

A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021  
Corpus Christi, Texas 78426  
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

March 13, 2013

Concho Resources, Inc.  
One Concho Center  
600 W. Illinois Avenue  
Midland, Texas 79701



Attn: Kanicia Castillo

30-015-40823

RE: Brutus 12 Federal Com No. 002H

Please find enclosed a copy of the survey from 0.00' to 7950.00' ran on the above referenced well.

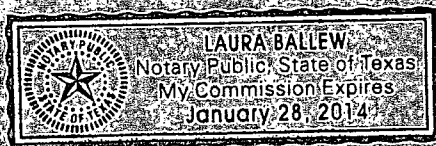
Sincerely,

  
Keith Havelka  
Operations

STATE OF TEXAS §  
COUNTY OF NUECES §

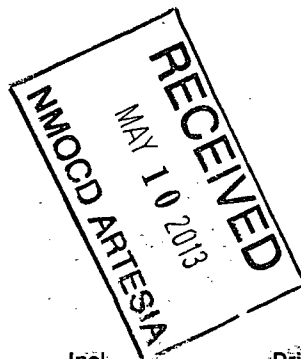
This instrument was acknowledged before me on the 13<sup>th</sup> day of March  
A.D., 2013, by Keith Havelka.

  
Laura Ballew  
Notary Public, State of Texas





Rig Name: Silver Oak 7  
State/County: New Mexico / Eddy  
Latitude: 32.05, Longitude: -104.04  
GRID: North is 0.16 Degrees East of True North  
VS-Azi: 0.00 Degrees



Depth Reference: RKB = 17.8'  
DRILLOG HA GYRO SURVEY CALCULATIONS  
Filename: gyro:survey.ut  
Minimum Curvature Method  
Report Date/Time: 3/13/2013 / 13:42  
Vaughn Energy Services  
Midland, Texas  
432-563-5444  
Survey Engineer: Tim Dillon  
Brutus 12 Federal Com No: 002H / API 30-015-40823

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 0:00                    | 0.00                 | 0.00                      | 0.00      | 0.00        | 0.00        | 0.00                      | 0.00                        | ****                          |
| 100:00                  | 1:02                 | 261.44                    | 99.99     | -0.13       | -0.88       | -0.89                     | 261.44                      | 1:02                          |
| 200:00                  | 1:07                 | 246.53                    | 199.98    | -0.64       | -2.61       | 2.69                      | 256.29                      | 0:28                          |
| 300:00                  | 0:87                 | 248.75                    | 299.96    | -1.29       | -4.18       | 4.37                      | 252.90                      | 0:21                          |
| 400:00                  | 0.79                 | 248.12                    | 399.95    | -1.82       | -5.52       | 5.81                      | 251.80                      | 0:09                          |
| 500:00                  | 0.58                 | 270.67                    | 499.95    | -2.07       | -6.67       | 6.98                      | 252.78                      | 0:33                          |
| 600:00                  | 0.37                 | 293.23                    | 599.94    | -1.93       | -7.47       | 7.72                      | 255.50                      | 0:27                          |
| 700:00                  | 0.31                 | 247.22                    | 699.94    | -1.91       | -8.02       | 8.24                      | 256.61                      | 0:27                          |
| 800:00                  | 0.23                 | 201.22                    | 799.94    | -2.20       | -8.34       | 8.62                      | 255.25                      | 0:22                          |
| 900:00                  | 0.24                 | 226.63                    | 899.94    | -2.52       | -8.56       | 8.92                      | 253.59                      | 0:10                          |
| 1000:00                 | 0.26                 | 252.05                    | 999.94    | -2.73       | -8.93       | 9.34                      | 252.98                      | 0:11                          |
| 1100:00                 | 0.29                 | 272.42                    | 1099.94   | -2.79       | -9.40       | 9.80                      | 253.45                      | 0:10                          |
| 1200:00                 | 0.31                 | 292.79                    | 1199.94   | -2.68       | -9.89       | 10.25                     | 254.85                      | 0:11                          |
| 1300:00                 | 0.20                 | 209.06                    | 1299.94   | -2.73       | -10.22      | 10.58                     | 255.07                      | 0:35                          |
| 1400:00                 | 0.09                 | 125.33                    | 1399.94   | -2.92       | -10.24      | 10.65                     | 254.09                      | 0:21                          |
| 1500:00                 | 0.15                 | 136.33                    | 1499.94   | -3.06       | -10.09      | 10.54                     | 253.12                      | 0:07                          |
| 1600:00                 | 0.20                 | 147.34                    | 1599.93   | -3.30       | -9.90       | 10.44                     | 251.55                      | 0:06                          |
| 1700:00                 | 0.31                 | 129.47                    | 1699.93   | -3.63       | -9.60       | 10.26                     | 249.31                      | 0:14                          |
| 1800:00                 | 0.43                 | 111.60                    | 1799.93   | -3.94       | -9.04       | 9.86                      | 246.45                      | 0:16                          |

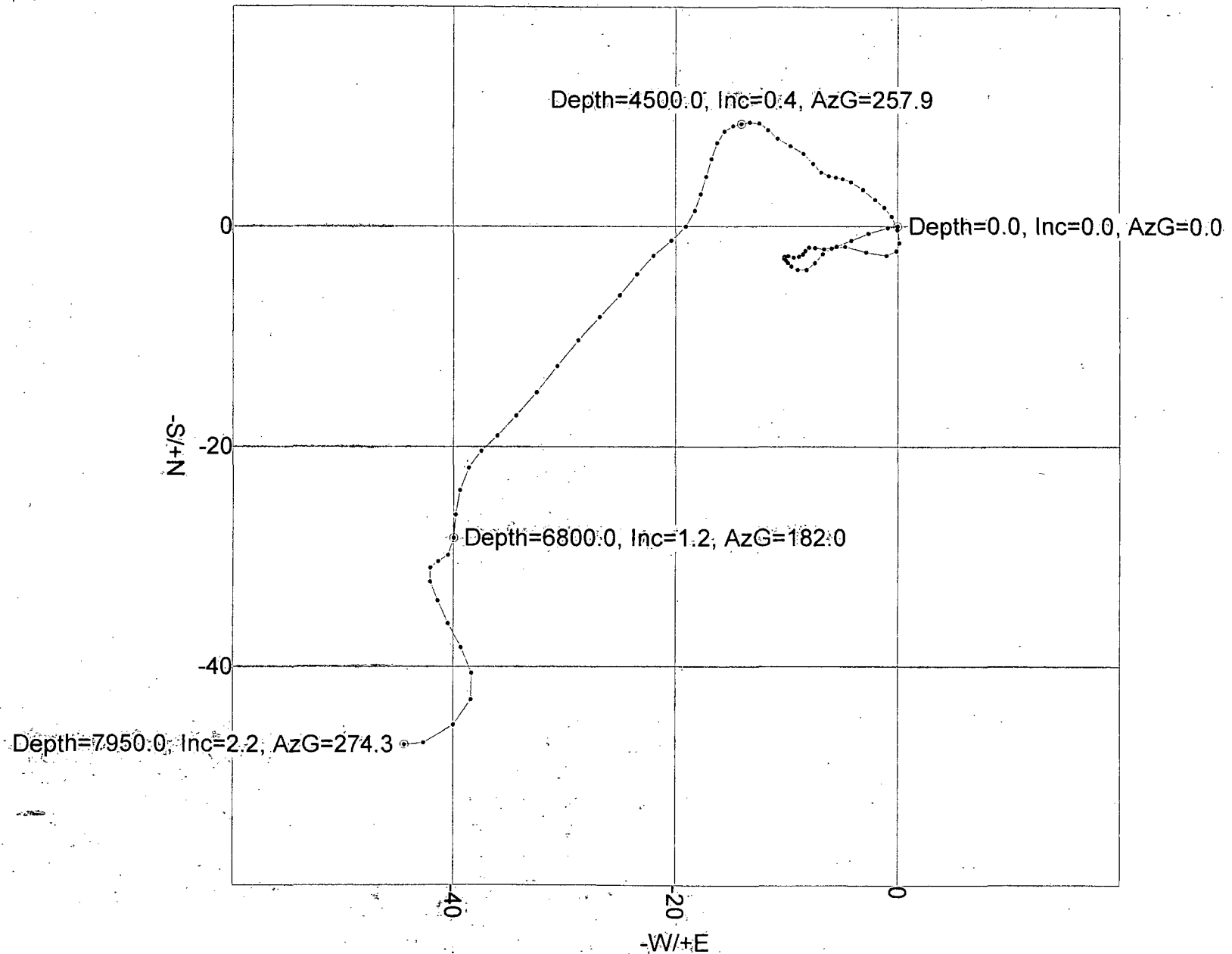
| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 1900.00                 | 0.54                 | 71.96                     | 1899.93   | -3.93       | -8.24       | 9.13                      | 244.50                      | 0.35                          |
| 2000.00                 | 0.65                 | 32.32                     | 1999.92   | -3.30       | -7.48       | 8.18                      | 246.19                      | 0.42                          |
| 2100.00                 | 0.58                 | 49.77                     | 2099.92   | -2.49       | -6.79       | 7.24                      | 249.84                      | 0.20                          |
| 2200.00                 | 0.52                 | 67.21                     | 2199.91   | -1.99       | -5.99       | 6.31                      | 251.62                      | 0.18                          |
| 2300.00                 | 0.94                 | 90.78                     | 2299.90   | -1.83       | -4.75       | 5.09                      | 248.96                      | 0.52                          |
| 2400.00                 | 1.37                 | 114.34                    | 2399.88   | -2.33       | -2.83       | 3.67                      | 230.53                      | 0.63                          |
| 2500.00                 | 0.85                 | 75.22                     | 2499.87   | -2.64       | -1.03       | 2.83                      | 201.24                      | 0.89                          |
| 2600.00                 | 0.32                 | 36.09                     | 2599.86   | -2.23       | -0.15       | 2.23                      | 183.82                      | 0.63                          |
| 2700.00                 | 0.58                 | 10.04                     | 2699.86   | -1.51       | 0.10        | 1.51                      | 176.12                      | 0.32                          |
| 2800.00                 | 0.83                 | 343.99                    | 2799.85   | -0.31       | -0.01       | 0.31                      | 181.98                      | 0.41                          |
| 2900.00                 | 0.68                 | 328.02                    | 2899.84   | -0.89       | -0.53       | 1.04                      | 329.44                      | 0.26                          |
| 3000.00                 | 0.53                 | 312.05                    | 2999.84   | 1.70        | -1.18       | 2.08                      | 325.22                      | 0.23                          |
| 3100.00                 | 0.72                 | 310.26                    | 3099.83   | 2.42        | -2.00       | 3.14                      | 320.35                      | 0.19                          |
| 3200.00                 | 0.89                 | 308.47                    | 3199.82   | 3.30        | -3.09       | 4.52                      | 316.94                      | 0.17                          |
| 3300.00                 | 0.61                 | 295.00                    | 3299.81   | 4.01        | -4.18       | 5.79                      | 313.83                      | 0.32                          |
| 3400.00                 | 0.34                 | 281.53                    | 3399.81   | 4.30        | -4.96       | 6.56                      | 310.93                      | 0.29                          |
| 3500.00                 | 0.37                 | 282.47                    | 3499.81   | 4.43        | -5.56       | 7.11                      | 308.52                      | 0.03                          |
| 3600.00                 | 0.37                 | 283.42                    | 3599.81   | 4.57        | -6.19       | 7.70                      | 306.44                      | 0.01                          |
| 3700.00                 | 0.53                 | 304.17                    | 3699.80   | 4.91        | -6.90       | 8.47                      | 305.45                      | 0.23                          |
| 3800.00                 | 0.69                 | 324.92                    | 3799.80   | 5.67        | -7.63       | 9.50                      | 306.61                      | 0.27                          |
| 3900.00                 | 0.76                 | 309.64                    | 3899.79   | 6.59        | -8.49       | 10.74                     | 307.81                      | 0.20                          |
| 4000.00                 | 0.82                 | 294.37                    | 3999.78   | 7.30        | -9.65       | 12.10                     | 307.12                      | 0.22                          |
| 4100.00                 | 0.73                 | 307.03                    | 4099.77   | 7.98        | -10.81      | 13.44                     | 306.44                      | 0.20                          |
| 4200.00                 | 0.63                 | 319.69                    | 4199.76   | 8.78        | -11.67      | 14.61                     | 306.96                      | 0.18                          |
| 4300.00                 | 0.54                 | 290.63                    | 4299.76   | 9.36        | -12.47      | 15.59                     | 306.91                      | 0.30                          |
| 4400.00                 | 0.45                 | 261.57                    | 4399.75   | 9.47        | -13.29      | 16.32                     | 305.47                      | 0.26                          |
| 4500.00                 | 0.44                 | 257.91                    | 4499.75   | 9.33        | -14.06      | 16.87                     | 303.58                      | 0.03                          |
| 4600.00                 | 0.44                 | 254.24                    | 4599.75   | 9.15        | -14.80      | 17.40                     | 301.71                      | 0.03                          |
| 4700.00                 | 0.65                 | 227.08                    | 4699.74   | 8.66        | -15.59      | 17.84                     | 299.04                      | 0.32                          |
| 4800.00                 | 0.85                 | 199.93                    | 4799.74   | 7.58        | -16.26      | 17.94                     | 294.98                      | 0.40                          |
| 4900.00                 | 0.91                 | 197.91                    | 4899.72   | 6.12        | -16.76      | 17.84                     | 290.06                      | 0.07                          |
| 5000.00                 | 1.00                 | 195.90                    | 4999.71   | 4.53        | -17.24      | 17.82                     | 284.71                      | 0.09                          |
| 5100.00                 | 0.93                 | 198.04                    | 5099.70   | 2.92        | -17.73      | 17.97                     | 279.36                      | 0.08                          |
| 5200.00                 | 0.88                 | 200.18                    | 5199.68   | 1.43        | -18.24      | 18.30                     | 274.49                      | 0.06                          |
| 5300.00                 | 1.02                 | 217.34                    | 5299.67   | 0.01        | -19.05      | 19.05                     | 270.02                      | 0.31                          |
| 5400.00                 | 1.15                 | 234.50                    | 5399.65   | -1.29       | -20.41      | 20.45                     | 266.40                      | 0.35                          |
| 5500.00                 | 1.24                 | 225.54                    | 5499.63   | -2.63       | -22.00      | 22.16                     | 263.18                      | 0.21                          |
| 5600.00                 | 1.33                 | 216.59                    | 5599.61   | -4.33       | -23.47      | 23.87                     | 259.56                      | 0.22                          |
| 5700.00                 | 1.47                 | 220.56                    | 5699.58   | -6.23       | -25.00      | 25.76                     | 256.00                      | 0.16                          |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 5800.00                 | 1.60                 | 224.53                    | 5799.54   | -8.20       | -26.80      | 28.03                     | -252.99                     | 0.17                          |
| 5900.00                 | 1.68                 | 220.60                    | 5899.50   | -10.31      | -28.74      | 30.53                     | 250.27                      | 0.14                          |
| 6000.00                 | 1.78                 | 216.67                    | 5999.45   | -12.67      | -30.62      | 33.14                     | 247.52                      | 0.16                          |
| 6100.00                 | 1.67                 | 219.37                    | 6099.41   | -15.05      | -32.48      | 35.79                     | 245.14                      | 0.14                          |
| 6200.00                 | 1.56                 | 222.08                    | 6199.37   | -17.19      | -34.32      | 38.38                     | 243.40                      | 0.13                          |
| 6300.00                 | 1.29                 | 224.62                    | 6299.34   | -19.00      | -36.02      | 40.72                     | 242.19                      | 0.28                          |
| 6400.00                 | 1.03                 | 227.16                    | 6399.32   | -20.41      | -37.47      | 42.67                     | 241.42                      | 0.26                          |
| 6500.00                 | 1.19                 | 209.89                    | 6499.30   | -21.92      | -38.65      | 44.43                     | 240.44                      | 0.37                          |
| 6600.00                 | 1.35                 | 192.62                    | 6599.27   | -23.97      | -39.42      | 46.14                     | 238.70                      | 0.41                          |
| 6700.00                 | 1.25                 | 187.31                    | 6699.25   | -26.21      | -39.82      | 47.67                     | 236.65                      | 0.15                          |
| 6800.00                 | 1.16                 | 182.00                    | 6799.23   | -28.30      | -39.99      | 48.99                     | 234.71                      | 0.15                          |
| 6900.00                 | 0.81                 | 221.77                    | 6899.21   | -29.84      | -40.50      | 50.31                     | 233.61                      | 0.75                          |
| 7000.00                 | 0.47                 | 261.53                    | 6999.21   | -30.43      | -41.38      | 51.37                     | 233.66                      | 0.54                          |
| 7100.00                 | 0.69                 | 210.41                    | 7099.20   | -31.02      | -42.09      | 52.28                     | 233.61                      | 0.54                          |
| 7200.00                 | 0.92                 | 159.28                    | 7199.19   | -32.29      | -42.11      | 53.07                     | 232.52                      | 0.73                          |
| 7300.00                 | 1.18                 | 156.89                    | 7299.18   | -33.99      | -41.42      | 53.58                     | 230.63                      | 0.26                          |
| 7400.00                 | 1.42                 | 154.50                    | 7399.15   | -36.05      | -40.49      | 54.21                     | 228.32                      | 0.24                          |
| 7500.00                 | 1.43                 | 149.75                    | 7499.12   | -38.24      | -39.33      | 54.86                     | 225.80                      | 0.12                          |
| 7600.00                 | 1.47                 | 164.99                    | 7599.09   | -40.56      | -38.37      | 55.83                     | 223.41                      | 0.39                          |
| 7700.00                 | 1.43                 | 197.45                    | 7699.06   | -42.99      | -38.41      | 57.65                     | 221.78                      | 0.81                          |
| 7800.00                 | 1.90                 | 227.05                    | 7799.02   | -45.31      | -40.00      | 60.44                     | 221.44                      | 0.97                          |
| 7900.00                 | 1.78                 | 251.19                    | 7898.97   | -46.94      | -42.68      | 63.45                     | 222.28                      | 0.78                          |
| 7950.00                 | 2.20                 | 274.26                    | 7948.94   | -47.12      | -44.37      | 64.72                     | 223.28                      | 1.79                          |

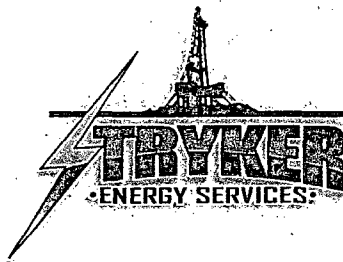


Vaughn Energy Services  
Midland, Texas  
432-563-5444

Survey Engineer: Tim Dillon  
Brutus 12 Federal Com No: 002H / API 30-015-40823



VES Survey Date: 03/07/2013



April 17, 2013

COG OPERATING, L.L.C.  
RECEIVED  
APR 29 2013  
ARTESIA WEST

New Mexico Energy, Minerals and Natural Resources Department  
Attn: Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, NM 87505

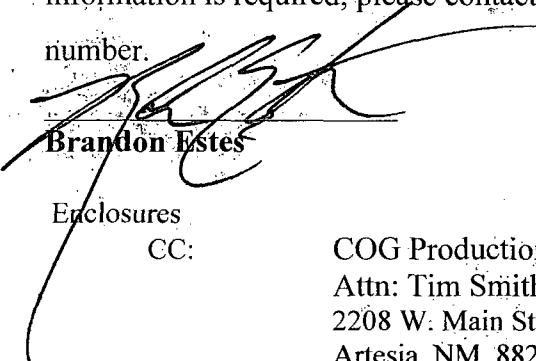
Attn: Jackie Lathan

Re: COG Production, L.L.C.  
Brutus 12 Federal Com #002H  
Red Bluff; Bone Spring  
Eddy County, New Mexico  
API# 30-015-40823

Enclosed please find the original and one (1) copy of the survey performed on the reference well by STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C. Other information required by your office is as follows:

| <u>Name &amp; Title</u> | <u>Drainhole No.</u> | <u>Survey Depths</u>    | <u>Dates Performed</u> | <u>Type Survey</u> |
|-------------------------|----------------------|-------------------------|------------------------|--------------------|
| Noah Townsend           | Original Hole        | 7,718 ft. to 12,571 ft. | 03-09-13 to 03-17-13   | MWD Survey         |

A certified plat on which the bottom-hole location is oriented to both surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

  
Brandon Estes

Enclosures

CC:

COG Production, L.L.C.  
Attn: Tim Smith  
2208 W. Main St  
Artesia, NM 88210

COG Production, L.L.C.  
Attn: Stormi Davis  
2208 W. Main St  
Artesia, NM 88210

NMEMaNRD\COG Production, L.L.C.\Brutus12 Federal Com#002H\C131029

STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C.

P.O. Box 1250

Montgomery, TX 77356

Office (936) 582-7296 \* Fax (936)-582-7297

ORIGINAL



April 17, 2013

**Survey Certification Report**

**STATE OF TEXAS**

**COUNTY OF Montgomery**

I, Todd Estes, certify that I am employed by STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C., and that I did on the day(s) of March 09, 2013 thru March 17, 2013, conduct or supervise the taking of a SEDS MWD Survey from a depth of 7,718 feet to 12,571 feet; that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Production, L.L.C, for the Brutus 12 Federal Com #002H well, API # **30-015-40823** in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles as set forth by STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C.

**Todd Estes**

**STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C.**

**STRYKER ENERGY DIRECTIONAL SERVICES, L.L.C.**

**P.O. Box 1250**

**Montgomery, TX 77356**

**Office (936) 582-7296 \* Fax (936)-582-7297**



# 30-015-40823 BRUTUS 12 FEDERAL COM #002H [39528]

## General Well Information

Status: New (Not Drilled or Completed)

Well Type: Oil  
Work Type: New  
Surface Location: O-12-26S-28E 370 FSL 2260 FEL  
Lat/Long: 32.0508777181681 -104.039437403403  
GL Elevation: 2936

Direction:  
Lease Type: Federal

Sing/Mult Compl: Single  
Potash Waiver:

## Proposed Formation and/or Notes

BONE SPRING

## Depths

Proposed: 12559

Measured: 0  
Plugback Measured:

## Formation Tops

| Formation | Top | Method Obtained | Producing |
|-----------|-----|-----------------|-----------|
|-----------|-----|-----------------|-----------|

## Event Dates

Initial APD Approval: 9/27/2012  
Most Recent APD Approval: 9/27/2012  
APD Cancellation:  
APD Extension Approval:  
Spud: 12/31/9999  
Approved Temporary Abandonment:  
Shut In Waiting For Pipeline:  
Plug and Abandoned Intent Received:  
Well Plugged:  
Site Release:  
Last Inspection:

Current APD Expiration: 9/27/2014

Expiration:

Plugged, Not Released  
Expiration:  
Intention To Plug:  
Last MIT:

## History

## Comments

## Operator

Company: [217955] COG PRODUCTION, LLC  
Address: 600 W. Illinois Ave  
Midland, TX 79701  
Country: U.S.A.  
Main Phone: 432-683-7443

## Central Contact Person

## Hobbs Contacts

## Artesia Contacts

## Pits

## Casing

## Well Completions

[51010] RED BLUFF;BONE SPRING, SOUTH

Status: New, Not Drilled

Last Produced:

## Financial Assurance

## Compliance

Note that Financial Assurance and Inactive Well Compliance are documented in separate reports ([Inactive Well Report](#), [Financial Assurance Report](#)).

Also note that some compliance issues are addressed at the operator level so not listed under each well.

## Complaints, Incidents and Spills

No Incidents Found

Please note that incidents that impact ground water are recorded along with "facilities" which may not be wells, so although the initial report may be recorded here as a spill, information related to the abatement plans, remediation plans and ground water impact information are not yet part of this application.

## Orders

No Orders Found





Job Number: C131029

State/Country: New Mexico / USA

Company: Concho Oil and Gas Operating, LLC

Declination: 7.43° Corrected To Grid

Lease/Well: Brutus 12 Federal Com # 2 H

Grid: 7.43°

Location: Eddy County

File name: C:\WINSERVE\DOCS\C131029.SVY

Rig Name: Silver Oak # 7

Date/Time: 22-Mar-13 / 14:09

RKB: N/A

Curve Name: SES ORIG. HOLE SURVEY RAN ON 3-08-13

G.L. or M.S.L.: N/A

## Stryker Energy Directional Services, LLC.

### WINSERVE SURVEY CALCULATIONS Minimum Curvature Method Vertical Section Plane 359.80 Vertical Section Referenced to Wellhead Rectangular Coordinates Referenced to Wellhead

| Measured<br>Depth<br>FT                        | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE<br>Distance<br>FT | Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|------------------------------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|---------------------------|------------------|-------------------------------|
| <b>Tie-In Data Provided by VES Gyro Survey</b> |                      |                           |                           |           |           |                           |                           |                  |                               |
| 7700.00                                        | 1.43                 | 197.45                    | 7699.06                   | -42.99    | -38.41    | -42.86                    | 57.65                     | 221.78           | .00                           |
| 7718.00                                        | 4.70                 | 357.20                    | 7717.04                   | -42.47    | -38.51    | -42.33                    | 57.33                     | 222.20           | 33.68                         |
| 7750.00                                        | 11.60                | 4.10                      | 7748.70                   | -37.94    | -38.35    | -37.81                    | 53.95                     | 225.30           | 21.74                         |
| 7781.00                                        | 16.60                | 6.70                      | 7778.76                   | -30.43    | -37.61    | -30.30                    | 48.38                     | 231.02           | 16.25                         |
| 7813.00                                        | 18.90                | 7.60                      | 7809.23                   | -20.75    | -36.39    | -20.63                    | 41.89                     | 240.30           | 7.24                          |
| 7844.00                                        | 19.00                | 5.30                      | 7838.55                   | -10.75    | -35.26    | -10.63                    | 36.86                     | 253.04           | 2.43                          |
| 7876.00                                        | 21.60                | 4.60                      | 7868.56                   | .31       | -34.30    | .43                       | 34.31                     | 270.51           | 8.16                          |
| 7908.00                                        | 23.70                | 2.00                      | 7898.09                   | 12.61     | -33.61    | 12.73                     | 35.89                     | 290.56           | 7.27                          |
| 7940.00                                        | 25.60                | 1.60                      | 7927.18                   | 25.95     | -33.19    | 26.06                     | 42.13                     | 308.02           | 5.96                          |
| 7972.00                                        | 26.10                | 2.00                      | 7955.98                   | 39.89     | -32.75    | 40.01                     | 51.61                     | 320.61           | 1.65                          |
| 8003.00                                        | 27.70                | .80                       | 7983.62                   | 53.91     | -32.41    | 54.03                     | 62.91                     | 328.99           | 5.45                          |
| 8035.00                                        | 30.20                | 359.70                    | 8011.62                   | 69.40     | -32.35    | 69.51                     | 76.57                     | 335.01           | 7.99                          |
| 8067.00                                        | 32.20                | 1.80                      | 8038.99                   | 85.97     | -32.13    | 86.08                     | 91.78                     | 339.51           | 7.11                          |
| 8099.00                                        | 36.40                | 2.50                      | 8065.42                   | 103.99    | -31.44    | 104.10                    | 108.64                    | 343.18           | 13.18                         |
| 8131.00                                        | 40.60                | 3.00                      | 8090.46                   | 123.88    | -30.48    | 123.99                    | 127.58                    | 346.18           | 13.16                         |
| 8162.00                                        | 45.00                | 2.00                      | 8113.20                   | 144.92    | -29.57    | 145.02                    | 147.90                    | 348.47           | 14.36                         |
| 8194.00                                        | 48.90                | 1.30                      | 8135.04                   | 168.29    | -28.90    | 168.39                    | 170.75                    | 350.25           | 12.29                         |
| 8226.00                                        | 51.40                | 1.30                      | 8155.54                   | 192.85    | -28.35    | 192.94                    | 194.92                    | 351.64           | 7.81                          |
| 8258.00                                        | 52.60                | 1.10                      | 8175.24                   | 218.06    | -27.82    | 218.15                    | 219.82                    | 352.73           | 3.78                          |
| 8290.00                                        | 55.30                | 2.50                      | 8194.07                   | 243.91    | -27.00    | 244.01                    | 245.40                    | 353.68           | 9.15                          |
| 8322.00                                        | 59.10                | 3.60                      | 8211.41                   | 270.77    | -25.56    | 270.85                    | 271.97                    | 354.61           | 12.22                         |
| 8354.00                                        | 62.80                | 3.40                      | 8226.94                   | 298.68    | -23.86    | 298.77                    | 299.64                    | 355.43           | 11.58                         |
| 8385.00                                        | 66.30                | 2.20                      | 8240.26                   | 326.64    | -22.50    | 326.71                    | 327.41                    | 356.06           | 11.82                         |
| 8416.00                                        | 69.00                | 2.00                      | 8252.05                   | 355.29    | -21.45    | 355.36                    | 355.93                    | 356.55           | 8.73                          |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE        |                  | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
|                         |                      |                           |                           |           |           |                           | Distance<br>FT | Direction<br>Deg |                               |
| 8448.00                 | 71.20                | 1.50                      | 8262.94                   | 385.36    | -20.53    | 385.43                    | 385.91         | 356.95           | 7.03                          |
| 8479.00                 | 74.50                | 1.50                      | 8272.08                   | 414.97    | -19.75    | 415.03                    | 415.44         | 357.27           | 10.65                         |
| 8511.00                 | 77.30                | .90                       | 8279.87                   | 445.99    | -19.10    | 446.06                    | 446.40         | 357.55           | 8.94                          |
| 8543.00                 | 81.20                | 358.30                    | 8285.84                   | 477.42    | -19.33    | 477.49                    | 477.81         | 357.68           | 14.57                         |
| 8567.00                 | 84.30                | 357.80                    | 8288.87                   | 501.21    | -20.14    | 501.28                    | 501.62         | 357.70           | 13.08                         |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 8599.00                 | 87.40                | 358.60                    | 8291.19                   | 533.11    | -21.14    | 533.18                    | 533.53         | 357.73           | 10.00                         |
| 8631.00                 | 88.60                | .20                       | 8292.30                   | 565.09    | -21.47    | 565.16                    | 565.49         | 357.82           | 6.25                          |
| 8663.00                 | 89.00                | .20                       | 8292.97                   | 597.08    | -21.36    | 597.15                    | 597.46         | 357.95           | 1.25                          |
| 8758.00                 | 89.00                | .80                       | 8294.63                   | 692.06    | -20.53    | 692.13                    | 692.37         | 358.30           | .63                           |
| 8854.00                 | 88.90                | .40                       | 8296.39                   | 788.04    | -19.53    | 788.10                    | 788.28         | 358.58           | .43                           |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 8948.00                 | 89.30                | 359.90                    | 8297.87                   | 882.03    | -19.28    | 882.09                    | 882.24         | 358.75           | .68                           |
| 9043.00                 | 90.30                | .90                       | 8298.20                   | 977.02    | -18.62    | 977.08                    | 977.20         | 358.91           | 1.49                          |
| 9139.00                 | 91.50                | 1.60                      | 8296.69                   | 1072.98   | -16.53    | 1073.04                   | 1073.11        | 359.12           | 1.45                          |
| 9234.00                 | 89.90                | 1.30                      | 8295.53                   | 1167.94   | -14.12    | 1167.99                   | 1168.03        | 359.31           | 1.71                          |
| 9330.00                 | 89.30                | 2.20                      | 8296.20                   | 1263.90   | -11.19    | 1263.93                   | 1263.95        | 359.49           | 1.13                          |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 9425.00                 | 89.30                | 2.70                      | 8297.36                   | 1358.80   | -7.13     | 1358.82                   | 1358.82        | 359.70           | .53                           |
| 9521.00                 | 89.60                | 3.60                      | 8298.28                   | 1454.65   | -1.85     | 1454.65                   | 1454.65        | 359.93           | .99                           |
| 9616.00                 | 89.60                | 3.60                      | 8298.95                   | 1549.46   | 4.11      | 1549.44                   | 1549.47        | .15              | .00                           |
| 9712.00                 | 87.10                | 2.20                      | 8301.71                   | 1645.29   | 8.97      | 1645.25                   | 1645.31        | .31              | 2.98                          |
| 9807.00                 | 87.00                | 1.50                      | 8306.60                   | 1740.11   | 12.03     | 1740.06                   | 1740.15        | .40              | .74                           |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 9902.00                 | 88.50                | 1.60                      | 8310.33                   | 1835.00   | 14.60     | 1834.94                   | 1835.06        | .46              | 1.58                          |
| 9997.00                 | 88.10                | .00                       | 8313.15                   | 1929.95   | 15.92     | 1929.88                   | 1930.01        | .47              | 1.74                          |
| 10092.00                | 89.30                | 2.30                      | 8315.30                   | 2024.90   | 17.83     | 2024.82                   | 2024.97        | .50              | 2.73                          |
| 10188.00                | 89.50                | 2.30                      | 8316.31                   | 2120.81   | 21.68     | 2120.72                   | 2120.92        | .59              | .21                           |
| 10283.00                | 89.40                | 2.00                      | 8317.22                   | 2215.74   | 25.24     | 2215.64                   | 2215.89        | .65              | .33                           |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 10378.00                | 89.10                | 2.20                      | 8318.46                   | 2310.67   | 28.73     | 2310.56                   | 2310.85        | .71              | .38                           |
| 10474.00                | 89.10                | 1.80                      | 8319.97                   | 2406.60   | 32.08     | 2406.47                   | 2406.81        | .76              | .42                           |
| 10569.00                | 89.30                | 1.60                      | 8321.30                   | 2501.55   | 34.89     | 2501.41                   | 2501.79        | .80              | .30                           |
| 10665.00                | 89.30                | 1.60                      | 8322.47                   | 2597.50   | 37.57     | 2597.36                   | 2597.78        | .83              | .00                           |
| 10760.00                | 89.00                | 1.30                      | 8323.88                   | 2692.46   | 39.98     | 2692.31                   | 2692.76        | .85              | .45                           |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 10856.00                | 88.50                | .60                       | 8325.97                   | 2788.43   | 41.57     | 2788.26                   | 2788.74        | .85              | .90                           |
| 10951.00                | 89.50                | .00                       | 8327.63                   | 2883.41   | 42.07     | 2883.24                   | 2883.71        | .84              | 1.23                          |
| 11046.00                | 90.00                | .40                       | 8328.05                   | 2978.41   | 42.40     | 2978.24                   | 2978.71        | .82              | .67                           |
| 11142.00                | 89.60                | 359.50                    | 8328.38                   | 3074.40   | 42.31     | 3074.24                   | 3074.70        | .79              | 1.03                          |
| 11237.00                | 89.50                | 359.00                    | 8329.13                   | 3169.39   | 41.07     | 3169.23                   | 3169.66        | .74              | .54                           |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 11333.00                | 89.40                | 358.30                    | 8330.05                   | 3265.36   | 38.81     | 3265.21                   | 3265.59        | .68              | .74                           |
| 11429.00                | 89.30                | 358.10                    | 8331.14                   | 3361.31   | 35.79     | 3361.16                   | 3361.50        | .61              | .23                           |
| 11524.00                | 89.90                | 358.30                    | 8331.80                   | 3456.26   | 32.81     | 3456.12                   | 3456.41        | .54              | .67                           |
| 11620.00                | 90.20                | 357.60                    | 8331.72                   | 3552.20   | 29.38     | 3552.07                   | 3552.32        | .47              | .79                           |
| 11714.00                | 89.30                | 358.80                    | 8332.13                   | 3646.15   | 26.42     | 3646.03                   | 3646.24        | .42              | 1.60                          |
|                         |                      |                           |                           |           |           |                           |                |                  |                               |
| 11810.00                | 89.60                | 358.80                    | 8333.05                   | 3742.12   | 24.41     | 3742.01                   | 3742.20        | .37              | .31                           |
| 11905.00                | 88.40                | 359.50                    | 8334.71                   | 3837.09   | 23.00     | 3836.99                   | 3837.16        | .34              | 1.46                          |
| 11999.00                | 88.00                | 359.50                    | 8337.66                   | 3931.04   | 22.18     | 3930.94                   | 3931.11        | .32              | .43                           |
| 12095.00                | 87.90                | 359.90                    | 8341.09                   | 4026.98   | 21.68     | 4026.88                   | 4027.04        | .31              | .43                           |
| 12188.00                | 87.10                | 359.70                    | 8345.15                   | 4119.89   | 21.36     | 4119.79                   | 4119.95        | .30              | .89                           |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE        |                  | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
|                         |                      |                           |                           |           |           |                           | Distance<br>FT | Direction<br>Deg |                               |
| 12283.00                | 87.50                | .00                       | 8349.63                   | 4214.78   | 21.11     | 4214.68                   | 4214.84        | .29              | .53                           |
| 12378.00                | 89.80                | 359.90                    | 8351.86                   | 4309.75   | 21.03     | 4309.65                   | 4309.80        | .28              | 2.42                          |
| 12473.00                | 90.70                | .40                       | 8351.45                   | 4404.75   | 21.27     | 4404.65                   | 4404.80        | .28              | 1.08                          |
| 12571.00                | 90.70                | .40                       | 8350.25                   | 4502.74   | 21.96     | 4502.63                   | 4502.79        | .28              | .00                           |

**Projection to Bit**

|          |       |     |         |         |       |         |         |     |     |
|----------|-------|-----|---------|---------|-------|---------|---------|-----|-----|
| 12622.00 | 90.70 | .40 | 8349.63 | 4553.73 | 22.31 | 4553.63 | 4553.79 | .28 | .00 |
|----------|-------|-----|---------|---------|-------|---------|---------|-----|-----|