



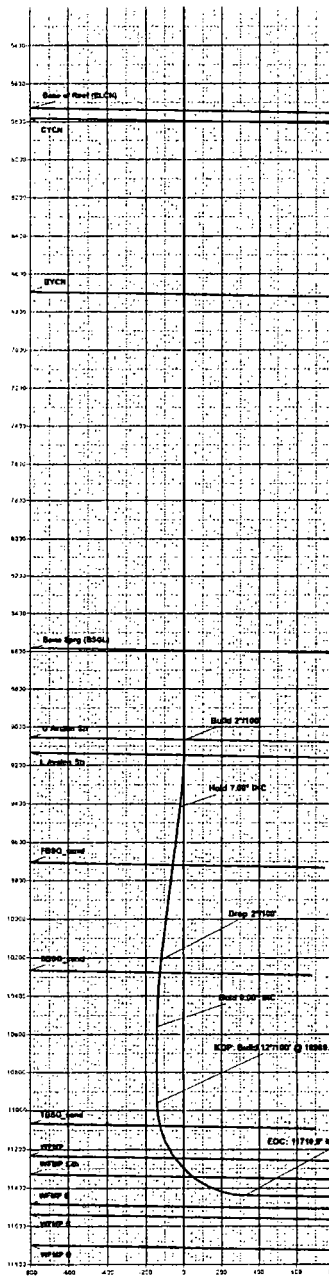
Mas Federal Com #2H  
Lea County, NM  
Q170\*\*\* & WT-170\*\*\*  
Design #1

Company Name: COG Operating, LLC  
Mas Federal Com #2H  
Lea County, NM  
Rig: Noram 21  
Created By: Shelly Peterkin  
Date: 6/7/2017

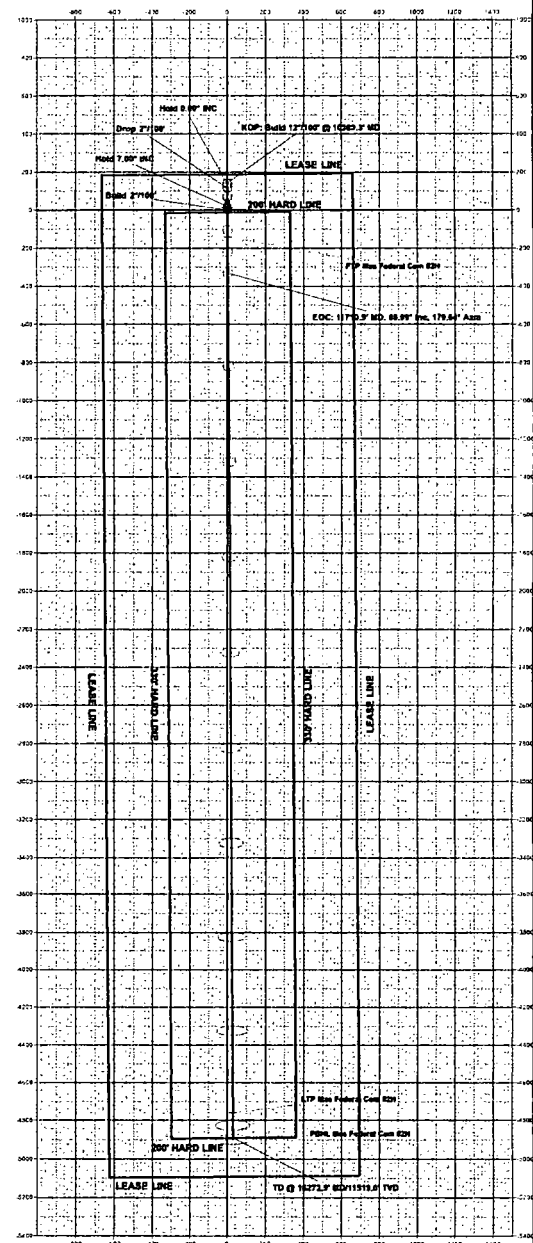
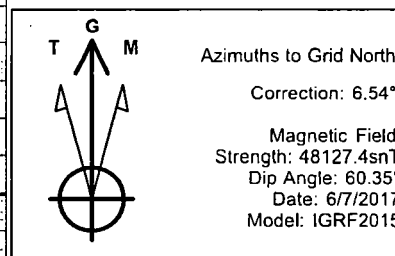
| WELL DETAILS: Mas Federal Com #2H |      |           |              |           |           |                   |
|-----------------------------------|------|-----------|--------------|-----------|-----------|-------------------|
| +N/S                              | +E/W | Northing  | Ground Level | 3718.0    |           |                   |
| 0.0                               | 0.0  | 551889.80 | Easting      | 744135.50 | Latitude  | 32° 32' 10.322 N  |
|                                   |      |           |              |           | Longitude | 103° 32' 28.147 W |
|                                   |      |           |              |           | Spot      |                   |

| DESIGN TARGET DETAILS    |         |         |      |           |           |                  |
|--------------------------|---------|---------|------|-----------|-----------|------------------|
| Name                     | TVD     | +N/S    | +E/W | Northing  | Easting   | Latitude         |
| FTP Mas Federal Com #2H  | 0.0     | -139.9  | 1.0  | 559549.95 | 744135.54 | 32° 32' 8.938 N  |
| LTP Mas Federal Com #2H  | 0.0     | -1780.2 | 30.5 | 554929.56 | 744165.97 | 32° 31' 21.218 N |
| P2HL Mas Federal Com #2H | 15119.0 | -4890.2 | 31.1 | 556793.50 | 744166.50 | 32° 31' 21.932 N |

| ANNOTATIONS |       |        |         |         |      |        |           |                                           |  |
|-------------|-------|--------|---------|---------|------|--------|-----------|-------------------------------------------|--|
| MD          | Inc   | Azi    | TVD     | +N/S    | +E/W | Vsect  | Departure | Annotation                                |  |
| 9070.0      | 0.00  | 0.00   | 9070.0  | 0.0     | 0.0  | 0.0    | 0.0       | Build 27100'                              |  |
| 9419.8      | 7.00  | 359.84 | 9418.9  | 21.3    | -0.1 | -21.3  | 21.3      | Hold 7.00' INC                            |  |
| 10219.5     | 7.00  | 359.84 | 10212.7 | 118.7   | -0.8 | -118.7 | 118.7     | Drop 27100'                               |  |
| 10569.3     | 0.00  | 0.00   | 10561.6 | 140.1   | -0.9 | -140.1 | 140.1     | Hold 0.00' INC                            |  |
| 10969.3     | 0.00  | 0.00   | 10961.6 | 140.1   | -0.9 | -140.1 | 140.1     | KOP: Build 127100' @ 10969.3' MD          |  |
| 11710.9     | 89.00 | 179.84 | 11439.0 | -329.0  | 2.1  | 329.0  | 699.2     | EOC: 11710.9' MD, 88.99' Inc, 179.84' Azi |  |
| 16272.9     | 89.00 | 179.84 | 11519.0 | -4890.2 | 31.1 | 4890.2 | 5170.4    | TD @ 16272.9' MD/11519.0' TVD             |  |



| PROJECT DETAILS: Lea County, NM |                                      |
|---------------------------------|--------------------------------------|
| Geodetic System:                | US State Plane 1927 (Exact solution) |
| Datum:                          | NAD 1927 (NADCON CONUS)              |
| Ellipsoid:                      | Clarke 1866                          |
| Zone:                           | New Mexico East 3001                 |
| System Datum:                   | Mean Sea Level                       |



Vertical Section at 179.84° (200 usf/m)



## **COG Operating, LLC**

**Lea County, NM**

**Sec 34, T20S, R34E**

**Mas Federal Com #2H**

**Wellbore #1**

**Plan: Design #1**

**HOBBS OCD**

**NOV 27 2017**

**RECEIVED**

## **QES Well Planning Report**

**07 June, 2017**





## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| 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                  |  |  |           |  |  | Sec 34, T20S, R34E |  |  |                 |  |  |                   |  |  |                   |  |  |
| Site Position:        |  |  | Northing: |  |  | 559,689.80 usft    |  |  | Latitude:       |  |  | 32° 32' 10.322 N  |  |  |                   |  |  |
| From:                 |  |  | Map       |  |  | Easting:           |  |  | 744,135.50 usft |  |  | Longitude:        |  |  | 103° 32' 28.147 W |  |  |
| Position Uncertainty: |  |  | 0.0 usft  |  |  | Slot Radius:       |  |  | 13-3/16 "       |  |  | Grid Convergence: |  |  | 0.43 °            |  |  |

|                      |                     |          |                     |                 |               |                   |
|----------------------|---------------------|----------|---------------------|-----------------|---------------|-------------------|
| Well                 | Mas Federal Com #2H |          |                     |                 |               |                   |
| Well Position        | +N/-S               | 0.0 usft | Northing:           | 559,689.80 usft | Latitude:     | 32° 32' 10.322 N  |
|                      | +E/-W               | 0.0 usft | Easting:            | 744,135.50 usft | Longitude:    | 103° 32' 28.147 W |
| Position Uncertainty |                     | 0.0 usft | Wellhead Elevation: | 0.0 usft        | Ground Level: | 3,718.0 usft      |

|           |             |             |                    |                  |                        |
|-----------|-------------|-------------|--------------------|------------------|------------------------|
| Wellbore  | Wellbore #1 |             |                    |                  |                        |
| Magnetics | Model Name  | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|           | IGRF2015    | 6/7/2017    | 6.97               | 60.35            | 48,127                 |

|                   |                            |                 |                 |                  |
|-------------------|----------------------------|-----------------|-----------------|------------------|
| Design:           | Design #1                  |                 |                 |                  |
| Audit Notes:      |                            |                 |                 |                  |
| Version:          | Phase:                     | PLAN            | Tie On Depth:   | 0.0              |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°) |
|                   | 0.0                        | 0.0             | 0.0             | 179.64           |

| Plan Sections         |                 |             |                       |              |              |                         |                        |                       |         |                     |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|---------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (") | Target              |
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 0.00                    | 0.00                   | 0.00                  | 0.00    |                     |
| 9,070.0               | 0.00            | 0.00        | 9,070.0               | 0.0          | 0.0          | 0.00                    | 0.00                   | 0.00                  | 0.00    |                     |
| 9,419.8               | 7.00            | 359.64      | 9,418.9               | 21.3         | -0.1         | 2.00                    | 2.00                   | 0.00                  | 359.64  |                     |
| 10,219.5              | 7.00            | 359.64      | 10,212.7              | 118.7        | -0.8         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                     |
| 10,569.3              | 0.00            | 0.00        | 10,561.6              | 140.1        | -0.9         | 2.00                    | -2.00                  | 0.00                  | 180.00  |                     |
| 10,969.3              | 0.00            | 0.00        | 10,961.6              | 140.1        | -0.9         | 0.00                    | 0.00                   | 0.00                  | 0.00    |                     |
| 11,710.9              | 89.00           | 179.64      | 11,439.0              | -329.0       | 2.1          | 12.00                   | 12.00                  | 24.22                 | 179.64  |                     |
| 16,272.9              | 89.00           | 179.64      | 11,519.0              | -4,890.2     | 31.1         | 0.00                    | 0.00                   | 0.00                  | 0.00    | PBHL Mas Federal Co |



## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Planned 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 100.0                 | 0.00            | 0.00        | 100.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 200.0                 | 0.00            | 0.00        | 200.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 300.0                 | 0.00            | 0.00        | 300.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 400.0                 | 0.00            | 0.00        | 400.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 500.0                 | 0.00            | 0.00        | 500.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 600.0                 | 0.00            | 0.00        | 600.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 700.0                 | 0.00            | 0.00        | 700.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 800.0                 | 0.00            | 0.00        | 800.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 900.0                 | 0.00            | 0.00        | 900.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,000.0               | 0.00            | 0.00        | 1,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,100.0               | 0.00            | 0.00        | 1,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,200.0               | 0.00            | 0.00        | 1,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,300.0               | 0.00            | 0.00        | 1,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,400.0               | 0.00            | 0.00        | 1,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,500.0               | 0.00            | 0.00        | 1,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,600.0               | 0.00            | 0.00        | 1,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| Rustler               |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,617.0               | 0.00            | 0.00        | 1,617.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,700.0               | 0.00            | 0.00        | 1,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| TOS                   |                 |             |                       |              |              |                         |                         |                        |                       |
| 1,712.0               | 0.00            | 0.00        | 1,712.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,800.0               | 0.00            | 0.00        | 1,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 1,900.0               | 0.00            | 0.00        | 1,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,000.0               | 0.00            | 0.00        | 2,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,100.0               | 0.00            | 0.00        | 2,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,200.0               | 0.00            | 0.00        | 2,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,300.0               | 0.00            | 0.00        | 2,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,400.0               | 0.00            | 0.00        | 2,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,500.0               | 0.00            | 0.00        | 2,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,600.0               | 0.00            | 0.00        | 2,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,700.0               | 0.00            | 0.00        | 2,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,800.0               | 0.00            | 0.00        | 2,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 2,900.0               | 0.00            | 0.00        | 2,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,000.0               | 0.00            | 0.00        | 3,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,100.0               | 0.00            | 0.00        | 3,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,200.0               | 0.00            | 0.00        | 3,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,300.0               | 0.00            | 0.00        | 3,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| BOS (Castile)         |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,337.0               | 0.00            | 0.00        | 3,337.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,400.0               | 0.00            | 0.00        | 3,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,500.0               | 0.00            | 0.00        | 3,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| Yates                 |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,512.0               | 0.00            | 0.00        | 3,512.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,600.0               | 0.00            | 0.00        | 3,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,700.0               | 0.00            | 0.00        | 3,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,800.0               | 0.00            | 0.00        | 3,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| Reef                  |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,827.0               | 0.00            | 0.00        | 3,827.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 3,900.0               | 0.00            | 0.00        | 3,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 4,000.0               | 0.00            | 0.00        | 4,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 4,100.0               | 0.00            | 0.00        | 4,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 4,200.0               | 0.00            | 0.00        | 4,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 4,300.0               | 0.00            | 0.00        | 4,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |



## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Planned Survey

| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| 4,400.0                     | 0.00               | 0.00           | 4,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,500.0                     | 0.00               | 0.00           | 4,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,600.0                     | 0.00               | 0.00           | 4,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,700.0                     | 0.00               | 0.00           | 4,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,800.0                     | 0.00               | 0.00           | 4,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,900.0                     | 0.00               | 0.00           | 4,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,000.0                     | 0.00               | 0.00           | 5,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,100.0                     | 0.00               | 0.00           | 5,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,200.0                     | 0.00               | 0.00           | 5,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,300.0                     | 0.00               | 0.00           | 5,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,400.0                     | 0.00               | 0.00           | 5,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,500.0                     | 0.00               | 0.00           | 5,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,600.0                     | 0.00               | 0.00           | 5,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,700.0                     | 0.00               | 0.00           | 5,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| Base of Reef (BLCN)         |                    |                |                             |                 |                 |                               |                               |                              |                             |
| 5,742.0                     | 0.00               | 0.00           | 5,742.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| CYCN                        |                    |                |                             |                 |                 |                               |                               |                              |                             |
| 5,797.0                     | 0.00               | 0.00           | 5,797.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,800.0                     | 0.00               | 0.00           | 5,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,900.0                     | 0.00               | 0.00           | 5,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,000.0                     | 0.00               | 0.00           | 6,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,100.0                     | 0.00               | 0.00           | 6,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,200.0                     | 0.00               | 0.00           | 6,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,300.0                     | 0.00               | 0.00           | 6,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,400.0                     | 0.00               | 0.00           | 6,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,500.0                     | 0.00               | 0.00           | 6,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,600.0                     | 0.00               | 0.00           | 6,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,700.0                     | 0.00               | 0.00           | 6,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| BYCN                        |                    |                |                             |                 |                 |                               |                               |                              |                             |
| 6,707.0                     | 0.00               | 0.00           | 6,707.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,800.0                     | 0.00               | 0.00           | 6,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 6,900.0                     | 0.00               | 0.00           | 6,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,000.0                     | 0.00               | 0.00           | 7,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,100.0                     | 0.00               | 0.00           | 7,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,200.0                     | 0.00               | 0.00           | 7,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,300.0                     | 0.00               | 0.00           | 7,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,400.0                     | 0.00               | 0.00           | 7,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,500.0                     | 0.00               | 0.00           | 7,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,600.0                     | 0.00               | 0.00           | 7,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,700.0                     | 0.00               | 0.00           | 7,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,800.0                     | 0.00               | 0.00           | 7,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 7,900.0                     | 0.00               | 0.00           | 7,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,000.0                     | 0.00               | 0.00           | 8,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,100.0                     | 0.00               | 0.00           | 8,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,200.0                     | 0.00               | 0.00           | 8,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,300.0                     | 0.00               | 0.00           | 8,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,400.0                     | 0.00               | 0.00           | 8,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,500.0                     | 0.00               | 0.00           | 8,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| Bone Sprg (BSGL)            |                    |                |                             |                 |                 |                               |                               |                              |                             |
| 8,595.0                     | 0.00               | 0.00           | 8,595.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,600.0                     | 0.00               | 0.00           | 8,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,700.0                     | 0.00               | 0.00           | 8,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 8,800.0                     | 0.00               | 0.00           | 8,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |



## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Planned 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) |
|------------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 8,900.0                                  | 0.00            | 0.00        | 8,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,000.0                                  | 0.00            | 0.00        | 9,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| <b>U Avalon Sh</b>                       |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,067.0                                  | 0.00            | 0.00        | 9,067.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| <b>Build 2°/100'</b>                     |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,070.0                                  | 0.00            | 0.00        | 9,070.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,100.0                                  | 0.60            | 359.64      | 9,100.0               | 0.2          | 0.0          | -0.2                    | 2.00                    | 2.00                   | 0.00                  |
| <b>L Avalon Sh</b>                       |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,147.0                                  | 1.54            | 359.64      | 9,147.0               | 1.0          | 0.0          | -1.0                    | 2.00                    | 2.00                   | 0.00                  |
| 9,200.0                                  | 2.60            | 359.64      | 9,200.0               | 2.9          | 0.0          | -2.9                    | 2.00                    | 2.00                   | 0.00                  |
| 9,300.0                                  | 4.60            | 359.64      | 9,299.8               | 9.2          | -0.1         | -9.2                    | 2.00                    | 2.00                   | 0.00                  |
| 9,400.0                                  | 6.60            | 359.64      | 9,399.3               | 19.0         | -0.1         | -19.0                   | 2.00                    | 2.00                   | 0.00                  |
| <b>Hold 7.00° INC</b>                    |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,419.8                                  | 7.00            | 359.64      | 9,418.9               | 21.3         | -0.1         | -21.3                   | 2.00                    | 2.00                   | 0.00                  |
| 9,500.0                                  | 7.00            | 359.64      | 9,498.5               | 31.1         | -0.2         | -31.1                   | 0.00                    | 0.00                   | 0.00                  |
| 9,600.0                                  | 7.00            | 359.64      | 9,597.8               | 43.3         | -0.3         | -43.3                   | 0.00                    | 0.00                   | 0.00                  |
| 9,700.0                                  | 7.00            | 359.64      | 9,697.0               | 55.5         | -0.4         | -55.5                   | 0.00                    | 0.00                   | 0.00                  |
| <b>FBSG_sand</b>                         |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,721.1                                  | 7.00            | 359.64      | 9,718.0               | 58.0         | -0.4         | -58.0                   | 0.00                    | 0.00                   | 0.00                  |
| 9,800.0                                  | 7.00            | 359.64      | 9,796.3               | 67.6         | -0.4         | -67.6                   | 0.00                    | 0.00                   | 0.00                  |
| 9,900.0                                  | 7.00            | 359.64      | 9,895.6               | 79.8         | -0.5         | -79.8                   | 0.00                    | 0.00                   | 0.00                  |
| 10,000.0                                 | 7.00            | 359.64      | 9,994.8               | 92.0         | -0.6         | -92.0                   | 0.00                    | 0.00                   | 0.00                  |
| 10,100.0                                 | 7.00            | 359.64      | 10,094.1              | 104.2        | -0.7         | -104.2                  | 0.00                    | 0.00                   | 0.00                  |
| 10,200.0                                 | 7.00            | 359.64      | 10,193.3              | 116.4        | -0.7         | -116.4                  | 0.00                    | 0.00                   | 0.00                  |
| <b>Drop 2°/100'</b>                      |                 |             |                       |              |              |                         |                         |                        |                       |
| 10,219.5                                 | 7.00            | 359.64      | 10,212.7              | 118.7        | -0.8         | -118.7                  | 0.00                    | 0.00                   | 0.00                  |
| <b>SBSG_sand</b>                         |                 |             |                       |              |              |                         |                         |                        |                       |
| 10,284.0                                 | 5.71            | 359.64      | 10,276.8              | 125.9        | -0.8         | -125.9                  | 2.00                    | -2.00                  | 0.00                  |
| 10,300.0                                 | 5.39            | 359.64      | 10,292.7              | 127.4        | -0.8         | -127.4                  | 2.00                    | -2.00                  | 0.00                  |
| 10,400.0                                 | 3.39            | 359.64      | 10,392.4              | 135.1        | -0.9         | -135.1                  | 2.00                    | -2.00                  | 0.00                  |
| 10,500.0                                 | 1.39            | 359.64      | 10,492.3              | 139.2        | -0.9         | -139.2                  | 2.00                    | -2.00                  | 0.00                  |
| <b>Hold 0.00° INC</b>                    |                 |             |                       |              |              |                         |                         |                        |                       |
| 10,569.3                                 | 0.00            | 0.00        | 10,561.6              | 140.1        | -0.9         | -140.1                  | 2.00                    | -2.00                  | 0.00                  |
| 10,600.0                                 | 0.00            | 0.00        | 10,592.3              | 140.1        | -0.9         | -140.1                  | 0.00                    | 0.00                   | 0.00                  |
| 10,700.0                                 | 0.00            | 0.00        | 10,692.3              | 140.1        | -0.9         | -140.1                  | 0.00                    | 0.00                   | 0.00                  |
| 10,800.0                                 | 0.00            | 0.00        | 10,792.3              | 140.1        | -0.9         | -140.1                  | 0.00                    | 0.00                   | 0.00                  |
| 10,900.0                                 | 0.00            | 0.00        | 10,892.3              | 140.1        | -0.9         | -140.1                  | 0.00                    | 0.00                   | 0.00                  |
| <b>KOP: Build 12°/100' @ 10969.3' MD</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 10,969.3                                 | 0.00            | 0.00        | 10,961.6              | 140.1        | -0.9         | -140.1                  | 0.00                    | 0.00                   | 0.00                  |
| 10,975.0                                 | 0.69            | 179.64      | 10,967.3              | 140.0        | -0.9         | -140.0                  | 12.00                   | 12.00                  | 0.00                  |
| 11,000.0                                 | 3.69            | 179.64      | 10,992.3              | 139.1        | -0.9         | -139.1                  | 12.00                   | 12.00                  | 0.00                  |
| 11,025.0                                 | 6.69            | 179.64      | 11,017.2              | 136.8        | -0.9         | -136.8                  | 12.00                   | 12.00                  | 0.00                  |
| 11,050.0                                 | 9.69            | 179.64      | 11,041.9              | 133.3        | -0.8         | -133.3                  | 12.00                   | 12.00                  | 0.00                  |
| 11,075.0                                 | 12.69           | 179.64      | 11,066.4              | 128.4        | -0.8         | -128.4                  | 12.00                   | 12.00                  | 0.00                  |
| <b>TBSG_sand</b>                         |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,086.7                                 | 14.09           | 179.64      | 11,077.8              | 125.7        | -0.8         | -125.7                  | 12.00                   | 12.00                  | 0.00                  |
| 11,100.0                                 | 15.69           | 179.64      | 11,090.7              | 122.3        | -0.8         | -122.3                  | 12.00                   | 12.00                  | 0.00                  |
| 11,125.0                                 | 18.69           | 179.64      | 11,114.6              | 114.9        | -0.7         | -114.9                  | 12.00                   | 12.00                  | 0.00                  |
| 11,150.0                                 | 21.69           | 179.64      | 11,138.0              | 106.3        | -0.7         | -106.3                  | 12.00                   | 12.00                  | 0.00                  |
| 11,175.0                                 | 24.69           | 179.64      | 11,161.0              | 96.4         | -0.6         | -96.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,200.0                                 | 27.69           | 179.64      | 11,183.4              | 85.4         | -0.5         | -85.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,225.0                                 | 30.69           | 179.64      | 11,205.3              | 73.2         | -0.5         | -73.2                   | 12.00                   | 12.00                  | 0.00                  |



## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Planned Survey

| Measured Depth (usft)                            | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|--------------------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 11,250.0                                         | 33.69           | 179.64      | 11,226.4              | 59.9         | -0.4         | -59.9                   | 12.00                   | 12.00                  | 0.00                  |
| <b>WFMP</b>                                      |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,274.2                                         | 36.59           | 179.64      | 11,246.2              | 46.0         | -0.3         | -46.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,275.0                                         | 36.69           | 179.64      | 11,246.8              | 45.5         | -0.3         | -45.5                   | 12.00                   | 12.00                  | 0.00                  |
| 11,300.0                                         | 39.69           | 179.64      | 11,266.5              | 30.0         | -0.2         | -30.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,325.0                                         | 42.69           | 179.64      | 11,285.3              | 13.6         | -0.1         | -13.6                   | 12.00                   | 12.00                  | 0.00                  |
| 11,350.0                                         | 45.69           | 179.64      | 11,303.2              | -3.8         | 0.0          | 3.8                     | 12.00                   | 12.00                  | 0.00                  |
| 11,375.0                                         | 48.69           | 179.64      | 11,320.2              | -22.2        | 0.1          | 22.2                    | 12.00                   | 12.00                  | 0.00                  |
| 11,400.0                                         | 51.69           | 179.64      | 11,336.2              | -41.4        | 0.3          | 41.4                    | 12.00                   | 12.00                  | 0.00                  |
| <b>WFMP Lith</b>                                 |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,410.9                                         | 52.99           | 179.64      | 11,342.9              | -50.0        | 0.3          | 50.0                    | 12.00                   | 12.00                  | 0.00                  |
| 11,425.0                                         | 54.69           | 179.64      | 11,351.2              | -61.4        | 0.4          | 61.4                    | 12.00                   | 12.00                  | 0.00                  |
| 11,450.0                                         | 57.69           | 179.64      | 11,365.1              | -82.2        | 0.5          | 82.2                    | 12.00                   | 12.00                  | 0.00                  |
| 11,475.0                                         | 60.69           | 179.64      | 11,377.9              | -103.6       | 0.7          | 103.6                   | 12.00                   | 12.00                  | 0.00                  |
| 11,500.0                                         | 63.69           | 179.64      | 11,389.6              | -125.7       | 0.8          | 125.7                   | 12.00                   | 12.00                  | 0.00                  |
| 11,525.0                                         | 66.69           | 179.64      | 11,400.1              | -148.4       | 0.9          | 148.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,550.0                                         | 69.69           | 179.64      | 11,409.4              | -171.6       | 1.1          | 171.6                   | 12.00                   | 12.00                  | 0.00                  |
| 11,575.0                                         | 72.69           | 179.64      | 11,417.4              | -195.3       | 1.2          | 195.3                   | 12.00                   | 12.00                  | 0.00                  |
| 11,600.0                                         | 75.69           | 179.64      | 11,424.2              | -219.3       | 1.4          | 219.3                   | 12.00                   | 12.00                  | 0.00                  |
| 11,625.0                                         | 78.69           | 179.64      | 11,429.8              | -243.7       | 1.5          | 243.7                   | 12.00                   | 12.00                  | 0.00                  |
| 11,650.0                                         | 81.69           | 179.64      | 11,434.0              | -268.3       | 1.7          | 268.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,675.0                                         | 84.69           | 179.64      | 11,437.0              | -293.2       | 1.9          | 293.2                   | 12.00                   | 12.00                  | 0.00                  |
| 11,700.0                                         | 87.69           | 179.64      | 11,438.7              | -318.1       | 2.0          | 318.1                   | 12.00                   | 12.00                  | 0.00                  |
| <b>EOC: 11710.9' MD, 88.99° Inc, 179.64° Azm</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,710.9                                         | 89.00           | 179.64      | 11,439.0              | -329.0       | 2.1          | 329.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,800.0                                         | 89.00           | 179.64      | 11,440.6              | -418.1       | 2.7          | 418.1                   | 0.00                    | 0.00                   | 0.00                  |
| 11,900.0                                         | 89.00           | 179.64      | 11,442.3              | -518.1       | 3.3          | 518.1                   | 0.00                    | 0.00                   | 0.00                  |
| 12,000.0                                         | 89.00           | 179.64      | 11,444.1              | -618.1       | 3.9          | 618.1                   | 0.00                    | 0.00                   | 0.00                  |
| 12,100.0                                         | 89.00           | 179.64      | 11,445.8              | -718.0       | 4.6          | 718.1                   | 0.00                    | 0.00                   | 0.00                  |
| 12,200.0                                         | 89.00           | 179.64      | 11,447.6              | -818.0       | 5.2          | 818.0                   | 0.00                    | 0.00                   | 0.00                  |
| 12,300.0                                         | 89.00           | 179.64      | 11,449.3              | -918.0       | 5.8          | 918.0                   | 0.00                    | 0.00                   | 0.00                  |
| 12,400.0                                         | 89.00           | 179.64      | 11,451.1              | -1,018.0     | 6.5          | 1,018.0                 | 0.00                    | 0.00                   | 0.00                  |
| 12,500.0                                         | 89.00           | 179.64      | 11,452.8              | -1,118.0     | 7.1          | 1,118.0                 | 0.00                    | 0.00                   | 0.00                  |
| 12,600.0                                         | 89.00           | 179.64      | 11,454.6              | -1,217.9     | 7.7          | 1,218.0                 | 0.00                    | 0.00                   | 0.00                  |
| 12,700.0                                         | 89.00           | 179.64      | 11,456.3              | -1,317.9     | 8.4          | 1,318.0                 | 0.00                    | 0.00                   | 0.00                  |
| 12,800.0                                         | 89.00           | 179.64      | 11,458.1              | -1,417.9     | 9.0          | 1,417.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,900.0                                         | 89.00           | 179.64      | 11,459.8              | -1,517.9     | 9.7          | 1,517.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,000.0                                         | 89.00           | 179.64      | 11,461.6              | -1,617.9     | 10.3         | 1,617.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,100.0                                         | 89.00           | 179.64      | 11,463.4              | -1,717.9     | 10.9         | 1,717.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,200.0                                         | 89.00           | 179.64      | 11,465.1              | -1,817.8     | 11.6         | 1,817.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,300.0                                         | 89.00           | 179.64      | 11,466.9              | -1,917.8     | 12.2         | 1,917.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,400.0                                         | 89.00           | 179.64      | 11,468.6              | -2,017.8     | 12.8         | 2,017.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,500.0                                         | 89.00           | 179.64      | 11,470.4              | -2,117.8     | 13.5         | 2,117.8                 | 0.00                    | 0.00                   | 0.00                  |
| 13,600.0                                         | 89.00           | 179.64      | 11,472.1              | -2,217.8     | 14.1         | 2,217.8                 | 0.00                    | 0.00                   | 0.00                  |
| 13,700.0                                         | 89.00           | 179.64      | 11,473.9              | -2,317.8     | 14.7         | 2,317.8                 | 0.00                    | 0.00                   | 0.00                  |
| 13,800.0                                         | 89.00           | 179.64      | 11,475.6              | -2,417.7     | 15.4         | 2,417.8                 | 0.00                    | 0.00                   | 0.00                  |
| 13,900.0                                         | 89.00           | 179.64      | 11,477.4              | -2,517.7     | 16.0         | 2,517.8                 | 0.00                    | 0.00                   | 0.00                  |
| 14,000.0                                         | 89.00           | 179.64      | 11,479.1              | -2,617.7     | 16.6         | 2,617.8                 | 0.00                    | 0.00                   | 0.00                  |
| 14,100.0                                         | 89.00           | 179.64      | 11,480.9              | -2,717.7     | 17.3         | 2,717.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,200.0                                         | 89.00           | 179.64      | 11,482.6              | -2,817.7     | 17.9         | 2,817.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,300.0                                         | 89.00           | 179.64      | 11,484.4              | -2,917.7     | 18.6         | 2,917.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,400.0                                         | 89.00           | 179.64      | 11,486.2              | -3,017.6     | 19.2         | 3,017.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,500.0                                         | 89.00           | 179.64      | 11,487.9              | -3,117.6     | 19.8         | 3,117.7                 | 0.00                    | 0.00                   | 0.00                  |



## Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Planned Survey

| Measured Depth (usft)         | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 14,600.0                      | 89.00           | 179.64      | 11,489.7              | -3,217.6     | 20.5         | 3,217.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,700.0                      | 89.00           | 179.64      | 11,491.4              | -3,317.6     | 21.1         | 3,317.7                 | 0.00                    | 0.00                   | 0.00                  |
| 14,800.0                      | 89.00           | 179.64      | 11,493.2              | -3,417.6     | 21.7         | 3,417.6                 | 0.00                    | 0.00                   | 0.00                  |
| 14,900.0                      | 89.00           | 179.64      | 11,494.9              | -3,517.5     | 22.4         | 3,517.6                 | 0.00                    | 0.00                   | 0.00                  |
| 15,000.0                      | 89.00           | 179.64      | 11,496.7              | -3,617.5     | 23.0         | 3,617.6                 | 0.00                    | 0.00                   | 0.00                  |
| 15,100.0                      | 89.00           | 179.64      | 11,498.4              | -3,717.5     | 23.6         | 3,717.6                 | 0.00                    | 0.00                   | 0.00                  |
| 15,200.0                      | 89.00           | 179.64      | 11,500.2              | -3,817.5     | 24.3         | 3,817.6                 | 0.00                    | 0.00                   | 0.00                  |
| 15,300.0                      | 89.00           | 179.64      | 11,501.9              | -3,917.5     | 24.9         | 3,917.6                 | 0.00                    | 0.00                   | 0.00                  |
| 15,400.0                      | 89.00           | 179.64      | 11,503.7              | -4,017.5     | 25.5         | 4,017.5                 | 0.00                    | 0.00                   | 0.00                  |
| 15,500.0                      | 89.00           | 179.64      | 11,505.4              | -4,117.4     | 26.2         | 4,117.5                 | 0.00                    | 0.00                   | 0.00                  |
| 15,600.0                      | 89.00           | 179.64      | 11,507.2              | -4,217.4     | 26.8         | 4,217.5                 | 0.00                    | 0.00                   | 0.00                  |
| 15,700.0                      | 89.00           | 179.64      | 11,509.0              | -4,317.4     | 27.5         | 4,317.5                 | 0.00                    | 0.00                   | 0.00                  |
| 15,800.0                      | 89.00           | 179.64      | 11,510.7              | -4,417.4     | 28.1         | 4,417.5                 | 0.00                    | 0.00                   | 0.00                  |
| 15,900.0                      | 89.00           | 179.64      | 11,512.5              | -4,517.4     | 28.7         | 4,517.5                 | 0.00                    | 0.00                   | 0.00                  |
| 16,000.0                      | 89.00           | 179.64      | 11,514.2              | -4,617.4     | 29.4         | 4,617.5                 | 0.00                    | 0.00                   | 0.00                  |
| 16,100.0                      | 89.00           | 179.64      | 11,516.0              | -4,717.3     | 30.0         | 4,717.4                 | 0.00                    | 0.00                   | 0.00                  |
| 16,200.0                      | 89.00           | 179.64      | 11,517.7              | -4,817.3     | 30.6         | 4,817.4                 | 0.00                    | 0.00                   | 0.00                  |
| TD @ 16272.9' MD/11519.0' TVD |                 |             |                       |              |              |                         |                         |                        |                       |
| 16,272.9                      | 89.00           | 179.64      | 11,519.0              | -4,890.2     | 31.1         | 4,890.3                 | 0.00                    | 0.00                   | 0.00                  |

## Design Targets

| Target Name                                                                     | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude         |
|---------------------------------------------------------------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|-------------------|
| - hit/miss target                                                               |               |              |            |              |              |                 |                |                  |                   |
| - Shape                                                                         |               |              |            |              |              |                 |                |                  |                   |
| LTP Mas Federal Com #                                                           | 0.00          | 0.00         | 0.0        | -4,760.2     | 30.5         | 554,929.56      | 744,165.96     | 32° 31' 23.218 N | 103° 32' 28.205 W |
| - plan misses target center by 4760.3usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E) |               |              |            |              |              |                 |                |                  |                   |
| - Point                                                                         |               |              |            |              |              |                 |                |                  |                   |
| FTP Mas Federal Com #                                                           | 0.00          | 0.00         | 0.0        | -139.9       | 1.0          | 559,549.89      | 744,136.54     | 32° 32' 8.938 N  | 103° 32' 28.147 W |
| - plan misses target center by 139.9usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)  |               |              |            |              |              |                 |                |                  |                   |
| - Point                                                                         |               |              |            |              |              |                 |                |                  |                   |
| PBHL Mas Federal Com                                                            | 0.00          | 0.00         | 11,519.0   | -4,890.2     | 31.1         | 554,799.60      | 744,166.60     | 32° 31' 21.932 N | 103° 32' 28.209 W |
| - plan hits target center                                                       |               |              |            |              |              |                 |                |                  |                   |
| - Point                                                                         |               |              |            |              |              |                 |                |                  |                   |



# Well Planning Report



|           |                     |                              |                            |
|-----------|---------------------|------------------------------|----------------------------|
| Database: | EDM5002             | Local Co-ordinate Reference: | Well Mas Federal Com #2H   |
| Company:  | COG Operating, LLC  | TVD Reference:               | KB @ 3747.0usft (Noram 21) |
| Project:  | Lea County, NM      | MD Reference:                | KB @ 3747.0usft (Noram 21) |
| Site:     | Sec 34, T20S, R34E  | North Reference:             | Grid                       |
| Well:     | Mas Federal Com #2H | Survey Calculation Method:   | Minimum Curvature          |
| Wellbore: | Wellbore #1         |                              |                            |
| Design:   | Design #1           |                              |                            |

## Formations

| Measured Depth (usft) | Vertical Depth (usft) | Name                | Lithology | Dip (°) | Dip Direction (°) |
|-----------------------|-----------------------|---------------------|-----------|---------|-------------------|
| 1,617.0               | 1,617.0               | Rustler             |           | 1.00    | 179.64            |
| 1,712.0               | 1,712.0               | TOS                 |           | 1.00    | 179.64            |
| 3,337.0               | 3,337.0               | BOS (Castile)       |           | 1.00    | 179.64            |
| 3,512.0               | 3,512.0               | Yates               |           | 1.00    | 179.64            |
| 3,827.0               | 3,827.0               | Reef                |           | 1.00    | 179.64            |
| 5,742.0               | 5,742.0               | Base of Reef (BLCN) |           | 1.00    | 179.64            |
| 5,797.0               | 5,797.0               | CYCN                |           | 1.00    | 179.64            |
| 6,707.0               | 6,707.0               | BYCN                |           | 1.00    | 179.64            |
| 8,595.0               | 8,595.0               | Bone Sprg (BSGL)    |           | 1.00    | 179.64            |
| 9,067.0               | 9,067.0               | U Avalon Sh         |           | 1.00    | 179.64            |
| 9,147.0               | 9,147.0               | L Avalon Sh         |           | 1.00    | 179.64            |
| 9,721.1               | 9,718.0               | FBSG_sand           |           | 1.00    | 179.64            |
| 10,284.0              | 10,276.8              | SBSG_sand           |           | 1.00    | 179.64            |
| 11,086.7              | 11,077.8              | TBSG_sand           |           | 1.00    | 179.64            |
| 11,274.2              | 11,246.2              | WFMP                |           | 1.00    | 179.64            |
| 11,410.9              | 11,342.9              | WFMP Lith           |           | 1.00    | 179.64            |

## Plan Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                                   |
|-----------------------|-----------------------|-------------------|--------------|-------------------------------------------|
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                                           |
| 9,070.0               | 9,070.0               | 0.0               | 0.0          | Build 2°/100'                             |
| 9,419.8               | 9,418.9               | 21.3              | -0.1         | Hold 7.00° INC                            |
| 10,219.5              | 10,212.7              | 118.7             | -0.8         | Drop 2°/100'                              |
| 10,569.3              | 10,561.6              | 140.1             | -0.9         | Hold 0.00° INC                            |
| 10,969.3              | 10,961.6              | 140.1             | -0.9         | KOP: Build 12°/100' @ 10969.3' MD         |
| 11,710.9              | 11,439.0              | -329.0            | 2.1          | EOC: 11710.9' MD, 88.99° Inc, 179.64° Azm |
| 16,272.9              | 11,519.0              | -4,890.2          | 31.1         | TD @ 16272.9' MD/11519.0' TVD             |