

CONCHO

## COG OPERATING LLC

LEA COUNTY, NM

BULLDOG

STOVE PIPE FED COM #1H

OWB

PWP0

**HOBBS CCD**

**MAY 30 2017**

**RECEIVED**

## Anticollision Report

09 January, 2017



# COG Operating LLC

## Anticollision Report

Company: COG OPERATING LLC  
Project: LEA COUNTY, NM  
Reference Site: BULLDOG  
Site Error: 0.0 usft  
Reference Well: STOVE PIPE FED COM #1H  
Well Error: 3.0 usft  
Reference Wellbore: OWB  
Reference Design: PWP0

Local Co-ordinate Reference: Well STOVE PIPE FED COM #1H  
TVD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
MD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at: 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

|                              |                                                                     |                |                     |
|------------------------------|---------------------------------------------------------------------|----------------|---------------------|
| Reference                    | PWP0                                                                |                |                     |
| Filter type:                 | NO GLOBAL FILTER: Using user defined selection & filtering criteria |                |                     |
| Interpolation Method:        | Stations                                                            | Error Model:   | ISCWSA              |
| Depth Range:                 | Unlimited                                                           | Scan Method:   | Closest Approach 3D |
| Results Limited by:          | Maximum center-center distance of 10,000.0 usft                     | Error Surface: | Major Axis          |
| Warning Levels Evaluated at: | 2.00 Sigma                                                          | Casing Method: | Not applied         |

| Survey Tool Program |              | Date              | 1/9/2017  |                     |  |
|---------------------|--------------|-------------------|-----------|---------------------|--|
| From<br>(usft)      | To<br>(usft) | Survey (Wellbore) | Tool Name | Description         |  |
| 0.0                 | 22,266.4     | PWP0 (OWB)        | MWD       | OWSG MWD - Standard |  |

| Site Name                            | Reference Measured Depth (usft) | Offset Measured Depth (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Separation Factor | Warning                   |
|--------------------------------------|---------------------------------|------------------------------|---------------------------------|----------------------------------|-------------------|---------------------------|
| Offset Well - Wellbore - Design      |                                 |                              |                                 |                                  |                   |                           |
| BULLDOG                              |                                 |                              |                                 |                                  |                   |                           |
| STOVE PIPE FED COM #21H - OWB - PWP0 | 12,036.5                        | 12,036.5                     | 40.6                            | -45.4                            | 0.472             | Stop Drilling Now, CC, SF |
| STOVE PIPE FED COM #21H - OWB - PWP0 | 12,050.0                        | 12,050.0                     | 40.7                            | -45.4                            | 0.473             | Stop Drilling Now, ES     |

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                       |                              |                       |                  |               |                                       |                                     |              |                                 |                                  |                           |                   | Offset Site Error: | 0.0 usft |
|--------------------------------------------------------------|-----------------------|------------------------------|-----------------------|------------------|---------------|---------------------------------------|-------------------------------------|--------------|---------------------------------|----------------------------------|---------------------------|-------------------|--------------------|----------|
| Survey Program: 0-MWD                                        |                       |                              |                       |                  |               |                                       |                                     |              |                                 |                                  |                           |                   | Offset Well Error: | 3.0 usft |
| Reference Measured Depth (usft)                              | Vertical Depth (usft) | Offset Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Semi Major Axis Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning            |          |
| 0.0                                                          | 0.0                   | 0.0                          | 0.0                   | 3.0              | 3.0           | 73.71                                 | 11.4                                | 39.0         | 40.6                            |                                  |                           |                   |                    |          |
| 100.0                                                        | 100.0                 | 100.0                        | 100.0                 | 3.0              | 3.0           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 34.6                             | 6.01                      | 6.766             |                    |          |
| 200.0                                                        | 200.0                 | 200.0                        | 200.0                 | 3.0              | 3.0           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 34.6                             | 6.08                      | 6.685             |                    |          |
| 300.0                                                        | 300.0                 | 300.0                        | 300.0                 | 3.1              | 3.1           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 34.4                             | 6.23                      | 6.519             |                    |          |
| 400.0                                                        | 400.0                 | 400.0                        | 400.0                 | 3.2              | 3.2           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 34.2                             | 6.46                      | 6.286             |                    |          |
| 500.0                                                        | 500.0                 | 500.0                        | 500.0                 | 3.4              | 3.4           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 33.9                             | 6.76                      | 6.007             |                    |          |
| 600.0                                                        | 600.0                 | 600.0                        | 600.0                 | 3.6              | 3.6           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 33.5                             | 7.12                      | 5.704             |                    |          |
| 700.0                                                        | 700.0                 | 700.0                        | 700.0                 | 3.8              | 3.8           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 33.1                             | 7.53                      | 5.393             |                    |          |
| 800.0                                                        | 800.0                 | 800.0                        | 800.0                 | 4.0              | 4.0           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 32.6                             | 7.99                      | 5.087             |                    |          |
| 900.0                                                        | 900.0                 | 900.0                        | 900.0                 | 4.2              | 4.2           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 32.2                             | 8.48                      | 4.792             |                    |          |
| 1,000.0                                                      | 1,000.0               | 1,000.0                      | 1,000.0               | 4.5              | 4.5           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 31.6                             | 9.00                      | 4.515             |                    |          |
| 1,100.0                                                      | 1,100.0               | 1,100.0                      | 1,100.0               | 4.8              | 4.8           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 31.1                             | 9.55                      | 4.257             |                    |          |
| 1,200.0                                                      | 1,200.0               | 1,200.0                      | 1,200.0               | 5.1              | 5.1           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 30.5                             | 10.11                     | 4.018             |                    |          |
| 1,300.0                                                      | 1,300.0               | 1,300.0                      | 1,300.0               | 5.3              | 5.3           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 29.9                             | 10.70                     | 3.798             |                    |          |
| 1,400.0                                                      | 1,400.0               | 1,400.0                      | 1,400.0               | 5.6              | 5.6           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 29.3                             | 11.30                     | 3.596             |                    |          |
| 1,500.0                                                      | 1,500.0               | 1,500.0                      | 1,500.0               | 6.0              | 6.0           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 28.7                             | 11.91                     | 3.411             |                    |          |
| 1,600.0                                                      | 1,600.0               | 1,600.0                      | 1,600.0               | 6.3              | 6.3           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 28.1                             | 12.54                     | 3.241             |                    |          |
| 1,700.0                                                      | 1,700.0               | 1,700.0                      | 1,700.0               | 6.6              | 6.6           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 27.5                             | 13.17                     | 3.085             |                    |          |
| 1,800.0                                                      | 1,800.0               | 1,800.0                      | 1,800.0               | 6.9              | 6.9           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 26.8                             | 13.81                     | 2.941             |                    |          |
| 1,900.0                                                      | 1,900.0               | 1,900.0                      | 1,900.0               | 7.2              | 7.2           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 26.2                             | 14.46                     | 2.809             |                    |          |
| 2,000.0                                                      | 2,000.0               | 2,000.0                      | 2,000.0               | 7.6              | 7.6           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 25.5                             | 15.12                     | 2.688             |                    |          |
| 2,100.0                                                      | 2,100.0               | 2,100.0                      | 2,100.0               | 7.9              | 7.9           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 24.9                             | 15.78                     | 2.575             |                    |          |
| 2,200.0                                                      | 2,200.0               | 2,200.0                      | 2,200.0               | 8.2              | 8.2           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 24.2                             | 16.44                     | 2.471             |                    |          |
| 2,300.0                                                      | 2,300.0               | 2,300.0                      | 2,300.0               | 8.6              | 8.6           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 23.5                             | 17.11                     | 2.374             |                    |          |
| 2,400.0                                                      | 2,400.0               | 2,400.0                      | 2,400.0               | 8.9              | 8.9           | 73.71                                 | 11.4                                | 39.0         | 40.6                            | 22.8                             | 17.79                     | 2.284             |                    |          |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



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North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                             |                             |                             |                     |                  |                             |                                           |                 |                              |                               |                                 |                      | Offset Site Error: 0.0 usft |
|--------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------|------------------|-----------------------------|-------------------------------------------|-----------------|------------------------------|-------------------------------|---------------------------------|----------------------|-----------------------------|
| Survey Program: 0-MWD                                        |                             |                             |                             |                     |                  |                             |                                           |                 |                              |                               |                                 |                      | Offset Well Error: 3.0 usft |
| Reference                                                    |                             | Offset                      |                             | Semi Major Axis     |                  | Highside<br>Toolface<br>(°) | Distance                                  |                 | Between<br>Centres<br>(usft) | Between<br>Ellipses<br>(usft) | Minimum<br>Separation<br>(usft) | Separation<br>Factor | Warning                     |
| Measured<br>Depth<br>(usft)                                  | Vertical<br>Depth<br>(usft) | Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Reference<br>(usft) | Offset<br>(usft) |                             | Offset Wellbore Centre<br>+N/-S<br>(usft) | +E/-W<br>(usft) |                              |                               |                                 |                      |                             |
| 2,500.0                                                      | 2,500.0                     | 2,500.0                     | 2,500.0                     | 9.2                 | 9.2              | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 22.2                          | 18.46                           | 2.201                |                             |
| 2,600.0                                                      | 2,600.0                     | 2,600.0                     | 2,600.0                     | 9.6                 | 9.6              | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 21.5                          | 19.14                           | 2.123                |                             |
| 2,700.0                                                      | 2,700.0                     | 2,700.0                     | 2,700.0                     | 9.9                 | 9.9              | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 20.8                          | 19.82                           | 2.050                |                             |
| 2,800.0                                                      | 2,800.0                     | 2,800.0                     | 2,800.0                     | 10.3                | 10.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 20.1                          | 20.51                           | 1.981                | Advise and Monitor          |
| 2,900.0                                                      | 2,900.0                     | 2,900.0                     | 2,900.0                     | 10.6                | 10.6             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 19.4                          | 21.20                           | 1.917                | Advise and Monitor          |
| 3,000.0                                                      | 3,000.0                     | 3,000.0                     | 3,000.0                     | 10.9                | 10.9             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 18.7                          | 21.88                           | 1.857                | Advise and Monitor          |
| 3,100.0                                                      | 3,100.0                     | 3,100.0                     | 3,100.0                     | 11.3                | 11.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 18.1                          | 22.57                           | 1.800                | Advise and Monitor          |
| 3,200.0                                                      | 3,200.0                     | 3,200.0                     | 3,200.0                     | 11.6                | 11.6             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 17.4                          | 23.27                           | 1.746                | Advise and Monitor          |
| 3,300.0                                                      | 3,300.0                     | 3,300.0                     | 3,300.0                     | 12.0                | 12.0             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 16.7                          | 23.96                           | 1.696                | Advise and Monitor          |
| 3,400.0                                                      | 3,400.0                     | 3,400.0                     | 3,400.0                     | 12.3                | 12.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 16.0                          | 24.65                           | 1.648                | Advise and Monitor          |
| 3,500.0                                                      | 3,500.0                     | 3,500.0                     | 3,500.0                     | 12.7                | 12.7             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 15.3                          | 25.35                           | 1.603                | Advise and Monitor          |
| 3,600.0                                                      | 3,600.0                     | 3,600.0                     | 3,600.0                     | 13.0                | 13.0             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 14.6                          | 26.05                           | 1.560                | Advise and Monitor          |
| 3,700.0                                                      | 3,700.0                     | 3,700.0                     | 3,700.0                     | 13.4                | 13.4             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 13.9                          | 26.75                           | 1.519                | Advise and Monitor          |
| 3,800.0                                                      | 3,800.0                     | 3,800.0                     | 3,800.0                     | 13.7                | 13.7             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 13.2                          | 27.45                           | 1.480                | Shut in Produces            |
| 3,900.0                                                      | 3,900.0                     | 3,900.0                     | 3,900.0                     | 14.1                | 14.1             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 12.5                          | 28.15                           | 1.444                | Shut in Produces            |
| 4,000.0                                                      | 4,000.0                     | 4,000.0                     | 4,000.0                     | 14.4                | 14.4             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 11.8                          | 28.85                           | 1.409                | Shut in Produces            |
| 4,100.0                                                      | 4,100.0                     | 4,100.0                     | 4,100.0                     | 14.8                | 14.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 11.1                          | 29.55                           | 1.375                | Shut in Produces            |
| 4,200.0                                                      | 4,200.0                     | 4,200.0                     | 4,200.0                     | 15.1                | 15.1             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 10.4                          | 30.25                           | 1.343                | Shut in Produces            |
| 4,300.0                                                      | 4,300.0                     | 4,300.0                     | 4,300.0                     | 15.5                | 15.5             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 9.7                           | 30.95                           | 1.313                | Shut in Produces            |
| 4,400.0                                                      | 4,400.0                     | 4,400.0                     | 4,400.0                     | 15.8                | 15.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 9.0                           | 31.66                           | 1.284                | Shut in Produces            |
| 4,500.0                                                      | 4,500.0                     | 4,500.0                     | 4,500.0                     | 16.2                | 16.2             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 8.3                           | 32.36                           | 1.256                | Shut in Produces            |
| 4,600.0                                                      | 4,600.0                     | 4,600.0                     | 4,600.0                     | 16.5                | 16.5             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 7.6                           | 33.07                           | 1.229                | Shut in Produces            |
| 4,700.0                                                      | 4,700.0                     | 4,700.0                     | 4,700.0                     | 16.9                | 16.9             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 6.9                           | 33.77                           | 1.203                | Shut in Produces            |
| 4,800.0                                                      | 4,800.0                     | 4,800.0                     | 4,800.0                     | 17.2                | 17.2             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 6.2                           | 34.48                           | 1.179                | Shut in Produces            |
| 4,900.0                                                      | 4,900.0                     | 4,900.0                     | 4,900.0                     | 17.6                | 17.6             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 5.4                           | 35.18                           | 1.155                | Shut in Produces            |
| 5,000.0                                                      | 5,000.0                     | 5,000.0                     | 5,000.0                     | 17.9                | 17.9             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 4.7                           | 35.89                           | 1.132                | Shut in Produces            |
| 5,100.0                                                      | 5,100.0                     | 5,100.0                     | 5,100.0                     | 18.3                | 18.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 4.0                           | 36.60                           | 1.110                | Shut in Produces            |
| 5,200.0                                                      | 5,200.0                     | 5,200.0                     | 5,200.0                     | 18.7                | 18.7             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 3.3                           | 37.30                           | 1.089                | Shut in Produces            |
| 5,300.0                                                      | 5,300.0                     | 5,300.0                     | 5,300.0                     | 19.0                | 19.0             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 2.6                           | 38.01                           | 1.069                | Shut in Produces            |
| 5,400.0                                                      | 5,400.0                     | 5,400.0                     | 5,400.0                     | 19.4                | 19.4             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 1.9                           | 38.72                           | 1.049                | Shut in Produces            |
| 5,500.0                                                      | 5,500.0                     | 5,500.0                     | 5,500.0                     | 19.7                | 19.7             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 1.2                           | 39.43                           | 1.031                | Shut in Produces            |
| 5,600.0                                                      | 5,600.0                     | 5,600.0                     | 5,600.0                     | 20.1                | 20.1             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | 0.5                           | 40.14                           | 1.012                | Shut in Produces            |
| 5,700.0                                                      | 5,700.0                     | 5,700.0                     | 5,700.0                     | 20.4                | 20.4             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -0.2                          | 40.85                           | 0.995                | Stop Drilling Now           |
| 5,800.0                                                      | 5,800.0                     | 5,800.0                     | 5,800.0                     | 20.8                | 20.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -0.9                          | 41.56                           | 0.978                | Stop Drilling Now           |
| 5,900.0                                                      | 5,900.0                     | 5,900.0                     | 5,900.0                     | 21.1                | 21.1             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -1.6                          | 42.27                           | 0.961                | Stop Drilling Now           |
| 6,000.0                                                      | 6,000.0                     | 6,000.0                     | 6,000.0                     | 21.5                | 21.5             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -2.3                          | 42.98                           | 0.945                | Stop Drilling Now           |
| 6,100.0                                                      | 6,100.0                     | 6,100.0                     | 6,100.0                     | 21.8                | 21.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -3.1                          | 43.69                           | 0.930                | Stop Drilling Now           |
| 6,200.0                                                      | 6,200.0                     | 6,200.0                     | 6,200.0                     | 22.2                | 22.2             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -3.8                          | 44.40                           | 0.915                | Stop Drilling Now           |
| 6,300.0                                                      | 6,300.0                     | 6,300.0                     | 6,300.0                     | 22.6                | 22.6             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -4.5                          | 45.11                           | 0.901                | Stop Drilling Now           |
| 6,400.0                                                      | 6,400.0                     | 6,400.0                     | 6,400.0                     | 22.9                | 22.9             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -5.2                          | 45.82                           | 0.887                | Stop Drilling Now           |
| 6,500.0                                                      | 6,500.0                     | 6,500.0                     | 6,500.0                     | 23.3                | 23.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -5.9                          | 46.53                           | 0.873                | Stop Drilling Now           |
| 6,600.0                                                      | 6,600.0                     | 6,600.0                     | 6,600.0                     | 23.6                | 23.6             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -6.6                          | 47.24                           | 0.860                | Stop Drilling Now           |
| 6,700.0                                                      | 6,700.0                     | 6,700.0                     | 6,700.0                     | 24.0                | 24.0             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -7.3                          | 47.95                           | 0.847                | Stop Drilling Now           |
| 6,800.0                                                      | 6,800.0                     | 6,800.0                     | 6,800.0                     | 24.3                | 24.3             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -8.0                          | 48.66                           | 0.835                | Stop Drilling Now           |
| 6,900.0                                                      | 6,900.0                     | 6,900.0                     | 6,900.0                     | 24.7                | 24.7             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -8.7                          | 49.37                           | 0.823                | Stop Drilling Now           |
| 7,000.0                                                      | 7,000.0                     | 7,000.0                     | 7,000.0                     | 25.0                | 25.0             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -9.5                          | 50.08                           | 0.811                | Stop Drilling Now           |
| 7,100.0                                                      | 7,100.0                     | 7,100.0                     | 7,100.0                     | 25.4                | 25.4             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -10.2                         | 50.80                           | 0.800                | Stop Drilling Now           |
| 7,200.0                                                      | 7,200.0                     | 7,200.0                     | 7,200.0                     | 25.8                | 25.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -10.9                         | 51.51                           | 0.789                | Stop Drilling Now           |
| 7,300.0                                                      | 7,300.0                     | 7,300.0                     | 7,300.0                     | 26.1                | 26.1             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -11.6                         | 52.22                           | 0.778                | Stop Drilling Now           |
| 7,400.0                                                      | 7,400.0                     | 7,400.0                     | 7,400.0                     | 26.5                | 26.5             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -12.3                         | 52.93                           | 0.768                | Stop Drilling Now           |
| 7,500.0                                                      | 7,500.0                     | 7,500.0                     | 7,500.0                     | 26.8                | 26.8             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -13.0                         | 53.64                           | 0.757                | Stop Drilling Now           |
| 7,600.0                                                      | 7,600.0                     | 7,600.0                     | 7,600.0                     | 27.2                | 27.2             | 73.71                       | 11.4                                      | 39.0            | 40.6                         | -13.7                         | 54.36                           | 0.747                | Stop Drilling Now           |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# COG Operating LLC

## Anticollision Report

Company: COG OPERATING LLC  
Project: LEA COUNTY, NM  
Reference Site: BULLDOG  
Site Error: 0.0 usft  
Reference Well: STOVE PIPE FED COM #1H  
Well Error: 3.0 usft  
Reference Wellbore: OWB  
Reference Design: PWP0

Local Co-ordinate Reference: Well STOVE PIPE FED COM #1H  
TVD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
MD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at: 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                             |                             |                             |                     |                  |                             |                              |                               |                                 |                      |         |                                 | Offset Site Error: 0.0 usft |
|--------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------|------------------|-----------------------------|------------------------------|-------------------------------|---------------------------------|----------------------|---------|---------------------------------|-----------------------------|
| Survey Program: 0-MWD                                        |                             |                             |                             |                     |                  |                             |                              |                               |                                 |                      |         |                                 | Offset Well Error: 3.0 usft |
| Reference                                                    |                             | Offset                      |                             | Semi Major Axis     |                  | Highside<br>Toolface<br>(°) | Distance                     |                               | Minimum<br>Separation<br>(usft) | Separation<br>Factor | Warning |                                 |                             |
| Measured<br>Depth<br>(usft)                                  | Vertical<br>Depth<br>(usft) | Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Reference<br>(usft) | Offset<br>(usft) |                             | Between<br>Centres<br>(usft) | Between<br>Ellipses<br>(usft) |                                 |                      |         |                                 |                             |
| 7,700.0                                                      | 7,700.0                     | 7,700.0                     | 7,700.0                     | 27.5                | 27.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -14.4                | 55.07   | 0.738 Stop Drilling Now         |                             |
| 7,800.0                                                      | 7,800.0                     | 7,800.0                     | 7,800.0                     | 27.9                | 27.9             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -15.2                | 55.78   | 0.728 Stop Drilling Now         |                             |
| 7,900.0                                                      | 7,900.0                     | 7,900.0                     | 7,900.0                     | 28.2                | 28.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -15.9                | 56.50   | 0.719 Stop Drilling Now         |                             |
| 8,000.0                                                      | 8,000.0                     | 8,000.0                     | 8,000.0                     | 28.6                | 28.6             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -16.6                | 57.21   | 0.710 Stop Drilling Now         |                             |
| 8,100.0                                                      | 8,100.0                     | 8,100.0                     | 8,100.0                     | 29.0                | 29.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -17.3                | 57.92   | 0.702 Stop Drilling Now         |                             |
| 8,200.0                                                      | 8,200.0                     | 8,200.0                     | 8,200.0                     | 29.3                | 29.3             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -18.0                | 58.63   | 0.693 Stop Drilling Now         |                             |
| 8,300.0                                                      | 8,300.0                     | 8,300.0                     | 8,300.0                     | 29.7                | 29.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -18.7                | 59.35   | 0.685 Stop Drilling Now         |                             |
| 8,400.0                                                      | 8,400.0                     | 8,400.0                     | 8,400.0                     | 30.0                | 30.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -19.4                | 60.06   | 0.677 Stop Drilling Now         |                             |
| 8,500.0                                                      | 8,500.0                     | 8,500.0                     | 8,500.0                     | 30.4                | 30.4             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -20.1                | 60.77   | 0.669 Stop Drilling Now         |                             |
| 8,600.0                                                      | 8,600.0                     | 8,600.0                     | 8,600.0                     | 30.7                | 30.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -20.9                | 61.49   | 0.661 Stop Drilling Now         |                             |
| 8,700.0                                                      | 8,700.0                     | 8,700.0                     | 8,700.0                     | 31.1                | 31.1             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -21.6                | 62.20   | 0.653 Stop Drilling Now         |                             |
| 8,800.0                                                      | 8,800.0                     | 8,800.0                     | 8,800.0                     | 31.5                | 31.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -22.3                | 62.92   | 0.646 Stop Drilling Now         |                             |
| 8,900.0                                                      | 8,900.0                     | 8,900.0                     | 8,900.0                     | 31.8                | 31.8             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -23.0                | 63.63   | 0.639 Stop Drilling Now         |                             |
| 9,000.0                                                      | 9,000.0                     | 9,000.0                     | 9,000.0                     | 32.2                | 32.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -23.7                | 64.34   | 0.631 Stop Drilling Now         |                             |
| 9,100.0                                                      | 9,100.0                     | 9,100.0                     | 9,100.0                     | 32.5                | 32.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -24.4                | 65.06   | 0.625 Stop Drilling Now         |                             |
| 9,200.0                                                      | 9,200.0                     | 9,200.0                     | 9,200.0                     | 32.9                | 32.9             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -25.1                | 65.77   | 0.618 Stop Drilling Now         |                             |
| 9,300.0                                                      | 9,300.0                     | 9,300.0                     | 9,300.0                     | 33.2                | 33.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -25.9                | 66.48   | 0.611 Stop Drilling Now         |                             |
| 9,400.0                                                      | 9,400.0                     | 9,400.0                     | 9,400.0                     | 33.6                | 33.6             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -26.6                | 67.20   | 0.605 Stop Drilling Now         |                             |
| 9,500.0                                                      | 9,500.0                     | 9,500.0                     | 9,500.0                     | 34.0                | 34.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -27.3                | 67.91   | 0.598 Stop Drilling Now         |                             |
| 9,600.0                                                      | 9,600.0                     | 9,600.0                     | 9,600.0                     | 34.3                | 34.3             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -28.0                | 68.63   | 0.592 Stop Drilling Now         |                             |
| 9,700.0                                                      | 9,700.0                     | 9,700.0                     | 9,700.0                     | 34.7                | 34.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -28.7                | 69.34   | 0.586 Stop Drilling Now         |                             |
| 9,800.0                                                      | 9,800.0                     | 9,800.0                     | 9,800.0                     | 35.0                | 35.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -29.4                | 70.06   | 0.580 Stop Drilling Now         |                             |
| 9,900.0                                                      | 9,900.0                     | 9,900.0                     | 9,900.0                     | 35.4                | 35.4             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -30.1                | 70.77   | 0.574 Stop Drilling Now         |                             |
| 10,000.0                                                     | 10,000.0                    | 10,000.0                    | 10,000.0                    | 35.7                | 35.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -30.9                | 71.48   | 0.568 Stop Drilling Now         |                             |
| 10,100.0                                                     | 10,100.0                    | 10,100.0                    | 10,100.0                    | 36.1                | 36.1             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -31.6                | 72.20   | 0.563 Stop Drilling Now         |                             |
| 10,200.0                                                     | 10,200.0                    | 10,200.0                    | 10,200.0                    | 36.5                | 36.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -32.3                | 72.91   | 0.557 Stop Drilling Now         |                             |
| 10,300.0                                                     | 10,300.0                    | 10,300.0                    | 10,300.0                    | 36.8                | 36.8             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -33.0                | 73.63   | 0.552 Stop Drilling Now         |                             |
| 10,400.0                                                     | 10,400.0                    | 10,400.0                    | 10,400.0                    | 37.2                | 37.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -33.7                | 74.34   | 0.547 Stop Drilling Now         |                             |
| 10,500.0                                                     | 10,500.0                    | 10,500.0                    | 10,500.0                    | 37.5                | 37.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -34.4                | 75.06   | 0.541 Stop Drilling Now         |                             |
| 10,600.0                                                     | 10,600.0                    | 10,600.0                    | 10,600.0                    | 37.9                | 37.9             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -35.1                | 75.77   | 0.536 Stop Drilling Now         |                             |
| 10,700.0                                                     | 10,700.0                    | 10,700.0                    | 10,700.0                    | 38.2                | 38.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -35.9                | 76.49   | 0.531 Stop Drilling Now         |                             |
| 10,800.0                                                     | 10,800.0                    | 10,800.0                    | 10,800.0                    | 38.6                | 38.6             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -36.6                | 77.20   | 0.526 Stop Drilling Now         |                             |
| 10,900.0                                                     | 10,900.0                    | 10,900.0                    | 10,900.0                    | 39.0                | 39.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -37.3                | 77.92   | 0.521 Stop Drilling Now         |                             |
| 11,000.0                                                     | 11,000.0                    | 11,000.0                    | 11,000.0                    | 39.3                | 39.3             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -38.0                | 78.63   | 0.517 Stop Drilling Now         |                             |
| 11,100.0                                                     | 11,100.0                    | 11,100.0                    | 11,100.0                    | 39.7                | 39.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -38.7                | 79.35   | 0.512 Stop Drilling Now         |                             |
| 11,200.0                                                     | 11,200.0                    | 11,200.0                    | 11,200.0                    | 40.0                | 40.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -39.4                | 80.06   | 0.508 Stop Drilling Now         |                             |
| 11,300.0                                                     | 11,300.0                    | 11,300.0                    | 11,300.0                    | 40.4                | 40.4             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -40.1                | 80.78   | 0.503 Stop Drilling Now         |                             |
| 11,400.0                                                     | 11,400.0                    | 11,400.0                    | 11,400.0                    | 40.7                | 40.7             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -40.9                | 81.49   | 0.499 Stop Drilling Now         |                             |
| 11,500.0                                                     | 11,500.0                    | 11,500.0                    | 11,500.0                    | 41.1                | 41.1             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -41.6                | 82.21   | 0.494 Stop Drilling Now         |                             |
| 11,600.0                                                     | 11,600.0                    | 11,600.0                    | 11,600.0                    | 41.5                | 41.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -42.3                | 82.92   | 0.490 Stop Drilling Now         |                             |
| 11,700.0                                                     | 11,700.0                    | 11,700.0                    | 11,700.0                    | 41.8                | 41.8             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -43.0                | 83.64   | 0.486 Stop Drilling Now         |                             |
| 11,800.0                                                     | 11,800.0                    | 11,800.0                    | 11,800.0                    | 42.2                | 42.2             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -43.7                | 84.35   | 0.482 Stop Drilling Now         |                             |
| 11,900.0                                                     | 11,900.0                    | 11,900.0                    | 11,900.0                    | 42.5                | 42.5             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -44.4                | 85.07   | 0.478 Stop Drilling Now         |                             |
| 12,000.0                                                     | 12,000.0                    | 12,000.0                    | 12,000.0                    | 42.9                | 42.9             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -45.1                | 85.78   | 0.474 Stop Drilling Now         |                             |
| 12,036.5                                                     | 12,036.5                    | 12,036.5                    | 12,036.5                    | 43.0                | 43.0             | 73.71                       | 11.4                         | 39.0                          | 40.6                            | -45.4                | 86.04   | 0.472 Stop Drilling Now, CC, SF |                             |
| 12,050.0                                                     | 12,050.0                    | 12,050.0                    | 12,050.0                    | 43.1                | 43.1             | -114.03                     | 11.4                         | 39.0                          | 40.7                            | -45.4                | 86.14   | 0.473 Stop Drilling Now, ES     |                             |
| 12,075.0                                                     | 12,075.0                    | 12,075.0                    | 12,075.0                    | 43.1                | 43.2             | -115.69                     | 11.4                         | 39.0                          | 41.3                            | -45.0                | 86.31   | 0.478 Stop Drilling Now         |                             |
| 12,100.0                                                     | 12,099.8                    | 12,100.2                    | 12,099.8                    | 43.2                | 43.2             | -118.79                     | 11.4                         | 39.0                          | 42.5                            | -44.0                | 86.48   | 0.492 Stop Drilling Now         |                             |
| 12,125.0                                                     | 12,124.5                    | 12,124.5                    | 12,124.5                    | 43.3                | 43.3             | -123.01                     | 11.4                         | 39.0                          | 44.6                            | -42.1                | 86.64   | 0.514 Stop Drilling Now         |                             |
| 12,150.0                                                     | 12,148.9                    | 12,148.9                    | 12,148.9                    | 43.4                | 43.4             | -127.94                     | 11.4                         | 39.0                          | 47.7                            | -39.1                | 86.81   | 0.549 Stop Drilling Now         |                             |
| 12,175.0                                                     | 12,173.1                    | 12,173.1                    | 12,173.1                    | 43.5                | 43.5             | -133.12                     | 11.4                         | 39.0                          | 52.0                            | -35.0                | 86.97   | 0.598 Stop Drilling Now         |                             |
| 12,200.0                                                     | 12,196.8                    | 12,203.2                    | 12,196.8                    | 43.5                | 43.6             | -138.18                     | 11.4                         | 39.0                          | 57.7                            | -29.5                | 87.15   | 0.662 Stop Drilling Now         |                             |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# COG Operating LLC

## Anticollision Report

Company: COG OPERATING LLC  
Project: LEA COUNTY, NM  
Reference Site: BULLDOG  
Site Error: 0.0 usft  
Reference Well: STOVE PIPE FED COM #1H  
Well Error: 3.0 usft  
Reference Wellbore: OWB  
Reference Design: PWP0

Local Co-ordinate Reference: Well STOVE PIPE FED COM #1H  
TVD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
MD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at: 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                       |                       |                       |                  |               |                       |                                     |              |                        |                         |                           |                   | Offset Site Error: 0.0 usft |
|--------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|-------------------------------------|--------------|------------------------|-------------------------|---------------------------|-------------------|-----------------------------|
| Survey Program: 0-MWD                                        |                       |                       |                       |                  |               |                       |                                     |              |                        |                         |                           |                   | Offset Well Error: 3.0 usft |
| Measured Depth (usft)                                        | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | +E/-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning                     |
| 12,225.0                                                     | 12,220.1              | 12,220.1              | 12,220.1              | 43.6             | 43.7          | -142.83               | 11.4                                | 39.0         | 64.8                   | -22.4                   | 87.29                     | 0.743             | Stop Drilling Now           |
| 12,250.0                                                     | 12,243.0              | 12,243.0              | 12,243.0              | 43.7             | 43.8          | -146.93               | 11.4                                | 39.0         | 73.4                   | -14.0                   | 87.44                     | 0.840             | Stop Drilling Now           |
| 12,275.0                                                     | 12,265.2              | 12,266.8              | 12,266.8              | 43.8             | 43.8          | -150.59               | 11.2                                | 39.1         | 83.3                   | -4.3                    | 87.59                     | 0.951             | Stop Drilling Now           |
| 12,300.0                                                     | 12,286.8              | 12,291.8              | 12,291.7              | 43.8             | 43.9          | -153.33               | 9.8                                 | 39.6         | 93.9                   | 6.2                     | 87.75                     | 1.070             | Shut in Produces            |
| 12,325.0                                                     | 12,307.8              | 12,317.3              | 12,317.1              | 43.9             | 44.0          | -155.21               | 7.2                                 | 40.6         | 105.0                  | 17.1                    | 87.90                     | 1.195             | Shut in Produces            |
| 12,350.0                                                     | 12,328.0              | 12,343.3              | 12,342.8              | 44.0             | 44.1          | -156.39               | 3.2                                 | 42.1         | 116.5                  | 28.4                    | 88.05                     | 1.323             | Shut in Produces            |
| 12,375.0                                                     | 12,347.4              | 12,369.9              | 12,368.7              | 44.0             | 44.2          | -157.03               | -2.3                                | 44.1         | 128.2                  | 40.0                    | 88.20                     | 1.454             | Shut in Produces            |
| 12,400.0                                                     | 12,365.9              | 12,396.9              | 12,394.7              | 44.1             | 44.3          | -157.23               | -9.2                                | 46.7         | 140.2                  | 51.9                    | 88.35                     | 1.587             | Advise and Monitor          |
| 12,425.0                                                     | 12,383.5              | 12,424.5              | 12,420.8              | 44.2             | 44.3          | -157.07               | -17.7                               | 49.8         | 152.5                  | 64.0                    | 88.50                     | 1.723             | Advise and Monitor          |
| 12,450.0                                                     | 12,400.2              | 12,452.7              | 12,446.8              | 44.2             | 44.4          | -156.61               | -27.7                               | 53.6         | 164.8                  | 76.2                    | 88.65                     | 1.860             | Advise and Monitor          |
| 12,475.0                                                     | 12,415.9              | 12,481.4              | 12,472.7              | 44.3             | 44.5          | -155.88               | -39.5                               | 57.9         | 177.4                  | 88.6                    | 88.80                     | 1.998             | Advise and Monitor          |
| 12,500.0                                                     | 12,430.6              | 12,510.8              | 12,498.2              | 44.4             | 44.6          | -154.93               | -53.0                               | 62.9         | 190.1                  | 101.1                   | 88.95                     | 2.137             |                             |
| 12,525.0                                                     | 12,444.1              | 12,540.7              | 12,523.3              | 44.4             | 44.7          | -153.79               | -68.2                               | 68.6         | 202.8                  | 113.7                   | 89.10                     | 2.276             |                             |
| 12,550.0                                                     | 12,456.6              | 12,571.3              | 12,547.9              | 44.5             | 44.8          | -152.47               | -85.3                               | 75.0         | 215.7                  | 126.4                   | 89.26                     | 2.417             |                             |
| 12,575.0                                                     | 12,467.9              | 12,602.5              | 12,571.8              | 44.6             | 44.9          | -150.99               | -104.2                              | 82.0         | 228.6                  | 139.2                   | 89.41                     | 2.557             |                             |
| 12,600.0                                                     | 12,478.0              | 12,634.5              | 12,594.7              | 44.6             | 44.9          | -149.37               | -125.0                              | 89.7         | 241.6                  | 152.0                   | 89.56                     | 2.697             |                             |
| 12,625.0                                                     | 12,486.9              | 12,667.1              | 12,616.6              | 44.7             | 45.0          | -147.62               | -147.7                              | 98.2         | 254.5                  | 164.8                   | 89.72                     | 2.837             |                             |
| 12,650.0                                                     | 12,494.6              | 12,700.5              | 12,637.2              | 44.8             | 45.1          | -145.75               | -172.3                              | 107.3        | 267.5                  | 177.6                   | 89.88                     | 2.976             |                             |
| 12,675.0                                                     | 12,501.0              | 12,734.6              | 12,656.3              | 44.8             | 45.2          | -143.77               | -198.8                              | 117.2        | 280.3                  | 190.3                   | 90.05                     | 3.113             |                             |
| 12,700.0                                                     | 12,506.2              | 12,769.6              | 12,673.7              | 44.9             | 45.3          | -141.69               | -227.2                              | 127.7        | 293.2                  | 202.9                   | 90.21                     | 3.250             |                             |
| 12,725.0                                                     | 12,510.0              | 12,805.3              | 12,689.2              | 44.9             | 45.4          | -139.52               | -257.4                              | 139.0        | 305.9                  | 215.5                   | 90.39                     | 3.384             |                             |
| 12,750.0                                                     | 12,512.6              | 12,841.9              | 12,702.6              | 45.0             | 45.6          | -137.26               | -289.3                              | 150.8        | 318.4                  | 227.8                   | 90.57                     | 3.516             |                             |
| 12,775.0                                                     | 12,513.9              | 12,879.4              | 12,713.5              | 45.1             | 45.7          | -134.93               | -322.9                              | 163.3        | 330.8                  | 240.0                   | 90.75                     | 3.645             |                             |
| 12,786.6                                                     | 12,514.0              | 12,897.0              | 12,717.6              | 45.1             | 45.7          | -133.83               | -338.9                              | 169.3        | 336.4                  | 245.6                   | 90.84                     | 3.704             |                             |
| 12,800.0                                                     | 12,514.0              | 12,917.8              | 12,721.7              | 45.1             | 45.8          | -132.94               | -358.1                              | 176.4        | 342.8                  | 251.8                   | 90.94                     | 3.769             |                             |
| 12,900.0                                                     | 12,513.6              | 13,057.9              | 12,729.0              | 45.4             | 46.3          | -126.38               | -489.4                              | 224.1        | 379.2                  | 287.5                   | 91.74                     | 4.134             |                             |
| 12,974.8                                                     | 12,513.0              | 13,150.5              | 12,728.8              | 45.7             | 46.7          | -123.50               | -578.2                              | 250.0        | 398.5                  | 306.1                   | 92.38                     | 4.314             |                             |
| 13,000.0                                                     | 12,512.7              | 13,182.7              | 12,728.6              | 45.8             | 46.8          | -122.91               | -609.5                              | 257.7        | 403.7                  | 311.1                   | 92.62                     | 4.359             |                             |
| 13,100.0                                                     | 12,511.7              | 13,313.7              | 12,728.0              | 46.2             | 47.5          | -121.20               | -738.2                              | 281.6        | 419.6                  | 325.9                   | 93.65                     | 4.480             |                             |
| 13,200.0                                                     | 12,510.6              | 13,448.0              | 12,726.9              | 46.6             | 48.2          | -120.39               | -871.9                              | 293.9        | 427.5                  | 332.7                   | 94.80                     | 4.510             |                             |
| 13,300.0                                                     | 12,509.5              | 13,566.4              | 12,725.7              | 47.2             | 48.8          | -120.32               | -990.2                              | 295.1        | 428.3                  | 332.3                   | 95.96                     | 4.463             |                             |
| 13,400.0                                                     | 12,508.5              | 13,666.4              | 12,724.6              | 47.7             | 49.4          | -120.34               | -1,090.2                            | 294.7        | 427.9                  | 330.7                   | 97.11                     | 4.406             |                             |
| 13,500.0                                                     | 12,507.4              | 13,766.4              | 12,723.5              | 48.3             | 50.0          | -120.37               | -1,190.2                            | 294.2        | 427.5                  | 329.1                   | 98.37                     | 4.346             |                             |
| 13,600.0                                                     | 12,506.3              | 13,866.4              | 12,722.4              | 49.0             | 50.7          | -120.40               | -1,290.2                            | 293.8        | 427.1                  | 327.4                   | 99.71                     | 4.283             |                             |
| 13,700.0                                                     | 12,505.3              | 13,966.4              | 12,721.3              | 49.7             | 51.4          | -120.43               | -1,390.2                            | 293.4        | 426.7                  | 325.5                   | 101.15                    | 4.219             |                             |
| 13,800.0                                                     | 12,504.2              | 14,066.4              | 12,720.3              | 50.5             | 52.2          | -120.46               | -1,490.2                            | 292.9        | 426.3                  | 323.6                   | 102.67                    | 4.152             |                             |
| 13,900.0                                                     | 12,503.1              | 14,166.4              | 12,719.2              | 51.3             | 53.0          | -120.49               | -1,590.2                            | 292.5        | 425.9                  | 321.6                   | 104.28                    | 4.084             |                             |
| 14,000.0                                                     | 12,502.1              | 14,266.4              | 12,718.1              | 52.1             | 53.8          | -120.52               | -1,690.2                            | 292.0        | 425.5                  | 319.6                   | 105.97                    | 4.016             |                             |
| 14,100.0                                                     | 12,501.0              | 14,366.4              | 12,717.0              | 53.0             | 54.7          | -120.54               | -1,790.2                            | 291.6        | 425.1                  | 317.4                   | 107.73                    | 3.946             |                             |
| 14,200.0                                                     | 12,499.9              | 14,466.4              | 12,716.0              | 53.9             | 55.7          | -120.57               | -1,890.2                            | 291.2        | 424.8                  | 315.2                   | 109.57                    | 3.877             |                             |
| 14,300.0                                                     | 12,498.9              | 14,566.4              | 12,714.9              | 54.9             | 56.6          | -120.60               | -1,990.2                            | 290.7        | 424.4                  | 312.9                   | 111.48                    | 3.807             |                             |
| 14,400.0                                                     | 12,497.8              | 14,666.4              | 12,713.8              | 55.9             | 57.6          | -120.63               | -2,090.2                            | 290.3        | 424.0                  | 310.5                   | 113.45                    | 3.737             |                             |
| 14,500.0                                                     | 12,496.7              | 14,766.4              | 12,712.7              | 56.9             | 58.6          | -120.66               | -2,190.1                            | 289.9        | 423.6                  | 308.1                   | 115.48                    | 3.668             |                             |
| 14,600.0                                                     | 12,495.7              | 14,866.4              | 12,711.6              | 57.9             | 59.7          | -120.69               | -2,290.1                            | 289.4        | 423.2                  | 305.6                   | 117.57                    | 3.600             |                             |
| 14,700.0                                                     | 12,494.6              | 14,966.4              | 12,710.6              | 59.0             | 60.7          | -120.72               | -2,390.1                            | 289.0        | 422.8                  | 303.1                   | 119.72                    | 3.532             |                             |
| 14,800.0                                                     | 12,493.5              | 15,066.4              | 12,709.5              | 60.1             | 61.8          | -120.75               | -2,490.1                            | 288.6        | 422.4                  | 300.5                   | 121.92                    | 3.465             |                             |
| 14,900.0                                                     | 12,492.5              | 15,166.4              | 12,708.4              | 61.2             | 62.9          | -120.78               | -2,590.1                            | 288.1        | 422.0                  | 297.9                   | 124.17                    | 3.399             |                             |
| 15,000.0                                                     | 12,491.4              | 15,266.4              | 12,707.3              | 62.4             | 64.1          | -120.81               | -2,690.1                            | 287.7        | 421.7                  | 295.2                   | 126.46                    | 3.334             |                             |
| 15,100.0                                                     | 12,490.4              | 15,366.4              | 12,706.2              | 63.5             | 65.3          | -120.83               | -2,790.1                            | 287.3        | 421.3                  | 292.5                   | 128.81                    | 3.271             |                             |
| 15,200.0                                                     | 12,489.3              | 15,466.4              | 12,705.2              | 64.7             | 66.5          | -120.86               | -2,890.1                            | 286.8        | 420.9                  | 289.7                   | 131.19                    | 3.208             |                             |
| 15,300.0                                                     | 12,488.2              | 15,566.4              | 12,704.1              | 65.9             | 67.7          | -120.89               | -2,990.1                            | 286.4        | 420.5                  | 286.9                   | 133.61                    | 3.147             |                             |
| 15,400.0                                                     | 12,487.2              | 15,666.3              | 12,703.0              | 67.2             | 68.9          | -120.92               | -3,090.1                            | 286.0        | 420.1                  | 284.0                   | 136.07                    | 3.087             |                             |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# COG Operating LLC

## Anticollision Report

Company: COG OPERATING LLC  
Project: LEA COUNTY, NM  
Reference Site: BULLDOG  
Site Error: 0.0 usft  
Reference Well: STOVE PIPE FED COM #1H  
Well Error: 3.0 usft  
Reference Wellbore: OWB  
Reference Design: PWP0

Local Co-ordinate Reference: Well STOVE PIPE FED COM #1H  
TVD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
MD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                       |                       |                       |                  |               |                       |                                     |              |                        |                         |                           |                          | Offset Site Error: 0.0 usft |
|--------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|-------------------------------------|--------------|------------------------|-------------------------|---------------------------|--------------------------|-----------------------------|
| Survey Program: 0-MWD                                        |                       |                       |                       |                  |               |                       |                                     |              |                        |                         |                           |                          | Offset Well Error: 3.0 usft |
| Reference                                                    |                       | Offset                |                       | Semi Major Axis  |               | Distance              |                                     |              |                        |                         |                           |                          |                             |
| Measured Depth (usft)                                        | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | +E/-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor        | Warning                     |
| 15,500.0                                                     | 12,486.1              | 15,766.3              | 12,701.9              | 68.4             | 70.1          | -120.95               | -3,190.1                            | 285.5        | 419.7                  | 281.1                   | 138.57                    | 3.029                    |                             |
| 15,600.0                                                     | 12,485.0              | 15,866.3              | 12,700.9              | 69.7             | 71.4          | -120.98               | -3,290.1                            | 285.1        | 419.3                  | 278.2                   | 141.10                    | 2.972                    |                             |
| 15,700.0                                                     | 12,484.0              | 15,966.3              | 12,699.8              | 71.0             | 72.7          | -121.01               | -3,390.1                            | 284.7        | 418.9                  | 275.3                   | 143.67                    | 2.916                    |                             |
| 15,800.0                                                     | 12,482.9              | 16,066.3              | 12,698.7              | 72.3             | 74.0          | -121.04               | -3,490.0                            | 284.2        | 418.6                  | 272.3                   | 146.26                    | 2.862                    |                             |
| 15,900.0                                                     | 12,481.8              | 16,166.3              | 12,697.6              | 73.6             | 75.3          | -121.07               | -3,590.0                            | 283.8        | 418.2                  | 269.3                   | 148.88                    | 2.809                    |                             |
| 16,000.0                                                     | 12,480.8              | 16,266.3              | 12,696.5              | 74.9             | 76.6          | -121.10               | -3,690.0                            | 283.3        | 417.8                  | 266.3                   | 151.53                    | 2.757                    |                             |
| 16,100.0                                                     | 12,479.7              | 16,366.3              | 12,695.5              | 76.3             | 77.9          | -121.13               | -3,790.0                            | 282.9        | 417.4                  | 263.2                   | 154.21                    | 2.707                    |                             |
| 16,200.0                                                     | 12,478.6              | 16,466.3              | 12,694.4              | 77.6             | 79.3          | -121.16               | -3,890.0                            | 282.5        | 417.0                  | 260.1                   | 156.91                    | 2.658                    |                             |
| 16,300.0                                                     | 12,477.6              | 16,566.3              | 12,693.3              | 79.0             | 80.6          | -121.19               | -3,990.0                            | 282.0        | 416.6                  | 257.0                   | 159.64                    | 2.610                    |                             |
| 16,400.0                                                     | 12,476.5              | 16,666.3              | 12,692.2              | 80.4             | 82.0          | -121.22               | -4,090.0                            | 281.6        | 416.2                  | 253.9                   | 162.38                    | 2.563                    |                             |
| 16,500.0                                                     | 12,475.4              | 16,766.3              | 12,691.1              | 81.8             | 83.4          | -121.25               | -4,190.0                            | 281.2        | 415.9                  | 250.7                   | 165.15                    | 2.518                    |                             |
| 16,600.0                                                     | 12,474.4              | 16,866.3              | 12,690.1              | 83.1             | 84.8          | -121.28               | -4,290.0                            | 280.7        | 415.5                  | 247.5                   | 167.94                    | 2.474                    |                             |
| 16,700.0                                                     | 12,473.3              | 16,966.3              | 12,689.0              | 84.6             | 86.2          | -121.31               | -4,390.0                            | 280.3        | 415.1                  | 244.3                   | 170.74                    | 2.431                    |                             |
| 16,800.0                                                     | 12,472.2              | 17,066.3              | 12,687.9              | 86.0             | 87.6          | -121.34               | -4,490.0                            | 279.9        | 414.7                  | 241.1                   | 173.57                    | 2.389                    |                             |
| 16,900.0                                                     | 12,471.2              | 17,166.3              | 12,686.8              | 87.4             | 89.0          | -121.37               | -4,590.0                            | 279.4        | 414.3                  | 237.9                   | 176.41                    | 2.349                    |                             |
| 17,000.0                                                     | 12,470.1              | 17,266.3              | 12,685.7              | 88.8             | 90.4          | -121.40               | -4,690.0                            | 279.0        | 413.9                  | 234.7                   | 179.27                    | 2.309                    |                             |
| 17,100.0                                                     | 12,469.0              | 17,366.3              | 12,684.7              | 90.3             | 91.9          | -121.43               | -4,789.9                            | 278.6        | 413.5                  | 231.4                   | 182.14                    | 2.270                    |                             |
| 17,200.0                                                     | 12,468.0              | 17,466.3              | 12,683.6              | 91.7             | 93.3          | -121.46               | -4,889.9                            | 278.1        | 413.2                  | 228.1                   | 185.03                    | 2.233                    |                             |
| 17,300.0                                                     | 12,466.9              | 17,566.3              | 12,682.5              | 93.2             | 94.8          | -121.49               | -4,989.9                            | 277.7        | 412.8                  | 224.8                   | 187.93                    | 2.196                    |                             |
| 17,400.0                                                     | 12,465.8              | 17,666.3              | 12,681.4              | 94.6             | 96.2          | -121.52               | -5,089.9                            | 277.3        | 412.4                  | 221.5                   | 190.85                    | 2.161                    |                             |
| 17,500.0                                                     | 12,464.8              | 17,766.3              | 12,680.4              | 96.1             | 97.7          | -121.55               | -5,189.9                            | 276.8        | 412.0                  | 218.2                   | 193.78                    | 2.126                    |                             |
| 17,600.0                                                     | 12,463.7              | 17,866.3              | 12,679.3              | 97.6             | 99.1          | -121.58               | -5,289.9                            | 276.4        | 411.6                  | 214.9                   | 196.72                    | 2.092                    |                             |
| 17,700.0                                                     | 12,462.7              | 17,966.3              | 12,678.2              | 99.1             | 100.6         | -121.62               | -5,389.9                            | 275.9        | 411.2                  | 211.6                   | 199.68                    | 2.060                    |                             |
| 17,800.0                                                     | 12,461.6              | 18,066.3              | 12,677.1              | 100.5            | 102.1         | -121.65               | -5,489.9                            | 275.5        | 410.9                  | 208.2                   | 202.64                    | 2.027                    |                             |
| 17,900.0                                                     | 12,460.5              | 18,166.3              | 12,676.0              | 102.0            | 103.6         | -121.68               | -5,589.9                            | 275.1        | 410.5                  | 204.8                   | 205.62                    | 1.996 Advise and Monitor |                             |
| 18,000.0                                                     | 12,459.5              | 18,266.3              | 12,675.0              | 103.5            | 105.1         | -121.71               | -5,689.9                            | 274.6        | 410.1                  | 201.5                   | 208.61                    | 1.966 Advise and Monitor |                             |
| 18,100.0                                                     | 12,458.4              | 18,366.3              | 12,673.9              | 105.0            | 106.6         | -121.74               | -5,789.9                            | 274.2        | 409.7                  | 198.1                   | 211.60                    | 1.936 Advise and Monitor |                             |
| 18,200.0                                                     | 12,457.3              | 18,466.3              | 12,672.8              | 106.5            | 108.1         | -121.77               | -5,889.9                            | 273.8        | 409.3                  | 194.7                   | 214.61                    | 1.907 Advise and Monitor |                             |
| 18,300.0                                                     | 12,456.3              | 18,566.3              | 12,671.7              | 108.0            | 109.6         | -121.80               | -5,989.9                            | 273.3        | 408.9                  | 191.3                   | 217.62                    | 1.879 Advise and Monitor |                             |
| 18,400.0                                                     | 12,455.2              | 18,666.3              | 12,670.6              | 109.6            | 111.1         | -121.83               | -6,089.9                            | 272.9        | 408.6                  | 187.9                   | 220.65                    | 1.852 Advise and Monitor |                             |
| 18,500.0                                                     | 12,454.1              | 18,766.3              | 12,669.6              | 111.1            | 112.6         | -121.86               | -6,189.9                            | 272.5        | 408.2                  | 184.5                   | 223.68                    | 1.825 Advise and Monitor |                             |
| 18,600.0                                                     | 12,453.1              | 18,866.3              | 12,668.5              | 112.6            | 114.1         | -121.89               | -6,289.9                            | 272.0        | 407.8                  | 181.1                   | 226.72                    | 1.799 Advise and Monitor |                             |
| 18,700.0                                                     | 12,452.0              | 18,966.3              | 12,667.4              | 114.1            | 115.6         | -121.93               | -6,389.9                            | 271.6        | 407.4                  | 177.6                   | 229.77                    | 1.773 Advise and Monitor |                             |
| 18,800.0                                                     | 12,450.9              | 19,066.3              | 12,666.3              | 115.7            | 117.2         | -121.96               | -6,489.9                            | 271.2        | 407.0                  | 174.2                   | 232.82                    | 1.748 Advise and Monitor |                             |
| 18,900.0                                                     | 12,449.9              | 19,166.3              | 12,665.3              | 117.2            | 118.7         | -121.99               | -6,589.9                            | 270.7        | 406.6                  | 170.7                   | 235.89                    | 1.724 Advise and Monitor |                             |
| 19,000.0                                                     | 12,448.8              | 19,266.3              | 12,664.2              | 118.7            | 120.2         | -122.02               | -6,689.9                            | 270.3        | 406.3                  | 167.3                   | 238.96                    | 1.700 Advise and Monitor |                             |
| 19,100.0                                                     | 12,447.7              | 19,366.3              | 12,663.1              | 120.3            | 121.8         | -122.05               | -6,789.9                            | 269.9        | 405.9                  | 163.8                   | 242.03                    | 1.677 Advise and Monitor |                             |
| 19,200.0                                                     | 12,446.7              | 19,466.3              | 12,662.0              | 121.8            | 123.3         | -122.08               | -6,889.9                            | 269.4        | 405.5                  | 160.4                   | 245.12                    | 1.654 Advise and Monitor |                             |
| 19,300.0                                                     | 12,445.6              | 19,566.3              | 12,660.9              | 123.4            | 124.8         | -122.12               | -6,989.9                            | 269.0        | 405.1                  | 156.9                   | 248.20                    | 1.632 Advise and Monitor |                             |
| 19,400.0                                                     | 12,444.5              | 19,666.3              | 12,659.9              | 124.9            | 126.4         | -122.15               | -7,089.9                            | 268.5        | 404.7                  | 153.4                   | 251.30                    | 1.611 Advise and Monitor |                             |
| 19,500.0                                                     | 12,443.5              | 19,766.3              | 12,658.8              | 126.5            | 127.9         | -122.18               | -7,189.9                            | 268.1        | 404.3                  | 149.9                   | 254.40                    | 1.589 Advise and Monitor |                             |
| 19,600.0                                                     | 12,442.4              | 19,866.3              | 12,657.7              | 128.0            | 129.5         | -122.21               | -7,289.9                            | 267.7        | 404.0                  | 146.5                   | 257.50                    | 1.569 Advise and Monitor |                             |
| 19,700.0                                                     | 12,441.3              | 19,966.3              | 12,656.6              | 129.6            | 131.0         | -122.24               | -7,389.7                            | 267.2        | 403.6                  | 143.0                   | 260.62                    | 1.549 Advise and Monitor |                             |
| 19,800.0                                                     | 12,440.3              | 20,066.3              | 12,655.5              | 131.1            | 132.6         | -122.27               | -7,489.7                            | 266.8        | 403.2                  | 139.5                   | 263.73                    | 1.529 Advise and Monitor |                             |
| 19,900.0                                                     | 12,439.2              | 20,166.3              | 12,654.5              | 132.7            | 134.1         | -122.31               | -7,589.7                            | 266.4        | 402.8                  | 136.0                   | 266.85                    | 1.509 Advise and Monitor |                             |
| 20,000.0                                                     | 12,438.1              | 20,266.3              | 12,653.4              | 134.3            | 135.7         | -122.34               | -7,689.7                            | 265.9        | 402.4                  | 132.5                   | 269.98                    | 1.491 Shut in Produces   |                             |
| 20,100.0                                                     | 12,437.1              | 20,366.3              | 12,652.3              | 135.8            | 137.3         | -122.37               | -7,789.7                            | 265.5        | 402.1                  | 128.9                   | 273.11                    | 1.472 Shut in Produces   |                             |
| 20,200.0                                                     | 12,436.0              | 20,466.3              | 12,651.2              | 137.4            | 138.8         | -122.40               | -7,889.7                            | 265.1        | 401.7                  | 125.4                   | 276.24                    | 1.454 Shut in Produces   |                             |
| 20,300.0                                                     | 12,435.0              | 20,566.3              | 12,650.2              | 139.0            | 140.4         | -122.44               | -7,989.7                            | 264.6        | 401.3                  | 121.9                   | 279.38                    | 1.436 Shut in Produces   |                             |
| 20,400.0                                                     | 12,433.9              | 20,666.3              | 12,649.1              | 140.6            | 142.0         | -122.47               | -8,089.7                            | 264.2        | 400.9                  | 118.4                   | 282.53                    | 1.419 Shut in Produces   |                             |
| 20,500.0                                                     | 12,432.8              | 20,766.3              | 12,648.0              | 142.1            | 143.5         | -122.50               | -8,189.7                            | 263.8        | 400.5                  | 114.9                   | 285.67                    | 1.402 Shut in Produces   |                             |
| 20,600.0                                                     | 12,431.8              | 20,866.3              | 12,646.9              | 143.7            | 145.1         | -122.53               | -8,289.7                            | 263.3        | 400.1                  | 111.3                   | 288.82                    | 1.385 Shut in Produces   |                             |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



# COG Operating LLC

## Anticollision Report

Company: COG OPERATING LLC  
Project: LEA COUNTY, NM  
Reference Site: BULLDOG  
Site Error: 0.0 usft  
Reference Well: STOVE PIPE FED COM #1H  
Well Error: 3.0 usft  
Reference Wellbore: OWB  
Reference Design: PWP0

Local Co-ordinate Reference: Well STOVE PIPE FED COM #1H  
TVD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
MD Reference: RKB=3295+29 @ 3324.0usft (NORAM 21)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: EDM\_Users  
Offset TVD Reference: Offset Datum

| Offset Design BULLDOG - STOVE PIPE FED COM #21H - OWB - PWP0 |                       |                       |                       |                  |               |                       |                                     |                                     |                        |                         |                           |                        | Offset Site Error: 0.0 usft |
|--------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|-------------------------------------|-------------------------------------|------------------------|-------------------------|---------------------------|------------------------|-----------------------------|
| Survey Program: 0-MWD                                        |                       |                       |                       |                  |               |                       |                                     |                                     |                        |                         |                           |                        | Offset Well Error: 3.0 usft |
| Reference                                                    |                       | Offset                |                       | Semi Major Axis  |               |                       | Distance                            |                                     |                        |                         |                           |                        | Warning                     |
| Measured Depth (usft)                                        | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor      |                             |
| 20,700.0                                                     | 12,430.7              | 20,966.3              | 12,645.8              | 145.3            | 146.7         | -122.56               | -8,389.7                            | 262.9                               | 399.8                  | 107.8                   | 291.98                    | 1.369 Shut in Produces |                             |
| 20,800.0                                                     | 12,429.6              | 21,066.3              | 12,644.8              | 146.9            | 148.3         | -122.60               | -8,489.7                            | 262.5                               | 399.4                  | 104.2                   | 295.14                    | 1.353 Shut in Produces |                             |
| 20,900.0                                                     | 12,428.6              | 21,166.3              | 12,643.7              | 148.5            | 149.8         | -122.63               | -8,589.7                            | 262.0                               | 399.0                  | 100.7                   | 298.30                    | 1.338 Shut in Produces |                             |
| 21,000.0                                                     | 12,427.5              | 21,266.3              | 12,642.6              | 150.0            | 151.4         | -122.66               | -8,689.6                            | 261.6                               | 398.6                  | 97.2                    | 301.46                    | 1.322 Shut in Produces |                             |
| 21,100.0                                                     | 12,426.4              | 21,366.3              | 12,641.5              | 151.6            | 153.0         | -122.70               | -8,789.6                            | 261.2                               | 398.2                  | 93.6                    | 304.63                    | 1.307 Shut in Produces |                             |
| 21,200.0                                                     | 12,425.4              | 21,466.3              | 12,640.4              | 153.2            | 154.6         | -122.73               | -8,889.6                            | 260.7                               | 397.9                  | 90.1                    | 307.80                    | 1.293 Shut in Produces |                             |
| 21,300.0                                                     | 12,424.3              | 21,566.3              | 12,639.4              | 154.8            | 156.2         | -122.76               | -8,989.6                            | 260.3                               | 397.5                  | 86.5                    | 310.98                    | 1.278 Shut in Produces |                             |
| 21,400.0                                                     | 12,423.2              | 21,666.3              | 12,638.3              | 156.4            | 157.8         | -122.79               | -9,089.6                            | 259.8                               | 397.1                  | 82.9                    | 314.16                    | 1.264 Shut in Produces |                             |
| 21,500.0                                                     | 12,422.2              | 21,766.3              | 12,637.2              | 158.0            | 159.3         | -122.83               | -9,189.6                            | 259.4                               | 396.7                  | 79.4                    | 317.34                    | 1.250 Shut in Produces |                             |
| 21,600.0                                                     | 12,421.1              | 21,866.3              | 12,636.1              | 159.6            | 160.9         | -122.86               | -9,289.6                            | 259.0                               | 396.3                  | 75.8                    | 320.52                    | 1.237 Shut in Produces |                             |
| 21,700.0                                                     | 12,420.0              | 21,966.3              | 12,635.0              | 161.2            | 162.5         | -122.89               | -9,389.6                            | 258.5                               | 396.0                  | 72.3                    | 323.71                    | 1.223 Shut in Produces |                             |
| 21,800.0                                                     | 12,419.0              | 22,066.3              | 12,634.0              | 162.8            | 164.1         | -122.93               | -9,489.6                            | 258.1                               | 395.6                  | 68.7                    | 326.90                    | 1.210 Shut in Produces |                             |
| 21,900.0                                                     | 12,417.9              | 22,166.3              | 12,632.9              | 164.4            | 165.7         | -122.96               | -9,589.6                            | 257.7                               | 395.2                  | 65.1                    | 330.09                    | 1.197 Shut in Produces |                             |
| 22,000.0                                                     | 12,416.8              | 22,266.3              | 12,631.8              | 166.0            | 167.3         | -122.99               | -9,689.6                            | 257.2                               | 394.8                  | 61.5                    | 333.28                    | 1.185 Shut in Produces |                             |
| 22,100.0                                                     | 12,415.8              | 22,366.3              | 12,630.7              | 167.6            | 168.9         | -123.03               | -9,789.6                            | 256.8                               | 394.5                  | 58.0                    | 336.48                    | 1.172 Shut in Produces |                             |
| 22,200.0                                                     | 12,414.7              | 22,466.3              | 12,629.7              | 169.2            | 170.5         | -123.06               | -9,889.6                            | 256.4                               | 394.1                  | 54.4                    | 339.68                    | 1.160 Shut in Produces |                             |
| 22,263.3                                                     | 12,414.0              | 22,526.9              | 12,629.0              | 170.2            | 171.5         | -123.08               | -9,950.2                            | 256.1                               | 393.8                  | 52.2                    | 341.66                    | 1.153 Shut in Produces |                             |
| 22,266.4                                                     | 12,414.0              | 22,526.9              | 12,629.0              | 170.2            | 171.5         | -123.08               | -9,950.2                            | 256.1                               | 393.9                  | 52.2                    | 341.71                    | 1.153 Shut in Produces |                             |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# COG Operating LLC

## Anticollision Report

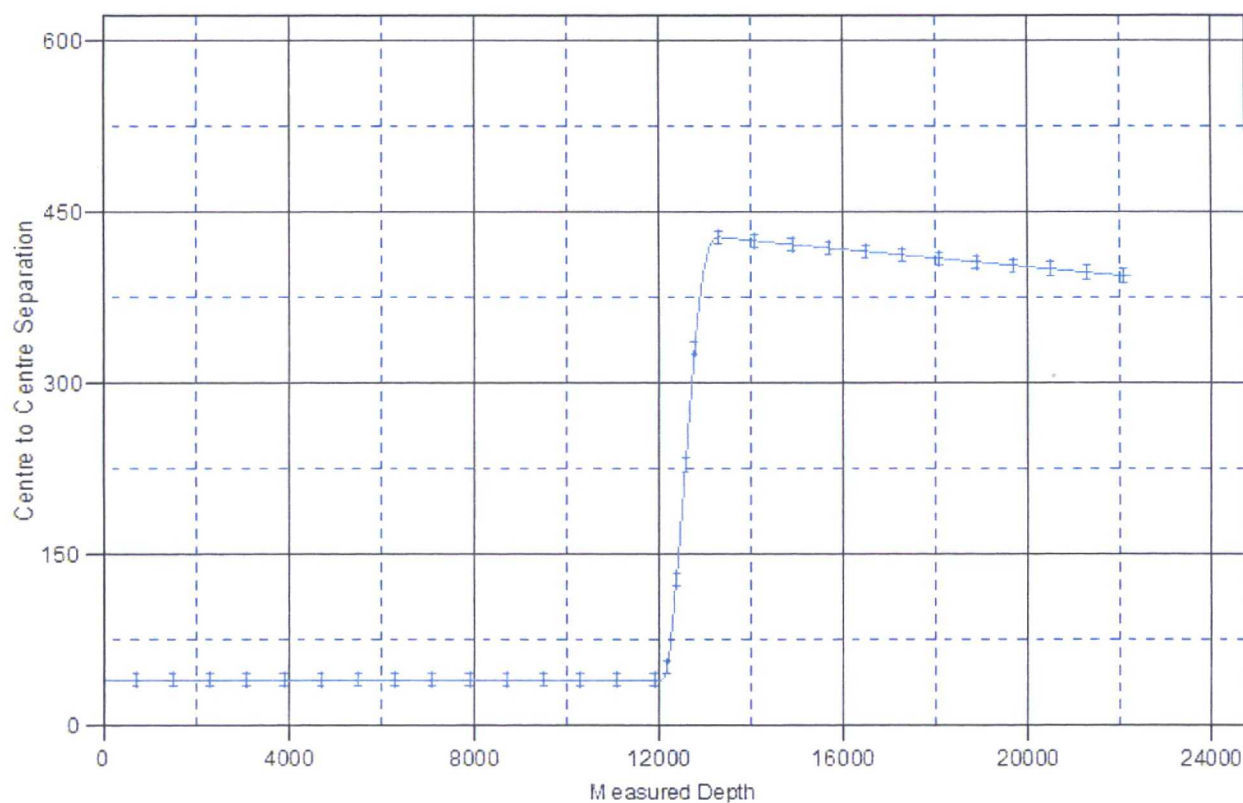
**Company:** COG OPERATING LLC  
**Project:** LEA COUNTY, NM  
**Reference Site:** BULLDOG  
**Site Error:** 0.0 usft  
**Reference Well:** STOVE PIPE FED COM #1H  
**Well Error:** 3.0 usft  
**Reference Wellbore:** OWB  
**Reference Design:** PWP0

**Local Co-ordinate Reference:** Well STOVE PIPE FED COM #1H  
**TVD Reference:** RKB=3295+29 @ 3324.0usft (NORAM 21)  
**MD Reference:** RKB=3295+29 @ 3324.0usft (NORAM 21)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM\_Users  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to RKB=3295+29 @ 3324.0usft (NORAM 21)  
Offset Depths are relative to Offset Datum  
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: STOVE PIPE FED COM #1H  
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30  
Grid Convergence at Surface is: 0.50°

### Ladder Plot



#### LEGEND

—+— STOVE PIPE FED COM #1H (NORAM 21)



# COG Operating LLC

## Anticollision Report

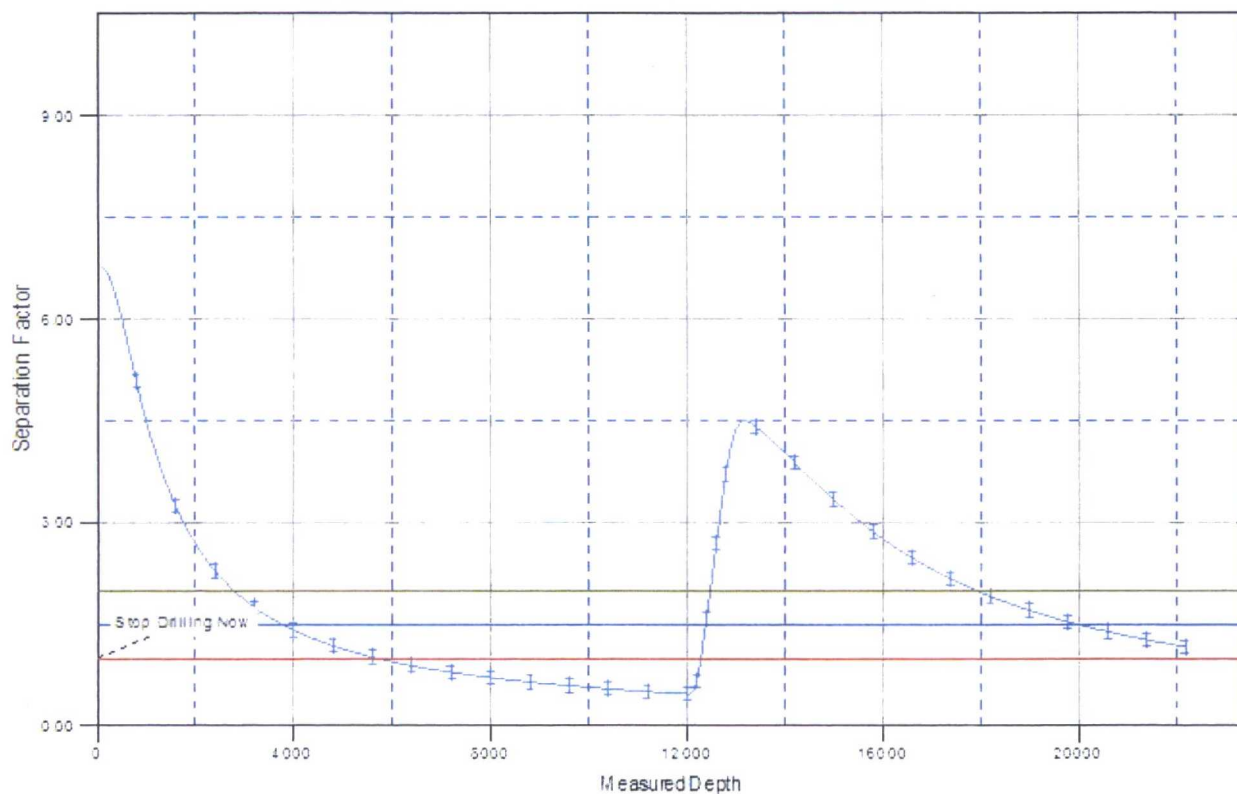
**Company:** COG OPERATING LLC  
**Project:** LEA COUNTY, NM  
**Reference Site:** BULLDOG  
**Site Error:** 0.0 usft  
**Reference Well:** STOVE PIPE FED COM #1H  
**Well Error:** 3.0 usft  
**Reference Wellbore:** OWB  
**Reference Design:** PWP0

**Local Co-ordinate Reference:** Well STOVE PIPE FED COM #1H  
**TVD Reference:** RKB=3295+29 @ 3324.0usft (NORAM 21)  
**MD Reference:** RKB=3295+29 @ 3324.0usft (NORAM 21)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM\_Users  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to RKB=3295+29 @ 3324.0usft (NORAM  
Offset Depths are relative to Offset Datum  
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: STOVE PIPE FED COM #1H  
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30  
Grid Convergence at Surface is: 0.50°

### Separation Factor Plot



#### LEGEND

—+— STOVE PIPE FED COM #1H