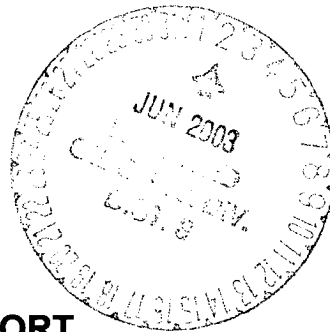




6501 S. Fiddler's Green Circle, Suite 400  
Greenwood Village, CO 80111  
(303) 486-3200



## SUB-SURFACE SURVEY CERTIFICATION REPORT

BP America Inc.

Company

May 28, 2003

Date

30-045-31379

Lease

Mudge LS 16M

Well Name

San Juan Co., New Mexico

County/State

Survey Depths

545

to

3099 ft

Type of Survey

Measurment While Drilling Surveys

Survey Depths

ft

Type of Survey

Survey Depths

to

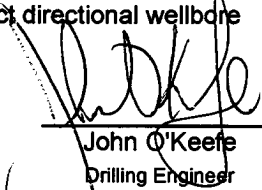
ft

Type of Survey

Site Supervisor

B. Richardson

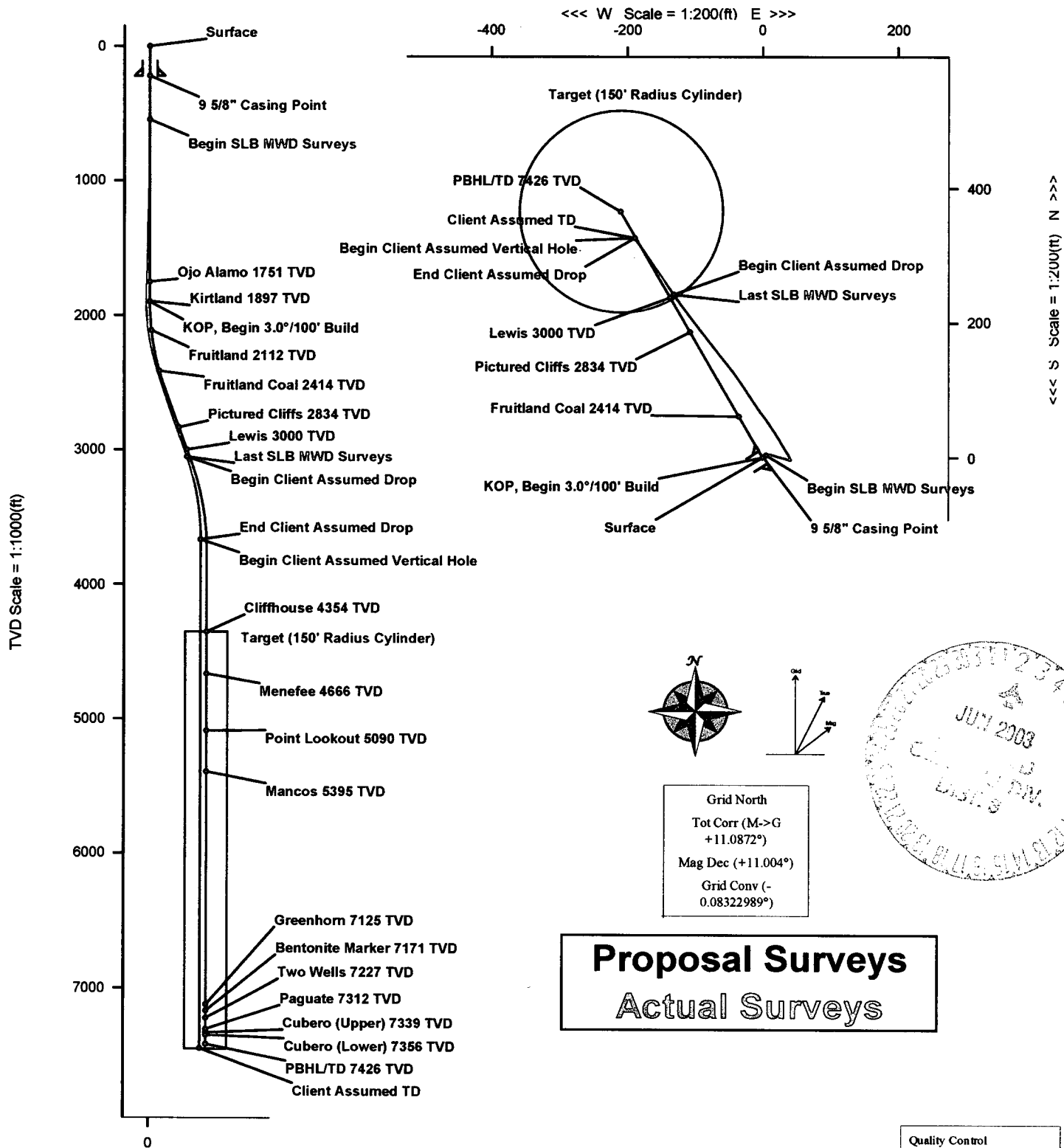
The data submitted in this report conforms to the standards and procedures as set forth by Schlumberger. This report represents a true and correct directional wellbore survey based on original survey data obtained at the well site.

  
John O'Keefe  
Drilling Engineer

This document has been subscribed and affirmed, or sworn before me in the county of Arapahoe in the state of Colorado, this 28th day of May, 2003.

Christine J. Wilson My commision expires: 12-12-05

| Well                |           |                |            | Field                              |               |           |                | Rig                        |                |                  |              |
|---------------------|-----------|----------------|------------|------------------------------------|---------------|-----------|----------------|----------------------------|----------------|------------------|--------------|
| <b>Mudge LS 16M</b> |           |                |            | <b>San Juan County, New Mexico</b> |               |           |                | <b>AWS 184</b>             |                |                  |              |
| Magnetic Parameters |           |                |            | Surface Location                   |               |           |                | Miscellaneous              |                |                  |              |
| Model               | BQGM 2002 | Dip            | 63.754°    | Date                               | April 9, 2003 | Latitude  | N36 54 40.100  | North                      | 2151010.08 BUS | Grid Convergence | -0.08322989° |
| Mag Dec             | +11.004°  | Field Strength | 51853.8 nT |                                    |               | Longitude | W107 56 18.900 | East                       | 2682577.15 BUS | Scale Factor     | 0.9999190000 |
|                     |           |                |            |                                    |               |           |                | Well Plan                  |                |                  |              |
|                     |           |                |            |                                    |               |           |                | Mudge LS 16M               |                |                  |              |
|                     |           |                |            |                                    |               |           |                | Rev2 jw 10-Mar-03          |                |                  |              |
|                     |           |                |            |                                    |               |           |                | TVD Reference              |                |                  |              |
|                     |           |                |            |                                    |               |           |                | RKB (6165.00 ft above MSL) |                |                  |              |
|                     |           |                |            |                                    |               |           |                | Survey Date                |                |                  |              |
|                     |           |                |            |                                    |               |           |                | May 28, 2003               |                |                  |              |



Vertical Section (ft) Azim = 330.09°, Scale = 1:1000 Origin = 0 N/-S, 0 E/-V

Quality Control  
 Date Drawn: Wed 09:52 AM  
 May 28, 2003  
 Drawn by: Jim Wimberg  
 Checked by: John O'Keefe  
 Client OK:

# Schlumberger

## Mudge LS 16M Final Surveys Report



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Date:</b> May 28, 2003<br><b>Client:</b> BP America Inc.<br><b>Field:</b> NM, San Juan County (NAD 83 WZ)<br><b>Structure / Slot:</b> BP 10-31N-11W (Mudge LS 16M) No Certified Plat - Have Lat-Long) / Mudge LS 16M<br><b>Well:</b> Mudge LS 16M<br><b>Borehole:</b> Original Hole<br><b>UWI/API#:</b><br><b>Survey Name / Date:</b> Mudge LS 16M Final Surveys / April 9, 2003<br><b>Tort / AHD / DDI / ERO ratio:</b> 47.932° / 446.33 ft / 4.334 / 0.06C<br><b>Grid Coordinate System:</b> NAD83 New Mexico State Planes, Western Zone, US Feet<br><b>Location Lat/Long:</b> N 36 54 40.100, W 107 58 18.90C<br><b>Location Grid N/E Y/X:</b> N 2151010.981 ftUS, E 2682577.153 ftUS<br><b>Grid Convergence Angle:</b> -0.08322989°<br><b>Grid Scale Factor:</b> 0.99991854 | <b>Survey / DLS Computation Method:</b> Minimum Curvature / Lubinski<br><b>Vertical Section Azimuth:</b> 330.090°<br><b>Vertical Section Origin:</b> N 0.000 ft, E 0.000 ft<br><b>TVD Reference Datum:</b> RKB<br><b>TVD Reference Elevation:</b> 6165.0 ft relative to MSL<br><b>Sea Bed / Ground Level Elevation:</b> 6151.000 ft relative to MSL<br><b>Magnetic Declination:</b> 11.004°<br><b>Total Field Strength:</b> 51653.800 nT<br><b>Magnetic Dip:</b> 63.754°<br><b>Declination Date:</b> April 09, 2003<br><b>Magnetic Declination Model:</b> BGGM 2002<br><b>North Reference:</b> Grid North<br><b>Total Cor Mag North -&gt; Grid North:</b> +11.087°<br><b>Local Coordinates Referenced To:</b> Well Head |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Comments              | Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | TVD (ft) | Vertical Section (ft) | NS (ft) | EW (ft) | DLS (deg/100 ft) | Northing (ftUS) | Easting (ftUS) | Latitude       | Longitude       |
|-----------------------|---------------------|-------------------|---------------|----------|-----------------------|---------|---------|------------------|-----------------|----------------|----------------|-----------------|
| Surface               | 0.00                | 0.00              | 57.75         | 0.00     | 0.00                  | 0.00    | 0.00    | 0.00             | 2151010.98      | 2682577.15     | N 36 54 40.100 | W 107 58 18.900 |
| Begin SLB MWD Surveys | 545.00              | 1.27              | 57.75         | 544.96   | 0.25                  | 3.22    | 5.11    | 0.23             | 2151014.20      | 2682582.26     | N 36 54 40.132 | W 107 58 18.837 |
|                       | 862.00              | 1.20              | 100.25        | 861.89   | -1.75                 | 4.51    | 11.35   | 0.28             | 2151015.49      | 2682588.50     | N 36 54 40.145 | W 107 58 18.760 |
|                       | 1179.00             | 1.42              | 109.25        | 1178.81  | -6.86                 | 2.62    | 18.32   | 0.09             | 2151013.60      | 2682595.47     | N 36 54 40.126 | W 107 58 18.674 |
|                       | 1495.00             | 1.90              | 103.38        | 1494.67  | -13.42                | 0.12    | 27.11   | 0.16             | 2151011.10      | 2682604.26     | N 36 54 40.102 | W 107 58 18.566 |
|                       | 1851.00             | 2.05              | 111.13        | 1850.46  | -22.42                | -3.54   | 38.79   | 0.09             | 2151007.44      | 2682615.94     | N 36 54 40.066 | W 107 58 18.422 |
|                       | 1893.00             | 2.08              | 106.90        | 1882.44  | -23.28                | -3.92   | 39.88   | 0.49             | 2151007.06      | 2682617.03     | N 36 54 40.062 | W 107 58 18.409 |
|                       | 1915.00             | 1.52              | 73.70         | 1914.43  | -23.81                | -3.97   | 40.85   | 3.62             | 2151007.01      | 2682618.00     | N 36 54 40.061 | W 107 58 18.397 |
|                       | 1947.00             | 1.73              | 5.25          | 1946.42  | -23.51                | -3.37   | 41.30   | 5.74             | 2151007.61      | 2682618.45     | N 36 54 40.067 | W 107 58 18.391 |
|                       | 1979.00             | 3.10              | 334.90        | 1978.39  | -22.25                | -2.10   | 40.98   | 5.72             | 2151008.88      | 2682618.12     | N 36 54 40.080 | W 107 58 18.395 |
|                       | 2011.00             | 4.25              | 332.40        | 2010.32  | -20.21                | -0.27   | 40.06   | 3.63             | 2151010.71      | 2682617.21     | N 36 54 40.098 | W 107 58 18.407 |
|                       | 2042.00             | 5.50              | 332.35        | 2041.21  | -17.58                | 2.07    | 38.84   | 4.03             | 2151013.05      | 2682615.99     | N 36 54 40.121 | W 107 58 18.422 |
|                       | 2074.00             | 6.75              | 330.10        | 2073.02  | -14.16                | 5.05    | 37.19   | 3.98             | 2151016.03      | 2682614.34     | N 36 54 40.151 | W 107 58 18.442 |
|                       | 2106.00             | 7.82              | 326.65        | 2104.77  | -10.11                | 8.50    | 35.05   | 3.61             | 2151019.48      | 2682612.20     | N 36 54 40.185 | W 107 58 18.469 |
|                       | 2138.00             | 8.65              | 328.33        | 2136.44  | -5.53                 | 12.37   | 32.59   | 2.70             | 2151023.35      | 2682609.74     | N 36 54 40.223 | W 107 58 18.499 |
|                       | 2170.00             | 9.55              | 330.23        | 2168.03  | -0.47                 | 16.72   | 30.01   | 2.96             | 2151027.70      | 2682607.16     | N 36 54 40.266 | W 107 58 18.531 |

|         |       |        |         |        |        |         |      |            |            |                |                 |
|---------|-------|--------|---------|--------|--------|---------|------|------------|------------|----------------|-----------------|
| 2202.00 | 10.70 | 330.50 | 2199.53 | 5.16   | 21.61  | 27.23   | 3.60 | 2151032.59 | 2682604.38 | N 36 54 40.314 | W 107 58 18.565 |
| 2233.00 | 11.95 | 328.77 | 2229.93 | 11.24  | 26.86  | 24.15   | 4.18 | 2151037.84 | 2682601.30 | N 36 54 40.366 | W 107 58 18.603 |
| 2265.00 | 12.88 | 327.77 | 2261.18 | 18.12  | 32.71  | 20.53   | 2.98 | 2151043.69 | 2682597.68 | N 36 54 40.424 | W 107 58 18.648 |
| 2297.00 | 13.73 | 327.15 | 2292.32 | 25.47  | 38.92  | 16.57   | 2.69 | 2151049.90 | 2682593.72 | N 36 54 40.485 | W 107 58 18.697 |
| 2329.00 | 14.70 | 326.55 | 2323.34 | 33.32  | 45.50  | 12.27   | 3.07 | 2151056.47 | 2682589.42 | N 36 54 40.550 | W 107 58 18.750 |
| 2361.00 | 15.38 | 325.40 | 2354.25 | 41.60  | 52.38  | 7.62    | 2.32 | 2151063.35 | 2682584.77 | N 36 54 40.618 | W 107 58 18.807 |
| 2393.00 | 15.93 | 324.20 | 2385.06 | 50.20  | 59.43  | 2.64    | 1.99 | 2151070.41 | 2682579.80 | N 36 54 40.688 | W 107 58 18.869 |
| 2425.00 | 16.50 | 324.00 | 2415.79 | 59.09  | 66.67  | -2.60   | 1.79 | 2151077.65 | 2682574.56 | N 36 54 40.759 | W 107 58 18.933 |
| 2457.00 | 17.30 | 325.20 | 2446.40 | 68.34  | 74.25  | -7.98   | 2.73 | 2151085.23 | 2682569.17 | N 36 54 40.834 | W 107 58 19.000 |
| 2489.00 | 18.20 | 326.55 | 2476.88 | 78.07  | 82.33  | -13.45  | 3.09 | 2151093.31 | 2682563.70 | N 36 54 40.914 | W 107 58 19.067 |
| 2553.00 | 18.10 | 326.77 | 2537.70 | 97.97  | 98.99  | -24.41  | 0.19 | 2151109.96 | 2682552.74 | N 36 54 41.078 | W 107 58 19.202 |
| 2585.00 | 17.95 | 326.25 | 2568.13 | 107.86 | 107.24 | -29.87  | 0.69 | 2151118.22 | 2682547.28 | N 36 54 41.160 | W 107 58 19.270 |
| 2616.00 | 18.17 | 325.73 | 2597.60 | 117.44 | 115.21 | -35.25  | 0.88 | 2151126.18 | 2682541.91 | N 36 54 41.239 | W 107 58 19.336 |
| 2648.00 | 18.33 | 324.10 | 2627.99 | 127.42 | 123.41 | -41.01  | 1.67 | 2151134.38 | 2682536.15 | N 36 54 41.320 | W 107 58 19.407 |
| 2680.00 | 18.52 | 322.45 | 2658.35 | 137.46 | 131.51 | -47.06  | 1.73 | 2151142.48 | 2682530.10 | N 36 54 41.400 | W 107 58 19.482 |
| 2712.00 | 18.88 | 321.60 | 2688.66 | 147.62 | 139.60 | -53.37  | 1.41 | 2151150.57 | 2682523.79 | N 36 54 41.480 | W 107 58 19.560 |
| 2744.00 | 19.23 | 321.45 | 2718.91 | 157.95 | 147.78 | -59.87  | 1.10 | 2151158.75 | 2682517.29 | N 36 54 41.560 | W 107 58 19.640 |
| 2766.00 | 19.05 | 321.75 | 2739.69 | 165.09 | 153.43 | -64.35  | 0.93 | 2151164.40 | 2682512.81 | N 36 54 41.616 | W 107 58 19.695 |
| 2840.00 | 19.85 | 322.25 | 2809.47 | 189.48 | 172.85 | -79.52  | 1.10 | 2151183.82 | 2682497.64 | N 36 54 41.808 | W 107 58 19.882 |
| 2904.00 | 19.70 | 322.17 | 2869.69 | 210.93 | 189.96 | -92.79  | 0.24 | 2151200.93 | 2682484.37 | N 36 54 41.977 | W 107 58 20.046 |
| 2968.00 | 19.65 | 322.88 | 2929.96 | 232.29 | 207.06 | -105.90 | 0.38 | 2151218.03 | 2682471.26 | N 36 54 42.146 | W 107 58 20.208 |
| 3032.00 | 19.50 | 323.83 | 2990.26 | 253.58 | 224.27 | -118.70 | 0.55 | 2151235.23 | 2682458.47 | N 36 54 42.316 | W 107 58 20.366 |
| 3099.00 | 18.77 | 325.48 | 3053.55 | 275.44 | 242.18 | -131.40 | 1.36 | 2151253.14 | 2682445.76 | N 36 54 42.493 | W 107 58 20.522 |
| 3099.47 | 18.76 | 325.48 | 3054.00 | 275.59 | 242.30 | -131.49 | 2.13 | 2151253.26 | 2682445.67 | N 36 54 42.494 | W 107 58 20.523 |
| 3724.67 | 0.00  | 325.48 | 3668.09 | 376.71 | 325.88 | -188.98 | 3.00 | 2151336.84 | 2682388.19 | N 36 54 43.319 | W 107 58 21.233 |
| 3725.58 | 0.00  | 325.48 | 3669.00 | 376.71 | 325.88 | -188.98 | 0.00 | 2151336.84 | 2682388.19 | N 36 54 43.319 | W 107 58 21.233 |
| 7514.58 | 0.00  | 325.48 | 7458.00 | 376.71 | 325.88 | -188.98 | 0.00 | 2151336.84 | 2682388.19 | N 36 54 43.319 | W 107 58 21.233 |

Survey Type: Raw Survey

Survey Error Model: SLB ISCWSA 3-D 95.00% Confidence 2.7955 sigma

Surveying Prog:

MD From ( ft )

MD To ( ft ) EOU Freq Survey Tool Type

0.00  
545.00  
3099.00

545.00 Act-Stns SLB\_BLIND  
3099.00 Act-Stns SLB\_MWD-STD  
7514.58 Act-Stns SLB\_BLIND

*\*Italicized stations are NOT used in position calculations.*