

Schlumberger

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



SUB-SURFACE SURVEY CERTIFICATION REPORT

30-045-30758

Surface 1320/S 2180/E
BITL 2002/S 875/E
12B

BP America Inc.

Company

March 4, 2003

Date

Lease

Mudge B 12B
Well Name

San Juan Co., NM
County/State

Survey Depths

269 to 3518 ft

Type of Survey

Measurements While Drilling (MWD)

Survey Depths

ft

Type of Survey

Survey Depths

to

ft

Type of Survey

Site Supervisor

Greg Johnson

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.

A. Allen Starkey
Account Manager

This document has been subscribed and affirmed, or sworn before me in the county of Arapahoe in the state of Colorado, this 7th day of March 20 03.

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

Survey Report - Geodetic

Report Date: 06-Mar-2003 Client: BP America Inc. Field: NM, San Juan County (NAD 83 WZ) Structure / Slot: BP 17 31N 11W (Mudge B 19M) / Mudge B 19M Well: Mudge B 19M Borehole: Original Hole UWI/AP#: Survey Name / Date: Mudge B 19M Final Surveys / March 4, 2003 Tort / AHD / DDI / ERD ratio: 79.406° / 1473.12 ft / 5.086 / 0.197 Grid Coordinate System: NAD83 New Mexico State Planes, Western Zone, US Feet Location Lat/Long: N 36 53 42.432, W 108 0 42.12C Location Grid NE YX: N 2145198.411 ftUS, E 2670935.678 ftUS Grid Convergence Angle: -0.10708303° Grid Scale Factor: 0.99991978		Survey / DLS Computation Method: Minimum Curvature / Lubinski Vertical Section Azimuth: 62.410° Vertical Section Origin: N 0.000 ft, E 0.000 ft TVD Reference Datum: RKB TVD Reference Elevation: 6331.000 ft relative to MSL Sea Bed / Ground Level Elevation: 6317.000 ft relative to MSL Magnetic Declination: +11.018° Total Field Strength: 51532.141 nT Magnetic Dip: 63.735° Declination Date: March 04, 2003 Magnetic Declination Model: BGGM 2002 North Reference: True North Total Corr Mag North -> True North: +11.018° Local Coordinates Referenced To: Well Head	
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Station ID	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	VSec (ft)	N-S (ft)	E-W (ft)	DLS (%/100ft)	Grid Coordinates			Geographic Coordinates	
									Northing (ftUS)	Easting (ftUS)		Latitude	Longitude
Surface	0.00	0.00	71.21	0.00	0.00	0.00	0.00	0.00	2145198.41	2670935.68		N 36 53 42.432	W 108 0 42.120
Begin SLB MWD Surveys	269.00	0.43	71.21	269.00	1.00	0.33	0.96	0.16	2145198.73	2670936.63		N 36 53 42.435	W 108 0 42.108
	300.00	0.80	73.26	300.00	1.33	0.42	1.27	1.20	2145198.83	2670936.95		N 36 53 42.436	W 108 0 42.104
	331.00	1.40	72.94	330.99	1.91	0.60	1.84	1.94	2145199.01	2670937.52		N 36 53 42.438	W 108 0 42.097
	363.00	1.70	54.74	362.98	2.76	0.99	2.60	1.79	2145199.39	2670938.28		N 36 53 42.442	W 108 0 42.088
	395.00	2.17	60.04	394.96	3.84	1.56	3.52	1.57	2145199.97	2670939.20		N 36 53 42.447	W 108 0 42.077
	427.00	3.13	54.94	426.93	5.31	2.37	4.76	3.09	2145200.77	2670940.44		N 36 53 42.455	W 108 0 42.061
	458.00	4.25	57.87	457.86	7.30	3.47	6.42	3.66	2145201.86	2670942.11		N 36 53 42.466	W 108 0 42.041
	490.00	4.68	57.21	489.76	9.78	4.80	8.52	1.35	2145203.20	2670944.21		N 36 53 42.479	W 108 0 42.015
	520.00	5.70	57.76	519.64	12.48	6.26	10.81	3.40	2145204.65	2670946.50		N 36 53 42.494	W 108 0 41.987
	552.00	6.20	60.71	551.47	15.79	7.95	13.66	1.83	2145206.34	2670949.36		N 36 53 42.511	W 108 0 41.952
	584.00	7.05	59.34	583.25	19.48	9.80	16.86	2.70	2145208.18	2670952.55		N 36 53 42.529	W 108 0 41.912
	616.00	7.78	63.39	614.99	23.61	11.77	20.49	2.80	2145210.14	2670956.18		N 36 53 42.548	W 108 0 41.868
	648.00	8.70	62.34	646.66	28.19	13.87	24.57	2.91	2145212.23	2670960.27		N 36 53 42.569	W 108 0 41.818
	679.00	9.38	65.07	677.27	33.06	16.02	28.93	2.59	2145214.37	2670964.64		N 36 53 42.590	W 108 0 41.764
	710.00	10.55	64.62	707.80	38.42	18.30	33.79	3.78	2145216.65	2670969.50		N 36 53 42.613	W 108 0 41.704
	742.00	11.35	65.79	739.22	44.49	20.85	39.31	2.59	2145219.18	2670975.02		N 36 53 42.638	W 108 0 41.636
	774.00	11.98	64.07	770.56	50.96	23.59	45.17	2.25	2145221.92	2670980.88		N 36 53 42.665	W 108 0 41.564

805.00	12.63	65.37	800.85	57.56	26.41	51.14	2.28	2145224.72	2670986.86	N 36 53 42.693	W 108 0 41.490
837.00	13.70	64.14	832.00	64.84	29.52	57.73	3.46	2145227.82	2670993.46	N 36 53 42.724	W 108 0 41.409
868.00	14.77	63.19	862.05	72.46	32.90	64.56	3.53	2145231.19	2671000.29	N 36 53 42.757	W 108 0 41.325
900.00	15.43	63.89	892.95	80.79	36.62	72.02	2.14	2145234.89	2671007.76	N 36 53 42.794	W 108 0 41.233
931.00	16.20	62.82	922.77	89.24	40.41	79.57	2.66	2145238.67	2671015.32	N 36 53 42.832	W 108 0 41.140
963.00	17.17	62.94	953.43	98.43	44.60	87.75	3.03	2145242.84	2671023.51	N 36 53 42.873	W 108 0 41.040
993.00	18.15	61.84	982.01	107.53	48.82	95.81	3.45	2145247.04	2671031.58	N 36 53 42.915	W 108 0 40.940
1025.00	19.23	61.19	1012.32	117.78	53.71	104.83	3.44	2145251.92	2671040.60	N 36 53 42.963	W 108 0 40.830
1057.00	20.52	60.39	1042.42	128.65	59.02	114.32	4.12	2145257.21	2671050.10	N 36 53 43.016	W 108 0 40.713
1088.00	21.75	59.89	1071.33	139.82	64.58	124.01	4.01	2145262.76	2671059.80	N 36 53 43.071	W 108 0 40.593
1119.00	22.75	60.99	1100.02	151.55	70.37	134.22	3.49	2145268.53	2671070.02	N 36 53 43.128	W 108 0 40.468
1151.00	23.75	61.07	1129.42	164.18	76.49	145.28	3.13	2145274.62	2671081.08	N 36 53 43.188	W 108 0 40.332
1182.00	24.63	60.57	1157.70	176.88	82.69	156.37	2.91	2145280.80	2671092.18	N 36 53 43.250	W 108 0 40.195
1246.00	26.05	60.82	1215.54	204.26	96.09	180.25	2.23	2145294.16	2671116.09	N 36 53 43.382	W 108 0 39.901
1309.00	26.63	63.04	1272.00	232.20	109.24	204.91	1.81	2145307.26	2671140.78	N 36 53 43.512	W 108 0 39.597
1402.00	26.77	62.69	1355.09	273.99	128.30	242.10	0.23	2145326.24	2671178.00	N 36 53 43.701	W 108 0 39.140
1498.00	26.76	62.72	1440.80	317.22	148.12	280.52	0.02	2145345.99	2671216.45	N 36 53 43.897	W 108 0 38.667
1593.00	27.23	63.07	1525.45	360.34	167.77	318.91	0.52	2145365.57	2671254.87	N 36 53 44.091	W 108 0 38.194
1688.00	28.45	63.49	1609.45	404.70	187.71	358.53	1.30	2145385.44	2671294.53	N 36 53 44.288	W 108 0 37.706
1750.00	28.60	62.74	1663.93	434.30	201.10	384.94	0.63	2145398.77	2671320.96	N 36 53 44.420	W 108 0 37.381
1845.00	29.25	61.82	1747.08	480.25	222.47	425.61	0.83	2145420.07	2671361.67	N 36 53 44.632	W 108 0 36.880
1909.00	28.92	61.96	1803.01	511.36	237.13	453.05	0.53	2145434.68	2671389.14	N 36 53 44.777	W 108 0 36.543
2003.00	28.35	61.94	1885.51	556.41	258.32	492.81	0.61	2145455.78	2671428.93	N 36 53 44.986	W 108 0 36.053
2067.00	28.60	62.19	1941.77	586.92	272.61	519.77	0.43	2145470.03	2671455.91	N 36 53 45.127	W 108 0 35.721
2129.00	28.40	61.79	1996.25	616.50	286.50	545.89	0.45	2145483.87	2671482.05	N 36 53 45.265	W 108 0 35.400
2193.00	28.70	61.89	2052.47	647.09	300.94	572.85	0.47	2145498.25	2671509.05	N 36 53 45.407	W 108 0 35.068
2287.00	27.73	60.96	2135.30	691.52	322.19	611.88	1.13	2145519.43	2671548.11	N 36 53 45.618	W 108 0 34.587
2350.00	27.85	61.79	2191.03	720.89	336.26	637.66	0.64	2145533.45	2671573.92	N 36 53 45.757	W 108 0 34.270
2446.00	28.30	61.14	2275.74	766.06	357.84	677.36	0.57	2145554.96	2671613.64	N 36 53 45.970	W 108 0 33.781
2505.00	28.87	62.36	2327.55	794.29	371.20	702.22	1.38	2145568.27	2671638.53	N 36 53 46.102	W 108 0 33.475
2569.00	28.44	62.99	2383.71	824.98	385.29	729.49	0.82	2145582.31	2671665.82	N 36 53 46.242	W 108 0 33.140
2633.00	27.62	63.09	2440.20	855.05	398.93	756.29	1.28	2145595.89	2671692.65	N 36 53 46.376	W 108 0 32.810
2696.00	26.77	61.44	2496.24	883.84	412.32	781.78	1.80	2145609.24	2671718.16	N 36 53 46.509	W 108 0 32.496
2760.00	28.08	62.34	2553.04	913.32	426.20	807.78	2.15	2145623.07	2671744.19	N 36 53 46.646	W 108 0 32.176
2823.00	26.18	62.21	2608.60	943.02	440.02	834.07	0.19	2145636.84	2671770.50	N 36 53 46.783	W 108 0 31.852
2887.00	27.27	62.45	2665.25	972.79	453.85	860.44	1.43	2145650.61	2671796.90	N 36 53 46.919	W 108 0 31.527
2918.00	26.44	61.84	2692.91	986.80	460.39	872.82	2.82	2145657.13	2671809.29	N 36 53 46.984	W 108 0 31.375

2949.00	25.91	60.57	2720.73	1000.47	466.98	884.81	2.49	2145663.70	2671821.28	N 36 53 47 049	W 108 0 31.227
2981.00	26.02	60.11	2749.50	1014.47	473.91	896.98	0.72	2145670.60	2671833.47	N 36 53 47 118	W 108 0 31.078
3013.00	25.75	59.47	2778.29	1028.42	480.94	909.05	1.21	2145677.61	2671845.55	N 36 53 47 187	W 108 0 30.929
3045.00	26.19	59.56	2807.06	1042.42	488.05	921.13	1.38	2145684.70	2671857.64	N 36 53 47 257	W 108 0 30.780
3076.00	25.38	59.48	2834.97	1055.89	494.89	932.75	2.62	2145691.51	2671869.28	N 36 53 47 325	W 108 0 30.637
3107.00	25.62	59.39	2862.95	1069.21	501.67	944.24	0.78	2145698.28	2671880.78	N 36 53 47 392	W 108 0 30.496
3138.00	25.02	59.57	2890.97	1082.45	508.41	955.66	1.95	2145704.99	2671892.21	N 36 53 47 459	W 108 0 30.355
3168.00	24.27	59.01	2918.24	1094.94	514.79	966.42	2.62	2145711.36	2671902.98	N 36 53 47 522	W 108 0 30.223
3200.00	24.62	59.95	2947.37	1108.17	521.52	977.83	1.64	2145718.06	2671914.40	N 36 53 47 588	W 108 0 30.082
3232.00	25.32	59.49	2976.38	1121.66	528.33	989.49	2.27	2145724.85	2671926.07	N 36 53 47 656	W 108 0 29.939
3263.00	26.10	59.79	3004.31	1135.10	535.13	1001.10	2.55	2145731.62	2671937.69	N 36 53 47 723	W 108 0 29.796
3296.00	26.58	60.97	3033.89	1149.73	542.36	1013.82	2.15	2145738.83	2671950.43	N 36 53 47 794	W 108 0 29.639
3327.00	26.52	62.46	3061.62	1163.58	548.93	1026.03	2.16	2145745.38	2671962.64	N 36 53 47 859	W 108 0 29.489
3359.00	26.83	63.44	3090.21	1177.95	555.46	1038.82	1.68	2145751.88	2671975.45	N 36 53 47 924	W 108 0 29.331
3391.00	26.94	64.08	3118.75	1192.41	561.86	1051.80	0.97	2145758.26	2671988.44	N 36 53 47 987	W 108 0 29.172
3423.00	27.52	64.17	3147.21	1207.05	568.25	1064.97	1.82	2145764.62	2672001.62	N 36 53 48 050	W 108 0 29.009
3518.00	27.87	64.67	3231.32	1251.17	587.31	1104.80	0.44	2145783.61	2672041.48	N 36 53 48 239	W 108 0 28.519
4447.00	0.00	64.67	4124.12	1472.52	682.09	1305.02	3.00	2145878.00	2672241.87	N 36 53 49 176	W 108 0 26.054
7806.00	0.00	64.67	7483.12	1472.52	682.09	1305.02	0.00	2145878.00	2672241.87	N 36 53 49 176	W 108 0 26.054

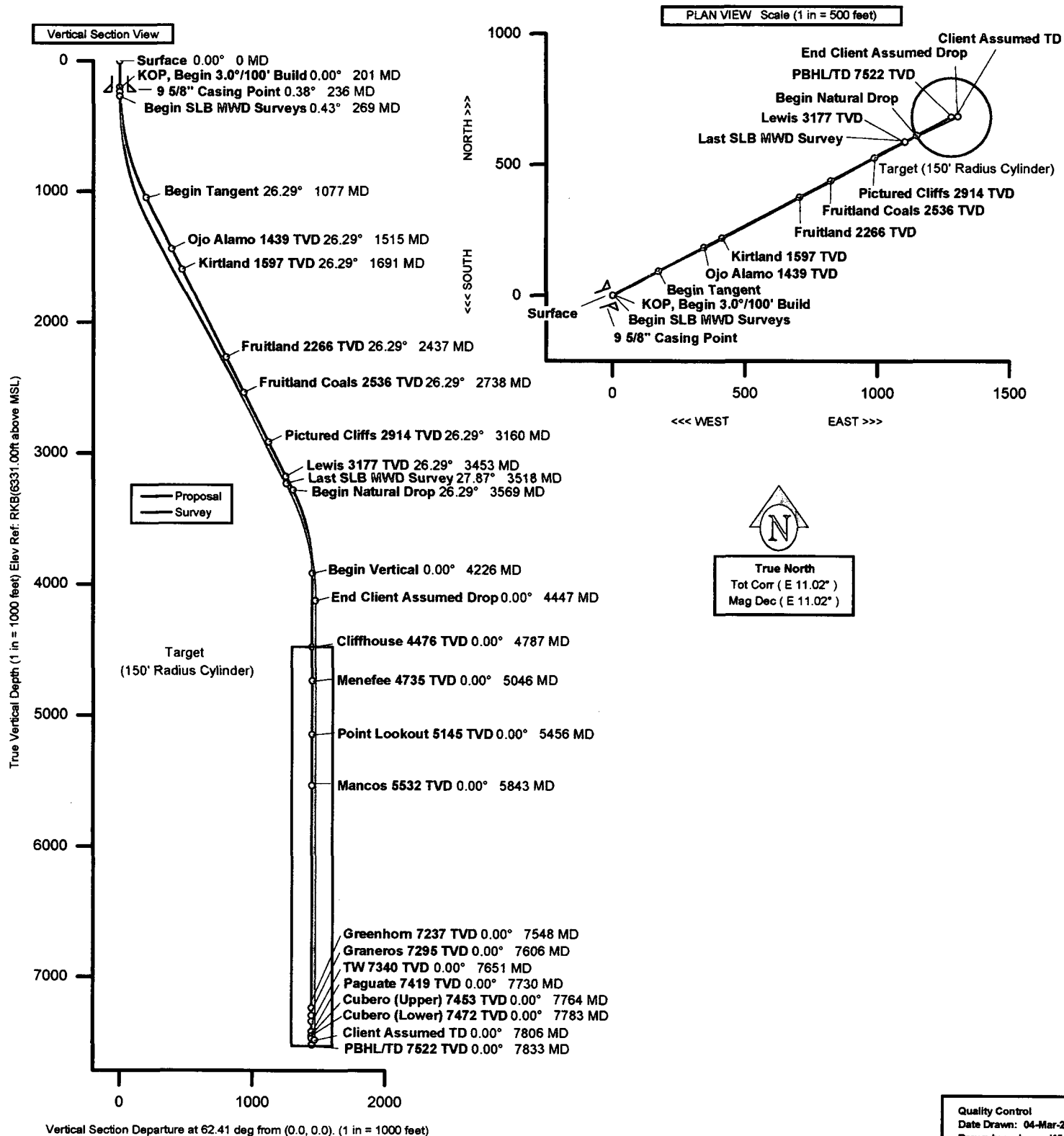
Survey Error Model: Topographic 3-D 95.00% Confidence 2.7955 sigma

Surveying Programme:

MD From (ft)	MD To (ft)	EOU Freq	Survey Tool Type
0.00	269.00	Act-Stns	Blind Drilling
269.00	3518.00	Act-Stns	MWD1
3518.00	7806.00	Act-Stns	Blind Drilling



WELL	FIELD	RIG
Mudge B 19M	San Juan County, New Mexico	Aztec 184
Magnetic Parameters Model: BGGM 2002 Dip: 63.735° Mag Dec: 11.018° Date: March 04, 2003 FS: 51532.1 nT	Surface Location Lat: N36 53 42.432 Lon: W108 0 42.120 North: 2145198.76 ftUS East: 2670936.28 ftUS Grid Conv: -0.1071° Scale Fact: 0.9999	Plan# : Rev0 jok 07-Oct-02 Slot: Mudge B 19M Elev Ref: RKB(6331.00ft above MSL) Date Drawn: 02:15:06PM 04-Mar-2003



Quality Control
Date Drawn: 04-Mar-2003
Drawn by: James Wimberg
Checked by: John O'Keefe
Client OK: _____