0.05	0.77
13,343.00	89.28	178.96	11,426.06	-2,064.76	741.92	2,071.53	0.27	0.23	0.14
13,438.00	88.62	178.19	11,427.80	-2,159.71	744.28	2,166.50	1.07	-0.69	-0.81
13,532.00	88.99	178.41	11,429.76	-2,253.65	747.07	2,260.46	0.46	0.39	0.23
13,626.00	88.52	179.87	11,431.80	-2,347.61	748.48	2,354.43	1.63	-0.50	1.55
13,721.00	89.37	180.94	11,433.55	-2,442.59	747.81	2,449.40	1.44	0.89	1.13
13,815.00	89.18	180.91	11,434.74	-2,536.57	746.29	2,543.37	0.20	-0.20	-0.03
13,909.00	89.16	181.03	11,436.10	-2,630.55	744.70	2,637.32	0.13	-0.02	0.13
14,003.00	88.78	180.86	11,437.79	-2,724.52	743.15	2,731.28	0.44	-0.40	-0.18
14,098.00	88.61	181.15	11,439.96	-2,819.48	741.48	2,826.22	0.35	-0.18	0.31
14,192.00	89.17	181.60	11,441.78	-2,913.43	739.23	2,920.15	0.76	0.60	0.48
14,286.00	86.97	180.67	11,444.94	-3,007.36	737.37	3,014.05	2.54	-2.34	-0.99
14,380.00	87.65	179.88	11,449.35	-3,101.25	736.92	3,107.93	1.11	0.72	-0.84
14,475.00	88.74	179.55	11,452.35	-3,196.20	737.39	3,202.88	1.20	1.15	-0.35
14,569.00	88.69	179.75	11,454.45	-3,290.17	737.96	3,296.86	0.22	-0.05	0.21
14,663.00	88.31	179.87	11,456.92	-3,384.14	738.27	3,390.83	0.42	-0.40	0.13
14,758.00	88.12	180.26	11,459.87	-3,479.10	738.17	3,485.77	0.46	-0.20	0.41
14,852.00	88.71	180.63	11,462.47	-3,573.06	737.44	3,579.72	0.74	0.63	0.39
14,947.00	87.83	179.22	11,465.34	-3,668.01	737.56	3,674.67	1.75	-0.93	-1.48
15,041.00	87.34	179.07	11,469.30	-3,761.91	738.96	3,768.59	0.55	-0.52	-0.16
15,135.00	87.17	179.34	11,473.81	-3,855.80	740.26	3,862.48	0.34	-0.18	0.29
15,230.00	88.10	180.50	11,477.73	-3,950.71	740.40	3,957.39	1.56	0.98	1.22
15,324.00	89.12	180.45	11,480.01	-4,044.68	739.62	4,051.35	1.09	1.09	-0.05
15,418.00	88.89	179.67	11,481.64	-4,138.67	739.52	4,145.33	0.86	-0.24	-0.83
15,513.00	88.68	179.96	11,483.65	-4,233.64	739.83	4,240.31	0.38	-0.22	0.31
15,607.00	87.73	180.15	11,486.60	-4,327.60	739.74	4,334.26	1.03	-1.01	0.20
15,701.00	88.55	178.80	11,489.65	-4,421.54	740.60	4,428.20	1.68	0.87	-1.44
15,795.00	89.80	178.27	11,491.00	-4,515.50	743.00	4,522.18	1.44	1.33	-0.56
15,889.00	89.60	178.16	11,491.49	-4,609.45	745.93	4,616.15	0.24	-0.21	-0.12
15,984.00	89.42	178.31	11,492.31	-4,704.40	748.85	4,711.13	0.25	-0.19	0.16
16,078.00	89.60	178.47	11,493.11	-4,798.36	751.49	4,805.11	0.26	0.19	0.17
16,173.00	89.34	179.01	11,493.99	-4,893.33	753.58	4,900.10	0.63	-0.27	0.57
16,267.00	88.47	179.40	11,495.78	-4,987.31	754.89	4,994.08	1.01	-0.93	0.41
16,361.00	88.48	178.53	11,498.29	-5,081.26	756.58	5,088.04	0.93	0.01	-0.93
16,456.00	89.52	177.83	11,499.94	-5,176.19	759.60	5,183.00	1.32	1.09	-0.74
16,550.00	89.39	178.20	11,500.84	-5,270.13	762.86	5,276.96	0.42	-0.14	0.39
16,644.00	89.31	178.50	11,501.91	-5,364.09	765.56	5,370.94	0.33	-0.09	0.32
16,738.00	89.05	179.10	11,503.25	-5,458.06	767.53	5,464.92	0.70	-0.28	0.64
16,832.00	88.91	179.26	11,504.92	-5,552.03	768.88	5,558.91	0.23	-0.15	0.17
16,927.00	88.68	179.19	11,506.92	-5,647.00	770.16	5,653.89	0.25	-0.24	-0.07
17,021.00	89.02	179.32	11,508.81	-5,740.98	771.38	5,747.87	0.39	0.36	0.14
17,115.00	88.37	179.61	11,510.95	-5,834.95	772.26	5,841.84	0.76	-0.69	0.31
17,209.00	87.63	179.47	11,514.23	-5,928.89	773.02	5,935.78	0.80	-0.79	-0.15

Survey Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #13H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Site:	Gettysburg State COM	**MD Reference:**	RKB @ 3454.80usft (Scandrill Quest - KB=30')
Well:	#13H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.14 Single User Db

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)
17,304.00	87.81	178.37	11,518.01	-6,023.79	774.80	6,030.70	1.17	0.19	-1.16
17,398.00	88.39	178.15	11,521.13	-6,117.70	777.66	6,124.63	0.66	0.62	-0.23
17,493.00	88.90	178.42	11,523.37	-6,212.63	780.50	6,219.58	0.61	0.54	0.28
17,587.00	88.78	178.58	11,525.27	-6,306.58	782.96	6,313.55	0.21	-0.13	0.17
17,681.00	88.53	179.01	11,527.48	-6,400.53	784.94	6,407.52	0.53	-0.27	0.46
17,776.00	87.40	178.60	11,530.85	-6,495.45	786.92	6,502.45	1.27	-1.19	-0.43
17,870.00	86.90	178.66	11,535.53	-6,589.30	789.16	6,596.32	0.54	-0.53	0.06
17,965.00	87.43	179.52	11,540.23	-6,684.17	790.67	6,691.20	1.06	0.56	0.91
18,059.00	87.04	179.78	11,544.76	-6,778.06	791.24	6,785.09	0.50	-0.41	0.28
18,153.00	86.61	180.19	11,549.97	-6,871.92	791.27	6,878.94	0.63	-0.46	0.44
18,247.00	86.33	180.42	11,555.76	-6,965.74	790.77	6,972.75	0.39	-0.30	0.24
18,341.00	85.98	180.78	11,562.06	-7,059.52	789.78	7,066.52	0.53	-0.37	0.38
18,436.00	85.60	180.90	11,569.03	-7,154.25	788.39	7,161.24	0.42	-0.40	0.13
18,530.00	85.45	181.06	11,576.37	-7,247.95	786.79	7,254.92	0.23	-0.16	0.17
18,620.53	85.67	181.11	11,583.37	-7,338.20	785.08	7,345.14	0.25	0.24	0.05
Cross 330' Offset:18620.53' MD, 11583.37' TVD, 85.67° INC									
18,622.13	85.67	181.11	11,583.50	-7,339.79	785.05	7,346.74	0.00	0.00	0.00
LTP(GSC#13H)									
18,624.00	85.68	181.11	11,583.64	-7,341.66	785.02	7,348.60	0.46	0.45	0.10
18,677.00	85.48	181.67	11,587.72	-7,394.48	783.74	7,401.41	1.12	-0.38	1.06
Final MWD Survey: 18677.00' MD, 11587.72' TVD									
18,730.00	85.48	181.67	11,591.90	-7,447.29	782.20	7,454.21	0.00	0.00	0.00
BHL: 18730.00' MD, 11591.90' TVD, 85.48° INC, 181.67° AZ, -7447.29' +N/-S, 782.20' +E/-W, 7454.21' VS - 220' FSL / 354' FEL - PBHL(GSC#									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,493.00	1,491.98	-21.19	28.30	Last MWD Survey: 1493.00' MD, 4.14°INC, 175.18°AZ
10,721.00	10,696.93	197.04	603.79	KOP: 10721.00' MD, 10696.93' TVD
11,318.32	11,193.36	-79.54	720.09	Cross 330' Offset:11318.32' MD, 11193.35' TVD, 56.14° INC
12,211.00	11,384.47	-934.12	729.23	EOC: 12211.00' MD, 11384.47' TVD, 89.41° INC, 182.35° AZ, 940.82' VS
18,620.53	11,583.37	-7,338.20	785.08	Cross 330' Offset:18620.53' MD, 11583.37' TVD, 85.67° INC
18,677.00	11,587.72	-7,394.48	783.74	Final MWD Survey: 18677.00' MD, 11587.72' TVD
18,730.00	11,591.90	-7,447.29	782.20	BHL: 18730.00' MD, 11591.90' TVD, 85.48° INC, 181.67° AZ, -7447.29' +N/-S, 7
18,730.00	11,591.90	-7,447.29	782.20	220' FSL / 354' FEL

Checked By: _____ Approved By: _____ Date: _____

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	18,555	22	5	18,328	70	5	18,190	24	5	18,013	25	5	17,829	35	5
	18,533	23	5	18,304	20	5	18,175	23	5	17,995	22	5	17,816	20	5
	18,510	22	4	18,284	15	4	18,152	19	4	17,973	22	4	17,796	24	4
	18,488	23	4	18,269	15	4	18,133	26	4	17,951	23	4	17,772	28	4
	18,465	32	3	18,254	14	3	18,107		3	17,928	22	3	17,744	17	3
	18,433	13	3	18,240	14	3	18,089	26	3	17,906	22	3	17,727	26	3
	18,420	22	3	18,226	12	3	18,063	25	3	17,864	20	3	17,701	19	3
	18,398		3	18,214		3	18,038		3	17,864		3	17,682		3
	Plug to Plu	127	30	Plug to Plu	72	30	Plug to Plu	67	30	Plug to Plu	72	30	Plug to Plu	73	30
	Frac Plug	18,615	Total Shots	Frac Plug	18,341	Total Shots	Frac Plug	18,200	Total Shots	Frac Plug	18,023	Total Shots	Frac Plug	17,845	Total Shots

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	17,638	44	5	17,471	32	5	17,290	35	5	17,117	28	5	16,941	32	5
	17,628	14	5	17,458	22	5	17,285	28	5	17,100	22	5	16,920	21	5
	17,614	21	4	17,436	22	4	17,257	22	4	17,078	19	4	16,899	22	4
	17,593	23	4	17,414	23	4	17,235	23	4	17,059	26	4	16,877	23	4
	17,570	22	3	17,391	22	3	17,212	22	3	17,033	18	3	16,854	22	3
	17,548	22	3	17,369	22	3	17,190	22	3	17,015	27	3	16,832	23	3
	17,526	23	3	17,347	22	3	17,168	23	3	16,988	15	3	16,809	22	3
	17,503		3	17,325		3	17,145		3	16,973		3	16,787		3
	Plug to Plu	78	30	Plug to Plu	67	30	Plug to Plu	65	30	Plug to Plu	69	30	Plug to Plu	78	30
	Frac Plug	17,671	Total Shots	Frac Plug	17,481	Total Shots	Frac Plug	17,300	Total Shots	Frac Plug	17,128	Total Shots	Frac Plug	16,955	Total Shots

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	16,762	25	5	16,578	30	5	16,396	33	5	16,228	26	5	16,022	49	5
	16,742	22	5	16,563	28	5	16,381	19	5	16,201	18	5	16,012	8	5
	16,720	22	4	16,535	16	4	16,362	23	4	16,183	24	4	16,004	23	4
	16,698	23	4	16,519	23	4	16,339	22	4	16,159	21	4	15,981	22	4
	16,675	22	3	16,496	22	3	16,317	22	3	16,138	22	3	15,959	22	3
	16,653	21	3	16,474	23	3	16,295	23	3	16,116	23	3	15,937	23	3
	16,632	24	3	16,451	22	3	16,272	18	3	16,093	22	3	15,914	22	3
	16,606		3	16,429		3	16,254		3	16,071		3	15,892		3
	Plug to Plu	73	30	Plug to Plu	78	30	Plug to Plu	71	30	Plug to Plu	80	30	Plug to Plu	49	30
	Frac Plug	16,771	Total Shots	Frac Plug	16,597	Total Shots	Frac Plug	16,410	Total Shots	Frac Plug	16,239	Total Shots	Frac Plug	16,030	Total Shots

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	15,870	22	5	15,691	22	5	15,510	24	5	15,322	33	5	15,135	41	5
	15,847	22	5	15,668	22	5	15,489	22	5	15,310	22	5	15,123	14	5
	15,825	23	4	15,646	23	4	15,467	23	4	15,288	23	4	15,109	19	4
	15,802	22	4	15,623	18	4	15,444	22	4	15,265	22	4	15,090	26	4
	15,780	22	3	15,605	26	3	15,422	22	3	15,243	22	3	15,064	27	3
	15,758	23	3	15,579	26	3	15,400	23	3	15,221	23	3	15,037	18	3
	15,735	22	3	15,553	19	3	15,377	22	3	15,198	22	3	15,019	14	3
	15,713		3	15,534		3	15,355		3	15,176		3	15,005		3
	Plug to Plu	79	30	Plug to Plu	79	30	Plug to Plu	79	30	Plug to Plu	67	30	Plug to Plu	56	30
	Frac Plug	15,881	Total Shots	Frac Plug	15,702	Total Shots	Frac Plug	15,523	Total Shots	Frac Plug	15,332	Total Shots	Frac Plug	15,146	Total Shots

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	14,970	35	5	14,793	25	5	14,601	38	5	14,432	28	5	14,258	28	5
	14,947	17	5	14,773	22	5	14,594	22	5	14,415	26	5	14,236	23	5
	14,930	26	4	14,751	23	4	14,572	23	4	14,389	19	4	14,213	22	4
	14,904	19	4	14,728	22	4	14,549	21	4	14,370	23	4	14,191	22	4
	14,885	23	3	14,706	23	3	14,528	24	3	14,347	22	3	14,169	23	3
	14,862	22	3	14,683	22	3	14,504	19	3	14,325	24	3	14,146	22	3
	14,840	22	3	14,661	22	3	14,485	25	3	14,301	15	3	14,124	22	3
	14,818		3	14,639		3	14,460		3	14,286		3	14,102		3
	Plug to Plu	80	30	Plug to Plu	79	30	Plug to Plu	76	30	Plug to Plu	78	30	Plug to Plu	83	30
	Frac Plug	14,984	Total Shots	Frac Plug	14,807	Total Shots	Frac Plug	14,625	Total Shots	Frac Plug	14,448	Total Shots	Frac Plug	14,274	Total Shots

		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
From Bottom to Top	14,071	31	5	13,886	31	5	13,722	22	5	13,543	22	5	13,349	37	5
	14,057	23	5	13,872	2	5	13,700	23	5	13,521	21	5	13,336	18	5
	14,034	21	4	13,870	40	4	13,677	22	4	13,500	24	4	13,318	22	4
	14,013	23	4	13,830	19	4	13,655	22	4	13,476	18	4	13,296	22	4
	13,990	20	3	13,811	24	3	13,633	23	3	13,458	27	3	13,274	23	3
	13,970	25	3	13,787	21	3	13,610	22	3	13,431	23	3	13,251	22	3
	13,945	28	3	13,766	22	3	13,588	23	3	13,408	22	3	13,229	23	3
	13,917		3	13,744		3	13,565		3	13,386		3	13,206		3
	Plug to Plu	71	30	Plug to Plu	75	30	Plug to Plu	77	30	Plug to Plu	77	30	Plug to Plu	63	30
	Frac Plug	14,084	Total Shots	Frac Plug	13,905	Total Shots	Frac Plug	13,732	Total Shots	Frac Plug	13,553	Total Shots	Frac Plug	13,359	Total Shots

	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots
From Bottom to Top	13,135	71	5	13,005	28	5	12,826	22	5	12,647	22	5	12,465	28	5
	13,118	18	5	12,981	21	5	12,804	23	5	12,625	20	5	12,446	25	5
	13,100	20	4	12,960	22	4	12,781	22	4	12,605	25	4	12,421	20	4
	13,080	15	4	12,938	23	4	12,759	23	4	12,580	18	4	12,401	23	4
	13,065	15	3	12,915	22	3	12,736	22	3	12,562	27	3	12,378	22	3
	13,050	10	3	12,893	22	3	12,714	22	3	12,535	27	3	12,356	22	3
	13,040	7	3	12,871	23	3	12,692	23	3	12,508	15	3	12,334	23	3
	13,033		3	12,848		3	12,669		3	12,493		3	12,311		3
	Plug to Plu	65	30	Plug to Plu	78	30	Plug to Plu	78	30	Plug to Plu	78	30	Plug to Plu	80	30
	Frac Plug	13,145	Total Shots	Frac Plug	13,016	Total Shots	Frac Plug	12,837	Total Shots	Frac Plug	12,658	Total Shots	Frac Plug	12,481	Total Shots

	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots	[redacted]	Distance Between Perfs	Shots
From Bottom to Top	12,279	32	5	12,110	27	5	11,931	22	5	11,740	34	5		11595	
	12,263	19	5	12,084	19	5	11,908	22	5	11,729	21	5			
	12,244	22	4	12,065	23	4	11,886	22	4	11,708	23	4			
	12,222	23	4	12,042	22	4	11,864	23	4	11,685	18	4			
	12,199	22	3	12,020	22	3	11,841	22	3	11,667	27	3			
	12,177	22	3	11,998	22	3	11,819	22	3	11,640	26	3			
	12,155	18	3	11,976	23	3	11,797	23	3	11,614	19	3			
	12,137		3	11,953		3	11,774		3	11,595		3			
	Plug to Plu	68	30	Plug to Plu	79	30	Plug to Plu	78	30	Plug to Plu	78	30	Plug to Plu	0	0
	Frac Plug	12,290	Total Shots	Frac Plug	12,121	Total Shots	Frac Plug	11,942	Total Shots	Frac Plug	11,763	Total Shots	Frac Plug		Total Shots

Gettysburg State Com #13H

Perfs	7.5% Acid (Gal)	Sand (#)	Fluid (Gal)
1	4511	361369	399311
2	4494	360024	389634
3	4494	363378	335454
4	3024	359725	364770
5	3024	360255	434406
6	5502	359748	433734
7	3024	360019	395178
8	3012	360001	398106
9	3390	360319	369546
10	3444	361142	421008
11	3012	360679	334308
12	3000	360119	421530
13	3012	360681	342876
14	2667	360808	328167
15	3024	360922	386274
16	3012	360196	320910
17	3024	360720	325542
18	3000	359756	348030
19	3012	358271	350856
20	3108	360409	438396
21	3024	359022	515844
22	3012	360939	314232
23	3024	361000	317646
24	3012	360050	364338
25	3066	360429	314706
26	3012	360496	309108
27	4536	360177	427224
28	3012	361542	318348
29	3012	360086	306756
30	3000	358951	331188
31	3024	360781	434406
32	3024	360018	320586
33	3012	359075	300876
34	3012	360017	309864
35	3024	361368	345618
36	3012	359525	343674
37	3444	359464	307818
38	3444	360441	288960
39	4536	357639	474968
Totals	**129,028**	**14,049,561**	**14,184,192**