

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

30-025-42145

HOBBS OCD

SEP 21 2015

RECEIVED

Well Name and Num: West Pearl 36 State Com #3H
Location: Sec 25, T19S, R34E
Operator: COG
Drilling Contractor: McVay Drilling Company

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.50	295	2.80	4916	61.30	11091		
0.40	556	2.90	5200	73.10	11218		
0.20	927	0.20	5672	18.90	10644		
0.10	1305	1.25	6145	31.01	10804		
0.00	1778	1.45	6620	11.30	10246		
0.10	1933	0.45	7002	13.30	10533		
0.70	2310	0.50	7479	79.90	11445		
1.50	2783	0.45	7957	92.30	11892		
3.60	3161	9.50	8306	91.60	12367		
1.80	3539	9.20	8642	89.70	12745		
0.10	1933	10.90	9052	87.20	13217		
0.70	2310	11.40	9277	90.00	13692		
1.50	2783	10.40	9437	91.60	14071		
3.60	3161	13.60	9817	91.80	14451		
1.80	3539	12.00	10072	89.60	14830		
1.20	4036	61.30	11091	91.10	15020		
3.10	4538	73.10	11218	91.10	15349		

By: Mario A. Garcia

Subscribed and sworn to before me this 12th day of August, 2015

Tina Flemens
Notary Public, Lea County, New Mexico



SEP 23 2015

jm



COG Operating LLC.

Lea County, NM

West Pearl 36 State Com

#3H

OH

Survey: MWD #1

Survey Report - Geographic

09 August, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3751.3usft (Original Well Elev)
Site:	West Pearl 36 State Com	MD Reference:	WELL @ 3751.3usft (Original Well Elev)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single-User Db

Project	Lea County, NM		
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: West Pearl 36 State Com					
Site Position:		Northing:	591,241.60 usft	Latitude:	32° 37' 22.065 N
From:	Map	Easting:	750,259.00 usft	Longitude:	103° 31' 13.807 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.44 °

Well	#3H					
Well Position	+N/-S	0.0 usft	Northing:	591,886.50 usft	Latitude:	32° 37' 28.108 N
	+E/-W	0.0 usft	Easting:	754,696.60 usft	Longitude:	103° 30' 21.865 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	usft	Ground Level:	3,734.3 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	7/6/2015	7.08	60.46	48,455

Design:	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	178.95	

Survey Program		Date	8/9/2015		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
10.0	15,401.0	MWD #1 (OH)	MWD	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	591,886.50	754,696.60	32° 37' 28.108 N	103° 30' 21.865 W
10.0	0.40	318.80	10.0	0.0	0.0	591,886.53	754,696.57	32° 37' 28.108 N	103° 30' 21.865 W
110.0	0.40	102.20	110.0	0.2	0.1	591,886.72	754,696.69	32° 37' 28.110 N	103° 30' 21.864 W
232.0	0.40	125.80	232.0	-0.1	0.8	591,886.38	754,697.45	32° 37' 28.106 N	103° 30' 21.855 W
295.0	0.50	155.80	295.0	-0.5	1.1	591,886.00	754,697.74	32° 37' 28.102 N	103° 30' 21.852 W
380.0	0.00	136.20	380.0	-0.8	1.3	591,885.66	754,697.89	32° 37' 28.099 N	103° 30' 21.850 W
469.0	0.40	164.50	469.0	-1.1	1.4	591,885.36	754,697.97	32° 37' 28.096 N	103° 30' 21.849 W
556.0	0.40	195.20	556.0	-1.7	1.4	591,884.78	754,697.97	32° 37' 28.090 N	103° 30' 21.849 W
644.0	0.10	140.60	644.0	-2.1	1.3	591,884.42	754,697.94	32° 37' 28.087 N	103° 30' 21.850 W
738.0	0.20	189.80	738.0	-2.3	1.4	591,884.20	754,697.97	32° 37' 28.085 N	103° 30' 21.849 W
832.0	0.50	136.20	832.0	-2.8	1.6	591,883.74	754,698.22	32° 37' 28.080 N	103° 30' 21.846 W
927.0	0.20	158.50	927.0	-3.2	2.0	591,883.28	754,698.57	32° 37' 28.076 N	103° 30' 21.842 W



Wellplanning
Survey Report - Geographic

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Site:	West Pearl 36 State Com	MD Reference:	WELL @ 3751.3usft (Original Well Elev)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,021.0	0.50	133.80	1,021.0	-3.7	2.3	591,882.85	754,698.93	32° 37' 28.071 N	103° 30' 21.838 W	
1,116.0	0.40	194.80	1,116.0	-4.3	2.5	591,882.24	754,699.14	32° 37' 28.065 N	103° 30' 21.836 W	
1,210.0	0.50	129.00	1,210.0	-4.8	2.8	591,881.67	754,699.38	32° 37' 28.059 N	103° 30' 21.833 W	
1,305.0	0.10	108.40	1,305.0	-5.1	3.2	591,881.38	754,699.78	32° 37' 28.057 N	103° 30' 21.829 W	
1,399.0	0.40	148.80	1,399.0	-5.4	3.4	591,881.07	754,700.02	32° 37' 28.054 N	103° 30' 21.826 W	
1,494.0	0.10	250.40	1,494.0	-5.7	3.5	591,880.76	754,700.12	32° 37' 28.050 N	103° 30' 21.825 W	
1,589.0	0.10	173.90	1,589.0	-5.9	3.5	591,880.65	754,700.05	32° 37' 28.049 N	103° 30' 21.825 W	
1,683.0	0.10	231.30	1,683.0	-6.0	3.4	591,880.52	754,699.99	32° 37' 28.048 N	103° 30' 21.826 W	
1,778.0	0.00	240.40	1,778.0	-6.0	3.3	591,880.47	754,699.93	32° 37' 28.048 N	103° 30' 21.827 W	
1,933.0	0.10	302.80	1,933.0	-6.0	3.2	591,880.54	754,699.82	32° 37' 28.048 N	103° 30' 21.828 W	
2,027.0	0.70	47.80	2,027.0	-5.5	3.6	591,880.97	754,700.17	32° 37' 28.053 N	103° 30' 21.824 W	
2,122.0	0.80	57.50	2,122.0	-4.8	4.6	591,881.71	754,701.16	32° 37' 28.060 N	103° 30' 21.812 W	
2,216.0	0.80	36.90	2,216.0	-3.9	5.5	591,882.59	754,702.11	32° 37' 28.068 N	103° 30' 21.801 W	
2,310.0	0.70	42.70	2,309.9	-3.0	6.3	591,883.54	754,702.89	32° 37' 28.078 N	103° 30' 21.792 W	
2,405.0	0.70	45.40	2,404.9	-2.1	7.1	591,884.37	754,703.70	32° 37' 28.086 N	103° 30' 21.782 W	
2,499.0	1.00	28.80	2,498.9	-1.0	7.9	591,885.49	754,704.50	32° 37' 28.097 N	103° 30' 21.773 W	
2,594.0	1.10	30.60	2,593.9	0.5	8.8	591,887.01	754,705.37	32° 37' 28.112 N	103° 30' 21.763 W	
2,688.0	1.00	18.20	2,687.9	2.1	9.5	591,888.56	754,706.08	32° 37' 28.127 N	103° 30' 21.754 W	
2,783.0	1.50	28.90	2,782.9	3.9	10.3	591,890.44	754,706.94	32° 37' 28.146 N	103° 30' 21.744 W	
2,877.0	2.20	37.30	2,876.8	6.4	12.0	591,892.95	754,708.63	32° 37' 28.170 N	103° 30' 21.724 W	
2,972.0	2.40	41.80	2,971.8	9.4	14.5	591,895.88	754,711.06	32° 37' 28.199 N	103° 30' 21.695 W	
3,066.0	2.50	44.50	3,065.7	12.3	17.2	591,898.81	754,713.81	32° 37' 28.228 N	103° 30' 21.663 W	
3,161.0	2.60	43.30	3,160.6	15.4	20.1	591,901.86	754,716.74	32° 37' 28.258 N	103° 30' 21.628 W	
3,255.0	2.90	42.40	3,254.5	18.7	23.2	591,905.17	754,719.80	32° 37' 28.290 N	103° 30' 21.592 W	
3,350.0	2.20	40.70	3,349.4	21.8	26.0	591,908.32	754,722.61	32° 37' 28.321 N	103° 30' 21.559 W	
3,444.0	1.90	35.80	3,443.3	24.5	28.1	591,910.96	754,724.70	32° 37' 28.347 N	103° 30' 21.534 W	
3,539.0	1.80	38.60	3,538.3	26.9	30.0	591,913.40	754,726.55	32° 37' 28.371 N	103° 30' 21.513 W	
3,589.0	1.80	40.70	3,588.2	28.1	31.0	591,914.61	754,727.56	32° 37' 28.383 N	103° 30' 21.501 W	
3,689.0	2.10	40.60	3,688.2	30.7	33.2	591,917.19	754,729.77	32° 37' 28.409 N	103° 30' 21.475 W	
3,782.0	2.20	43.60	3,781.1	33.3	35.5	591,919.78	754,732.11	32° 37' 28.434 N	103° 30' 21.447 W	
3,877.0	2.40	45.70	3,876.0	36.0	38.2	591,922.49	754,734.79	32° 37' 28.461 N	103° 30' 21.415 W	
3,971.0	1.00	46.30	3,970.0	37.9	40.2	591,924.43	754,736.80	32° 37' 28.480 N	103° 30' 21.392 W	
4,066.0	1.20	67.20	4,065.0	38.9	41.7	591,925.39	754,738.31	32° 37' 28.489 N	103° 30' 21.374 W	
4,160.0	1.20	142.20	4,159.0	38.5	43.2	591,924.99	754,739.82	32° 37' 28.485 N	103° 30' 21.356 W	
4,255.0	1.30	149.30	4,253.9	36.8	44.4	591,923.28	754,740.98	32° 37' 28.468 N	103° 30' 21.343 W	
4,349.0	3.10	180.90	4,347.9	33.3	44.9	591,919.82	754,741.49	32° 37' 28.434 N	103° 30' 21.337 W	
4,443.0	3.10	183.40	4,441.7	28.2	44.7	591,914.74	754,741.30	32° 37' 28.384 N	103° 30' 21.340 W	
4,538.0	3.00	186.40	4,536.6	23.2	44.3	591,909.70	754,740.87	32° 37' 28.334 N	103° 30' 21.346 W	
4,633.0	2.80	187.10	4,631.5	18.4	43.7	591,904.93	754,740.30	32° 37' 28.287 N	103° 30' 21.353 W	
4,727.0	2.90	189.20	4,725.4	13.8	43.0	591,900.31	754,739.64	32° 37' 28.241 N	103° 30' 21.361 W	
4,822.0	2.60	191.60	4,820.2	9.3	42.2	591,895.82	754,738.82	32° 37' 28.197 N	103° 30' 21.371 W	
4,916.0	2.80	189.80	4,914.1	5.0	41.4	591,891.47	754,738.00	32° 37' 28.154 N	103° 30' 21.381 W	
5,011.0	2.80	216.00	5,009.0	0.8	39.6	591,887.31	754,736.24	32° 37' 28.112 N	103° 30' 21.402 W	
5,105.0	2.90	249.70	5,102.9	-1.9	36.1	591,884.63	754,732.66	32° 37' 28.086 N	103° 30' 21.444 W	
5,200.0	2.90	253.30	5,197.8	-3.4	31.5	591,883.10	754,728.11	32° 37' 28.071 N	103° 30' 21.497 W	
5,294.0	2.70	258.00	5,291.7	-4.5	27.1	591,881.96	754,723.66	32° 37' 28.061 N	103° 30' 21.549 W	
5,389.0	2.60	257.60	5,386.6	-5.5	22.8	591,881.03	754,719.37	32° 37' 28.052 N	103° 30' 21.599 W	
5,483.0	2.50	259.70	5,480.5	-6.3	18.7	591,880.21	754,715.27	32° 37' 28.044 N	103° 30' 21.647 W	
5,578.0	2.20	261.80	5,575.4	-6.9	14.8	591,879.57	754,711.43	32° 37' 28.038 N	103° 30' 21.692 W	
5,672.0	2.00	262.90	5,669.3	-7.4	11.4	591,879.11	754,708.01	32° 37' 28.034 N	103° 30' 21.732 W	
5,767.0	1.90	266.10	5,764.3	-7.7	8.2	591,878.80	754,704.80	32° 37' 28.031 N	103° 30' 21.770 W	
5,861.0	1.80	266.40	5,858.2	-7.9	5.2	591,878.60	754,701.77	32° 37' 28.029 N	103° 30' 21.805 W	
5,956.0	1.80	266.20	5,953.2	-8.1	2.2	591,878.41	754,698.79	32° 37' 28.027 N	103° 30' 21.840 W	
6,050.0	1.60	266.60	6,047.2	-8.3	-0.6	591,878.24	754,696.01	32° 37' 28.026 N	103° 30' 21.873 W	
6,145.0	1.50	269.50	6,142.1	-8.4	-3.2	591,878.15	754,693.44	32° 37' 28.025 N	103° 30' 21.903 W	



Wellplanning

Survey Report - Geographic

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Project:	Lea County, NM	TVD Reference:	WELL @ 3751.3usft (Original Well Elev)
Site:	West Pearl 36 State Com	MD Reference:	WELL @ 3751.3usft (Original Well Elev)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,239.0	1.30	258.00	6,236.1	-8.6	-5.4	591,877.91	754,691.17	32° 37' 28.023 N	103° 30' 21.929 W	
6,334.0	1.00	249.60	6,331.1	-9.1	-7.3	591,877.40	754,689.34	32° 37' 28.018 N	103° 30' 21.951 W	
6,430.0	1.10	233.00	6,427.1	-9.9	-8.8	591,876.55	754,687.82	32° 37' 28.010 N	103° 30' 21.969 W	
6,525.0	1.20	228.20	6,522.0	-11.2	-10.2	591,875.34	754,686.35	32° 37' 27.998 N	103° 30' 21.986 W	
6,620.0	1.40	248.10	6,617.0	-12.3	-12.1	591,874.25	754,684.53	32° 37' 27.987 N	103° 30' 22.007 W	
6,716.0	1.70	246.00	6,713.0	-13.3	-14.5	591,873.23	754,682.14	32° 37' 27.977 N	103° 30' 22.035 W	
6,811.0	1.80	245.00	6,807.9	-14.5	-17.1	591,872.03	754,679.50	32° 37' 27.966 N	103° 30' 22.066 W	
6,906.0	2.10	234.00	6,902.9	-16.1	-19.9	591,870.37	754,676.74	32° 37' 27.949 N	103° 30' 22.099 W	
7,002.0	0.50	297.50	6,998.9	-17.0	-21.7	591,869.53	754,674.95	32° 37' 27.941 N	103° 30' 22.120 W	
7,097.0	0.50	303.50	7,093.9	-16.6	-22.4	591,869.95	754,674.23	32° 37' 27.946 N	103° 30' 22.128 W	
7,192.0	0.70	304.80	7,188.8	-16.0	-23.2	591,870.51	754,673.41	32° 37' 27.951 N	103° 30' 22.138 W	
7,288.0	0.60	310.00	7,284.8	-15.3	-24.1	591,871.17	754,672.54	32° 37' 27.958 N	103° 30' 22.148 W	
7,383.0	0.60	314.00	7,379.8	-14.7	-24.8	591,871.84	754,671.80	32° 37' 27.964 N	103° 30' 22.156 W	
7,479.0	0.50	314.10	7,475.8	-14.0	-25.5	591,872.48	754,671.14	32° 37' 27.971 N	103° 30' 22.164 W	
7,574.0	0.40	300.40	7,570.8	-13.6	-26.0	591,872.93	754,670.56	32° 37' 27.975 N	103° 30' 22.171 W	
7,671.0	0.40	301.80	7,667.8	-13.2	-26.6	591,873.28	754,669.98	32° 37' 27.979 N	103° 30' 22.178 W	
7,766.0	0.40	306.20	7,762.8	-12.9	-27.2	591,873.65	754,669.43	32° 37' 27.983 N	103° 30' 22.184 W	
7,830.0	0.70	147.80	7,826.8	-13.0	-27.1	591,873.45	754,669.46	32° 37' 27.981 N	103° 30' 22.184 W	
7,862.0	1.50	153.50	7,858.8	-13.6	-26.8	591,872.91	754,669.75	32° 37' 27.975 N	103° 30' 22.180 W	
7,894.0	2.00	157.30	7,890.8	-14.5	-26.4	591,872.02	754,670.15	32° 37' 27.966 N	103° 30' 22.176 W	
7,925.0	3.10	167.20	7,921.8	-15.8	-26.1	591,870.71	754,670.54	32° 37' 27.953 N	103° 30' 22.171 W	
7,957.0	4.50	172.80	7,953.7	-17.9	-25.7	591,868.62	754,670.89	32° 37' 27.933 N	103° 30' 22.167 W	
7,989.0	5.80	171.30	7,985.6	-20.7	-25.3	591,865.77	754,671.30	32° 37' 27.904 N	103° 30' 22.163 W	
8,021.0	7.60	170.80	8,017.3	-24.4	-24.7	591,862.09	754,671.88	32° 37' 27.868 N	103° 30' 22.156 W	
8,052.0	9.20	172.00	8,048.0	-28.9	-24.0	591,857.61	754,672.55	32° 37' 27.824 N	103° 30' 22.149 W	
8,084.0	10.30	173.50	8,079.6	-34.3	-23.4	591,852.23	754,673.23	32° 37' 27.770 N	103° 30' 22.142 W	
8,147.0	11.60	172.10	8,141.4	-46.1	-21.9	591,840.36	754,674.74	32° 37' 27.653 N	103° 30' 22.125 W	
8,211.0	11.50	171.40	8,204.1	-58.8	-20.0	591,827.68	754,676.58	32° 37' 27.527 N	103° 30' 22.105 W	
8,306.0	9.50	170.30	8,297.5	-75.9	-17.3	591,810.59	754,679.32	32° 37' 27.358 N	103° 30' 22.074 W	
8,370.0	8.40	166.60	8,360.7	-85.7	-15.3	591,800.83	754,681.29	32° 37' 27.261 N	103° 30' 22.052 W	
8,433.0	8.40	167.70	8,423.1	-94.6	-13.3	591,791.86	754,683.34	32° 37' 27.172 N	103° 30' 22.029 W	
8,497.0	8.70	167.70	8,486.3	-103.9	-11.2	591,782.56	754,685.36	32° 37' 27.080 N	103° 30' 22.006 W	
8,578.0	9.50	168.40	8,566.3	-116.5	-8.6	591,770.03	754,688.01	32° 37' 26.956 N	103° 30' 21.976 W	
8,642.0	9.20	168.00	8,629.5	-126.7	-6.5	591,759.85	754,690.14	32° 37' 26.855 N	103° 30' 21.952 W	
8,705.0	10.20	167.70	8,691.6	-137.0	-4.2	591,749.48	754,692.37	32° 37' 26.752 N	103° 30' 21.927 W	
8,769.0	11.40	163.00	8,754.4	-148.6	-1.2	591,737.89	754,695.43	32° 37' 26.637 N	103° 30' 21.892 W	
8,832.0	10.80	164.10	8,816.3	-160.2	2.3	591,726.26	754,698.87	32° 37' 26.522 N	103° 30' 21.853 W	
8,896.0	12.40	168.90	8,879.0	-172.8	5.2	591,713.75	754,701.83	32° 37' 26.398 N	103° 30' 21.820 W	
8,991.0	11.60	179.70	8,971.9	-192.3	7.2	591,694.19	754,703.85	32° 37' 26.204 N	103° 30' 21.798 W	
9,055.0	10.90	184.00	9,034.7	-204.8	6.9	591,681.71	754,703.46	32° 37' 26.081 N	103° 30' 21.804 W	
9,150.0	12.40	182.20	9,127.7	-223.9	5.8	591,662.56	754,702.44	32° 37' 25.891 N	103° 30' 21.817 W	
9,214.0	12.90	181.10	9,190.1	-238.0	5.4	591,648.55	754,702.04	32° 37' 25.753 N	103° 30' 21.823 W	
9,277.0	11.40	180.40	9,251.7	-251.2	5.3	591,635.29	754,701.86	32° 37' 25.622 N	103° 30' 21.827 W	
9,341.0	9.90	180.70	9,314.6	-263.0	5.2	591,623.47	754,701.75	32° 37' 25.505 N	103° 30' 21.829 W	
9,437.0	10.40	183.60	9,409.1	-279.9	4.5	591,606.57	754,701.10	32° 37' 25.337 N	103° 30' 21.838 W	
9,500.0	10.70	183.50	9,471.1	-291.4	3.8	591,595.05	754,700.39	32° 37' 25.223 N	103° 30' 21.847 W	
9,564.0	12.00	182.90	9,533.8	-304.0	3.1	591,582.48	754,699.69	32° 37' 25.099 N	103° 30' 21.857 W	
9,628.0	13.70	181.60	9,596.2	-318.2	2.5	591,568.26	754,699.14	32° 37' 24.958 N	103° 30' 21.864 W	
9,692.0	14.20	181.50	9,658.3	-333.7	2.1	591,552.83	754,698.73	32° 37' 24.806 N	103° 30' 21.871 W	
9,753.0	14.00	181.90	9,717.5	-348.5	1.7	591,537.98	754,698.28	32° 37' 24.659 N	103° 30' 21.877 W	
9,817.0	13.60	181.60	9,779.6	-363.8	1.2	591,522.72	754,697.82	32° 37' 24.508 N	103° 30' 21.884 W	
9,881.0	13.20	181.50	9,841.9	-378.6	0.8	591,507.89	754,697.42	32° 37' 24.361 N	103° 30' 21.890 W	
9,945.0	12.70	181.80	9,904.3	-392.9	0.4	591,493.56	754,697.00	32° 37' 24.219 N	103° 30' 21.896 W	
10,009.0	12.20	182.50	9,966.8	-406.7	-0.1	591,479.77	754,696.49	32° 37' 24.083 N	103° 30' 21.904 W	
10,072.0	12.00	183.30	10,028.4	-419.9	-0.8	591,466.58	754,695.82	32° 37' 23.953 N	103° 30' 21.913 W	



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3751.3usft (Original Well Elev)
Site:	West Pearl 36 State Com	MD Reference:	WELL @ 3751.3usft (Original Well Elev)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,136.0	12.00	182.90	10,091.0	-433.2	-1.5	591,453.30	754,695.10	32° 37' 23.821 N	103° 30' 21.922 W	
10,200.0	11.80	183.20	10,153.6	-446.4	-2.2	591,440.12	754,694.40	32° 37' 23.691 N	103° 30' 21.932 W	
10,264.0	11.30	182.20	10,216.3	-459.2	-2.8	591,427.32	754,693.79	32° 37' 23.564 N	103° 30' 21.940 W	
10,328.0	12.00	180.00	10,279.0	-472.1	-3.0	591,414.40	754,693.55	32° 37' 23.436 N	103° 30' 21.944 W	
10,391.0	13.40	178.90	10,340.4	-486.0	-2.9	591,400.55	754,693.69	32° 37' 23.299 N	103° 30' 21.943 W	
10,455.0	13.20	178.10	10,402.7	-500.7	-2.5	591,385.83	754,694.08	32° 37' 23.154 N	103° 30' 21.940 W	
10,533.0	13.30	177.90	10,478.6	-518.5	-1.9	591,367.97	754,694.70	32° 37' 22.977 N	103° 30' 21.935 W	
10,580.0	13.30	178.60	10,524.4	-529.3	-1.6	591,357.16	754,695.03	32° 37' 22.870 N	103° 30' 21.932 W	
10,612.0	15.30	179.80	10,555.4	-537.2	-1.5	591,349.26	754,695.14	32° 37' 22.792 N	103° 30' 21.931 W	
10,644.0	18.90	181.30	10,586.0	-546.7	-1.6	591,339.85	754,695.03	32° 37' 22.699 N	103° 30' 21.933 W	
10,676.0	23.00	180.90	10,615.8	-558.1	-1.8	591,328.41	754,694.82	32° 37' 22.586 N	103° 30' 21.937 W	
10,708.0	28.00	178.40	10,644.7	-571.9	-1.7	591,314.64	754,694.93	32° 37' 22.449 N	103° 30' 21.937 W	
10,740.0	32.90	177.10	10,672.3	-588.1	-1.0	591,298.45	754,695.58	32° 37' 22.289 N	103° 30' 21.931 W	
10,772.0	36.40	176.30	10,698.6	-606.2	0.0	591,280.28	754,696.63	32° 37' 22.109 N	103° 30' 21.920 W	
10,804.0	39.10	176.60	10,723.9	-625.8	1.2	591,260.73	754,697.84	32° 37' 21.916 N	103° 30' 21.908 W	
10,836.0	41.60	178.30	10,748.3	-646.5	2.2	591,240.04	754,698.76	32° 37' 21.711 N	103° 30' 21.899 W	
10,868.0	43.90	180.00	10,771.8	-668.2	2.5	591,218.32	754,699.07	32° 37' 21.496 N	103° 30' 21.897 W	
10,899.0	46.50	180.30	10,793.6	-690.2	2.4	591,196.33	754,699.01	32° 37' 21.278 N	103° 30' 21.900 W	
10,931.0	48.90	180.60	10,815.2	-713.8	2.2	591,172.66	754,698.83	32° 37' 21.044 N	103° 30' 21.904 W	
10,963.0	50.20	179.10	10,835.9	-738.2	2.3	591,148.31	754,698.89	32° 37' 20.803 N	103° 30' 21.906 W	
10,995.0	51.40	178.50	10,856.2	-763.0	2.8	591,123.52	754,699.41	32° 37' 20.558 N	103° 30' 21.902 W	
11,027.0	53.40	179.30	10,875.7	-788.3	3.3	591,098.17	754,699.90	32° 37' 20.307 N	103° 30' 21.898 W	
11,059.0	57.10	180.20	10,893.9	-814.6	3.4	591,071.89	754,700.01	32° 37' 20.047 N	103° 30' 21.899 W	
11,091.0	61.30	180.80	10,910.3	-842.1	3.2	591,044.41	754,699.77	32° 37' 19.775 N	103° 30' 21.905 W	
11,123.0	63.30	180.90	10,925.2	-870.4	2.7	591,016.08	754,699.34	32° 37' 19.495 N	103° 30' 21.912 W	
11,155.0	67.20	181.00	10,938.6	-899.5	2.3	590,987.03	754,698.86	32° 37' 19.207 N	103° 30' 21.921 W	
11,186.0	71.20	181.40	10,949.6	-928.4	1.7	590,958.06	754,698.25	32° 37' 18.921 N	103° 30' 21.930 W	
11,218.0	73.10	181.50	10,959.4	-958.9	0.9	590,927.61	754,697.48	32° 37' 18.620 N	103° 30' 21.942 W	
11,254.0	75.80	182.10	10,969.0	-993.6	-0.2	590,892.95	754,696.39	32° 37' 18.277 N	103° 30' 21.958 W	
11,286.0	77.50	181.70	10,976.4	-1,024.7	-1.2	590,861.83	754,695.36	32° 37' 17.969 N	103° 30' 21.973 W	
11,318.0	78.10	181.30	10,983.2	-1,055.9	-2.1	590,830.57	754,694.54	32° 37' 17.660 N	103° 30' 21.985 W	
11,350.0	77.90	180.80	10,989.8	-1,087.2	-2.6	590,799.27	754,693.97	32° 37' 17.350 N	103° 30' 21.995 W	
11,382.0	78.20	180.50	10,996.5	-1,118.5	-3.0	590,767.97	754,693.61	32° 37' 17.040 N	103° 30' 22.002 W	
11,414.0	78.50	180.40	11,002.9	-1,149.9	-3.2	590,736.63	754,693.37	32° 37' 16.730 N	103° 30' 22.008 W	
11,445.0	79.90	180.80	11,008.7	-1,180.3	-3.5	590,706.18	754,693.05	32° 37' 16.429 N	103° 30' 22.014 W	
11,483.0	81.10	181.00	11,015.0	-1,217.8	-4.1	590,668.71	754,692.46	32° 37' 16.058 N	103° 30' 22.024 W	
11,513.0	82.20	181.50	11,019.4	-1,247.5	-4.8	590,639.03	754,691.81	32° 37' 15.765 N	103° 30' 22.035 W	
11,544.0	85.20	180.70	11,022.8	-1,278.3	-5.4	590,608.23	754,691.22	32° 37' 15.460 N	103° 30' 22.044 W	
11,607.0	88.70	182.20	11,026.1	-1,341.2	-7.0	590,545.35	754,689.63	32° 37' 14.838 N	103° 30' 22.069 W	
11,703.0	90.60	180.50	11,026.7	-1,437.1	-9.2	590,449.38	754,687.37	32° 37' 13.888 N	103° 30' 22.104 W	
11,797.0	91.40	181.00	11,025.1	-1,531.1	-10.5	590,355.41	754,686.14	32° 37' 12.959 N	103° 30' 22.127 W	
11,892.0	92.30	179.70	11,022.0	-1,626.0	-11.0	590,260.46	754,685.56	32° 37' 12.019 N	103° 30' 22.142 W	
11,987.0	90.80	178.20	11,019.4	-1,721.0	-9.3	590,165.52	754,687.30	32° 37' 11.080 N	103° 30' 22.131 W	
12,082.0	91.20	176.30	11,017.8	-1,815.9	-4.7	590,070.65	754,691.85	32° 37' 10.141 N	103° 30' 22.086 W	
12,177.0	91.70	176.70	11,015.4	-1,910.6	1.1	589,975.86	754,697.65	32° 37' 9.202 N	103° 30' 22.027 W	
12,271.0	92.20	176.70	11,012.2	-2,004.4	6.5	589,882.07	754,703.06	32° 37' 8.274 N	103° 30' 21.972 W	
12,367.0	91.60	175.00	11,009.0	-2,100.1	13.4	589,786.37	754,710.00	32° 37' 7.326 N	103° 30' 21.900 W	
12,461.0	90.20	175.40	11,007.5	-2,193.8	21.3	589,692.72	754,717.87	32° 37' 6.399 N	103° 30' 21.816 W	
12,556.0	88.10	175.10	11,008.9	-2,288.4	29.1	589,598.06	754,725.73	32° 37' 5.462 N	103° 30' 21.733 W	
12,650.0	89.00	177.90	11,011.3	-2,382.2	34.9	589,504.28	754,731.47	32° 37' 4.533 N	103° 30' 21.674 W	
12,745.0	89.70	179.00	11,012.4	-2,477.2	37.4	589,409.32	754,734.04	32° 37' 3.594 N	103° 30' 21.653 W	
12,840.0	88.40	178.50	11,013.9	-2,572.1	39.5	589,314.36	754,736.11	32° 37' 2.654 N	103° 30' 21.637 W	
12,935.0	88.40	179.10	11,016.6	-2,667.1	41.5	589,219.41	754,738.10	32° 37' 1.714 N	103° 30' 21.623 W	
13,030.0	87.70	179.30	11,019.8	-2,762.0	42.8	589,124.48	754,739.42	32° 37' 0.775 N	103° 30' 21.616 W	
13,125.0	87.70	179.50	11,023.6	-2,856.9	43.8	589,029.56	754,740.42	32° 36' 59.836 N	103° 30' 21.613 W	



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3751.3usft (Original Well Elev)
Site:	West Pearl 36.State Com	MD Reference:	WELL @ 3751.3usft (Original Well Elev)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,217.0	87.20	179.90	11,027.7	-2,948.8	44.3	588,937.65	754,740.90	32° 36' 58.926 N	103° 30' 21.616 W
13,312.0	87.30	180.20	11,032.3	-3,043.7	44.2	588,842.76	754,740.82	32° 36' 57.987 N	103° 30' 21.625 W
13,408.0	85.80	180.60	11,038.1	-3,139.6	43.6	588,746.94	754,740.15	32° 36' 57.039 N	103° 30' 21.642 W
13,503.0	86.50	180.80	11,044.5	-3,234.3	42.4	588,652.17	754,738.99	32° 36' 56.101 N	103° 30' 21.664 W
13,597.0	88.90	181.50	11,048.2	-3,328.2	40.5	588,558.27	754,737.10	32° 36' 55.172 N	103° 30' 21.695 W
13,692.0	90.00	181.60	11,049.1	-3,423.2	37.9	588,463.31	754,734.54	32° 36' 54.233 N	103° 30' 21.733 W
13,787.0	90.80	179.80	11,048.5	-3,518.2	36.8	588,368.32	754,733.37	32° 36' 53.293 N	103° 30' 21.755 W
13,882.0	90.90	178.00	11,047.1	-3,613.1	38.6	588,273.35	754,735.20	32° 36' 52.353 N	103° 30' 21.743 W
13,976.0	90.40	176.80	11,046.0	-3,707.0	42.9	588,179.46	754,739.46	32° 36' 51.424 N	103° 30' 21.701 W
14,071.0	91.60	176.70	11,044.3	-3,801.9	48.2	588,084.63	754,744.85	32° 36' 50.485 N	103° 30' 21.647 W
14,166.0	90.30	177.80	11,042.8	-3,896.7	52.8	587,989.75	754,749.40	32° 36' 49.546 N	103° 30' 21.602 W
14,261.0	89.50	178.50	11,042.9	-3,991.7	55.9	587,894.80	754,752.47	32° 36' 48.607 N	103° 30' 21.575 W
14,356.0	90.50	178.40	11,042.9	-4,086.7	58.4	587,799.84	754,755.04	32° 36' 47.667 N	103° 30' 21.554 W
14,451.0	91.80	178.40	11,041.0	-4,181.6	61.1	587,704.90	754,757.69	32° 36' 46.727 N	103° 30' 21.531 W
14,546.0	90.80	178.60	11,038.9	-4,276.5	63.6	587,609.96	754,760.18	32° 36' 45.787 N	103° 30' 21.511 W
14,641.0	89.00	179.20	11,039.0	-4,371.5	65.4	587,514.98	754,762.00	32° 36' 44.848 N	103° 30' 21.498 W
14,736.0	90.00	179.60	11,039.9	-4,466.5	66.4	587,419.99	754,763.00	32° 36' 43.908 N	103° 30' 21.495 W
14,830.0	89.60	179.00	11,040.2	-4,560.5	67.5	587,326.00	754,764.15	32° 36' 42.977 N	103° 30' 21.491 W
14,925.0	90.90	178.90	11,039.8	-4,655.5	69.3	587,231.02	754,765.89	32° 36' 42.037 N	103° 30' 21.479 W
15,020.0	90.10	178.00	11,038.9	-4,750.4	71.9	587,136.06	754,768.46	32° 36' 41.098 N	103° 30' 21.457 W
15,115.0	89.90	176.40	11,038.9	-4,845.3	76.5	587,041.17	754,773.10	32° 36' 40.158 N	103° 30' 21.412 W
15,210.0	89.10	176.00	11,039.8	-4,940.1	82.8	586,946.39	754,779.39	32° 36' 39.220 N	103° 30' 21.347 W
15,305.0	90.40	176.10	11,040.2	-5,034.9	89.3	586,851.61	754,785.94	32° 36' 38.282 N	103° 30' 21.279 W
15,349.0	91.10	176.10	11,039.6	-5,078.8	92.3	586,807.72	754,788.93	32° 36' 37.847 N	103° 30' 21.248 W
15,401.0	91.10	176.10	11,038.6	-5,130.7	95.9	586,755.85	754,792.46	32° 36' 37.334 N	103° 30' 21.211 W
PBHL(WP36S#3H)									

Checked By: _____ Approved By: _____ Date: _____