


DNPM/AL  
Fls. 2-117  


**Parte 4**  
**Listagem Definitiva da Amostragem**

DNF/MAL  
Fls. 7-118  


**4.0 LISTAGEM DEFINITIVA DA AMOSTRAGEM**

A Gyrodata Directional Survey

for

**BRASKEM**

Well: **Mina 04**, 7"  
Location: RIGLESS, SAL GEMA

Job Number: BZ0419GVC029

Run Date: 02 Apr 2019

Calculation Method: MINIMUM CURVATURE

Survey Latitude: 9.633980 deg. S  
Longitude: 35.749201 deg. W

Well Head Location -  
From Local Horizontal Reference: N 0.00 m. E 0.00 m.

Azimuth Correction:  
Gyro: Bearings are Relative to True North

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Local Horizontal Reference

A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 280.00                      | 0.50         | 100.25          | 280.00                      | 0.08                            | 0.04 S                              | 0.76 E |
| 281.00                      | 0.49         | 99.06           | 281.00                      | 0.07                            | 0.04 S                              | 0.76 E |
| 282.00                      | 0.49         | 98.50           | 282.00                      | 0.08                            | 0.04 S                              | 0.77 E |
| 283.00                      | 0.49         | 98.66           | 283.00                      | 0.11                            | 0.04 S                              | 0.78 E |
| 284.00                      | 0.48         | 98.77           | 284.00                      | 0.13                            | 0.04 S                              | 0.79 E |
| 285.00                      | 0.48         | 98.80           | 285.00                      | 0.15                            | 0.04 S                              | 0.80 E |
| 286.00                      | 0.48         | 98.82           | 286.00                      | 0.16                            | 0.05 S                              | 0.81 E |
| 287.00                      | 0.48         | 98.84           | 287.00                      | 0.17                            | 0.05 S                              | 0.81 E |
| 288.00                      | 0.47         | 99.09           | 288.00                      | 0.18                            | 0.05 S                              | 0.82 E |
| 289.00                      | 0.46         | 99.55           | 289.00                      | 0.19                            | 0.05 S                              | 0.83 E |
| 290.00                      | 0.45         | 100.42          | 290.00                      | 0.20                            | 0.05 S                              | 0.84 E |
| 291.00                      | 0.44         | 101.72          | 291.00                      | 0.20                            | 0.05 S                              | 0.85 E |
| 292.00                      | 0.43         | 103.12          | 292.00                      | 0.19                            | 0.05 S                              | 0.85 E |
| 293.00                      | 0.42         | 104.91          | 293.00                      | 0.19                            | 0.06 S                              | 0.86 E |
| 294.00                      | 0.40         | 107.03          | 294.00                      | 0.18                            | 0.06 S                              | 0.87 E |
| 295.00                      | 0.39         | 109.66          | 295.00                      | 0.18                            | 0.06 S                              | 0.87 E |
| 296.00                      | 0.38         | 112.10          | 296.00                      | 0.19                            | 0.06 S                              | 0.88 E |
| 297.00                      | 0.36         | 114.19          | 297.00                      | 0.20                            | 0.07 S                              | 0.89 E |
| 298.00                      | 0.35         | 116.61          | 298.00                      | 0.20                            | 0.07 S                              | 0.89 E |
| 299.00                      | 0.34         | 118.82          | 299.00                      | 0.21                            | 0.07 S                              | 0.90 E |
| 300.00                      | 0.34         | 120.57          | 300.00                      | 0.21                            | 0.07 S                              | 0.90 E |
| 301.00                      | 0.34         | 121.91          | 301.00                      | 0.21                            | 0.08 S                              | 0.91 E |
| 302.00                      | 0.34         | 122.77          | 302.00                      | 0.21                            | 0.08 S                              | 0.91 E |
| 303.00                      | 0.35         | 123.78          | 303.00                      | 0.22                            | 0.08 S                              | 0.92 E |
| 304.00                      | 0.36         | 124.55          | 304.00                      | 0.22                            | 0.09 S                              | 0.92 E |
| 305.00                      | 0.37         | 125.02          | 305.00                      | 0.21                            | 0.09 S                              | 0.93 E |
| 306.00                      | 0.38         | 124.59          | 306.00                      | 0.20                            | 0.09 S                              | 0.93 E |
| 307.00                      | 0.40         | 123.96          | 307.00                      | 0.19                            | 0.10 S                              | 0.94 E |
| 308.00                      | 0.42         | 123.36          | 308.00                      | 0.17                            | 0.10 S                              | 0.94 E |
| 309.00                      | 0.45         | 122.30          | 309.00                      | 0.14                            | 0.11 S                              | 0.95 E |
| 310.00                      | 0.46         | 121.66          | 310.00                      | 0.12                            | 0.11 S                              | 0.96 E |
| 311.00                      | 0.48         | 121.71          | 311.00                      | 0.11                            | 0.11 S                              | 0.96 E |
| 312.00                      | 0.50         | 121.85          | 312.00                      | 0.11                            | 0.12 S                              | 0.97 E |
| 313.00                      | 0.51         | 122.30          | 313.00                      | 0.11                            | 0.12 S                              | 0.98 E |
| 314.00                      | 0.51         | 122.62          | 314.00                      | 0.11                            | 0.13 S                              | 0.99 E |
| 315.00                      | 0.51         | 122.78          | 315.00                      | 0.12                            | 0.13 S                              | 0.99 E |



DNPV/AL  
Fls. 7.127  
ON

A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 316.00                      | 0.51         | 122.95          | 316.00                      | 0.12                            | 0.14 S                              | 1.00 E |
| 317.00                      | 0.51         | 123.64          | 317.00                      | 0.11                            | 0.14 S                              | 1.01 E |
| 318.00                      | 0.51         | 124.42          | 318.00                      | 0.11                            | 0.15 S                              | 1.02 E |
| 319.00                      | 0.50         | 125.14          | 319.00                      | 0.10                            | 0.15 S                              | 1.02 E |
| 320.00                      | 0.49         | 126.03          | 320.00                      | 0.09                            | 0.16 S                              | 1.03 E |
| 321.00                      | 0.48         | 126.26          | 321.00                      | 0.09                            | 0.16 S                              | 1.04 E |
| 322.00                      | 0.48         | 125.96          | 322.00                      | 0.09                            | 0.17 S                              | 1.04 E |
| 323.00                      | 0.47         | 125.24          | 323.00                      | 0.10                            | 0.17 S                              | 1.05 E |
| 324.00                      | 0.47         | 124.13          | 323.99                      | 0.13                            | 0.18 S                              | 1.06 E |
| 325.00                      | 0.47         | 122.68          | 324.99                      | 0.15                            | 0.18 S                              | 1.06 E |
| 326.00                      | 0.47         | 120.99          | 325.99                      | 0.17                            | 0.19 S                              | 1.07 E |
| 327.00                      | 0.47         | 119.24          | 326.99                      | 0.19                            | 0.19 S                              | 1.08 E |
| 328.00                      | 0.46         | 116.96          | 327.99                      | 0.20                            | 0.19 S                              | 1.09 E |
| 329.00                      | 0.45         | 114.62          | 328.99                      | 0.21                            | 0.20 S                              | 1.09 E |
| 330.00                      | 0.44         | 112.48          | 329.99                      | 0.21                            | 0.20 S                              | 1.10 E |
| 331.00                      | 0.42         | 110.04          | 330.99                      | 0.21                            | 0.20 S                              | 1.11 E |
| 332.00                      | 0.40         | 108.49          | 331.99                      | 0.20                            | 0.21 S                              | 1.11 E |
| 333.00                      | 0.38         | 108.08          | 332.99                      | 0.18                            | 0.21 S                              | 1.12 E |
| 334.00                      | 0.36         | 108.87          | 333.99                      | 0.16                            | 0.21 S                              | 1.13 E |
| 335.00                      | 0.35         | 110.63          | 334.99                      | 0.14                            | 0.21 S                              | 1.13 E |
| 336.00                      | 0.34         | 113.34          | 335.99                      | 0.13                            | 0.21 S                              | 1.14 E |
| 337.00                      | 0.33         | 117.09          | 336.99                      | 0.13                            | 0.22 S                              | 1.14 E |
| 338.00                      | 0.32         | 121.20          | 337.99                      | 0.13                            | 0.22 S                              | 1.15 E |
| 339.00                      | 0.32         | 125.61          | 338.99                      | 0.13                            | 0.22 S                              | 1.15 E |
| 340.00                      | 0.33         | 129.74          | 339.99                      | 0.14                            | 0.23 S                              | 1.16 E |
| 341.00                      | 0.34         | 133.62          | 340.99                      | 0.15                            | 0.23 S                              | 1.16 E |
| 342.00                      | 0.35         | 137.84          | 341.99                      | 0.17                            | 0.23 S                              | 1.17 E |
| 343.00                      | 0.37         | 141.51          | 342.99                      | 0.20                            | 0.24 S                              | 1.17 E |
| 344.00                      | 0.38         | 143.88          | 343.99                      | 0.23                            | 0.24 S                              | 1.17 E |
| 345.00                      | 0.39         | 145.47          | 344.99                      | 0.26                            | 0.25 S                              | 1.18 E |
| 346.00                      | 0.40         | 145.91          | 345.99                      | 0.29                            | 0.26 S                              | 1.18 E |
| 347.00                      | 0.41         | 145.68          | 346.99                      | 0.31                            | 0.26 S                              | 1.19 E |
| 348.00                      | 0.41         | 144.27          | 347.99                      | 0.32                            | 0.27 S                              | 1.19 E |
| 349.00                      | 0.41         | 142.73          | 348.99                      | 0.31                            | 0.27 S                              | 1.19 E |
| 350.00                      | 0.40         | 141.10          | 349.99                      | 0.29                            | 0.28 S                              | 1.20 E |
| 351.00                      | 0.40         | 140.14          | 350.99                      | 0.27                            | 0.28 S                              | 1.20 E |



DNP VIAL  
No. 7128  
A

A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 352.00                      | 0.40         | 139.24          | 351.99                      | 0.24                            | 0.29 S                              | 1.21 E |
| 353.00                      | 0.40         | 138.92          | 352.99                      | 0.21                            | 0.29 S                              | 1.21 E |
| 354.00                      | 0.40         | 138.81          | 353.99                      | 0.18                            | 0.30 S                              | 1.22 E |
| 355.00                      | 0.41         | 139.26          | 354.99                      | 0.15                            | 0.30 S                              | 1.22 E |
| 356.00                      | 0.42         | 139.84          | 355.99                      | 0.12                            | 0.31 S                              | 1.23 E |
| 357.00                      | 0.43         | 140.88          | 356.99                      | 0.10                            | 0.32 S                              | 1.23 E |
| 358.00                      | 0.45         | 142.05          | 357.99                      | 0.09                            | 0.32 S                              | 1.24 E |
| 359.00                      | 0.46         | 143.69          | 358.99                      | 0.08                            | 0.33 S                              | 1.24 E |
| 360.00                      | 0.47         | 145.05          | 359.99                      | 0.08                            | 0.33 S                              | 1.24 E |
| 361.00                      | 0.48         | 146.71          | 360.99                      | 0.08                            | 0.34 S                              | 1.25 E |
| 362.00                      | 0.49         | 147.47          | 361.99                      | 0.10                            | 0.35 S                              | 1.25 E |
| 363.00                      | 0.49         | 148.11          | 362.99                      | 0.13                            | 0.36 S                              | 1.26 E |
| 364.00                      | 0.49         | 147.91          | 363.99                      | 0.18                            | 0.36 S                              | 1.26 E |
| 365.00                      | 0.49         | 146.71          | 364.99                      | 0.23                            | 0.37 S                              | 1.27 E |
| 366.00                      | 0.48         | 145.52          | 365.99                      | 0.28                            | 0.38 S                              | 1.27 E |
| 367.00                      | 0.48         | 143.77          | 366.99                      | 0.33                            | 0.38 S                              | 1.28 E |
| 368.00                      | 0.47         | 142.65          | 367.99                      | 0.36                            | 0.39 S                              | 1.28 E |
| 369.00                      | 0.46         | 140.77          | 368.99                      | 0.40                            | 0.40 S                              | 1.29 E |
| 370.00                      | 0.46         | 139.34          | 369.99                      | 0.42                            | 0.40 S                              | 1.29 E |
| 371.00                      | 0.45         | 138.01          | 370.99                      | 0.43                            | 0.41 S                              | 1.30 E |
| 372.00                      | 0.45         | 136.99          | 371.99                      | 0.42                            | 0.42 S                              | 1.30 E |
| 373.00                      | 0.44         | 136.71          | 372.99                      | 0.38                            | 0.42 S                              | 1.31 E |
| 374.00                      | 0.45         | 136.66          | 373.99                      | 0.32                            | 0.43 S                              | 1.31 E |
| 375.00                      | 0.45         | 137.39          | 374.99                      | 0.25                            | 0.43 S                              | 1.32 E |
| 376.00                      | 0.47         | 139.18          | 375.99                      | 0.20                            | 0.44 S                              | 1.32 E |
| 377.00                      | 0.50         | 140.89          | 376.99                      | 0.14                            | 0.44 S                              | 1.33 E |
| 378.00                      | 0.54         | 143.12          | 377.99                      | 0.11                            | 0.45 S                              | 1.33 E |
| 379.00                      | 0.58         | 144.61          | 378.99                      | 0.09                            | 0.46 S                              | 1.34 E |
| 380.00                      | 0.63         | 146.77          | 379.99                      | 0.08                            | 0.47 S                              | 1.35 E |
| 381.00                      | 0.67         | 148.39          | 380.99                      | 0.08                            | 0.48 S                              | 1.35 E |
| 382.00                      | 0.71         | 149.91          | 381.99                      | 0.09                            | 0.49 S                              | 1.36 E |
| 383.00                      | 0.74         | 151.02          | 382.99                      | 0.10                            | 0.50 S                              | 1.37 E |
| 384.00                      | 0.78         | 151.79          | 383.99                      | 0.10                            | 0.51 S                              | 1.37 E |
| 385.00                      | 0.81         | 152.32          | 384.99                      | 0.09                            | 0.52 S                              | 1.38 E |
| 386.00                      | 0.83         | 152.11          | 385.99                      | 0.08                            | 0.54 S                              | 1.38 E |
| 387.00                      | 0.83         | 151.68          | 386.99                      | 0.08                            | 0.55 S                              | 1.39 E |



## A Gyrodata Directional Survey

BRASKEM

Well: Mina 04, 7"

Location: RIGLESS, SAL GEMA

Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 388.00                      | 0.81         | 150.62          | 387.99                      | 0.08                            | 0.56 S                              | 1.40 E |
| 389.00                      | 0.77         | 148.98          | 388.99                      | 0.07                            | 0.57 S                              | 1.41 E |
| 390.00                      | 0.72         | 147.02          | 389.99                      | 0.06                            | 0.58 S                              | 1.41 E |
| 391.00                      | 0.67         | 145.06          | 390.99                      | 0.05                            | 0.59 S                              | 1.42 E |
| 392.00                      | 0.62         | 143.42          | 391.99                      | 0.03                            | 0.60 S                              | 1.43 E |
| 393.00                      | 0.58         | 141.63          | 392.99                      | 0.03                            | 0.61 S                              | 1.43 E |
| 394.00                      | 0.55         | 139.85          | 393.99                      | 0.07                            | 0.62 S                              | 1.44 E |
| 395.00                      | 0.50         | 137.89          | 394.99                      | 0.11                            | 0.63 S                              | 1.44 E |
| 396.00                      | 0.47         | 135.78          | 395.99                      | 0.16                            | 0.63 S                              | 1.45 E |
| 397.00                      | 0.44         | 133.51          | 396.99                      | 0.21                            | 0.64 S                              | 1.46 E |
| 398.00                      | 0.43         | 131.18          | 397.99                      | 0.24                            | 0.64 S                              | 1.46 E |
| 399.00                      | 0.42         | 129.32          | 398.99                      | 0.29                            | 0.65 S                              | 1.47 E |
| 400.00                      | 0.42         | 128.16          | 399.99                      | 0.31                            | 0.65 S                              | 1.47 E |
| 401.00                      | 0.44         | 127.53          | 400.99                      | 0.32                            | 0.66 S                              | 1.48 E |
| 402.00                      | 0.45         | 127.18          | 401.99                      | 0.30                            | 0.66 S                              | 1.48 E |
| 403.00                      | 0.46         | 127.19          | 402.99                      | 0.27                            | 0.67 S                              | 1.49 E |
| 404.00                      | 0.47         | 128.22          | 403.99                      | 0.24                            | 0.67 S                              | 1.50 E |
| 405.00                      | 0.47         | 130.35          | 404.99                      | 0.22                            | 0.68 S                              | 1.50 E |
| 406.00                      | 0.48         | 133.63          | 405.99                      | 0.21                            | 0.68 S                              | 1.51 E |
| 407.00                      | 0.50         | 137.92          | 406.99                      | 0.24                            | 0.69 S                              | 1.52 E |
| 408.00                      | 0.51         | 142.95          | 407.99                      | 0.28                            | 0.69 S                              | 1.52 E |
| 409.00                      | 0.53         | 148.54          | 408.99                      | 0.32                            | 0.70 S                              | 1.53 E |
| 410.00                      | 0.55         | 155.29          | 409.99                      | 0.38                            | 0.71 S                              | 1.53 E |
| 411.00                      | 0.57         | 160.23          | 410.99                      | 0.44                            | 0.72 S                              | 1.53 E |
| 412.00                      | 0.59         | 164.93          | 411.99                      | 0.51                            | 0.73 S                              | 1.54 E |
| 413.00                      | 0.61         | 168.88          | 412.99                      | 0.57                            | 0.74 S                              | 1.54 E |
| 414.00                      | 0.63         | 171.87          | 413.99                      | 0.61                            | 0.75 S                              | 1.54 E |
| 415.00                      | 0.64         | 173.41          | 414.99                      | 0.64                            | 0.76 S                              | 1.54 E |
| 416.00                      | 0.66         | 173.06          | 415.99                      | 0.64                            | 0.77 S                              | 1.54 E |
| 417.00                      | 0.67         | 171.28          | 416.99                      | 0.62                            | 0.78 S                              | 1.55 E |
| 418.00                      | 0.68         | 168.93          | 417.99                      | 0.59                            | 0.80 S                              | 1.55 E |
| 419.00                      | 0.68         | 166.90          | 418.99                      | 0.54                            | 0.81 S                              | 1.55 E |
| 420.00                      | 0.69         | 165.13          | 419.99                      | 0.49                            | 0.82 S                              | 1.55 E |
| 421.00                      | 0.69         | 163.12          | 420.99                      | 0.43                            | 0.83 S                              | 1.56 E |
| 422.00                      | 0.70         | 163.02          | 421.99                      | 0.36                            | 0.84 S                              | 1.56 E |
| 423.00                      | 0.72         | 163.18          | 422.99                      | 0.28                            | 0.85 S                              | 1.56 E |



A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 424.00                      | 0.73         | 163.74          | 423.99                      | 0.22                            | 0.87 S                              | 1.57 E |
| 425.00                      | 0.75         | 164.83          | 424.99                      | 0.19                            | 0.88 S                              | 1.57 E |
| 426.00                      | 0.77         | 166.75          | 425.99                      | 0.22                            | 0.89 S                              | 1.57 E |
| 427.00                      | 0.79         | 169.49          | 426.99                      | 0.26                            | 0.90 S                              | 1.58 E |
| 428.00                      | 0.81         | 172.61          | 427.99                      | 0.30                            | 0.92 S                              | 1.58 E |
| 429.00                      | 0.83         | 175.11          | 428.99                      | 0.33                            | 0.93 S                              | 1.58 E |
| 430.00                      | 0.84         | 176.24          | 429.99                      | 0.35                            | 0.95 S                              | 1.58 E |
| 431.00                      | 0.84         | 175.74          | 430.99                      | 0.35                            | 0.96 S                              | 1.58 E |
| 432.00                      | 0.84         | 173.71          | 431.99                      | 0.33                            | 0.98 S                              | 1.58 E |
| 433.00                      | 0.83         | 170.83          | 432.99                      | 0.32                            | 0.99 S                              | 1.59 E |
| 434.00                      | 0.82         | 167.74          | 433.99                      | 0.30                            | 1.00 S                              | 1.59 E |
| 435.00                      | 0.80         | 164.77          | 434.99                      | 0.29                            | 1.02 S                              | 1.59 E |
| 436.00                      | 0.79         | 161.72          | 435.99                      | 0.27                            | 1.03 S                              | 1.60 E |
| 437.00                      | 0.77         | 158.45          | 436.99                      | 0.28                            | 1.04 S                              | 1.60 E |
| 438.00                      | 0.76         | 155.20          | 437.99                      | 0.29                            | 1.06 S                              | 1.61 E |
| 439.00                      | 0.75         | 151.99          | 438.99                      | 0.29                            | 1.07 S                              | 1.61 E |
| 440.00                      | 0.74         | 149.28          | 439.99                      | 0.31                            | 1.08 S                              | 1.62 E |
| 441.00                      | 0.73         | 147.30          | 440.99                      | 0.34                            | 1.09 S                              | 1.62 E |
| 442.00                      | 0.73         | 146.10          | 441.99                      | 0.38                            | 1.10 S                              | 1.63 E |
| 443.00                      | 0.74         | 145.69          | 442.99                      | 0.43                            | 1.11 S                              | 1.64 E |
| 444.00                      | 0.74         | 145.69          | 443.99                      | 0.47                            | 1.12 S                              | 1.65 E |
| 445.00                      | 0.75         | 145.77          | 444.99                      | 0.48                            | 1.13 S                              | 1.65 E |
| 446.00                      | 0.76         | 145.61          | 445.99                      | 0.46                            | 1.14 S                              | 1.66 E |
| 447.00                      | 0.76         | 145.32          | 446.99                      | 0.42                            | 1.15 S                              | 1.67 E |
| 448.00                      | 0.77         | 144.91          | 447.99                      | 0.36                            | 1.17 S                              | 1.68 E |
| 449.00                      | 0.78         | 144.43          | 448.99                      | 0.30                            | 1.18 S                              | 1.68 E |
| 450.00                      | 0.79         | 143.99          | 449.99                      | 0.24                            | 1.19 S                              | 1.69 E |
| 451.00                      | 0.80         | 143.45          | 450.99                      | 0.17                            | 1.20 S                              | 1.70 E |
| 452.00                      | 0.80         | 142.81          | 451.99                      | 0.10                            | 1.21 S                              | 1.71 E |
| 453.00                      | 0.80         | 142.36          | 452.99                      | 0.04                            | 1.22 S                              | 1.72 E |
| 454.00                      | 0.80         | 142.17          | 453.99                      | 0.03                            | 1.23 S                              | 1.73 E |
| 455.00                      | 0.80         | 142.02          | 454.99                      | 0.07                            | 1.24 S                              | 1.73 E |
| 456.00                      | 0.80         | 141.90          | 455.99                      | 0.11                            | 1.25 S                              | 1.74 E |
| 457.00                      | 0.79         | 141.60          | 456.99                      | 0.13                            | 1.27 S                              | 1.75 E |
| 458.00                      | 0.79         | 141.34          | 457.99                      | 0.14                            | 1.28 S                              | 1.76 E |
| 459.00                      | 0.78         | 141.38          | 458.99                      | 0.15                            | 1.29 S                              | 1.77 E |



A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 460.00                      | 0.77         | 141.77          | 459.99                      | 0.15                            | 1.30 S                              | 1.78 E |
| 461.00                      | 0.76         | 142.48          | 460.99                      | 0.16                            | 1.31 S                              | 1.78 E |
| 462.00                      | 0.75         | 143.52          | 461.99                      | 0.17                            | 1.32 S                              | 1.79 E |
| 463.00                      | 0.74         | 144.77          | 462.99                      | 0.18                            | 1.33 S                              | 1.80 E |
| 464.00                      | 0.74         | 146.10          | 463.99                      | 0.20                            | 1.34 S                              | 1.81 E |
| 465.00                      | 0.74         | 147.79          | 464.99                      | 0.21                            | 1.35 S                              | 1.81 E |
| 466.00                      | 0.74         | 149.41          | 465.99                      | 0.23                            | 1.36 S                              | 1.82 E |
| 467.00                      | 0.74         | 150.94          | 466.99                      | 0.25                            | 1.37 S                              | 1.83 E |
| 468.00                      | 0.74         | 152.60          | 467.99                      | 0.26                            | 1.38 S                              | 1.83 E |
| 469.00                      | 0.74         | 153.96          | 468.99                      | 0.27                            | 1.40 S                              | 1.84 E |
| 470.00                      | 0.74         | 155.08          | 469.99                      | 0.28                            | 1.41 S                              | 1.85 E |
| 471.00                      | 0.73         | 155.89          | 470.99                      | 0.29                            | 1.42 S                              | 1.85 E |
| 472.00                      | 0.73         | 156.51          | 471.99                      | 0.30                            | 1.43 S                              | 1.86 E |
| 473.00                      | 0.72         | 156.82          | 472.99                      | 0.31                            | 1.44 S                              | 1.86 E |
| 474.00                      | 0.71         | 157.10          | 473.99                      | 0.32                            | 1.45 S                              | 1.87 E |
| 475.00                      | 0.70         | 157.28          | 474.99                      | 0.33                            | 1.46 S                              | 1.87 E |
| 476.00                      | 0.69         | 156.81          | 475.99                      | 0.33                            | 1.48 S                              | 1.88 E |
| 477.00                      | 0.67         | 156.18          | 476.99                      | 0.34                            | 1.49 S                              | 1.88 E |
| 478.00                      | 0.65         | 155.30          | 477.99                      | 0.33                            | 1.50 S                              | 1.88 E |
| 479.00                      | 0.63         | 154.52          | 478.99                      | 0.33                            | 1.51 S                              | 1.89 E |
| 480.00                      | 0.62         | 154.14          | 479.99                      | 0.32                            | 1.52 S                              | 1.89 E |
| 481.00                      | 0.60         | 153.95          | 480.99                      | 0.31                            | 1.53 S                              | 1.90 E |
| 482.00                      | 0.59         | 154.07          | 481.99                      | 0.31                            | 1.54 S                              | 1.90 E |
| 483.00                      | 0.58         | 154.41          | 482.99                      | 0.30                            | 1.55 S                              | 1.91 E |
| 484.00                      | 0.58         | 154.85          | 483.99                      | 0.29                            | 1.55 S                              | 1.91 E |
| 485.00                      | 0.57         | 155.35          | 484.99                      | 0.29                            | 1.56 S                              | 1.92 E |
| 486.00                      | 0.56         | 156.16          | 485.99                      | 0.29                            | 1.57 S                              | 1.92 E |
| 487.00                      | 0.56         | 157.59          | 486.99                      | 0.29                            | 1.58 S                              | 1.92 E |
| 488.00                      | 0.56         | 159.44          | 487.99                      | 0.30                            | 1.59 S                              | 1.93 E |
| 489.00                      | 0.56         | 161.71          | 488.99                      | 0.30                            | 1.60 S                              | 1.93 E |
| 490.00                      | 0.56         | 163.85          | 489.99                      | 0.31                            | 1.61 S                              | 1.93 E |
| 491.00                      | 0.56         | 165.98          | 490.99                      | 0.30                            | 1.62 S                              | 1.94 E |
| 492.00                      | 0.55         | 167.81          | 491.99                      | 0.28                            | 1.63 S                              | 1.94 E |
| 493.00                      | 0.55         | 169.16          | 492.99                      | 0.26                            | 1.64 S                              | 1.94 E |
| 494.00                      | 0.54         | 170.14          | 493.99                      | 0.24                            | 1.65 S                              | 1.94 E |
| 495.00                      | 0.53         | 170.79          | 494.99                      | 0.22                            | 1.66 S                              | 1.94 E |

## A Gyrodata Directional Survey

BRASKEM

Well: Mina 04, 7"

Location: RIGLESS, SAL GEMA

Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 496.00                      | 0.52         | 170.89          | 495.99                      | 0.20                            | 1.67 S                              | 1.95 E |
| 497.00                      | 0.51         | 170.25          | 496.99                      | 0.18                            | 1.67 S                              | 1.95 E |
| 498.00                      | 0.50         | 168.96          | 497.99                      | 0.16                            | 1.68 S                              | 1.95 E |
| 499.00                      | 0.48         | 166.81          | 498.98                      | 0.16                            | 1.69 S                              | 1.95 E |
| 500.00                      | 0.46         | 163.87          | 499.98                      | 0.15                            | 1.70 S                              | 1.95 E |
| 501.00                      | 0.45         | 160.56          | 500.98                      | 0.14                            | 1.71 S                              | 1.95 E |
| 502.00                      | 0.44         | 157.00          | 501.98                      | 0.14                            | 1.71 S                              | 1.96 E |
| 503.00                      | 0.43         | 153.77          | 502.98                      | 0.14                            | 1.72 S                              | 1.96 E |
| 504.00                      | 0.41         | 150.89          | 503.98                      | 0.15                            | 1.73 S                              | 1.96 E |
| 505.00                      | 0.41         | 148.48          | 504.98                      | 0.15                            | 1.73 S                              | 1.97 E |
| 506.00                      | 0.40         | 146.81          | 505.98                      | 0.16                            | 1.74 S                              | 1.97 E |
| 507.00                      | 0.40         | 145.83          | 506.98                      | 0.17                            | 1.74 S                              | 1.98 E |
| 508.00                      | 0.40         | 145.54          | 507.98                      | 0.18                            | 1.75 S                              | 1.98 E |
| 509.00                      | 0.40         | 145.51          | 508.98                      | 0.19                            | 1.76 S                              | 1.98 E |
| 510.00                      | 0.41         | 146.49          | 509.98                      | 0.20                            | 1.76 S                              | 1.99 E |
| 511.00                      | 0.41         | 148.12          | 510.98                      | 0.20                            | 1.77 S                              | 1.99 E |
| 512.00                      | 0.42         | 150.30          | 511.98                      | 0.20                            | 1.77 S                              | 1.99 E |
| 513.00                      | 0.42         | 152.85          | 512.98                      | 0.21                            | 1.78 S                              | 2.00 E |
| 514.00                      | 0.42         | 155.18          | 513.98                      | 0.21                            | 1.79 S                              | 2.00 E |
| 515.00                      | 0.42         | 157.14          | 514.98                      | 0.21                            | 1.79 S                              | 2.00 E |
| 516.00                      | 0.42         | 158.69          | 515.98                      | 0.20                            | 1.80 S                              | 2.01 E |
| 517.00                      | 0.42         | 159.69          | 516.98                      | 0.21                            | 1.81 S                              | 2.01 E |
| 518.00                      | 0.42         | 160.36          | 517.98                      | 0.24                            | 1.81 S                              | 2.01 E |
| 519.00                      | 0.41         | 160.87          | 518.98                      | 0.27                            | 1.82 S                              | 2.01 E |
| 520.00                      | 0.41         | 161.78          | 519.98                      | 0.28                            | 1.83 S                              | 2.02 E |
| 521.00                      | 0.40         | 162.06          | 520.98                      | 0.29                            | 1.84 S                              | 2.02 E |
| 522.00                      | 0.39         | 162.26          | 521.98                      | 0.00                            | 1.84 S                              | 2.02 E |
| 523.00                      | 0.38         | 162.45          | 522.98                      | 0.00                            | 1.85 S                              | 2.02 E |
| 524.00                      | 0.37         | 161.82          | 523.98                      | 0.00                            | 1.85 S                              | 2.03 E |
| 525.00                      | 0.35         | 161.01          | 524.98                      | 0.00                            | 1.86 S                              | 2.03 E |
| 526.00                      | 0.34         | 161.13          | 525.98                      | 0.00                            | 1.87 S                              | 2.03 E |
| 527.00                      | 0.32         | 160.18          | 526.98                      | 0.00                            | 1.87 S                              | 2.03 E |
| 528.00                      | 0.30         | 158.78          | 527.98                      | 0.00                            | 1.88 S                              | 2.03 E |
| 529.00                      | 0.28         | 156.52          | 528.98                      | 0.00                            | 1.88 S                              | 2.03 E |
| 530.00                      | 0.26         | 154.20          | 529.98                      | 0.00                            | 1.89 S                              | 2.04 E |
| 531.00                      | 0.25         | 158.74          | 530.98                      | 0.00                            | 1.89 S                              | 2.04 E |

DNF 12 AL  
7.133  
*[Signature]*

A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 532.00                      | 0.24         | 147.65          | 531.98                      | 0.00                            | 1.89 S                              | 2.04 E |
| 533.00                      | 0.22         | 128.97          | 532.98                      | 0.00                            | 1.90 S                              | 2.04 E |
| 534.00                      | 0.19         | 120.00          | 533.98                      | 0.00                            | 1.90 S                              | 2.05 E |
| 535.00                      | 0.16         | 119.65          | 534.98                      | 0.00                            | 1.90 S                              | 2.05 E |
| 536.00                      | 0.11         | 155.62          | 535.98                      | 0.00                            | 1.90 S                              | 2.05 E |

**Final Station Closure: Distance: 2.80 m Az: 132.85 deg.**



**Parte 5**  
**Controle de Qualidade**

DNPV'AL  
Fis. 7.135  
Q1

Survey QC – Vertical Continuous Analysis Sheet

gyrodata

SURVEY QUALITY CONTROL – SPECIFICATION DATA

PRE-JOB CALIBRATION VERIFICATION (ROLL TEST)

| System Parameter   | dGx   | dGy   | dmb0  | Mean Gravity Error | Stdev Gravity Error |
|--------------------|-------|-------|-------|--------------------|---------------------|
| Standard Deviation | 0.007 | 0.007 | 0.007 | 0.00018            | 0.00001             |
| Tolerance          | 0.033 | 0.033 | 0.087 | 0.00591            | 0.00720             |

CALIBRATION

|             |       |                  |             |
|-------------|-------|------------------|-------------|
| Tool Number | FA088 | Calibration Date | 06 Jan 2016 |
|-------------|-------|------------------|-------------|

OPERATING TEMPERATURE

|                              |      |       |    |        |                                      |
|------------------------------|------|-------|----|--------|--------------------------------------|
| Calibration range            | From | 30.03 | To | 120.04 |                                      |
| Gyro operating range for Job | From | 63.28 | To | 64.22  | In-Spec if +/- 2.5 °C of Calibration |

INCLINATION DIFFERENCE TEST

|  |      |
|--|------|
| Chi-square test value                      | 1.3  |
| Tolerance                                  | 34.4 |
| Number of overlapping survey stations used | 15.0 |

CO-ORDINATE DIFFERENCE TEST

|  | North | East | Vertical |
|--|-------|------|----------|
| Chi-square test value                      | 2.3   | 4.3  | 3.8      |
| Tolerance                                  | 34.4  | 34.4 | 34.4     |
| Number of overlapping survey stations used | 15.0  | 15.0 | 15.0     |



**Parte 6**  
**Relatório Cronológico**  
**da Operação**



## 6.0 RELATÓRIO CRONOLÓGICO DA OPERAÇÃO

### 02 de abril de 2019

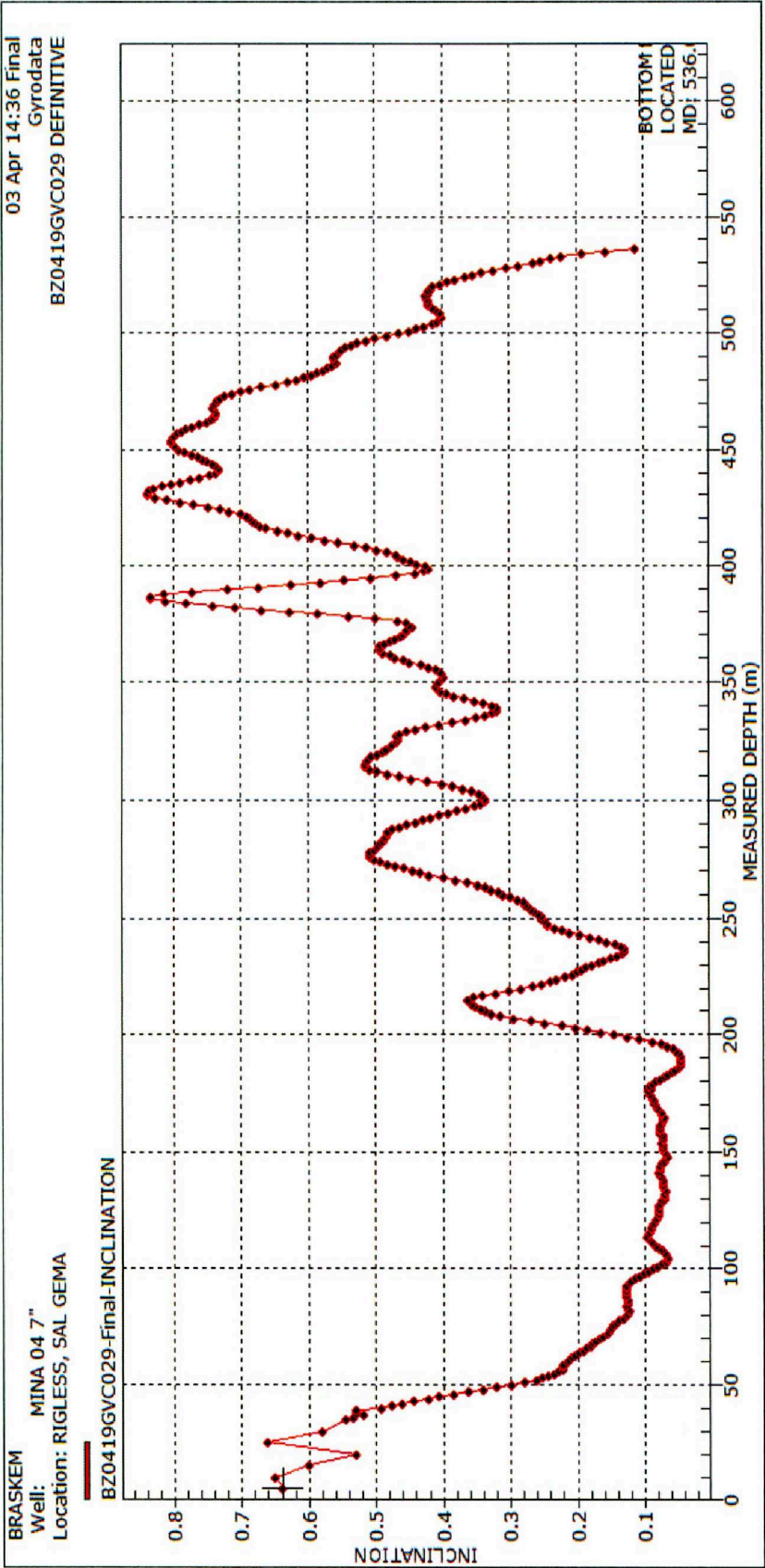
18:00 Chegada da equipe na mina 04  
19:25 Conexão gyrodata/flodim  
19:40 Início de corrida mina 04  
21:45 Desmontagem de Equipamentos  
22:30 Pós calibração

*[Handwritten signature]*

**Parte 7**  
**Gráficos**

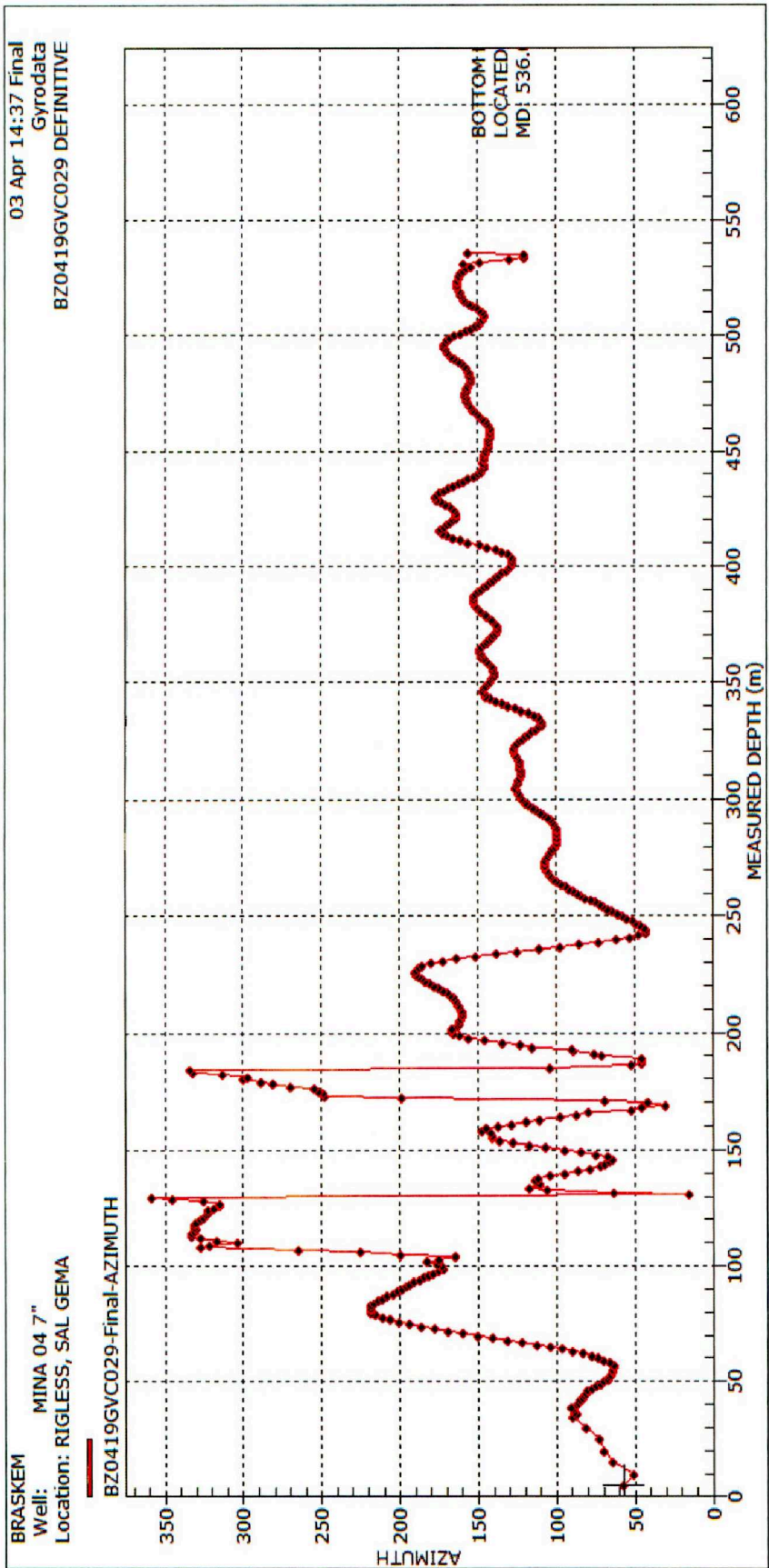


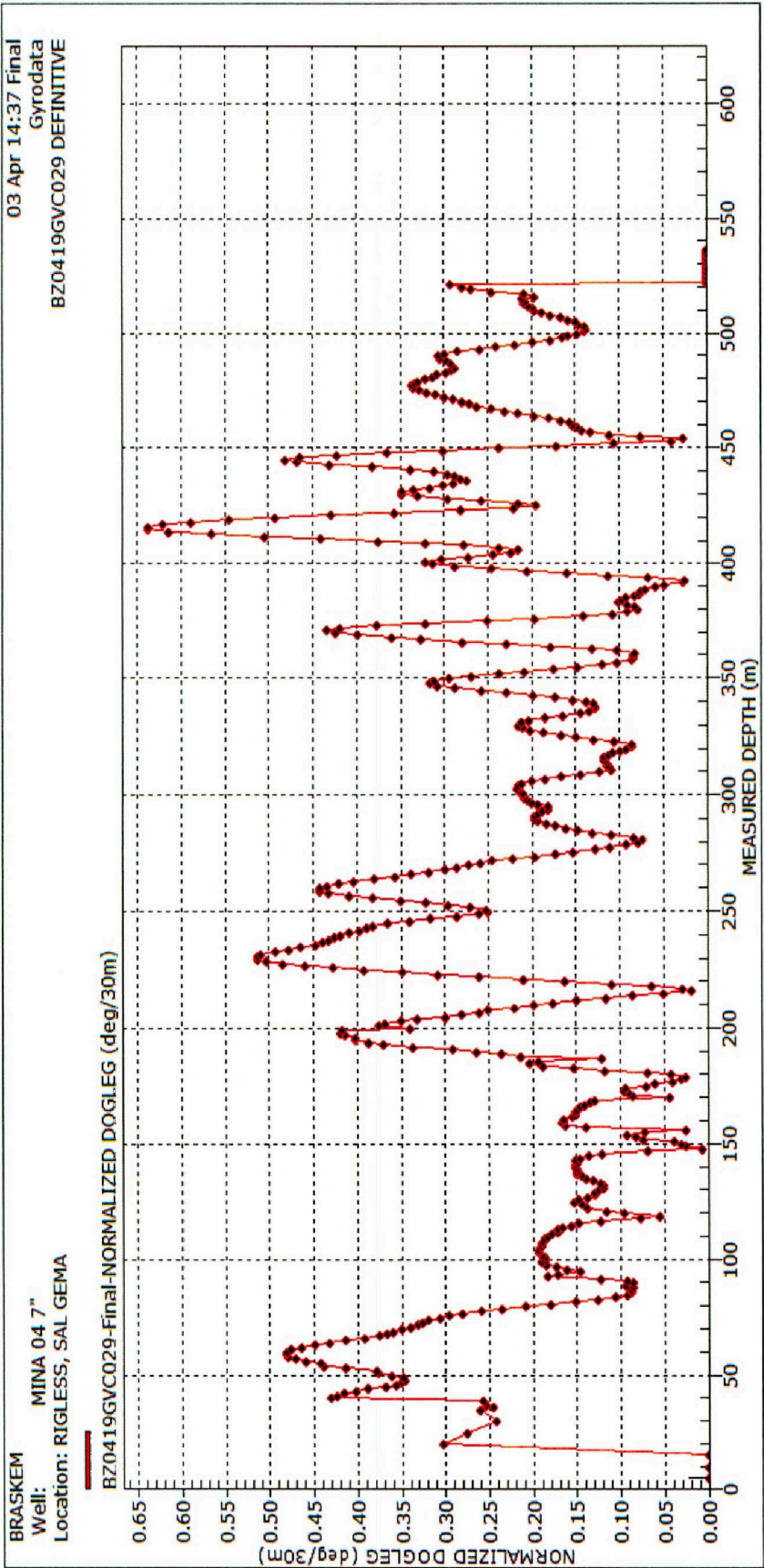
SNP VIAL  
No. 2139  
[Signature]



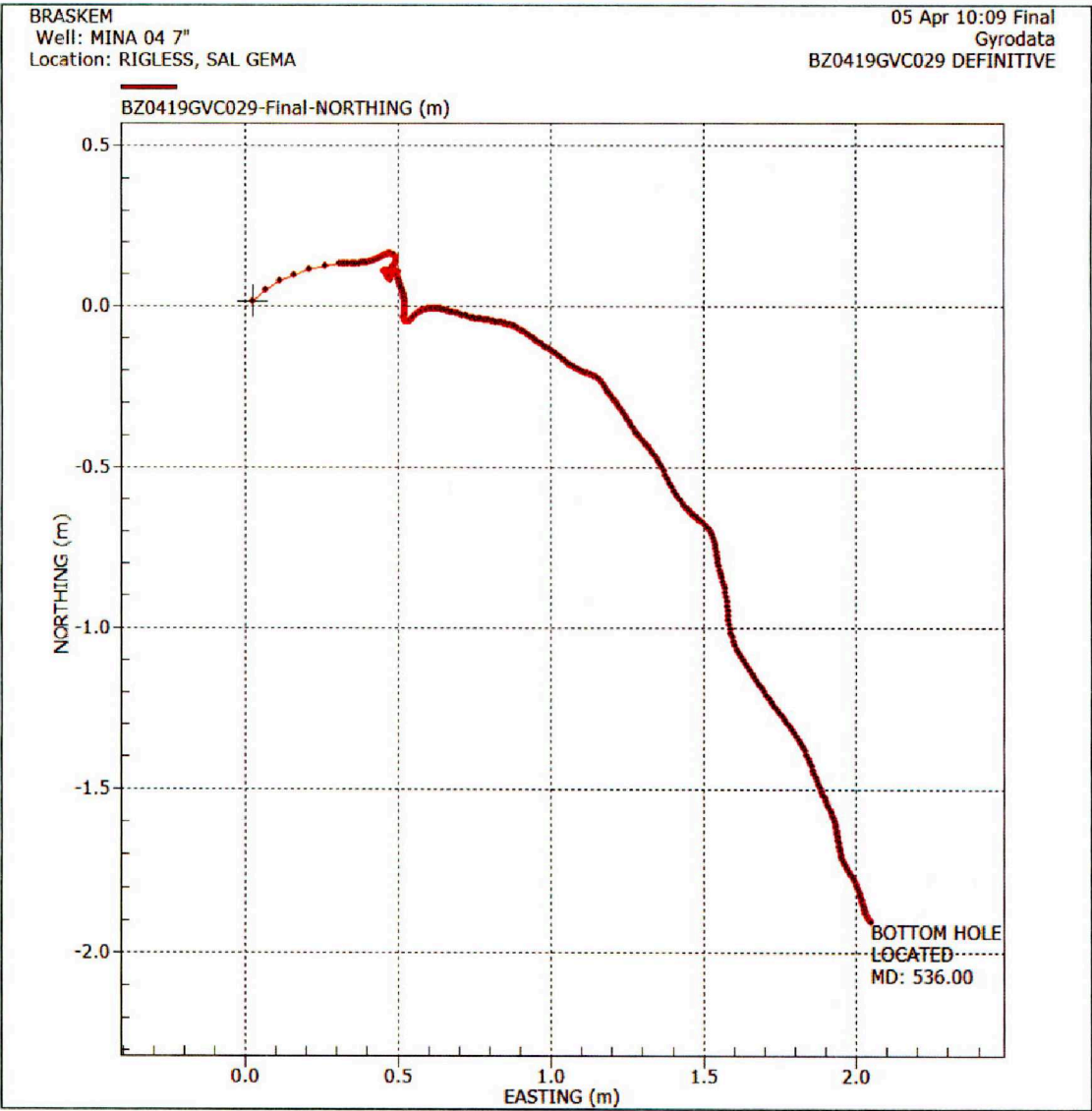


DNP VIAL  
Fig. 7.140  
*[Signature]*











**Braskem**

Campo: Sal Gema


Poço: Mina 35

Gyro Multshot Contínuo

Data da Amostragem: 3 de Abril de 2019

**Número de Trabalho: BZ0419GVC030**



DNPA/AL  
Fls. 7/44  


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A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 0.00                        | 0.00         | 0.00            | 0.00                        | 0.00                            | 0.00 N                              | 0.00 E |
| 5.02                        | 0.64         | 57.29           | 5.02                        | 0.00                            | 0.02 N                              | 0.02 E |
| 10.02                       | 0.65         | 51.02           | 10.02                       | 0.00                            | 0.05 N                              | 0.07 E |
| 15.00                       | 0.60         | 64.27           | 15.00                       | 0.00                            | 0.08 N                              | 0.11 E |
| 20.02                       | 0.53         | 69.93           | 20.02                       | 0.30                            | 0.10 N                              | 0.16 E |
| 25.00                       | 0.66         | 72.65           | 25.00                       | 0.27                            | 0.11 N                              | 0.21 E |
| 30.00                       | 0.58         | 80.53           | 30.00                       | 0.24                            | 0.13 N                              | 0.26 E |
| 35.00                       | 0.54         | 89.78           | 35.00                       | 0.26                            | 0.13 N                              | 0.31 E |
| 36.00                       | 0.53         | 86.39           | 36.00                       | 0.24                            | 0.13 N                              | 0.32 E |
| 37.00                       | 0.52         | 88.77           | 37.00                       | 0.25                            | 0.13 N                              | 0.33 E |
| 38.00                       | 0.53         | 89.09           | 38.00                       | 0.26                            | 0.13 N                              | 0.34 E |
| 39.00                       | 0.53         | 90.48           | 39.00                       | 0.26                            | 0.13 N                              | 0.35 E |
| 40.00                       | 0.49         | 86.56           | 40.00                       | 0.43                            | 0.13 N                              | 0.36 E |
| 41.00                       | 0.48         | 85.55           | 41.00                       | 0.42                            | 0.13 N                              | 0.36 E |
| 42.00                       | 0.46         | 84.66           | 42.00                       | 0.41                            | 0.13 N                              | 0.37 E |
| 43.00                       | 0.44         | 83.10           | 43.00                       | 0.40                            | 0.13 N                              | 0.38 E |
| 44.00                       | 0.42         | 81.74           | 44.00                       | 0.39                            | 0.13 N                              | 0.39 E |
| 45.00                       | 0.41         | 80.89           | 45.00                       | 0.37                            | 0.14 N                              | 0.40 E |
| 46.00                       | 0.38         | 79.54           | 46.00                       | 0.36                            | 0.14 N                              | 0.40 E |
| 47.00                       | 0.36         | 76.86           | 47.00                       | 0.35                            | 0.14 N                              | 0.41 E |
| 48.00                       | 0.34         | 73.93           | 48.00                       | 0.35                            | 0.14 N                              | 0.41 E |
| 49.00                       | 0.32         | 71.36           | 49.00                       | 0.35                            | 0.14 N                              | 0.42 E |
| 50.00                       | 0.30         | 69.25           | 50.00                       | 0.36                            | 0.14 N                              | 0.42 E |
| 51.00                       | 0.28         | 67.19           | 51.00                       | 0.38                            | 0.14 N                              | 0.43 E |
| 52.00                       | 0.26         | 65.55           | 52.00                       | 0.38                            | 0.15 N                              | 0.43 E |
| 53.00                       | 0.25         | 64.43           | 53.00                       | 0.41                            | 0.15 N                              | 0.44 E |
| 54.00                       | 0.24         | 64.20           | 54.00                       | 0.44                            | 0.15 N                              | 0.44 E |
| 55.00                       | 0.24         | 63.72           | 55.00                       | 0.44                            | 0.15 N                              | 0.45 E |
| 56.00                       | 0.23         | 63.22           | 56.00                       | 0.46                            | 0.15 N                              | 0.45 E |
| 57.00                       | 0.22         | 63.06           | 57.00                       | 0.47                            | 0.16 N                              | 0.45 E |
| 58.00                       | 0.22         | 65.74           | 58.00                       | 0.48                            | 0.16 N                              | 0.46 E |
| 59.00                       | 0.22         | 69.54           | 59.00                       | 0.48                            | 0.16 N                              | 0.46 E |
| 60.00                       | 0.22         | 73.18           | 60.00                       | 0.48                            | 0.16 N                              | 0.46 E |
| 61.00                       | 0.21         | 76.99           | 61.00                       | 0.48                            | 0.16 N                              | 0.47 E |
| 62.00                       | 0.21         | 82.66           | 62.00                       | 0.46                            | 0.16 N                              | 0.47 E |
| 63.00                       | 0.20         | 89.07           | 63.00                       | 0.45                            | 0.16 N                              | 0.47 E |



A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 64.00                       | 0.20         | 96.22           | 64.00                       | 0.43                            | 0.16 N                              | 0.48 E |
| 65.00                       | 0.19         | 103.71          | 65.00                       | 0.41                            | 0.16 N                              | 0.48 E |
| 66.00                       | 0.19         | 112.29          | 66.00                       | 0.39                            | 0.16 N                              | 0.48 E |
| 67.00                       | 0.18         | 121.61          | 67.00                       | 0.37                            | 0.16 N                              | 0.49 E |
| 68.00                       | 0.18         | 131.13          | 68.00                       | 0.37                            | 0.16 N                              | 0.49 E |
| 69.00                       | 0.17         | 140.40          | 69.00                       | 0.36                            | 0.15 N                              | 0.49 E |
| 70.00                       | 0.17         | 150.01          | 70.00                       | 0.35                            | 0.15 N                              | 0.49 E |
| 71.00                       | 0.16         | 159.49          | 71.00                       | 0.34                            | 0.15 N                              | 0.49 E |
| 72.00                       | 0.16         | 168.75          | 72.00                       | 0.33                            | 0.15 N                              | 0.49 E |
| 73.00                       | 0.15         | 177.30          | 73.00                       | 0.33                            | 0.14 N                              | 0.50 E |
| 74.00                       | 0.15         | 185.84          | 74.00                       | 0.32                            | 0.14 N                              | 0.50 E |
| 75.00                       | 0.15         | 193.31          | 75.00                       | 0.31                            | 0.14 N                              | 0.49 E |
| 76.00                       | 0.15         | 199.97          | 76.00                       | 0.30                            | 0.14 N                              | 0.49 E |
| 77.00                       | 0.14         | 205.56          | 77.00                       | 0.28                            | 0.13 N                              | 0.49 E |
| 78.00                       | 0.14         | 210.51          | 78.00                       | 0.26                            | 0.13 N                              | 0.49 E |
| 79.00                       | 0.13         | 215.03          | 79.00                       | 0.23                            | 0.13 N                              | 0.49 E |
| 80.00                       | 0.13         | 217.77          | 80.00                       | 0.21                            | 0.13 N                              | 0.49 E |
| 81.00                       | 0.12         | 218.20          | 81.00                       | 0.18                            | 0.13 N                              | 0.49 E |
| 82.00                       | 0.12         | 218.51          | 82.00                       | 0.15                            | 0.13 N                              | 0.49 E |
| 83.00                       | 0.12         | 218.19          | 83.00                       | 0.13                            | 0.12 N                              | 0.49 E |
| 84.00                       | 0.13         | 216.51          | 84.00                       | 0.10                            | 0.12 N                              | 0.48 E |
| 85.00                       | 0.13         | 213.43          | 85.00                       | 0.09                            | 0.12 N                              | 0.48 E |
| 86.00                       | 0.12         | 210.35          | 86.00                       | 0.09                            | 0.12 N                              | 0.48 E |
| 87.00                       | 0.12         | 207.27          | 87.00                       | 0.09                            | 0.12 N                              | 0.48 E |
| 88.00                       | 0.13         | 204.19          | 88.00                       | 0.09                            | 0.11 N                              | 0.48 E |
| 89.00                       | 0.13         | 201.19          | 89.00                       | 0.09                            | 0.11 N                              | 0.48 E |
| 90.00                       | 0.13         | 198.36          | 90.00                       | 0.08                            | 0.11 N                              | 0.48 E |
| 91.00                       | 0.13         | 195.80          | 91.00                       | 0.09                            | 0.11 N                              | 0.48 E |
| 92.00                       | 0.13         | 193.45          | 92.00                       | 0.12                            | 0.11 N                              | 0.48 E |
| 93.00                       | 0.13         | 190.40          | 93.00                       | 0.18                            | 0.10 N                              | 0.48 E |
| 94.00                       | 0.12         | 187.29          | 94.00                       | 0.17                            | 0.10 N                              | 0.48 E |
| 95.00                       | 0.12         | 184.51          | 95.00                       | 0.15                            | 0.10 N                              | 0.48 E |
| 96.00                       | 0.11         | 181.52          | 96.00                       | 0.16                            | 0.10 N                              | 0.48 E |
| 97.00                       | 0.11         | 178.06          | 97.00                       | 0.17                            | 0.10 N                              | 0.48 E |
| 98.00                       | 0.10         | 174.59          | 98.00                       | 0.18                            | 0.09 N                              | 0.48 E |
| 99.00                       | 0.09         | 172.07          | 99.00                       | 0.19                            | 0.09 N                              | 0.48 E |

ORIGINAL  
Fis. 7.121  
[Signature]

A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 100.00                      | 0.09         | 172.55          | 100.00                      | 0.19                            | 0.09 N                              | 0.48 E |
| 101.00                      | 0.08         | 175.39          | 101.00                      | 0.19                            | 0.09 N                              | 0.48 E |
| 102.00                      | 0.07         | 181.91          | 102.00                      | 0.19                            | 0.09 N                              | 0.48 E |
| 103.00                      | 0.07         | 174.28          | 103.00                      | 0.19                            | 0.09 N                              | 0.48 E |
| 104.00                      | 0.06         | 164.57          | 104.00                      | 0.19                            | 0.09 N                              | 0.48 E |
| 105.00                      | 0.06         | 199.13          | 105.00                      | 0.19                            | 0.08 N                              | 0.48 E |
| 106.00                      | 0.07         | 225.00          | 106.00                      | 0.19                            | 0.08 N                              | 0.48 E |
| 107.00                      | 0.07         | 264.32          | 107.00                      | 0.19                            | 0.08 N                              | 0.47 E |
| 108.00                      | 0.07         | 326.76          | 108.00                      | 0.19                            | 0.08 N                              | 0.47 E |
| 109.00                      | 0.08         | 321.19          | 109.00                      | 0.19                            | 0.08 N                              | 0.47 E |
| 110.00                      | 0.08         | 303.01          | 110.00                      | 0.18                            | 0.09 N                              | 0.47 E |
| 111.00                      | 0.09         | 316.12          | 111.00                      | 0.18                            | 0.09 N                              | 0.47 E |
| 112.00                      | 0.09         | 326.78          | 112.00                      | 0.17                            | 0.09 N                              | 0.47 E |
| 113.00                      | 0.09         | 332.92          | 113.00                      | 0.17                            | 0.09 N                              | 0.47 E |
| 114.00                      | 0.10         | 332.30          | 114.00                      | 0.17                            | 0.09 N                              | 0.47 E |
| 115.00                      | 0.09         | 330.55          | 115.00                      | 0.16                            | 0.09 N                              | 0.47 E |
| 116.00                      | 0.09         | 330.17          | 116.00                      | 0.15                            | 0.09 N                              | 0.47 E |
| 117.00                      | 0.09         | 330.49          | 117.00                      | 0.12                            | 0.09 N                              | 0.47 E |
| 118.00                      | 0.09         | 330.87          | 118.00                      | 0.08                            | 0.10 N                              | 0.47 E |
| 119.00                      | 0.09         | 329.66          | 119.00                      | 0.05                            | 0.10 N                              | 0.46 E |
| 120.00                      | 0.08         | 326.83          | 120.00                      | 0.09                            | 0.10 N                              | 0.46 E |
| 121.00                      | 0.08         | 324.73          | 121.00                      | 0.12                            | 0.10 N                              | 0.46 E |
| 122.00                      | 0.08         | 323.31          | 122.00                      | 0.14                            | 0.10 N                              | 0.46 E |
| 123.00                      | 0.08         | 322.04          | 123.00                      | 0.14                            | 0.10 N                              | 0.46 E |
| 124.00                      | 0.08         | 322.13          | 124.00                      | 0.14                            | 0.10 N                              | 0.46 E |
| 125.00                      | 0.08         | 318.50          | 125.00                      | 0.15                            | 0.10 N                              | 0.46 E |
| 126.00                      | 0.08         | 315.00          | 126.00                      | 0.15                            | 0.11 N                              | 0.46 E |
| 127.00                      | 0.08         | 315.00          | 127.00                      | 0.14                            | 0.11 N                              | 0.46 E |
| 128.00                      | 0.08         | 325.35          | 128.00                      | 0.13                            | 0.11 N                              | 0.46 E |
| 129.00                      | 0.07         | 345.34          | 129.00                      | 0.13                            | 0.11 N                              | 0.46 E |
| 130.00                      | 0.07         | 358.49          | 130.00                      | 0.12                            | 0.11 N                              | 0.46 E |
| 131.00                      | 0.07         | 14.42           | 131.00                      | 0.12                            | 0.11 N                              | 0.46 E |
| 132.00                      | 0.07         | 62.53           | 132.00                      | 0.12                            | 0.11 N                              | 0.46 E |
| 133.00                      | 0.07         | 105.70          | 133.00                      | 0.12                            | 0.11 N                              | 0.46 E |
| 134.00                      | 0.07         | 116.57          | 134.00                      | 0.13                            | 0.11 N                              | 0.46 E |
| 135.00                      | 0.07         | 110.58          | 135.00                      | 0.14                            | 0.11 N                              | 0.46 E |



DNP/VAL  
Fis. 7122  
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A Gyrodata Directional Survey

BRASKEM  
Well: Mina 04, 7"  
Location: RIGLESS, SAL GEMA  
Job Number: BZ0419GVC029

| MEASURED<br>DEPTH<br>meters | INCL<br>deg. | AZIMUTH<br>deg. | VERTICAL<br>DEPTH<br>meters | NORMALIZED<br>DOGLEG<br>deg/30m | HORIZONTAL<br>COORDINATES<br>meters |        |
|-----------------------------|--------------|-----------------|-----------------------------|---------------------------------|-------------------------------------|--------|
| 136.00                      | 0.07         | 110.10          | 136.00                      | 0.14                            | 0.11 N                              | 0.46 E |
| 137.00                      | 0.07         | 112.94          | 137.00                      | 0.15                            | 0.11 N                              | 0.46 E |
| 138.00                      | 0.07         | 110.79          | 138.00                      | 0.15                            | 0.11 N                              | 0.46 E |
| 139.00                      | 0.07         | 103.72          | 139.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 140.00                      | 0.08         | 94.22           | 140.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 141.00                      | 0.08         | 85.38           | 141.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 142.00                      | 0.08         | 78.23           | 142.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 143.00                      | 0.08         | 71.69           | 143.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 144.00                      | 0.08         | 68.60           | 144.00                      | 0.15                            | 0.11 N                              | 0.47 E |
| 145.00                      | 0.07         | 66.16           | 145.00                      | 0.14                            | 0.11 N                              | 0.47 E |
| 146.00                      | 0.07         | 64.04           | 146.00                      | 0.12                            | 0.11 N                              | 0.47 E |
| 147.00                      | 0.07         | 66.72           | 147.00                      | 0.07                            | 0.11 N                              | 0.47 E |
| 148.00                      | 0.06         | 74.47           | 148.00                      | 0.01                            | 0.11 N                              | 0.48 E |
| 149.00                      | 0.07         | 83.70           | 149.00                      | 0.02                            | 0.11 N                              | 0.48 E |
| 150.00                      | 0.07         | 94.55           | 150.00                      | 0.03                            | 0.11 N                              | 0.48 E |
| 151.00                      | 0.07         | 106.84          | 151.00                      | 0.04                            | 0.11 N                              | 0.48 E |
| 152.00                      | 0.07         | 116.97          | 152.00                      | 0.07                            | 0.11 N                              | 0.48 E |
| 153.00                      | 0.07         | 127.16          | 153.00                      | 0.08                            | 0.11 N                              | 0.48 E |
| 154.00                      | 0.07         | 135.50          | 154.00                      | 0.09                            | 0.11 N                              | 0.48 E |
| 155.00                      | 0.07         | 140.89          | 155.00                      | 0.07                            | 0.11 N                              | 0.48 E |
| 156.00                      | 0.07         | 140.95          | 156.00                      | 0.02                            | 0.11 N                              | 0.48 E |
| 157.00                      | 0.07         | 141.72          | 157.00                      | 0.14                            | 0.11 N                              | 0.49 E |
| 158.00                      | 0.08         | 147.24          | 158.00                      | 0.16                            | 0.11 N                              | 0.49 E |
| 159.00                      | 0.08         | 144.18          | 159.00                      | 0.16                            | 0.10 N                              | 0.49 E |
| 160.00                      | 0.08         | 136.38          | 160.00                      | 0.16                            | 0.10 N                              | 0.49 E |
| 161.00                      | 0.08         | 128.15          | 161.00                      | 0.16                            | 0.10 N                              | 0.49 E |
| 162.00                      | 0.07         | 119.13          | 162.00                      | 0.15                            | 0.10 N                              | 0.49 E |
| 163.00                      | 0.07         | 110.02          | 163.00                      | 0.15                            | 0.10 N                              | 0.49 E |
| 164.00                      | 0.07         | 97.13           | 164.00                      | 0.15                            | 0.10 N                              | 0.49 E |
| 165.00                      | 0.07         | 86.94           | 165.00                      | 0.15                            | 0.10 N                              | 0.49 E |
| 166.00                      | 0.07         | 79.28           | 166.00                      | 0.15                            | 0.10 N                              | 0.49 E |
| 167.00                      | 0.07         | 51.79           | 167.00                      | 0.14                            | 0.10 N                              | 0.50 E |
| 168.00                      | 0.08         | 45.00           | 168.00                      | 0.13                            | 0.10 N                              | 0.50 E |
| 169.00                      | 0.08         | 30.17           | 169.00                      | 0.13                            | 0.10 N                              | 0.50 E |
| 170.00                      | 0.08         | 41.50           | 170.00                      | 0.04                            | 0.10 N                              | 0.50 E |
| 171.00                      | 0.08         | 68.63           | 171.00                      | 0.09                            | 0.11 N                              | 0.50 E |