



## **COG Operating, LLC**

Lea County, NM

Sec 8, T26S, R34E

Gunner 8 Federal Com #7H

Wellbore #1

Design: Wellbore #1

## **Survey Report - Geographic**

10 August, 2015





HP  
Survey Report - Geographic



<b>Company:</b>	COG Operating, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunner 8 Federal Com #7H
<b>Project:</b>	Lea County, NM	<b>TVD Reference:</b>	Well @ 3379.0usft (McVay 8)
<b>Site:</b>	Sec 8, T26S, R34E	<b>MD Reference:</b>	Well @ 3379.0usft (McVay 8)
<b>Well:</b>	Gunner 8 Federal Com #7H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Compass

<b>Project</b>	Lea County, NM		
<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>	Sec 8, T26S, R34E				
<b>Site Position:</b>		<b>Northing:</b>	383,330.50 usft	<b>Latitude:</b>	32° 3' 3.943 N
<b>From:</b>	Map	<b>Easting:</b>	760,820.40 usft	<b>Longitude:</b>	103° 29' 29.432 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.45 "

<b>Well</b>	Gunner 8 Federal Com #7H					
<b>Well Position</b>	+N-S	0.0 usft	<b>Northing:</b>	383,330.70 usft	<b>Latitude:</b>	32° 3' 3.942 N
	+E-W	0.0 usft	<b>Easting:</b>	760,860.30 usft	<b>Longitude:</b>	103° 29' 28.969 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b>	3,353.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/13/2015	7.11	59.94	48,042

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	1.30	

<b>Survey Program</b>	Date 8/10/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
200.0	800.0	NOV Surveys (Wellbore #1)	Good_gyro	Good Gyro
850.0	19,734.0	MWD (Wellbore #1)	MWD default	MWD - Standard

<b>Survey</b>										
<b>Measured</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Map</b>	<b>Map</b>	<b>Latitude</b>	<b>Longitude</b>	
<b>Depth (usft)</b>			<b>Depth (usft)</b>			<b>Northing (usft)</b>	<b>Easting (usft)</b>			
0.0	0.00	0.00	0.0	0.0	0.0	383,330.70	760,860.30	32° 3' 3.942 N	103° 29' 28.969 W	
200.0	0.10	111.00	200.0	-0.1	0.2	383,330.64	760,860.46	32° 3' 3.941 N	103° 29' 28.967 W	
340.0	0.10	99.00	340.0	-0.1	0.4	383,330.57	760,860.69	32° 3' 3.940 N	103° 29' 28.964 W	
590.0	0.10	24.00	590.0	0.0	0.7	383,330.74	760,861.00	32° 3' 3.942 N	103° 29' 28.960 W	
770.0	0.40	314.00	770.0	0.6	0.3	383,331.32	760,860.61	32° 3' 3.948 N	103° 29' 28.965 W	
800.0	0.60	303.00	800.0	0.8	0.1	383,331.48	760,860.40	32° 3' 3.949 N	103° 29' 28.967 W	
<b>Tie In To GYRO @ 800' MD / 800' TVD</b>										
850.0	0.30	302.70	850.0	1.0	-0.2	383,331.69	760,860.07	32° 3' 3.951 N	103° 29' 28.971 W	
1,035.0	1.80	104.40	1,035.0	0.5	2.2	383,331.23	760,862.48	32° 3' 3.947 N	103° 29' 28.943 W	
1,220.0	1.10	107.60	1,219.9	-0.7	6.7	383,329.97	760,866.99	32° 3' 3.934 N	103° 29' 28.891 W	
1,407.0	2.10	86.10	1,406.8	-1.0	11.8	383,329.66	760,872.12	32° 3' 3.930 N	103° 29' 28.831 W	



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<b>Site:</b>	Sec 8, T26S, R34E	<b>MD Reference:</b>	Well @ 3379.0usft (McVay 8)
<b>Well:</b>	Gunner 8 Federal Com #7H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1 596.0	2 10	90.00	1,595.7	-0.8	18.7	383,329.90	760,879.03	32° 3' 3.932 N	103° 29' 28.751 W
1 785.0	1.80	105.50	1,784.6	-1.6	25.1	383,329.10	760,885.36	32° 3' 3.924 N	103° 29' 28.678 W
1 974.0	2.30	81.90	1,973.5	-1.9	31.7	383,328.84	760,891.97	32° 3' 3.921 N	103° 29' 28.601 W
2 163.0	1.80	85.80	2,162.4	-1.1	38.4	383,329.59	760,898.69	32° 3' 3.928 N	103° 29' 28.523 W
2 351.0	1.20	95.60	2,350.3	-1.1	43.3	383,329.62	760,903.59	32° 3' 3.928 N	103° 29' 28.466 W
2 540.0	2.30	79.10	2,539.2	-0.6	49.0	383,330.14	760,909.29	32° 3' 3.932 N	103° 29' 28.399 W
2 729.0	1.80	76.60	2,728.1	0.8	55.6	383,331.55	760,915.90	32° 3' 3.946 N	103° 29' 28.323 W
2 917.0	1.60	71.00	2,916.0	2.4	61.0	383,333.09	760,921.25	32° 3' 3.961 N	103° 29' 28.260 W
3 106.0	1.20	67.50	3,104.9	4.0	65.3	383,334.70	760,925.57	32° 3' 3.976 N	103° 29' 28.210 W
3 200.0	2.80	84.70	3 198.9	4.6	68.5	383,335.29	760,928.77	32° 3' 3.982 N	103° 29' 28.173 W
3 389.0	3.30	94.90	3 387.6	4.6	78.5	383,335.25	760,938.79	32° 3' 3.981 N	103° 29' 28.056 W
3 578.0	2.30	97.00	3,576.4	3.6	87.7	383,334.33	760,947.97	32° 3' 3.971 N	103° 29' 27.950 W
3 766.0	1.90	97.70	3,764.3	2.8	94.5	383,333.45	760,954.80	32° 3' 3.962 N	103° 29' 27.870 W
3 955.0	1.20	89.30	3,953.2	2.4	99.6	383,333.05	760,959.89	32° 3' 3.957 N	103° 29' 27.811 W
4 144.0	2.60	70.70	4,142.1	3.8	105.6	383,334.50	760,965.91	32° 3' 3.971 N	103° 29' 27.741 W
4 333.0	3.30	88.90	4,330.8	5.3	115.1	383,336.02	760,975.40	32° 3' 3.985 N	103° 29' 27.631 W
4 522.0	3.00	99.10	4,519.6	4.6	125.4	383,335.34	760,985.72	32° 3' 3.978 N	103° 29' 27.511 W
4 711.0	2.50	94.20	4,708.3	3.6	134.4	383,334.25	760,994.72	32° 3' 3.986 N	103° 29' 27.407 W
4 900.0	2.60	94.60	4,897.1	2.9	142.8	383,333.61	761,003.10	32° 3' 3.959 N	103° 29' 27.309 W
5 088.0	2.80	108.30	5,084.9	1.1	151.4	383,331.82	761,011.71	32° 3' 3.941 N	103° 29' 27.209 W
5 277.0	1.60	82.60	5,273.8	0.0	158.4	383,330.72	761,018.71	32° 3' 3.930 N	103° 29' 27.128 W
5 464.0	1.20	67.10	5,460.7	1.1	162.8	383,331.81	761,023.10	32° 3' 3.940 N	103° 29' 27.077 W
5 653.0	2.10	92.80	5,649.7	1.7	168.1	383,332.41	761,028.38	32° 3' 3.946 N	103° 29' 27.016 W
5 841.0	2.30	94.90	5 837.5	1.2	175.3	383,331.92	761,035.58	32° 3' 3.940 N	103° 29' 26.932 W
6 030.0	1.90	98.10	6 026.4	0.5	182.2	383,331.16	761,042.46	32° 3' 3.932 N	103° 29' 26.852 W
6 219.0	2.10	101.20	6,215.3	-0.7	188.7	383,330.04	761,048.96	32° 3' 3.921 N	103° 29' 26.777 W
6 408.0	1.90	103.30	6,404.2	-2.0	195.1	383,328.65	761,055.41	32° 3' 3.906 N	103° 29' 26.702 W
6 596.0	2.10	101.90	6,592.1	-3.5	201.5	383,327.22	761,061.81	32° 3' 3.892 N	103° 29' 26.628 W
6 785.0	2.10	108.60	6,780.9	-5.3	208.2	383,325.41	761,068.48	32° 3' 3.873 N	103° 29' 26.550 W
6 974.0	2.30	91.40	6,969.8	-6.5	215.3	383,324.21	761,075.56	32° 3' 3.861 N	103° 29' 26.468 W
7 163.0	2.30	100.20	7,158.6	-7.3	222.8	383,323.44	761,083.08	32° 3' 3.853 N	103° 29' 26.381 W
7 352.0	2.30	96.00	7,347.5	-8.3	230.3	383,322.38	761,090.58	32° 3' 3.841 N	103° 29' 26.294 W
7 541.0	1.90	82.60	7,536.4	-8.3	237.2	383,322.38	761,097.46	32° 3' 3.841 N	103° 29' 26.214 W
7 729.0	1.90	95.30	7,724.3	-8.2	243.4	383,322.50	761,103.66	32° 3' 3.842 N	103° 29' 26.142 W
7 918.0	1.80	100.50	7,913.2	-9.0	249.4	383,321.67	761,109.69	32° 3' 3.833 N	103° 29' 26.072 W
8 107.0	1.80	84.70	8,102.1	-9.3	255.3	383,321.40	761,115.57	32° 3' 3.830 N	103° 29' 26.004 W
8 296.0	1.60	101.20	8,291.0	-9.5	260.8	383,321.16	761,121.11	32° 3' 3.827 N	103° 29' 25.939 W
8 484.0	2.10	83.70	8,478.9	-9.7	266.8	383,321.03	761,127.11	32° 3' 3.825 N	103° 29' 25.870 W
8 673.0	2.50	79.80	8,667.7	-8.6	274.3	383,322.14	761,134.61	32° 3' 3.836 N	103° 29' 25.782 W
8 862.0	1.90	100.90	8,856.6	-8.4	281.4	383,322.28	761,141.74	32° 3' 3.837 N	103° 29' 25.699 W
9 021.0	1.60	82.30	9,015.5	-8.6	286.2	383,322.08	761,146.53	32° 3' 3.834 N	103° 29' 25.644 W
9 210.0	1.20	88.60	9,204.5	-8.2	290.8	383,322.48	761,151.13	32° 3' 3.838 N	103° 29' 25.590 W
9 257.0	1.10	82.30	9,251.5	-8.1	291.8	383,322.55	761,152.06	32° 3' 3.838 N	103° 29' 25.579 W
9 304.0	3.00	26.40	9,298.4	-7.0	292.8	383,323.71	761,153.06	32° 3' 3.850 N	103° 29' 25.568 W
9 351.0	7.20	8.80	9,345.2	-3.0	293.8	383,327.73	761,154.06	32° 3' 3.890 N	103° 29' 25.556 W
9 399.0	11.40	5.30	9,392.6	4.7	294.7	383,335.43	761,154.96	32° 3' 3.966 N	103° 29' 25.545 W
9 446.0	15.10	0.70	9,438.3	15.5	295.2	383,346.18	761,155.46	32° 3' 4.072 N	103° 29' 25.538 W
9 493.0	18.30	359.30	9,483.4	29.0	295.1	383,359.68	761,155.44	32° 3' 4.206 N	103° 29' 25.537 W
9 540.0	21.10	3.50	9,527.6	44.8	295.6	383,375.51	761,155.87	32° 3' 4.362 N	103° 29' 25.530 W
9 587.0	24.80	4.60	9,570.9	63.1	296.9	383,393.78	761,157.18	32° 3' 4.543 N	103° 29' 25.514 W
9 634.0	27.30	4.90	9,613.1	83.7	298.6	383,414.35	761,158.89	32° 3' 4.746 N	103° 29' 25.492 W
9 682.0	29.00	6.00	9,655.4	106.2	300.7	383,436.89	761,161.05	32° 3' 4.969 N	103° 29' 25.465 W
9 698.0	30.30	5.30	9,669.3	114.1	301.5	383,444.77	761,161.82	32° 3' 5.047 N	103° 29' 25.455 W
9 746.0	34.30	2.10	9,709.9	139.7	303.1	383,470.35	761,163.44	32° 3' 5.300 N	103° 29' 25.434 W
9 793.0	39.20	0.00	9,747.5	167.8	303.6	383,498.46	761,163.92	32° 3' 5.578 N	103° 29' 25.426 W



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<b>Well:</b>	Gunner 8 Federal Com #7H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,840.0	45.80	0.30	9,782.2	199.5	303.7	383,530.19	761,164.01	32° 3' 5.892 N	103° 29' 25.422 W
9,887.0	51.90	357.90	9,813.1	234.9	303.1	383,565.56	761,163.42	32° 3' 6.242 N	103° 29' 25.425 W
9,934.0	58.60	357.20	9,839.9	273.4	301.5	383,604.12	761,161.76	32° 3' 6.624 N	103° 29' 25.441 W
9,981.0	64.80	357.50	9,862.1	314.7	299.6	383,645.43	761,159.85	32° 3' 7.033 N	103° 29' 25.460 W
10,029.0	72.00	358.60	9,879.8	359.3	298.1	383,690.01	761,158.35	32° 3' 7.474 N	103° 29' 25.473 W
10,076.0	79.90	359.30	9,891.2	404.9	297.2	383,735.56	761,157.52	32° 3' 7.925 N	103° 29' 25.479 W
10,105.0	85.30	358.90	9,894.9	433.6	296.8	383,764.30	761,157.07	32° 3' 8.209 N	103° 29' 25.481 W
10,152.0	88.00	358.60	9,897.7	480.5	295.7	383,811.21	761,156.04	32° 3' 8.674 N	103° 29' 25.489 W
10,247.0	88.00	358.60	9,901.0	575.4	293.4	383,906.12	761,153.72	32° 3' 9.613 N	103° 29' 25.507 W
10,341.0	88.70	0.00	9,903.7	669.4	292.3	384,000.07	761,152.57	32° 3' 10.543 N	103° 29' 25.512 W
10,435.0	90.10	0.00	9,904.7	763.4	292.3	384,094.06	761,152.57	32° 3' 11.473 N	103° 29' 25.504 W
10,530.0	90.40	0.30	9,904.3	858.4	292.5	384,189.06	761,152.82	32° 3' 12.413 N	103° 29' 25.492 W
10,624.0	90.40	0.70	9,903.6	952.4	293.3	384,283.06	761,153.64	32° 3' 13.343 N	103° 29' 25.474 W
10,718.0	90.60	1.40	9,902.8	1,046.3	295.1	384,377.04	761,155.37	32° 3' 14.273 N	103° 29' 25.445 W
10,813.0	90.10	1.80	9,902.2	1,141.3	297.7	384,472.00	761,158.02	32° 3' 15.212 N	103° 29' 25.406 W
10,907.0	90.30	1.80	9,901.9	1,235.3	300.7	384,565.95	761,160.97	32° 3' 16.142 N	103° 29' 25.363 W
11,002.0	89.20	0.00	9,902.3	1,330.2	302.2	384,660.93	761,162.46	32° 3' 17.082 N	103° 29' 25.337 W
11,096.0	90.10	0.30	9,902.9	1,424.2	302.4	384,754.93	761,162.71	32° 3' 18.012 N	103° 29' 25.326 W
11,191.0	90.10	1.00	9,902.7	1,519.2	303.5	384,849.92	761,163.79	32° 3' 18.952 N	103° 29' 25.305 W
11,285.0	91.50	0.30	9,901.4	1,613.2	304.6	384,943.90	761,164.85	32° 3' 19.882 N	103° 29' 25.284 W
11,379.0	91.70	0.30	9,898.8	1,707.2	305.0	385,037.86	761,165.34	32° 3' 20.811 N	103° 29' 25.270 W
11,473.0	91.50	0.70	9,896.1	1,801.1	305.9	385,131.82	761,166.16	32° 3' 21.741 N	103° 29' 25.252 W
11,568.0	90.60	358.90	9,894.4	1,896.1	305.5	385,226.80	761,165.83	32° 3' 22.681 N	103° 29' 25.247 W
11,662.0	90.30	358.60	9,893.7	1,990.1	303.5	385,320.78	761,163.78	32° 3' 23.611 N	103° 29' 25.262 W
11,756.0	89.90	358.20	9,893.5	2,084.0	300.9	385,414.74	761,161.16	32° 3' 24.541 N	103° 29' 25.284 W
11,851.0	90.40	358.60	9,893.2	2,179.0	298.2	385,509.70	761,158.51	32° 3' 25.481 N	103° 29' 25.305 W
11,945.0	90.30	358.60	9,892.7	2,273.0	295.9	385,603.67	761,156.21	32° 3' 26.411 N	103° 29' 25.324 W
12,040.0	89.70	358.60	9,892.7	2,367.9	293.6	385,698.64	761,153.89	32° 3' 27.351 N	103° 29' 25.343 W
12,134.0	92.00	0.00	9,891.3	2,461.9	292.4	385,792.62	761,152.74	32° 3' 28.281 N	103° 29' 25.348 W
12,228.0	92.20	0.00	9,887.8	2,555.9	292.4	385,886.55	761,152.74	32° 3' 29.211 N	103° 29' 25.339 W
12,323.0	91.80	0.00	9,884.5	2,650.8	292.4	385,981.50	761,152.74	32° 3' 30.150 N	103° 29' 25.330 W
12,417.0	91.80	359.60	9,881.6	2,744.8	292.1	386,075.45	761,152.41	32° 3' 31.080 N	103° 29' 25.326 W
12,512.0	91.00	0.00	9,879.2	2,839.7	291.8	386,170.42	761,152.08	32° 3' 32.020 N	103° 29' 25.321 W
12,606.0	90.60	0.30	9,877.9	2,933.7	292.0	386,264.41	761,152.33	32° 3' 32.950 N	103° 29' 25.310 W
12,700.0	90.80	0.30	9,876.8	3,027.7	292.5	386,358.40	761,152.82	32° 3' 33.880 N	103° 29' 25.295 W
12,794.0	89.70	0.30	9,876.4	3,121.7	293.0	386,452.40	761,153.31	32° 3' 34.810 N	103° 29' 25.281 W
12,889.0	90.10	359.30	9,876.5	3,216.7	292.7	386,547.40	761,152.98	32° 3' 35.750 N	103° 29' 25.276 W
12,983.0	89.70	359.30	9,876.7	3,310.7	291.5	386,641.39	761,151.83	32° 3' 36.680 N	103° 29' 25.281 W
13,078.0	90.40	0.00	9,876.6	3,405.7	291.0	386,736.39	761,151.25	32° 3' 37.620 N	103° 29' 25.279 W
13,170.0	91.00	0.30	9,875.5	3,499.7	291.2	386,831.38	761,151.49	32° 3' 38.551 N	103° 29' 25.268 W
13,264.0	91.30	359.60	9,873.6	3,591.7	291.1	386,922.36	761,151.41	32° 3' 39.481 N	103° 29' 25.260 W
13,358.0	90.40	359.60	9,872.2	3,685.6	290.5	387,016.34	761,150.75	32° 3' 40.411 N	103° 29' 25.260 W
13,453.0	91.50	359.30	9,870.6	3,780.6	289.5	387,111.33	761,149.84	32° 3' 41.331 N	103° 29' 25.262 W
13,547.0	91.30	359.30	9,868.3	3,874.6	288.4	387,205.29	761,148.69	32° 3' 42.261 N	103° 29' 25.266 W
13,641.0	91.10	359.30	9,866.4	3,968.6	287.2	387,299.26	761,147.54	32° 3' 43.191 N	103° 29' 25.271 W
13,735.0	90.60	359.60	9,865.0	4,062.5	286.3	387,393.25	761,146.64	32° 3' 44.121 N	103° 29' 25.273 W
13,830.0	90.10	358.60	9,864.4	4,157.5	284.9	387,488.23	761,145.15	32° 3' 45.061 N	103° 29' 25.282 W
13,925.0	89.90	358.20	9,864.4	4,252.5	282.2	387,583.20	761,142.50	32° 3' 46.001 N	103° 29' 25.304 W
14,019.0	90.40	357.20	9,864.2	4,346.4	278.4	387,677.12	761,138.73	32° 3' 46.930 N	103° 29' 25.339 W
14,113.0	90.80	357.50	9,863.2	4,440.3	274.1	387,771.01	761,134.38	32° 3' 47.860 N	103° 29' 25.381 W
14,207.0	91.30	359.30	9,861.4	4,534.3	271.5	387,864.95	761,131.76	32° 3' 48.790 N	103° 29' 25.403 W
14,302.0	89.40	358.90	9,860.9	4,629.2	270.0	387,959.94	761,130.26	32° 3' 49.730 N	103° 29' 25.412 W
14,396.0	90.30	359.30	9,861.1	4,723.2	268.5	388,053.92	761,128.79	32° 3' 50.660 N	103° 29' 25.421 W
14,491.0	89.70	359.60	9,861.1	4,818.2	267.6	388,148.92	761,127.88	32° 3' 51.600 N	103° 29' 25.423 W
14,585.0	91.30	0.30	9,860.3	4,912.2	267.5	388,242.91	761,127.79	32° 3' 52.530 N	103° 29' 25.415 W



HP  
Survey Report - Geographic



<b>Company:</b>	COG Operating, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunner 8 Federal Com #7H
<b>Project:</b>	Lea County, NM	<b>TVD Reference:</b>	Well @ 3379 Ousft (McVay 8)
<b>Site:</b>	Sec 8, T26S, R34E	<b>MD Reference:</b>	Well @ 3379 Ousft (McVay 8)
<b>Well:</b>	Gunner 8 Federal Com #7H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,680.0	91.10	0.70	9,858.3	5,007.2	268.3	388,337.89	761,128.62	32° 3' 53.470 N	103° 29' 25.397 W
14,774.0	91.00	1.00	9,856.6	5,101.2	269.7	388,431.86	761,130.02	32° 3' 54.400 N	103° 29' 25.372 W
14,869.0	90.10	1.00	9,855.7	5,196.1	271.4	388,526.84	761,131.67	32° 3' 55.339 N	103° 29' 25.344 W
14,963.0	89.60	0.30	9,855.9	5,290.1	272.4	388,620.83	761,132.74	32° 3' 56.269 N	103° 29' 25.323 W
15,058.0	89.40	359.60	9,856.7	5,385.1	272.4	388,715.83	761,132.66	32° 3' 57.210 N	103° 29' 25.316 W
15,152.0	90.10	358.90	9,857.2	5,479.1	271.1	388,809.82	761,131.43	32° 3' 58.140 N	103° 29' 25.321 W
15,247.0	91.70	358.60	9,855.7	5,574.1	269.1	388,904.78	761,129.35	32° 3' 59.080 N	103° 29' 25.337 W
15,341.0	91.50	358.60	9,853.0	5,668.0	266.8	388,998.72	761,127.06	32° 4' 0.009 N	103° 29' 25.355 W
15,435.0	91.50	358.60	9,850.6	5,762.0	264.5	389,092.66	761,124.76	32° 4' 0.939 N	103° 29' 25.373 W
15,530.0	91.00	358.90	9,848.5	5,856.9	262.4	389,187.61	761,122.69	32° 4' 1.879 N	103° 29' 25.389 W
15,624.0	91.10	359.30	9,846.8	5,950.9	260.9	389,281.58	761,121.22	32° 4' 2.809 N	103° 29' 25.397 W
15,719.0	91.10	358.90	9,845.0	6,045.9	259.4	389,376.55	761,119.72	32° 4' 3.749 N	103° 29' 25.406 W
15,813.0	90.60	358.90	9,843.6	6,139.8	257.6	389,470.53	761,117.92	32° 4' 4.679 N	103° 29' 25.418 W
15,907.0	90.40	359.30	9,842.7	6,233.8	256.1	389,564.51	761,116.44	32° 4' 5.609 N	103° 29' 25.427 W
16,002.0	90.10	359.60	9,842.3	6,328.8	255.2	389,659.51	761,115.53	32° 4' 6.549 N	103° 29' 25.429 W
16,096.0	92.40	0.30	9,840.3	6,422.8	255.2	389,753.48	761,115.45	32° 4' 7.479 N	103° 29' 25.421 W
16,190.0	92.40	0.70	9,836.3	6,516.7	256.0	389,847.39	761,116.27	32° 4' 8.408 N	103° 29' 25.403 W
16,285.0	90.60	359.60	9,833.9	6,611.7	256.2	389,942.35	761,116.52	32° 4' 9.348 N	103° 29' 25.392 W
16,379.0	91.00	0.30	9,832.5	6,705.6	256.1	390,036.34	761,116.43	32° 4' 10.278 N	103° 29' 25.384 W
16,473.0	90.80	359.60	9,831.1	6,799.6	256.1	390,130.33	761,116.35	32° 4' 11.208 N	103° 29' 25.377 W
16,567.0	90.80	359.60	9,829.8	6,893.6	255.4	390,224.32	761,115.70	32° 4' 12.138 N	103° 29' 25.376 W
16,662.0	91.00	359.30	9,828.3	6,988.6	254.5	390,319.30	761,114.78	32° 4' 13.078 N	103° 29' 25.378 W
16,756.0	91.00	359.60	9,826.6	7,082.6	253.6	390,413.28	761,113.88	32° 4' 14.008 N	103° 29' 25.380 W
16,850.0	89.40	359.60	9,826.3	7,176.6	252.9	390,507.28	761,113.23	32° 4' 14.938 N	103° 29' 25.379 W
16,945.0	88.90	359.30	9,827.7	7,271.6	252.0	390,602.26	761,112.31	32° 4' 15.878 N	103° 29' 25.381 W
17,039.0	89.90	359.60	9,828.7	7,365.6	251.1	390,696.25	761,111.41	32° 4' 16.809 N	103° 29' 25.383 W
17,133.0	90.40	359.30	9,828.4	7,459.5	250.2	390,790.25	761,110.51	32° 4' 17.739 N	103° 29' 25.385 W
17,228.0	90.60	359.60	9,827.6	7,554.5	249.3	390,885.24	761,109.60	32° 4' 18.679 N	103° 29' 25.387 W
17,322.0	91.00	359.60	9,826.3	7,648.5	248.6	390,979.23	761,108.94	32° 4' 19.609 N	103° 29' 25.386 W
17,416.0	91.30	0.00	9,824.4	7,742.5	248.3	391,073.21	761,108.61	32° 4' 20.539 N	103° 29' 25.381 W
17,511.0	91.30	0.00	9,822.3	7,837.5	248.3	391,168.18	761,108.61	32° 4' 21.479 N	103° 29' 25.372 W
17,605.0	91.80	359.60	9,819.7	7,931.4	248.0	391,262.15	761,108.29	32° 4' 22.409 N	103° 29' 25.368 W
17,699.0	89.70	359.30	9,818.5	8,025.4	247.1	391,356.13	761,107.38	32° 4' 23.339 N	103° 29' 25.370 W
17,793.0	89.70	359.30	9,819.0	8,119.4	245.9	391,450.12	761,106.23	32° 4' 24.269 N	103° 29' 25.374 W
17,888.0	90.30	359.60	9,819.0	8,214.4	245.0	391,545.12	761,105.32	32° 4' 25.209 N	103° 29' 25.376 W
17,982.0	91.00	0.00	9,817.9	8,308.4	244.7	391,639.11	761,104.99	32° 4' 26.139 N	103° 29' 25.372 W
18,076.0	88.90	0.00	9,818.0	8,402.4	244.7	391,733.10	761,104.99	32° 4' 27.069 N	103° 29' 25.363 W
18,171.0	88.90	0.30	9,819.8	8,497.4	244.9	391,828.08	761,105.24	32° 4' 28.009 N	103° 29' 25.352 W
18,265.0	88.70	0.00	9,821.8	8,591.4	245.2	391,922.06	761,105.49	32° 4' 28.939 N	103° 29' 25.340 W
18,360.0	89.70	0.00	9,823.1	8,686.4	245.2	392,017.05	761,105.49	32° 4' 29.879 N	103° 29' 25.332 W
18,454.0	89.90	359.60	9,823.4	8,780.4	244.9	392,111.05	761,105.16	32° 4' 30.809 N	103° 29' 25.327 W
18,548.0	90.30	358.90	9,823.3	8,874.3	243.6	392,205.04	761,103.93	32° 4' 31.739 N	103° 29' 25.333 W
18,643.0	90.60	358.20	9,822.5	8,969.3	241.2	392,300.01	761,101.53	32° 4' 32.679 N	103° 29' 25.352 W
18,737.0	91.00	358.20	9,821.2	9,063.3	238.3	392,393.95	761,098.57	32° 4' 33.609 N	103° 29' 25.378 W
18,831.0	91.70	358.20	9,819.0	9,157.2	235.3	392,487.88	761,095.62	32° 4' 34.539 N	103° 29' 25.404 W
18,926.0	90.40	358.90	9,817.3	9,251.1	232.9	392,582.83	761,093.22	32° 4' 35.479 N	103° 29' 25.423 W
19,020.0	90.80	358.60	9,816.3	9,346.1	230.9	392,676.80	761,091.17	32° 4' 36.409 N	103° 29' 25.438 W
19,115.0	90.30	359.30	9,815.4	9,441.1	229.1	392,771.78	761,089.43	32° 4' 37.349 N	103° 29' 25.450 W
19,209.0	90.80	358.90	9,814.5	9,535.1	227.7	392,865.77	761,087.95	32° 4' 38.279 N	103° 29' 25.458 W
19,303.0	89.00	359.30	9,814.6	9,629.1	226.2	392,959.75	761,086.48	32° 4' 39.209 N	103° 29' 25.467 W
19,397.0	90.30	359.30	9,815.2	9,723.0	225.0	393,053.74	761,085.33	32° 4' 40.139 N	103° 29' 25.472 W
19,492.0	90.80	359.30	9,814.3	9,818.0	223.9	393,148.73	761,084.17	32° 4' 41.079 N	103° 29' 25.477 W
19,523.0	91.00	359.30	9,813.8	9,849.0	223.5	393,179.72	761,083.79	32° 4' 41.386 N	103° 29' 25.478 W
19,719.8	91.00	359.30	9,810.4	10,045.8	221.1	393,376.48	761,081.38	32° 4' 43.333 N	103° 29' 25.488 W

Crossed 330' Hard Line @ 19720' MD / 9810' TVD



HP  
Survey Report - Geographic



<b>Company:</b>	COG Operating, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunner 8 Federal Com #7H
<b>Project:</b>	Lea County, NM	<b>TVD Reference:</b>	Well @ 3379 Dusst (McVay 8)
<b>Site:</b>	Sec 8, T26S, R34E	<b>MD Reference:</b>	Well @ 3379.0usft (McVay 8)
<b>Well:</b>	Gunner 8 Federal Com #7H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,734.0	91.00	359.30	9,810.1	10,060.0	220.9	393,390.67	761,081.21	32° 4' 43.474 N	103° 29' 25.489 W
TD @ 19734' MD / 9810' TVD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
800.0	800.0	0.8	0.1	Tie In To GYRO @ 800' MD / 800' TVD
19,719.8	9,810.4	10,045.8	221.1	Crossed 330' Hard Line @ 19720' MD / 9810' TVD
19,734.0	9,810.1	10,060.0	220.9	TD @ 19734' MD / 9810' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



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

Well Name and Num: Gunner 8 Federal Com # 7H  
 Location: Sec 8, T26S, 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>
1.90	3766	29.00	9682	13.60	9817		
2.60	4144	51.90	9887	12.00	10072		
3.00	4522	88.00	10247	90.30	17511		
2.60	4990	90.40	10624	90.80	16567		
1.60	5277	89.20	11002	88.90	16945		
1.20	5461	91.50	11473	90.60	17228		
2.30	5841	90.40	11945	91.00	16530		
1.90	6030	92.00	12134	90.40	15907		
2.30	6408	91.80	12417	92.40	16190		
2.30	6974	90.80	12700	91.00	17982		
2.30	7352	90.40	13078	89.70	18360		
1.90	7729	91.30	13170	91.70	18831		
1.80	8107	90.10	13830	90.80	19209		
2.10	8484	91.30	14207	91.00	19523		
1.90	8862	91.90	14680				
1.60	9021	89.40	15058				
11.40	9399	91.50	15341				

By: Marc A. Bane

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

Tina Flemens

Notary Public, Lea County, New Mexico



**Gunner 8 Federal Com #7H (30-025-41211)  
Sec 8-T26S-R34E**

<u>Stages</u>	<u>7 1/2% Acid (Gals)</u>	<u>Proppant (#)</u>	<u>Clean Fluid (Gals)</u>
1	1500	299725	273240
2	3066	300694	310968
3	3024	299947	308826
4	3024	300522	310296
5	3000	299608	304224
6	3000	209721	248609
7	3024	299594	291732
8	2970	301053	295584
9	3066	299789	291144
10	3024	301406	290850
11	3000	299778	293850
12	3000	299735	290826
13	4536	299562	301056
14	3024	300245	290766
15	3012	299692	289998
16	3012	299483	290124
17	3024	299795	288918
18	3024	300628	289548
19	3024	299247	289968
20	2982	302027	288900
21	3012	299886	286302
22	3000	301788	288558
23	4494	299732	308658
24	3012	301083	286596
25	3012	300381	287352
26	3024	300089	286986
27	3024	299989	286356
28	3024	304965	288330
29	3000	301032	286332
30	3000	300230	283909
31	3066	298777	277998
32	3066	299540	281442
33	3012	298419	306252
34	3000	300058	283686
35	3066	299917	280434
36	3108	300266	281694
37	3096	299777	284244
38	3054	300565	282438
39	3012	300877	282438
40	3012	300161	279918
41	3150	300391	282786
42	3024	301207	278292
43	3012	300306	278700
44	3012	301212	281136
45	3012	297928	277272
46	3012	299323	278196
47	3024	298853	273000
48	3012	300684	278322
49	3000	299757	278058
50	3012	298916	277986
51	3066	299626	274890
52	3012	300456	277356
53	3012	301027	294702
54	3000	300657	278100
55	3000	301222	278814
56	3012	298442	272568
57	3024	300613	273000
58	3024	299641	275142
59	2982	298550	274260
60	3012	301446	277210
61	3012	300062	275822
62	3012	300864	276830
63	4536	302111	280538
64	3054	306194	277818
<b>Totals</b>	<b>196,450</b>	<b>19,129,271</b>	<b>18,240,140</b>



Date: 11/20/16  
 Pressure level: 9500  
 Well: Gunner 6 Fed Com 87H  
 Name/number: Gunner 6 Fed Com 87H  
 Casing 1 size: 8 1/2  
 Capacity-bbls/lin. ft.: 0.0232  
 Top of casing: 0  
 TD of casing: 19,688  
 TVD: 9953  
 AFE: 1093  
 Shotwell Plug: 16,154

(entered data to be carried to 6th stage)

Fluid Database

1	Treated Water
2	7.5 % Acid
3	Slickwater
4	Water Frac G-RU(1)
5	
6	
7	
8	
9	
10	
11	
12	

Proppant Database

1	100 Mesh
2	40/70 White
3	
4	
5	
6	
7	
8	

Chemical Database

1	BE-9
2	Loaurf-360
3	Clay Web
4	HPH Breaker
5	FR-65
6	OptiSeal-WF
7	OptiSeal H TE
8	Scalesorb
9	Parasorb
10	Scalesorb 12

	Stage 1	Distance Between Perfs	Shots	Stage 2	Distance Between Perfs	Shots	Stage 3	Distance Between Perfs	Shots	Stage 4	Distance Between Perfs	Shots	Stage 5	Distance Between Perfs	Shots				
From Bottom	10,585	50	14	10,433	50	14	10,285	50	14	10,137	48	14	10,085	50	14				
Bottom	10,535	50	12	10,385	50	12	10,235	50	12	10,085	50	12	10,035	50	12				
Top	10,485		10	10,335		10	10,185		10	10,035		10	10,035		10				
Plug to Plug	145		38	Plug to Plug	148		Plug to Plug	154		Plug to Plug	146		Plug to Plug	154		38			
Frac Plug	19,895		Total Shots	Frac Plug	19,485		Total Shots	Frac Plug	19,314		Total Shots	Frac Plug	19,169		Total Shots	Frac Plug	19,614		Total Shots

	Stage 6	Distance Between Perfs	Shots	Stage 7	Distance Between Perfs	Shots	Stage 8	Distance Between Perfs	Shots	Stage 9	Distance Between Perfs	Shots	Stage 10	Distance Between Perfs	Shots				
From Bottom	10,035	47	14	10,084	50	14	10,032	52	14	10,084	48	14	10,134	50	14				
Bottom	10,085	40	12	10,034	50	12	10,086	54	12	10,034	50	12	10,086	55	12				
Top	10,034		10	10,084		10	10,032		10	10,084		10	10,034		10				
Plug to Plug	151		38	Plug to Plug	156		Plug to Plug	150		Plug to Plug	153		Plug to Plug	148		38			
Frac Plug	19,889		Total Shots	Frac Plug	19,799		Total Shots	Frac Plug	19,579		Total Shots	Frac Plug	19,489		Total Shots	Frac Plug	19,399		Total Shots

	Stage 11	Distance Between Perfs	Shots	Stage 12	Distance Between Perfs	Shots	Stage 13	Distance Between Perfs	Shots	Stage 14	Distance Between Perfs	Shots	Stage 15	Distance Between Perfs	Shots				
From Bottom	10,084	50	14	10,030	54	14	10,078	56	14	10,034	52	14	10,084	50	14				
Bottom	10,034	50	12	10,084	50	12	10,032	48	12	10,084	50	12	10,034	50	12				
Top	10,084		10	10,034		10	10,086		10	10,034		10	10,084		10				
Plug to Plug	151		38	Plug to Plug	167		Plug to Plug	133		Plug to Plug	160		Plug to Plug	140		38			
Frac Plug	19,319		Total Shots	Frac Plug	17,829		Total Shots	Frac Plug	17,792		Total Shots	Frac Plug	17,829		Total Shots	Frac Plug	17,499		Total Shots

	Stage 16	Distance Between Perfs	Shots	Stage 17	Distance Between Perfs	Shots	Stage 18	Distance Between Perfs	Shots	Stage 19	Distance Between Perfs	Shots	Stage 20	Distance Between Perfs	Shots				
From Bottom	10,030	55	14	10,084	50	14	10,033	50	14	10,084	49	14	10,033	50	14				
Bottom	10,084	50	12	10,038	55	12	10,093	50	12	10,033	50	12	10,033	50	12				
Top	10,034		10	10,083		10	10,033		10	10,083		10	10,033		10				
Plug to Plug	159		38	Plug to Plug	143		Plug to Plug	150		Plug to Plug	143		Plug to Plug	187		38			
Frac Plug	17,339		Total Shots	Frac Plug	17,309		Total Shots	Frac Plug	17,859		Total Shots	Frac Plug	18,809		Total Shots	Frac Plug	18,759		Total Shots

	Stage 21	Distance Between Perfs	Shots	Stage 22	Distance Between Perfs	Shots	Stage 23	Distance Between Perfs	Shots	Stage 24	Distance Between Perfs	Shots	Stage 25	Distance Between Perfs	Shots				
From Bottom	10,085	48	14	10,433	50	14	10,200	71	14	10,133	50	14	10,083	45	14				
Bottom	10,533	50	12	10,383	48	12	10,225	42	12	10,033	55	12	10,033	50	12				
Top	10,483		10	10,337		10	10,183		10	10,033		10	10,033		10				
Plug to Plug	158		38	Plug to Plug	170		Plug to Plug	176		Plug to Plug	148		Plug to Plug	182		38			
Frac Plug	19,898		Total Shots	Frac Plug	19,458		Total Shots	Frac Plug	19,200		Total Shots	Frac Plug	19,154		Total Shots	Frac Plug	19,098		Total Shots

	Stage 26	Distance Between Perfs	Shots	Stage 27	Distance Between Perfs	Shots	Stage 28	Distance Between Perfs	Shots	Stage 29	Distance Between Perfs	Shots	Stage 30	Distance Between Perfs	Shots				
From Bottom	10,033	50	14	10,083	50	14	10,032	40	14	10,083	50	14	10,032	50	14				
Bottom	10,085	47	12	10,033	55	12	10,082	50	12	10,032	45	12	10,082	47	12				
Top	10,032		10	10,082		10	10,032		10	10,082		10	10,032		10				
Plug to Plug	148		38	Plug to Plug	150		Plug to Plug	154		Plug to Plug	148		Plug to Plug	151		38			
Frac Plug	19,858		Total Shots	Frac Plug	19,788		Total Shots	Frac Plug	19,558		Total Shots	Frac Plug	19,484		Total Shots	Frac Plug	19,358		Total Shots

	Stage 31	Distance Between Perfs	Shots	Stage 32	Distance Between Perfs	Shots	Stage 33	Distance Between Perfs	Shots	Stage 34	Distance Between Perfs	Shots	Stage 35	Distance Between Perfs	Shots				
From Bottom	10,082	53	14	10,032	50	14	10,082	50	14	10,031	51	14	10,082	50	14				
Bottom	10,032	50	12	10,085	53	12	10,032	50	12	10,082	56	12	10,032	53	12				
Top	10,082		10	10,032		10	10,082		10	10,031		10	10,082		10				
Plug to Plug	152		38	Plug to Plug	147		Plug to Plug	151		Plug to Plug	157		Plug to Plug	148		38			
Frac Plug	19,107		Total Shots	Frac Plug	14,893		Total Shots	Frac Plug	14,898		Total Shots	Frac Plug	14,867		Total Shots	Frac Plug	14,598		Total Shots

Spot Acid Bbls	Stage 36	Distance Between Perfs	Shots	Stage 37	Distance Between Perfs	Shots	Stage 38	Distance Between Perfs	Shots	Stage 39	Distance Between Perfs	Shots	Stage 40	Distance Between Perfs	Shots		
	14,332	50	14	14,182	50	14	14,032	50	14	13,880	53	14	13,732	49	14		
	14,282	50	12	14,132	50	12	13,982	49	12	13,831	50	12	13,680	50	12		
	14,732		10	14,082		10	13,932		10	13,781		10	13,630		10		
Plug to Plug	153	36	Plug to Plug	158	36	Plug to Plug	142	36	Plug to Plug	150	36	Plug to Plug	150	36	Plug to Plug	150	36
Frac Plug	14,389	Total Shots		14,397	Total Shots		14,848	Total Shots		13,999	Total Shots		13,788	Total Shots		13,788	Total Shots

From Bottom to Top	Stage 41	Distance Between Perfs	Shots	Stage 42	Distance Between Perfs	Shots	Stage 43	Distance Between Perfs	Shots	Stage 44	Distance Between Perfs	Shots	Stage 45	Distance Between Perfs	Shots		
	13,581	49	14	13,427	54	14	13,281	50	14	13,127	54	14	12,981	50	14		
	13,531	50	12	13,381	50	12	13,231	50	12	13,081	50	12	12,931	50	12		
	13,481		10	13,331		10	13,181		10	13,031		10	12,881		10		
Plug to Plug	150	36	Plug to Plug	160	36	Plug to Plug	146	36	Plug to Plug	143	36	Plug to Plug	127	36	Plug to Plug	127	36
Frac Plug	13,589	Total Shots		13,884	Total Shots		13,399	Total Shots		13,168	Total Shots		12,813	Total Shots		12,813	Total Shots

From Bottom to Top	Stage 46	Distance Between Perfs	Shots	Stage 47	Distance Between Perfs	Shots	Stage 48	Distance Between Perfs	Shots	Stage 49	Distance Between Perfs	Shots	Stage 50	Distance Between Perfs	Shots		
	12,830	48	14	12,681	50	14	12,528	53	14	12,381	50	14	12,230	50	14		
	12,781	50	12	12,631	50	12	12,481	50	12	12,331	51	12	12,180	47	12		
	12,731		10	12,581		10	12,431		10	12,280		10	12,130		10		
Plug to Plug	144	36	Plug to Plug	154	36	Plug to Plug	142	36	Plug to Plug	152	36	Plug to Plug	137	36	Plug to Plug	137	36
Frac Plug	12,856	Total Shots		12,711	Total Shots		12,659	Total Shots		12,614	Total Shots		12,502	Total Shots		12,502	Total Shots

From Bottom to Top	Stage 51	Distance Between Perfs	Shots	Stage 52	Distance Between Perfs	Shots	Stage 53	Distance Between Perfs	Shots	Stage 54	Distance Between Perfs	Shots	Stage 55	Distance Between Perfs	Shots		
	12,084	49	14	11,930	50	14	11,781	49	14	11,630	50	14	11,480	50	14		
	12,030	50	12	11,880	50	12	11,730	50	12	11,580	50	12	11,430	50	12		
	11,980		10	11,830		10	11,680		10	11,530		10	11,380		10		
Plug to Plug	148	36	Plug to Plug	154	36	Plug to Plug	146	36	Plug to Plug	154	36	Plug to Plug	154	36	Plug to Plug	154	36
Frac Plug	12,089	Total Shots		11,939	Total Shots		11,889	Total Shots		11,839	Total Shots		11,789	Total Shots		11,789	Total Shots

From Bottom to Top	Stage 56	Distance Between Perfs	Shots	Stage 57	Distance Between Perfs	Shots	Stage 58	Distance Between Perfs	Shots	Stage 59	Distance Between Perfs	Shots	Stage 60	Distance Between Perfs	Shots		
	11,330	50	14	11,180	55	14	11,030	50	14	10,880	55	14	10,730	50	14		
	11,280	45	12	11,130	50	12	10,980	45	12	10,830	50	12	10,679	46	12		
	11,230		10	11,080		10	10,930		10	10,780		10	10,630		10		
Plug to Plug	148	36	Plug to Plug	156	36	Plug to Plug	144	36	Plug to Plug	155	36	Plug to Plug	146	36	Plug to Plug	146	36
Frac Plug	11,251	Total Shots		11,205	Total Shots		11,849	Total Shots		11,899	Total Shots		11,750	Total Shots		11,750	Total Shots

From Bottom to Top	Stage 61	Distance Between Perfs	Shots	Stage 62	Distance Between Perfs	Shots	Stage 63	Distance Between Perfs	Shots	Stage 64	Distance Between Perfs	Shots	Stage 65	Distance Between Perfs	Shots		
	10,579	54	14	10,431	48	14	10,279	50	14	10,129	51	14	10,029				
	10,529	50	12	10,279	50	12	10,229	50	12	10,079	50	12					
	10,479		10	10,329		10	10,179		10	10,029		10					
Plug to Plug	158	36	Plug to Plug	142	36	Plug to Plug	158	36	Plug to Plug	125	36	Plug to Plug	0	0	Plug to Plug	0	0
Frac Plug	10,694	Total Shots		10,654	Total Shots		10,312	Total Shots		10,164	Total Shots			Total Shots			Total Shots