

# Archer

Archer Directional Drilling Services.  
12101 Cutten Road  
Houston, Texas 77066  
Tel: 281-301-2600  
Fax: 281-301-2795

COG Operating, LLC  
One Concho Center  
600 W. Illinois Avenue  
Midland, Texas 79701

3001540542

May 16, 2013

Re: COG Operating, LLC  
Sidemarine 10 Fed Com 2H  
Field: Wildcat  
Rig: United 40  
Eddy County, New Mexico  
API # 30-015-40542

Enclosed please find the original of the surveys performed on the referenced well by Archer Directional Drilling Services. Other information required by your office is as follows:

| <u>Name &amp; Title<br/>Of Surveyor</u> | <u>Wellhole<br/>Number</u> | <u>Survey<br/>Depths</u> | <u>Dates<br/>Performed</u> | <u>Type<br/>Survey</u> |
|-----------------------------------------|----------------------------|--------------------------|----------------------------|------------------------|
| Justin Warnack<br>Field Engineer        | Original Hole              | 4085-9076                | 05/01/13-05/08/13          | MWD                    |

If additional information is required, please contact the undersigned at the letterhead address and phone number.



Amador Baggerly  
MWD Coordinator

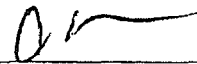
# Archer

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12101 Cutten Road  
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## MWD Survey Certification

State of New Mexico  
County of Eddy

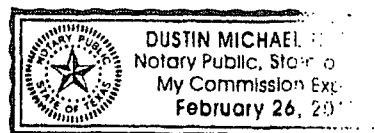
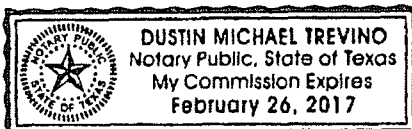
I, Amador Baggerly, certify that; I am employed by Archer Directional Drilling Services; that I did on the day(s) of 05/01/13 through 05/08/13, conduct or supervise the taking of MWD surveys from a depth of 4085 feet to a depth of 9076 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Archer Directional Drilling Services; that I am authorized and qualified to make this report; that these surveys were conducted at the request of COG Operating, LLC for the Sidmarine 10 Fed Com 2H (API # 30-015-40542), Well located in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Archer Directional Drilling Services

  
\_\_\_\_\_  
Amador Baggerly  
MWD Coordinator

State of Texas  
County of Harris

Before me, a notary public, on this day personally appeared Amador Baggerly, on this 17 day of May 2013, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statement therein contained are true and correct.

  
\_\_\_\_\_  
Notary Public's Signature



**Archer**

Company: COG Operating, LLC

Well: Sidemarine 10 Fed Com 2H

Location: Eddy County, New Mexico

Rig: UDI 40

Job Date: 05/01/13 - 05/08/13

Job Number: 04236-433-22

Mag Decl.: 7.49

Dir Driller: Cody Styles

MWD Eng: Justin Warnack

Calculation Method

Minimum Curvature

Proposed Azimuth

359.7

Depth Reference

KBG

Tie Into: Gyro Survey

| Survey Number | Survey Depth (ft) | Inclination (deg) | Azimuth (deg) | Course Length (ft) | True Vertical Depth (ft) | Vertical Section (ft) | Coordinates |          | Closure       |                   | Dogleg Severity (d/100') | Build Rate (d/100') | Walk Rate (d/100') |
|---------------|-------------------|-------------------|---------------|--------------------|--------------------------|-----------------------|-------------|----------|---------------|-------------------|--------------------------|---------------------|--------------------|
|               |                   |                   |               |                    |                          |                       | N/S (ft)    | E/W (ft) | Distance (ft) | Direction Azimuth |                          |                     |                    |
| Tie In        | 3993.00           | 0.26              | 190.3         | 0                  | 3992.95                  | 3.27                  | 3.24 N      | 6.31 W   | 0.00          | 0.00              | 0                        | 0                   | 0                  |
| 1             | 4085              | 0.4               | 191.6         | 92                 | 4084.95                  | 2.75                  | 2.72 N      | 6.41 W   | 6.96          | 292.99            | 0.15                     | 0.15                | 1.41               |
| 2             | 4117              | 0.4               | 228.5         | 32                 | 4116.95                  | 2.57                  | 2.54 N      | 6.52 W   | 6.99          | 291.26            | 0.79                     | 0.00                | 115.31             |
| 3             | 4148              | 1.8               | 348.6         | 31                 | 4147.94                  | 2.97                  | 2.94 N      | 6.70 W   | 7.31          | 293.72            | 6.55                     | 4.52                | 387.42             |
| 4             | 4180              | 5.0               | 355.4         | 32                 | 4179.88                  | 4.86                  | 4.83 N      | 6.91 W   | 8.43          | 304.94            | 10.06                    | 10.00               | 21.25              |
| 5             | 4212              | 8.2               | 356.2         | 32                 | 4211.67                  | 8.53                  | 8.49 N      | 7.17 W   | 11.11         | 319.83            | 10.00                    | 10.00               | 2.50               |
| 6             | 4243              | 11.8              | 358.8         | 31                 | 4242.19                  | 13.90                 | 13.87 N     | 7.38 W   | 15.71         | 331.97            | 11.70                    | 11.61               | 8.39               |
| 7             | 4275              | 15.6              | 358.2         | 32                 | 4273.27                  | 21.48                 | 21.44 N     | 7.59 W   | 22.75         | 340.52            | 11.88                    | 11.88               | -1.88              |
| 8             | 4309              | 20.0              | 355.7         | 34                 | 4305.64                  | 31.86                 | 31.82 N     | 8.17 W   | 32.85         | 345.61            | 13.13                    | 12.94               | -7.35              |
| 9             | 4341              | 23.0              | 354.3         | 32                 | 4335.41                  | 43.54                 | 43.50 N     | 9.20 W   | 44.46         | 348.06            | 9.51                     | 9.38                | -4.37              |
| 10            | 4373              | 26.1              | 353.0         | 32                 | 4364.51                  | 56.76                 | 56.71 N     | 10.68 W  | 57.70         | 349.34            | 9.83                     | 9.69                | -4.06              |
| 11            | 4404              | 29.4              | 352.2         | 31                 | 4391.94                  | 71.08                 | 71.02 N     | 12.54 W  | 72.12         | 349.99            | 10.71                    | 10.65               | -2.58              |
| 12            | 4436              | 32.9              | 352.6         | 32                 | 4419.33                  | 87.49                 | 87.42 N     | 14.73 W  | 88.66         | 350.44            | 10.96                    | 10.94               | 1.25               |
| 13            | 4468              | 36.2              | 353.6         | 32                 | 4445.68                  | 105.52                | 105.44 N    | 16.90 W  | 106.78        | 350.89            | 10.46                    | 10.31               | 3.13               |
| 14            | 4500              | 39.1              | 354.7         | 32                 | 4471.01                  | 124.97                | 124.88 N    | 18.89 W  | 126.30        | 351.40            | 9.30                     | 9.06                | 3.44               |
| 15            | 4531              | 42.3              | 355.8         | 31                 | 4494.51                  | 145.12                | 145.02 N    | 20.55 W  | 146.47        | 351.93            | 10.58                    | 10.32               | 3.55               |
| 16            | 4563              | 45.6              | 356.0         | 32                 | 4517.55                  | 167.28                | 167.17 N    | 22.14 W  | 168.63        | 352.46            | 10.32                    | 10.31               | 0.62               |
| 17            | 4594              | 48.8              | 355.5         | 31                 | 4538.61                  | 189.96                | 189.85 N    | 23.83 W  | 191.34        | 352.85            | 10.39                    | 10.32               | -1.61              |
| 18            | 4626              | 52.2              | 355.0         | 32                 | 4558.96                  | 214.58                | 214.46 N    | 25.88 W  | 216.01        | 353.12            | 10.69                    | 10.63               | -1.56              |
| 19            | 4658              | 55.5              | 355.2         | 32                 | 4577.83                  | 240.33                | 240.20 N    | 28.08 W  | 241.83        | 353.33            | 10.32                    | 10.31               | 0.62               |
| 20            | 4689              | 58.4              | 355.6         | 31                 | 4594.74                  | 266.23                | 266.10 N    | 30.16 W  | 267.80        | 353.53            | 9.42                     | 9.35                | 1.29               |
| 21            | 4721              | 61.1              | 356.2         | 32                 | 4610.86                  | 293.81                | 293.66 N    | 32.14 W  | 295.42        | 353.75            | 8.59                     | 8.44                | 1.87               |
| 22            | 4753              | 64.0              | 356.2         | 32                 | 4625.61                  | 322.15                | 322.00 N    | 34.02 W  | 323.79        | 353.97            | 9.06                     | 9.06                | 0.00               |
| 23            | 4785              | 66.6              | 356.5         | 32                 | 4638.98                  | 351.17                | 351.01 N    | 35.87 W  | 352.84        | 354.17            | 8.17                     | 8.12                | 0.94               |
| 24            | 4816              | 69.2              | 356.5         | 31                 | 4650.64                  | 379.85                | 379.67 N    | 37.62 W  | 381.53        | 354.34            | 8.39                     | 8.39                | 0.00               |
| 25            | 4848              | 71.7              | 356.6         | 32                 | 4661.35                  | 409.95                | 409.77 N    | 39.44 W  | 411.67        | 354.50            | 7.82                     | 7.81                | 0.31               |
| 26            | 4880              | 74.2              | 357.0         | 32                 | 4670.73                  | 440.50                | 440.32 N    | 41.14 W  | 442.23        | 354.66            | 7.90                     | 7.81                | 1.25               |
| 27            | 4911              | 76.4              | 357.5         | 31                 | 4678.59                  | 470.46                | 470.26 N    | 42.58 W  | 472.19        | 354.83            | 7.27                     | 7.10                | 1.61               |
| 28            | 4943              | 79.1              | 357.6         | 32                 | 4685.38                  | 501.71                | 501.50 N    | 43.92 W  | 503.42        | 355.00            | 8.44                     | 8.44                | 0.31               |
| 29            | 4975              | 81.6              | 357.5         | 32                 | 4690.75                  | 533.23                | 533.02 N    | 45.27 W  | 534.94        | 355.15            | 7.82                     | 7.81                | -0.31              |
| 30            | 5006              | 84.0              | 357.0         | 31                 | 4694.63                  | 563.95                | 563.74 N    | 46.74 W  | 565.67        | 355.26            | 7.91                     | 7.74                | -1.61              |
| 31            | 5038              | 85.9              | 356.7         | 32                 | 4697.45                  | 595.79                | 595.56 N    | 48.49 W  | 597.54        | 355.34            | 6.01                     | 5.94                | -0.94              |
| 32            | 5067              | 87.9              | 356.1         | 29                 | 4699.02                  | 624.69                | 624.46 N    | 50.31 W  | 626.49        | 355.39            | 7.20                     | 6.90                | -2.07              |
| 33            | 5099              | 89.8              | 356.0         | 32                 | 4699.66                  | 656.62                | 656.38 N    | 52.52 W  | 658.48        | 355.43            | 5.95                     | 5.94                | -0.31              |
| 34            | 5162              | 90.3              | 355.9         | 63                 | 4699.60                  | 719.48                | 719.22 N    | 56.97 W  | 721.47        | 355.47            | 0.81                     | 0.79                | -0.16              |
| 35            | 5258              | 91.2              | 356.0         | 96                 | 4698.35                  | 815.26                | 814.97 N    | 63.75 W  | 817.46        | 355.53            | 0.94                     | 0.94                | 0.10               |
| 36            | 5353              | 91.8              | 355.7         | 95                 | 4695.86                  | 910.01                | 909.69 N    | 70.62 W  | 912.43        | 355.56            | 0.71                     | 0.63                | -0.32              |



Company: COG Operating, LLC  
 Well: Sidemarine 10 Fed Com 2H  
 Location: Eddy County, New Mexico  
 Rig: UDI 40  
 Job Date: 05/01/13 - 05/08/13

Job Number: 04236-433-22  
 Mag Decl.: 7.49  
 Dir Driller: Cody Styles  
 MWD Eng: Justin Warnack

Calculation Method: Minimum Curvature  
 Proposed Azimuth: 359.7  
 Depth Reference: KBG  
 Tie Into: Gyro Survey

| Survey Number | Survey Depth (ft) | Inclination (deg) | Azimuth (deg) | Course Length (ft) | True Vertical Depth (ft) | Vertical Section (ft) | Coordinates |          | Closure       |                   | Dogleg Severity (d/100') | Build Rate (d/100') | Walk Rate (d/100') |
|---------------|-------------------|-------------------|---------------|--------------------|--------------------------|-----------------------|-------------|----------|---------------|-------------------|--------------------------|---------------------|--------------------|
|               |                   |                   |               |                    |                          |                       | N/S (ft)    | E/W (ft) | Distance (ft) | Direction Azimuth |                          |                     |                    |
| 37            | 5448              | 90.9              | 356.8         | 95                 | 4693.62                  | 1004.81               | 1004.46 N   | 76.83 W  | 1007.39       | 355.63            | 1.50                     | -0.95               | 1.16               |
| 38            | 5543              | 91.5              | 357.0         | 95                 | 4691.63                  | 1099.67               | 1099.30 N   | 81.97 W  | 1102.35       | 355.74            | 0.67                     | 0.63                | 0.21               |
| 39            | 5638              | 91.1              | 357.4         | 95                 | 4689.48                  | 1194.55               | 1194.16 N   | 86.60 W  | 1197.30       | 355.85            | 0.60                     | -0.42               | 0.42               |
| 40            | 5733              | 89.6              | 357.3         | 95                 | 4688.90                  | 1289.47               | 1289.05 N   | 91.00 W  | 1292.26       | 355.96            | 1.58                     | -1.58               | -0.11              |
| 41            | 5829              | 89.8              | 357.1         | 96                 | 4689.40                  | 1385.37               | 1384.94 N   | 95.69 W  | 1388.24       | 356.05            | 0.29                     | 0.21                | -0.21              |
| 42            | 5924              | 90.2              | 357.0         | 95                 | 4689.40                  | 1480.27               | 1479.81 N   | 100.58 W | 1483.23       | 356.11            | 0.43                     | 0.42                | -0.11              |
| 43            | 6019              | 90.7              | 356.9         | 95                 | 4688.65                  | 1575.15               | 1574.67 N   | 105.63 W | 1578.21       | 356.16            | 0.54                     | 0.53                | -0.11              |
| 44            | 6114              | 91.4              | 356.9         | 95                 | 4686.91                  | 1670.02               | 1669.52 N   | 110.77 W | 1673.19       | 356.20            | 0.74                     | 0.74                | 0.00               |
| 45            | 6209              | 91.7              | 357.1         | 95                 | 4684.34                  | 1764.88               | 1764.35 N   | 115.74 W | 1768.15       | 356.25            | 0.38                     | 0.32                | 0.21               |
| 46            | 6304              | 91.1              | 356.7         | 95                 | 4682.02                  | 1859.73               | 1859.19 N   | 120.87 W | 1863.11       | 356.28            | 0.76                     | -0.63               | -0.42              |
| 47            | 6400              | 91.6              | 356.4         | 96                 | 4679.76                  | 1955.56               | 1954.98 N   | 126.65 W | 1959.08       | 356.29            | 0.61                     | 0.52                | -0.31              |
| 48            | 6495              | 90.4              | 356.0         | 95                 | 4678.10                  | 2050.36               | 2049.76 N   | 132.94 W | 2054.07       | 356.29            | 1.33                     | -1.26               | -0.42              |
| 49            | 6590              | 90.9              | 355.8         | 95                 | 4677.03                  | 2145.14               | 2144.51 N   | 139.73 W | 2149.06       | 356.27            | 0.57                     | 0.53                | -0.21              |
| 50            | 6685              | 91.7              | 356.4         | 95                 | 4674.87                  | 2239.93               | 2239.26 N   | 146.19 W | 2244.03       | 356.26            | 1.05                     | 0.84                | 0.63               |
| 51            | 6780              | 90.8              | 356.2         | 95                 | 4672.80                  | 2334.73               | 2334.04 N   | 152.32 W | 2339.01       | 356.27            | 0.97                     | -0.95               | -0.21              |
| 52            | 6875              | 91.1              | 355.6         | 95                 | 4671.22                  | 2429.51               | 2428.79 N   | 159.11 W | 2433.99       | 356.25            | 0.71                     | 0.32                | -0.63              |
| 53            | 6970              | 91.5              | 355.2         | 95                 | 4669.07                  | 2524.21               | 2523.45 N   | 166.73 W | 2528.96       | 356.22            | 0.60                     | 0.42                | -0.42              |
| 54            | 7065              | 91.1              | 356.2         | 95                 | 4666.91                  | 2618.95               | 2618.16 N   | 173.85 W | 2623.93       | 356.20            | 1.13                     | -0.42               | 1.05               |
| 55            | 7161              | 91.5              | 356.4         | 96                 | 4664.73                  | 2714.75               | 2713.94 N   | 180.05 W | 2719.90       | 356.20            | 0.47                     | 0.42                | 0.21               |
| 56            | 7256              | 91.1              | 356.5         | 95                 | 4662.58                  | 2809.57               | 2808.73 N   | 185.93 W | 2814.88       | 356.21            | 0.43                     | -0.42               | 0.11               |
| 57            | 7351              | 91.3              | 356.3         | 95                 | 4660.59                  | 2904.39               | 2903.52 N   | 191.89 W | 2909.86       | 356.22            | 0.30                     | 0.21                | -0.21              |
| 58            | 7446              | 92.0              | 356.4         | 95                 | 4657.85                  | 2999.19               | 2998.29 N   | 197.94 W | 3004.82       | 356.22            | 0.74                     | 0.74                | 0.11               |
| 59            | 7541              | 90.9              | 356.6         | 95                 | 4655.45                  | 3094.01               | 3093.08 N   | 203.73 W | 3099.78       | 356.23            | 1.18                     | -1.16               | 0.21               |
| 60            | 7636              | 91.1              | 358.0         | 95                 | 4653.79                  | 3188.90               | 3187.96 N   | 208.21 W | 3194.75       | 356.26            | 1.49                     | 0.21                | 1.47               |
| 61            | 7731              | 90.9              | 359.3         | 95                 | 4652.13                  | 3283.87               | 3282.91 N   | 210.45 W | 3289.65       | 356.33            | 1.38                     | -0.21               | 1.37               |
| 62            | 7827              | 90.2              | 0.7           | 96                 | 4651.21                  | 3379.86               | 3378.91 N   | 210.45 W | 3385.45       | 356.44            | 1.63                     | -0.73               | -373.54            |
| 63            | 7922              | 90.8              | 3.1           | 95                 | 4650.38                  | 3474.78               | 3473.84 N   | 207.30 W | 3480.02       | 356.59            | 2.60                     | 0.63                | 2.53               |
| 64            | 8017              | 91.6              | 5.5           | 95                 | 4648.39                  | 3569.45               | 3568.55 N   | 200.18 W | 3574.16       | 356.79            | 2.66                     | 0.84                | 2.53               |
| 65            | 8112              | 91.2              | 7.8           | 95                 | 4646.07                  | 3663.72               | 3662.87 N   | 189.18 W | 3667.76       | 357.04            | 2.46                     | -0.42               | 2.42               |
| 66            | 8207              | 91.6              | 8.1           | 95                 | 4643.75                  | 3757.72               | 3756.93 N   | 176.04 W | 3761.05       | 357.32            | 0.53                     | 0.42                | 0.32               |
| 67            | 8302              | 91.0              | 9.2           | 95                 | 4641.60                  | 3851.55               | 3850.83 N   | 161.76 W | 3854.22       | 357.59            | 1.32                     | -0.63               | 1.16               |
| 68            | 8398              | 91.5              | 9.6           | 96                 | 4639.50                  | 3946.16               | 3945.51 N   | 146.08 W | 3948.22       | 357.88            | 0.67                     | 0.52                | 0.42               |
| 69            | 8493              | 90.5              | 9.5           | 95                 | 4637.84                  | 4039.75               | 4039.18 N   | 130.33 W | 4041.28       | 358.15            | 1.06                     | -1.05               | -0.11              |
| 70            | 8588              | 90.9              | 9.6           | 95                 | 4636.68                  | 4133.35               | 4132.86 N   | 114.57 W | 4134.45       | 358.41            | 0.43                     | 0.42                | 0.11               |
| 71            | 8683              | 91.8              | 9.3           | 95                 | 4634.44                  | 4226.96               | 4226.54 N   | 98.97 W  | 4227.70       | 358.66            | 1.00                     | 0.95                | -0.32              |
| 72            | 8778              | 91.2              | 9.7           | 95                 | 4631.96                  | 4320.55               | 4320.21 N   | 83.30 W  | 4321.01       | 358.90            | 0.76                     | -0.63               | 0.42               |
| 73            | 8873              | 91.6              | 10.2          | 95                 | 4629.64                  | 4414.01               | 4413.75 N   | 66.89 W  | 4414.26       | 359.13            | 0.67                     | 0.42                | 0.53               |
| 74            | 8969              | 92.3              | 10.2          | 96                 | 4626.37                  | 4508.36               | 4508.18 N   | 49.90 W  | 4508.45       | 359.37            | 0.73                     | 0.73                | 0.00               |

**Archer**

Company: COG Operating, LLC

Well: Sidemarine 10 Fed Com 2H

Location: Eddy County, New Mexico

Rig: UDI 40

Job Date: 05/01/13 - 05/08/13

Job Number: 04236-433-22

Mag Decl.: 7.49

Dir Driller: Cody Styles

MWD Eng: Justin Warnack

Calculation Method

Minimum Curvature

Proposed Azimuth

359.7

Depth Reference

KBG

Tie Into: Gyro Survey

| Survey Number | Survey Depth (ft) | Inclination (deg) | Azimuth (deg) | Course Length (ft) | True Vertical Depth (ft) | Vertical Section (ft) | Coordinates |          | Closure       |                   | Dogleg Severity (d/100') | Build Rate (d/100') | Walk Rate (d/100') |
|---------------|-------------------|-------------------|---------------|--------------------|--------------------------|-----------------------|-------------|----------|---------------|-------------------|--------------------------|---------------------|--------------------|
|               |                   |                   |               |                    |                          |                       | N/S (ft)    | E/W (ft) | Distance (ft) | Direction Azimuth |                          |                     |                    |
| 75            | 9012              | 92.8              | 10.5          | 43                 | 4624.46                  | 4550.58               | 4550.43 N   | 42.18 W  | 4550.63       | 359.47            | 1.36                     | 1.16                | 0.70               |
| Proj.         | 9076              | 92.8              | 10.5          | 64                 | 4621.33                  | 4613.38               | 4613.29 N   | 30.53 W  | 4613.39       | 359.62            | 0.00                     | 0.00                | 0.00               |



## **COG Operating, LLC**

**Eddy County(NM27E)**

**Sec.10-T17S-R29E**

**Sidmarine 10 Federal #2H**

**Wellbore #1**

**Survey: Survey #2-Archer MWD**

## **Standard Survey Report**

**13 May, 2013**

# **Archer**

Company: COG Operating, LLC  
 Project: Eddy County(NM27E)  
 Site: Sec.10-T17S-R29E  
 Well: Sidemarine 10 Federal #2H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Sidemarine 10 Federal #2H  
 TVD Reference: WELL @ 3588.00usft  
 MD Reference: WELL @ 3588.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

Project: Eddy County(NM27E)  
 Map System: US State Plane 1927 (Exact solution)  
 Geo Datum: NAD 1927 (NADCON CONUS)  
 Map Zone: New Mexico East 3001  
 System Datum: Mean Sea Level

Site: Sec.10-T17S-R29E  
 Site Position: Northing: 674,215.100 usft Latitude: 32° 51' 11.480 N  
 From: Map Easting: 585,900.600 usft Longitude: 104° 3' 12.993 W  
 Position Uncertainty: 0.00 usft Slot Radius: 13-3/16" Grid Convergence: 0.15 "

Well: Sidemarine 10 Federal #2H  
 Well Position: +N/-S 0.00 usft Northing: 670,370.200 usft Latitude: 32° 50' 33.542 N  
 +E/-W 0.00 usft Easting: 581,631.600 usft Longitude: 104° 4' 3.151 W  
 Position Uncertainty: 0.00 usft Wellhead Elevation: usft Ground Level: 3,572.00 usft

Wellbore: Wellbore #1  
 Magnetics: Model Name Sample Date Declination Dip Angle Field Strength  
 (°) (°) (nT)  
 IGRF2010 2013/04/17 7.64 60.63 48,749

Design: Wellbore #1  
 Audit Notes:  
 Version: 1.0 Phase: ACTUAL Tie On Depth: 0.00  
 Vertical Section: Depth From (TVD) +N/-S +E/-W Direction  
 (usft) (usft) (usft) (°)  
 0.00 0.00 0.00 359.73

Survey Program Date: 2013/05/13  
 From To Survey (Wellbore) Tool Name Description  
 (usft) (usft)  
 100.00 3,993.00 Survey #1-VES Gyro (Wellbore #1) GYD\_DP\_MS Gyrodata gyro-compassing and drop  
 4,085.00 9,076.00 Survey #2-Archer MWD (Wellbore #1) MWD MWD - Standard

Survey:  
 Measured Depth Inclination Azimuth Vertical Depth +N/-S +E/-W Vertical Section Dogleg Build Turn  
 (usft) (°) (°) (usft) (usft) (usft) (usft) Rate Rate Rate  
 (°/100usft) (°/100usft) (°/100usft)  
 Tie-In / VES Survey  
 3,993.00 0.26 190.30 3,992.95 3.24 -6.31 3.27 0.00 0.00 0.00  
 First Archer Survey  
 4,085.00 0.40 191.60 4,084.95 2.72 -6.41 2.75 0.15 0.15 1.41  
 4,117.00 0.40 228.50 4,116.95 2.53 -6.52 2.56 0.79 0.00 115.31  
 4,148.00 1.80 348.60 4,147.94 2.94 -6.69 2.97 6.55 4.52 387.42  
 4,180.00 5.00 355.40 4,179.88 4.82 -6.90 4.85 10.06 10.00 21.25  
 4,212.00 8.20 356.20 4,211.66 8.49 -7.17 8.52 10.00 10.00 2.50  
 4,243.00 11.80 358.80 4,242.19 13.87 -7.38 13.90 11.70 11.61 8.39  
 4,275.00 15.60 358.20 4,273.27 21.44 -7.58 21.48 11.88 11.87 -1.87  
 4,309.00 20.00 355.70 4,305.64 31.81 -8.16 31.85 13.13 12.94 -7.35  
 4,341.00 23.00 354.30 4,335.41 43.49 -9.20 43.54 9.51 9.37 -4.37



Archer  
Survey Report

# Archer

Company: COG Operating, LLC  
Project: Eddy County(NM27E)  
Site: Sec.10-T17S-R29E  
Well: Sidemarine 10 Federal #2H  
Wellbore: Wellbore #1  
Design: Wellbore #1

Local Co-ordinate Reference: Well Sidemarine 10 Federal #2H  
TVD Reference: WELL @ 3586.00usft  
MD Reference: WELL @ 3586.00usft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: EDM 5000.1 Single User Db

| Survey                      |                    |                |                             |                 |                 |                               |                               |                              |                             |  |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|--|
| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |  |
| 4,373.00                    | 26.10              | 353.00         | 4,364.51                    | 56.70           | -10.67          | 56.75                         | 9.83                          | 9.69                         | -4.06                       |  |
| 4,404.00                    | 29.40              | 352.20         | 4,391.94                    | 71.01           | -12.54          | 71.07                         | 10.71                         | 10.65                        | -2.58                       |  |
| 4,436.00                    | 32.90              | 352.60         | 4,419.32                    | 87.42           | -14.73          | 87.49                         | 10.96                         | 10.94                        | 1.25                        |  |
| 4,468.00                    | 36.20              | 353.60         | 4,445.68                    | 105.43          | -16.90          | 105.51                        | 10.46                         | 10.31                        | 3.12                        |  |
| 4,500.00                    | 39.10              | 354.70         | 4,471.01                    | 124.88          | -18.88          | 124.97                        | 9.30                          | 9.06                         | 3.44                        |  |
| 4,531.00                    | 42.30              | 355.80         | 4,494.51                    | 145.02          | -20.55          | 145.12                        | 10.58                         | 10.32                        | 3.55                        |  |
| 4,563.00                    | 45.60              | 356.00         | 4,517.54                    | 167.17          | -22.14          | 167.27                        | 10.32                         | 10.31                        | 0.62                        |  |
| 4,594.00                    | 48.80              | 355.50         | 4,538.60                    | 189.85          | -23.83          | 189.96                        | 10.39                         | 10.32                        | -1.61                       |  |
| 4,626.00                    | 52.20              | 355.00         | 4,558.96                    | 214.45          | -25.87          | 214.57                        | 10.69                         | 10.62                        | -1.56                       |  |
| 4,658.00                    | 55.50              | 355.20         | 4,577.83                    | 240.19          | -28.08          | 240.33                        | 10.32                         | 10.31                        | 0.62                        |  |
| 4,689.00                    | 58.40              | 355.60         | 4,594.74                    | 266.09          | -30.16          | 266.23                        | 9.42                          | 9.35                         | 1.29                        |  |
| 4,721.00                    | 61.10              | 356.20         | 4,610.85                    | 293.66          | -32.14          | 293.81                        | 8.59                          | 8.44                         | 1.87                        |  |
| 4,753.00                    | 64.00              | 356.20         | 4,625.60                    | 321.99          | -34.02          | 322.15                        | 9.06                          | 9.06                         | 0.00                        |  |
| 4,785.00                    | 66.60              | 356.50         | 4,638.97                    | 351.00          | -35.87          | 351.17                        | 8.17                          | 8.12                         | 0.94                        |  |
| 4,816.00                    | 69.20              | 356.50         | 4,650.64                    | 379.67          | -37.62          | 379.85                        | 8.39                          | 8.39                         | 0.00                        |  |
| 4,848.00                    | 71.70              | 356.60         | 4,661.34                    | 409.77          | -39.43          | 409.95                        | 7.82                          | 7.81                         | 0.31                        |  |
| 4,880.00                    | 74.20              | 357.00         | 4,670.73                    | 440.31          | -41.14          | 440.50                        | 7.90                          | 7.81                         | 1.25                        |  |
| 4,911.00                    | 76.40              | 357.50         | 4,678.59                    | 470.26          | -42.58          | 470.46                        | 7.27                          | 7.10                         | 1.61                        |  |
| 4,943.00                    | 79.10              | 357.60         | 4,685.38                    | 501.50          | -43.92          | 501.70                        | 8.44                          | 8.44                         | 0.31                        |  |
| 4,975.00                    | 81.60              | 357.50         | 4,690.74                    | 533.02          | -45.26          | 533.23                        | 7.82                          | 7.81                         | -0.31                       |  |
| 5,006.00                    | 84.00              | 357.00         | 4,694.63                    | 563.73          | -46.74          | 563.95                        | 7.91                          | 7.74                         | -1.61                       |  |
| 5,038.00                    | 85.90              | 356.70         | 4,697.45                    | 595.56          | -48.49          | 595.78                        | 6.01                          | 5.94                         | -0.94                       |  |
| 5,067.00                    | 87.90              | 356.10         | 4,699.01                    | 624.46          | -50.31          | 624.69                        | 7.20                          | 6.90                         | -2.07                       |  |
| 5,099.00                    | 89.80              | 356.00         | 4,699.66                    | 656.37          | -52.51          | 656.62                        | 5.95                          | 5.94                         | -0.31                       |  |
| 5,162.00                    | 90.30              | 355.90         | 4,699.60                    | 719.22          | -56.96          | 719.48                        | 0.81                          | 0.79                         | -0.16                       |  |
| 5,258.00                    | 91.20              | 356.00         | 4,698.35                    | 814.97          | -63.74          | 815.26                        | 0.94                          | 0.94                         | 0.10                        |  |
| 5,353.00                    | 91.80              | 355.70         | 4,695.86                    | 909.69          | -70.62          | 910.01                        | 0.71                          | 0.63                         | -0.32                       |  |
| 5,448.00                    | 90.90              | 356.80         | 4,693.62                    | 1,004.45        | -76.83          | 1,004.81                      | 1.50                          | -0.95                        | 1.16                        |  |
| 5,543.00                    | 91.50              | 357.00         | 4,691.63                    | 1,099.29        | -81.96          | 1,099.67                      | 0.67                          | 0.63                         | 0.21                        |  |
| 5,638.00                    | 91.10              | 357.40         | 4,689.48                    | 1,194.16        | -86.60          | 1,194.56                      | 0.60                          | -0.42                        | 0.42                        |  |
| 5,733.00                    | 89.60              | 357.30         | 4,688.90                    | 1,289.05        | -90.99          | 1,289.47                      | 1.58                          | -1.58                        | -0.11                       |  |
| 5,829.00                    | 89.80              | 357.10         | 4,689.40                    | 1,384.93        | -95.68          | 1,385.38                      | 0.29                          | 0.21                         | -0.21                       |  |
| 5,924.00                    | 90.20              | 357.00         | 4,689.40                    | 1,479.81        | -100.57         | 1,480.27                      | 0.43                          | 0.42                         | -0.11                       |  |
| 6,019.00                    | 90.70              | 356.90         | 4,688.65                    | 1,574.67        | -105.63         | 1,575.16                      | 0.54                          | 0.53                         | -0.11                       |  |
| 6,114.00                    | 91.40              | 356.90         | 4,686.91                    | 1,669.51        | -110.76         | 1,670.03                      | 0.74                          | 0.74                         | 0.00                        |  |
| 6,209.00                    | 91.70              | 357.10         | 4,684.34                    | 1,764.35        | -115.73         | 1,764.88                      | 0.38                          | 0.32                         | 0.21                        |  |
| 6,304.00                    | 91.10              | 356.70         | 4,682.02                    | 1,859.18        | -120.87         | 1,859.74                      | 0.76                          | -0.63                        | -0.42                       |  |
| 6,400.00                    | 91.60              | 356.40         | 4,679.76                    | 1,954.98        | -126.65         | 1,955.56                      | 0.61                          | 0.52                         | -0.31                       |  |
| 6,495.00                    | 90.40              | 356.00         | 4,678.10                    | 2,049.75        | -132.94         | 2,050.37                      | 1.33                          | -1.26                        | -0.42                       |  |
| 6,590.00                    | 90.90              | 355.80         | 4,677.02                    | 2,144.50        | -139.73         | 2,145.15                      | 0.57                          | 0.53                         | -0.21                       |  |
| 6,685.00                    | 91.70              | 356.40         | 4,674.87                    | 2,239.26        | -146.19         | 2,239.93                      | 1.05                          | 0.84                         | 0.63                        |  |
| 6,780.00                    | 90.80              | 356.20         | 4,672.80                    | 2,334.04        | -152.32         | 2,334.74                      | 0.97                          | -0.95                        | -0.21                       |  |
| 6,875.00                    | 91.10              | 355.60         | 4,671.22                    | 2,428.78        | -159.11         | 2,429.52                      | 0.71                          | 0.32                         | -0.63                       |  |
| 6,970.00                    | 91.50              | 355.20         | 4,669.06                    | 2,523.45        | -166.73         | 2,524.22                      | 0.60                          | 0.42                         | -0.42                       |  |
| 7,065.00                    | 91.10              | 356.20         | 4,666.91                    | 2,618.16        | -173.85         | 2,618.96                      | 1.13                          | -0.42                        | 1.05                        |  |
| 7,161.00                    | 91.50              | 356.40         | 4,664.73                    | 2,713.93        | -180.04         | 2,714.76                      | 0.47                          | 0.42                         | 0.21                        |  |
| 7,256.00                    | 91.10              | 356.50         | 4,662.58                    | 2,808.72        | -185.93         | 2,809.58                      | 0.43                          | -0.42                        | 0.11                        |  |
| 7,351.00                    | 91.30              | 356.30         | 4,660.59                    | 2,903.52        | -191.89         | 2,904.40                      | 0.30                          | 0.21                         | -0.21                       |  |
| 7,446.00                    | 92.00              | 356.50         | 4,657.85                    | 2,998.29        | -197.85         | 2,999.20                      | 0.77                          | 0.74                         | 0.21                        |  |
| 7,541.00                    | 90.90              | 356.60         | 4,655.45                    | 3,093.09        | -203.57         | 3,094.03                      | 1.16                          | -1.16                        | 0.11                        |  |
| 7,636.00                    | 91.10              | 358.00         | 4,653.79                    | 3,187.96        | -208.04         | 3,188.92                      | 1.49                          | 0.21                         | 1.47                        |  |
| 7,731.00                    | 90.90              | 359.30         | 4,652.13                    | 3,282.92        | -210.28         | 3,283.89                      | 1.38                          | -0.21                        | 1.37                        |  |
| 7,827.00                    | 90.20              | 0.70           | 4,651.21                    | 3,378.91        | -210.28         | 3,379.88                      | 1.63                          | -0.73                        | 1.46                        |  |
| 7,922.00                    | 90.80              | 3.10           | 4,650.38                    | 3,473.85        | -207.13         | 3,474.80                      | 2.60                          | 0.63                         | 2.53                        |  |



|                  |                           |                                     |                                |
|------------------|---------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | COG Operating, LLC        | <b>Local Co-ordinate Reference:</b> | Well Sidemarine 10 Federal #2H |
| <b>Project:</b>  | Eddy County(NM27E)        | <b>TVD Reference:</b>               | WELL @ 3588.00usft             |
| <b>Site:</b>     | Sec.10-T17S-R29E          | <b>MD Reference:</b>                | WELL @ 3586.00usft             |
| <b>Well:</b>     | Sidemarine 10 Federal #2H | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | Wellbore #1               | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Wellbore #1               | <b>Database:</b>                    | EDM 5000.1 Single User Db      |

## Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 8,017.00              | 91.60           | 5.50        | 4,648.39              | 3,568.55     | -200.01      | 3,569.47                | 2.66                    | 0.84                   | 2.53                  |
| 8,112.00              | 91.20           | 7.80        | 4,646.07              | 3,662.88     | -189.01      | 3,663.74                | 2.46                    | -0.42                  | 2.42                  |
| 8,207.00              | 91.60           | 8.10        | 4,643.75              | 3,756.94     | -175.88      | 3,757.74                | 0.53                    | 0.42                   | 0.32                  |
| 8,302.00              | 91.00           | 9.20        | 4,641.59              | 3,850.83     | -161.59      | 3,851.56                | 1.32                    | -0.63                  | 1.16                  |
| 8,398.00              | 91.50           | 9.60        | 4,639.50              | 3,945.52     | -145.92      | 3,946.17                | 0.67                    | 0.52                   | 0.42                  |
| 8,493.00              | 90.50           | 9.50        | 4,637.84              | 4,039.19     | -130.16      | 4,039.76                | 1.06                    | -1.05                  | -0.11                 |
| 8,588.00              | 90.90           | 9.60        | 4,636.68              | 4,132.86     | -114.40      | 4,133.36                | 0.43                    | 0.42                   | 0.11                  |
| 8,683.00              | 91.80           | 9.30        | 4,634.44              | 4,226.55     | -98.80       | 4,226.97                | 1.00                    | 0.95                   | -0.32                 |
| 8,778.00              | 91.20           | 9.70        | 4,631.96              | 4,320.21     | -83.13       | 4,320.56                | 0.76                    | -0.63                  | 0.42                  |
| 8,873.00              | 91.60           | 10.20       | 4,629.63              | 4,413.75     | -66.72       | 4,414.02                | 0.67                    | 0.42                   | 0.53                  |
| 8,969.00              | 92.30           | 10.20       | 4,626.37              | 4,508.18     | -49.73       | 4,508.37                | 0.73                    | 0.73                   | 0.00                  |
| Last Archer Survey    |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,012.00              | 92.80           | 10.50       | 4,624.45              | 4,550.44     | -42.01       | 4,550.59                | 1.36                    | 1.16                   | 0.70                  |
| PTB                   |                 |             |                       |              |              |                         |                         |                        |                       |
| 9,076.00              | 92.80           | 10.50       | 4,621.33              | 4,613.29     | -30.36       | 4,613.39                | 0.00                    | 0.00                   | 0.00                  |

## Design Targets

| Target Name                 | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude       |
|-----------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|-----------------|
| - hit/miss target           |               |              |            |              |              |                 |                |                  |                 |
| - Shape                     |               |              |            |              |              |                 |                |                  |                 |
| Sidemarine 10 Fed #2H       | 0.00          | 0.00         | 4,621.33   | 4,613.29     | -30.36       | 674,983.493     | 581,601.237    | 32° 51' 19.193 N | 104° 4' 3.371 W |
| - survey hits target center |               |              |            |              |              |                 |                |                  |                 |
| - Point                     |               |              |            |              |              |                 |                |                  |                 |

## Survey Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | Comment             |
|-----------------------|-----------------------|-------------------|---------------------|
| 3,993.00              | 3,992.95              | 3.24              | Tie-In / VES Survey |
| 4,085.00              | 4,084.95              | 2.72              | First Archer Survey |
| 9,012.00              | 4,624.45              | 4,550.44          | Last Archer Survey  |
| 9,076.00              | 4,621.33              | 4,613.29          | PTB                 |

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

Company: COG Operating LLC (Concho)  
Lease/Well: Sidemarine 10 Federal/No 002H



Rig Name: UDI 40  
State/County: New Mexico/Eddy  
Latitude: 32.87, Longitude: -104.04  
GRID North is 0.16 Degrees East of True North  
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 14'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut  
Minimum Curvature Method  
Report Date/Time: 5/3/2013 / 15:27

Vaughn Energy Services  
Midland, Texas  
432-563-5444  
Surveyor: Tim Dillon  
Sidemarine 10 Federal No 002H / API 30-015-40542

| 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                  | 0.41                 | 214.59                    | 100.00    | -0.29       | -0.20       | 0.35                      | 214.59                      | 0.41                          |
| 200.00                  | 0.42                 | 219.86                    | 200.00    | -0.86       | -0.64       | 1.07                      | 216.38                      | 0.04                          |
| 300.00                  | 0.43                 | 216.85                    | 299.99    | -1.44       | -1.10       | 1.81                      | 217.18                      | 0.02                          |
| 400.00                  | 0.37                 | 226.40                    | 399.99    | -1.97       | -1.56       | 2.51                      | 218.32                      | 0.09                          |
| 500.00                  | 0.23                 | 164.77                    | 499.99    | -2.39       | -1.74       | 2.95                      | 216.06                      | 0.33                          |
| 600.00                  | 0.31                 | 143.97                    | 599.99    | -2.80       | -1.53       | 3.19                      | 208.65                      | 0.12                          |
| 700.00                  | 0.54                 | 134.58                    | 699.99    | -3.34       | -1.04       | 3.50                      | 197.25                      | 0.24                          |
| 800.00                  | 0.40                 | 133.28                    | 799.98    | -3.91       | -0.45       | 3.94                      | 186.57                      | 0.14                          |
| 900.00                  | 0.33                 | 143.12                    | 899.98    | -4.38       | -0.02       | 4.38                      | 180.30                      | 0.09                          |
| 1000.00                 | 0.23                 | 47.65                     | 999.98    | -4.48       | 0.30        | 4.49                      | 176.22                      | 0.42                          |
| 1100.00                 | 0.11                 | 271.69                    | 1099.98   | -4.35       | 0.34        | 4.36                      | 175.52                      | 0.32                          |
| 1200.00                 | 0.31                 | 334.07                    | 1199.98   | -4.10       | 0.12        | 4.10                      | 178.29                      | 0.28                          |
| 1300.00                 | 0.23                 | 307.96                    | 1299.98   | -3.73       | -0.16       | 3.73                      | 182.40                      | 0.14                          |
| 1400.00                 | 0.40                 | 302.85                    | 1399.98   | -3.42       | -0.61       | 3.47                      | 190.06                      | 0.16                          |
| 1500.00                 | 0.25                 | 296.42                    | 1499.98   | -3.13       | -1.09       | 3.32                      | 199.26                      | 0.15                          |
| 1600.00                 | 0.42                 | 299.30                    | 1599.97   | -2.86       | -1.61       | 3.28                      | 209.42                      | 0.16                          |
| 1700.00                 | 0.34                 | 290.23                    | 1699.97   | -2.58       | -2.21       | 3.39                      | 220.57                      | 0.10                          |
| 1800.00                 | 0.20                 | 258.28                    | 1799.97   | -2.51       | -2.65       | 3.65                      | 226.57                      | 0.20                          |

| 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                 | 0.34                 | 286.36                    | 1899.97   | -2.46       | -3.10       | 3.96                      | 231.56                      | 0.19                          |
| 2000.00                 | 0.47                 | 299.68                    | 1999.97   | -2.18       | -3.74       | 4.33                      | 239.81                      | 0.16                          |
| 2100.00                 | 0.41                 | 310.45                    | 2099.96   | -1.74       | -4.36       | 4.70                      | 248.25                      | 0.10                          |
| 2200.00                 | 0.34                 | 307.13                    | 2199.96   | -1.33       | -4.87       | 5.05                      | 254.72                      | 0.07                          |
| 2300.00                 | 0.41                 | 309.93                    | 2299.96   | -0.92       | -5.38       | 5.46                      | 260.27                      | 0.07                          |
| 2400.00                 | 0.28                 | 292.14                    | 2399.96   | -0.60       | -5.88       | 5.91                      | 264.16                      | 0.17                          |
| 2500.00                 | 0.26                 | 319.64                    | 2499.96   | -0.34       | -6.25       | 6.26                      | 266.91                      | 0.13                          |
| 2600.00                 | 0.26                 | 327.97                    | 2599.96   | 0.03        | -6.52       | 6.52                      | 270.26                      | 0.04                          |
| 2700.00                 | 0.32                 | 322.08                    | 2699.95   | 0.44        | -6.82       | 6.83                      | 273.73                      | 0.06                          |
| 2800.00                 | 0.19                 | 343.84                    | 2799.95   | 0.82        | -7.03       | 7.08                      | 276.64                      | 0.16                          |
| 2900.00                 | 0.21                 | 334.82                    | 2899.95   | 1.14        | -7.16       | 7.25                      | 279.06                      | 0.04                          |
| 3000.00                 | 0.18                 | 10.67                     | 2999.95   | 1.46        | -7.21       | 7.35                      | 281.48                      | 0.12                          |
| 3100.00                 | 0.19                 | 4.20                      | 3099.95   | 1.78        | -7.16       | 7.38                      | 283.97                      | 0.02                          |
| 3200.00                 | 0.22                 | 39.97                     | 3199.95   | 2.09        | -7.03       | 7.33                      | 286.59                      | 0.13                          |
| 3300.00                 | 0.20                 | 56.25                     | 3299.95   | 2.34        | -6.76       | 7.15                      | 289.08                      | 0.06                          |
| 3400.00                 | 0.21                 | 65.54                     | 3399.95   | 2.51        | -6.44       | 6.92                      | 291.30                      | 0.04                          |
| 3500.00                 | 0.18                 | 20.92                     | 3499.95   | 2.74        | -6.22       | 6.79                      | 293.77                      | 0.15                          |
| 3600.00                 | 0.14                 | 52.58                     | 3599.95   | 2.96        | -6.06       | 6.75                      | 296.05                      | 0.10                          |
| 3700.00                 | 0.14                 | 4.15                      | 3699.95   | 3.16        | -5.95       | 6.74                      | 297.94                      | 0.12                          |
| 3800.00                 | 0.04                 | 241.29                    | 3799.95   | 3.26        | -5.97       | 6.80                      | 298.61                      | 0.16                          |
| 3900.00                 | 0.19                 | 308.43                    | 3899.95   | 3.35        | -6.13       | 6.99                      | 298.62                      | 0.18                          |
| 3993.00                 | 0.26                 | 190.30                    | 3992.95   | 3.24        | -6.29       | 7.08                      | 297.21                      | 0.42                          |