



Scientific Drilling

Survey Report

30-045-32875



Company: BP Date: 1/19/2006 Time: 17 01 18 Page: 1
Field: SAN JUAN, New Mexico Co-ordinate(NE) Reference: Well Atlantic LS #1M, Gnd North
Site: SEC 25-T31N-R10W Vertical (TVD) Reference: AGL=6631+KB=13 5' 6645 0
Well: Atlantic LS #1M Section (VS) Reference: Well (0 00N,0 00E,164.02Azi)
Wellpath: OH Survey Calculation Method: Minimum Curvature Db: Sybase

Field: SAN JUAN, New Mexico
SAN JUAN COUNTY, NEW MEXICO
USA
Map System: US State Plane Coordinate System 1983
Geo Datum: GRS 1980
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Western Zone
Coordinate System: Well Centre
Geomagnetic Model: bggm2005

Site: SEC 25-T31N-R10W

SAN JUAN NEW MEXICO

Site Position: Northing: ft Latitude:
From: Lease Line Easting: ft Longitude:
Position Uncertainty: 0 00 ft North Reference: Grid
Ground Level: 6408 00 ft Grid Convergence: 0.00 deg

Well: Atlantic LS #1M

Slot Name:

Well Position: +N/-S -1981.28 ft Northing: 2134973 98 ft Latitude: 36 52 1 768 N
+E/-W -292 78 ft Easting: 2723951.10 ft Longitude: 107 49 49.490 W
Position Uncertainty: 0.00 ft

Wellpath: OH

Drilled From: Surface
Tie-on Depth: 0 00 ft
Above System Datum: Mean Sea Level
Declination: 10.65 deg
Mag Dip Angle: 63 73 deg
Direction
deg

Current Datum: AGL=6631+KB=13.5' Height 6645.00 ft
Magnetic Data: 12/14/2005
Field Strength: 51420 nT
Vertical Section: Depth From (TVD) +N/-S
ft ft
0 00 0 00 0.00 164.02

Survey Program for Definitive Wellpath

Date: 1/19/2006 Validated: No Version: 2
Actual From To Survey Toolcode Tool Name
ft ft
247 00 3789 00 MWD Survey (247.00-3789.00) MWD ISCWSA MWD - Standard
3834 00 7523 00 Assumed Survey (3834 00-7523 0 BLIND Blind drilling

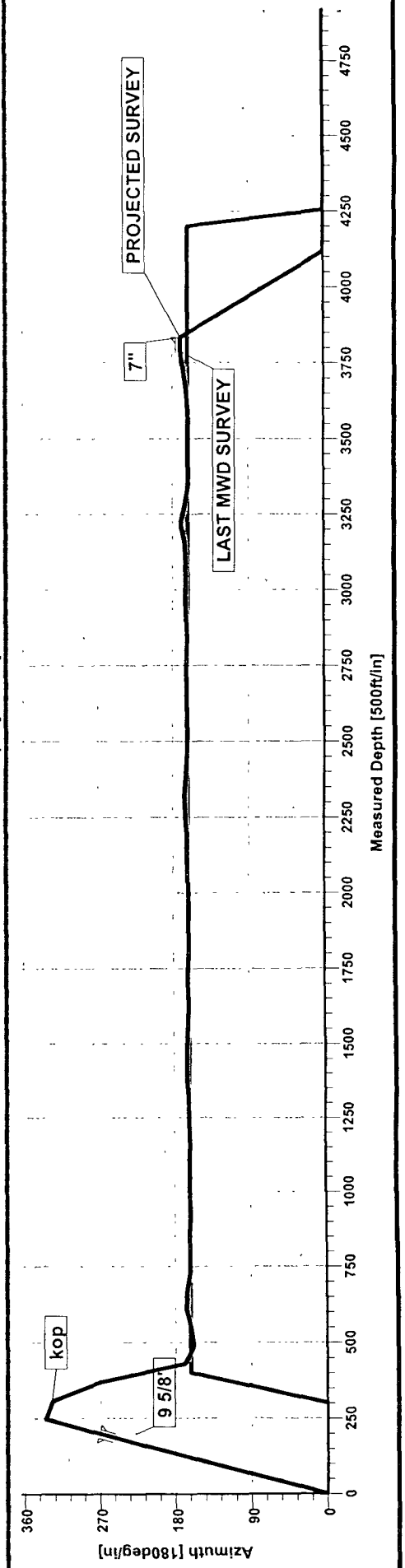
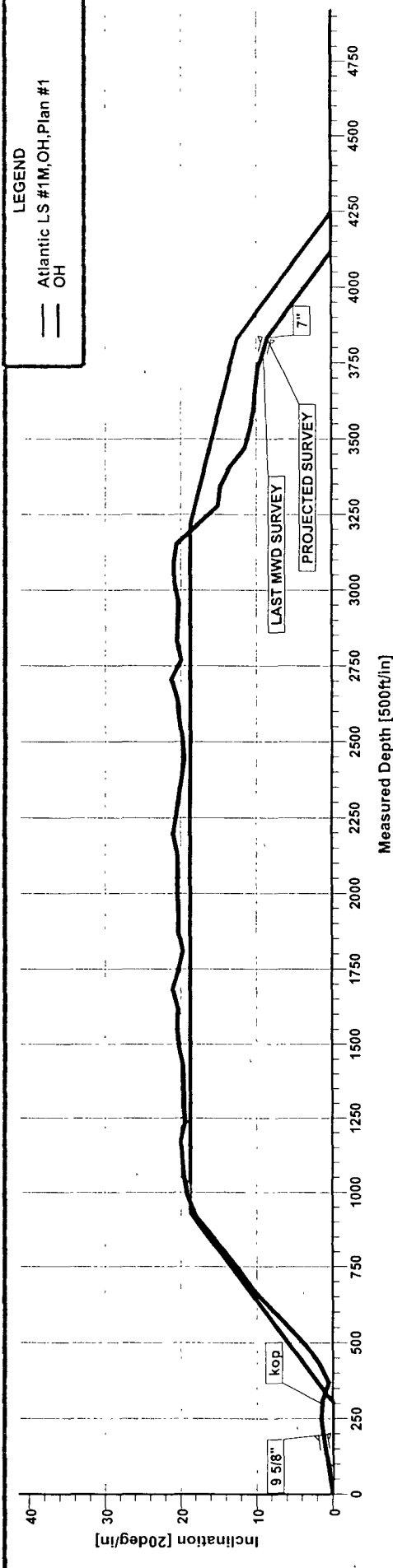
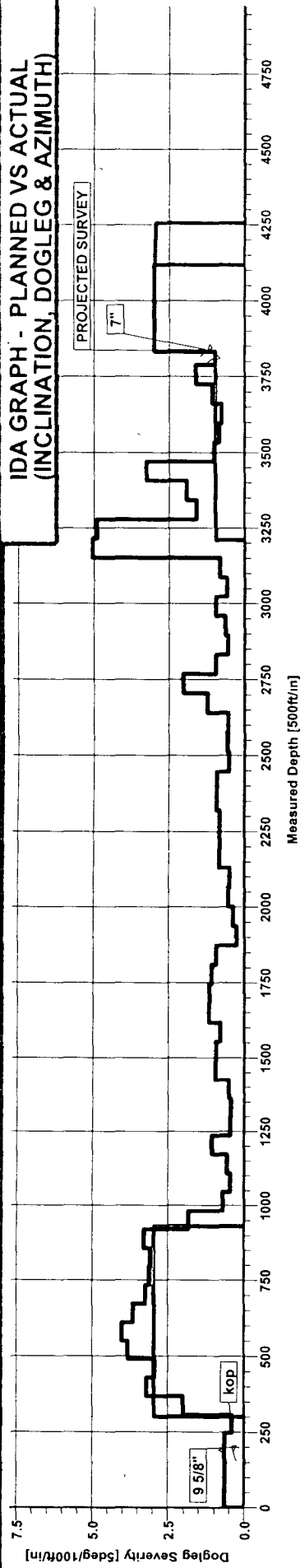
Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
200.02	1.28	334.85	200.00	2.02	-0.95	-2.20	0.64	0.64	0.00	9 5/8"
247.00	1.58	334.85	246.97	3.08	-1.45	-3.36	0.64	0.64	0.00	MWD ISCWSA
300.00	1.46	328.19	299.95	4.32	-2.11	-4.73	0.41	-0.23	-12.57	kop
308.00	1.44	327.09	307.95	4.49	-2.22	-4.93	0.41	-0.21	-13.76	MWD ISCWSA
369.00	0.57	270.73	368.94	5.13	-2.94	-5.75	2.00	-1.43	-92.39	MWD ISCWSA
430.00	1.77	169.59	429.93	4.21	-3.07	-4.90	3.22	1.97	-165.80	MWD ISCWSA
490.00	3.47	158.22	489.86	1.61	-2.23	-2.17	2.95	2.83	-18.95	MWD ISCWSA
551.00	5.79	161.71	550.66	-3.02	-0.58	2.75	3.83	3.80	5.72	MWD ISCWSA
611.00	8.10	167.51	610.22	-10.02	1.28	9.99	4.02	3.85	9.67	MWD ISCWSA
673.00	10.36	166.14	671.41	-19.70	3.56	19.92	3.66	3.65	-2.21	MWD ISCWSA
734.00	12.18	162.21	731.23	-31.16	6.84	31.84	3.24	2.98	-6.44	MWD ISCWSA
795.00	14.07	163.16	790.64	-44.38	10.96	45.68	3.12	3.10	1.56	MWD ISCWSA
857.00	15.98	162.80	850.51	-59.75	15.66	61.75	3.08	3.08	-0.58	MWD ISCWSA
920.00	18.03	161.72	910.76	-77.29	21.29	80.17	3.29	3.25	-1.71	MWD ISCWSA
982.00	19.13	162.66	969.52	-96.10	27.33	99.91	1.84	1.77	1.52	MWD ISCWSA
1046.00	19.58	162.54	1029.91	-116.34	33.67	121.11	0.71	0.70	-0.19	MWD ISCWSA
1109.00	19.86	162.76	1089.21	-136.63	40.01	142.37	0.46	0.44	0.35	MWD ISCWSA
1172.00	20.00	161.77	1148.44	-157.09	46.55	163.83	0.58	0.22	-1.57	MWD ISCWSA
1236.00	19.47	163.06	1208.68	-177.68	53.08	185.43	1.07	-0.83	2.02	MWD ISCWSA
1299.00	19.65	163.72	1268.05	-197.90	59.11	206.52	0.45	0.29	1.05	MWD ISCWSA
1363.00	19.64	164.56	1328.32	-218.59	64.99	228.04	0.44	-0.02	1.31	MWD ISCWSA



Scientific Drilling
Directional Drilling Operations

Field: SAN JUAN, New Mexico
Site: SEC 25-T31N-R10W
Well: Atlantic LS #1M 30-045-3 2875
Wellpath: OH





Scientific Drilling

Survey Report

30-045-32875



Company: BP Date: 1/19/2006 Time: 17 01 18 Page: 2
Field: SAN JUAN, New Mexico Co-ordinate(NE) Reference: Well: Atlantic LS #1M, Grid North
Site: SEC 25-T31N-R10W Vertical (TVD) Reference: AGL=6631+KB=13 5' 6645 0
Well: Atlantic LS #1M Section (VS) Reference: Well (0 00N, 0 00E, 164 02Azi)
Wellpath: OH Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DI.S deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
1425.00	19 69	165 49	1386 70	-238 75	70 38	248 90	0 51	0 08	1 50	MWD ISCWSA
1489.00	20 30	165 29	1446 85	-259 92	75 90	270 78	0 96	0 95	-0 31	MWD ISCWSA
1554.00	20 48	163 62	1507 77	-281 74	81 97	293 42	0 94	0 28	-2 57	MWD ISCWSA
1618.00	20 43	162 17	1567 74	-303 11	88 55	315 78	0 80	-0 08	-2 27	MWD ISCWSA
1682.00	21 11	163 07	1627 58	-324 77	95 33	338 47	1 17	1 06	1 41	MWD ISCWSA
1746.00	20 37	162 99	1687 43	-346 45	101 94	361 13	1 16	-1 16	-0 12	MWD ISCWSA
1810.00	19 79	161 84	1747 54	-367 40	108 58	383 09	1 10	-0 91	-1 80	MWD ISCWSA
1874.00	20 36	162 42	1807 65	-388 31	115 31	405 05	0 94	0 89	0 91	MWD ISCWSA
1938.00	20 35	161 95	1867 66	-409 50	122 13	427 30	0 26	-0 02	-0 73	MWD ISCWSA
2002.00	20 51	162 46	1927 63	-430 77	128 95	449 63	0 37	0 25	0 80	MWD ISCWSA
2066.00	20 46	163 45	1987 58	-452 18	135 52	472 02	0 55	-0 08	1 55	MWD ISCWSA
2130.00	20 52	164 33	2047 53	-473 71	141 73	494 42	0 49	0 09	1 37	MWD ISCWSA
2168 98	20 84	164 19	2084 00	-486 96	145 47	508 19	0 84	0 83	-0 36	OJO ALAMO
2194.00	21 05	164 10	2107 37	-495 56	147 91	517 13	0 84	0 83	-0 35	MWD ISCWSA
2258.00	20 64	165 02	2167 18	-517 51	153 98	539 90	0 82	-0 64	1 44	MWD ISCWSA
2278 10	20 54	165 39	2186 00	-524 35	155 78	546 97	0 83	-0 51	1 85	KIRTLAND
2321 00	20 32	166 20	2226 20	-538 86	159 46	561 94	0 83	-0 51	1 88	MWD ISCWSA
2385.00	19 93	164 90	2286 29	-560 18	164 95	583 95	0 93	-0 61	-2 03	MWD ISCWSA
2448.00	19 58	163 51	2345 58	-580 67	170 74	605 24	0 93	-0 56	-2 21	MWD ISCWSA
2512.00	19 85	162 91	2405 83	-601 34	176 98	626 83	0 53	0 42	-0 94	MWD ISCWSA
2576 00	20 22	162 77	2465 96	-622 29	183 45	648 75	0 58	0 58	-0 22	MWD ISCWSA
2641 00	20 53	163 28	2526 89	-643 94	190 05	671 38	0 55	0 48	0 78	MWD ISCWSA
2705.00	21 28	163 98	2586 68	-665 85	196 49	694 21	1 24	1 17	1 09	MWD ISCWSA
2769.00	19 99	163 32	2646 57	-687 49	202 83	716 76	2 05	-2 02	-1 03	MWD ISCWSA
2833 00	20 59	162 98	2706 60	-708 73	209 27	738 96	0 96	0 94	-0 53	MWD ISCWSA
2896 00	20 44	163 89	2765 61	-729 89	215 56	761 03	0 56	-0 24	1 44	MWD ISCWSA
2922 03	20 40	164 36	2790 00	-738 63	218 05	770 11	0 65	-0 16	1 79	FRUITLAND
2960.00	20 34	165 04	2825 60	-751 37	221 54	783 33	0 65	-0 15	1 80	MWD ISCWSA
3024.00	20 93	165 54	2885 49	-773 19	227 26	805 88	0 96	0 92	0 78	MWD ISCWSA
3088.00	20 99	164 50	2945 25	-795 30	233 18	828 77	0 59	0 09	-1 62	MWD ISCWSA
3152.00	20 63	165 60	3005 08	-817 27	239 05	851 50	0 83	-0 56	1 72	MWD ISCWSA
3216 00	17 86	170 66	3065 50	-837 88	243 44	872 52	5 05	-4 33	7 91	MWD ISCWSA
3228 06	17 33	169 84	3077 00	-841 47	244 06	876 15	4 89	-4 43	-6 83	Fruitland coal-1M
3279.00	15 11	165 74	3125 91	-855 38	247 03	890 33	4 89	-4 35	-8 04	MWD ISCWSA
3343 00	14 84	161 88	3187 74	-871 25	251 64	906 86	1 61	-0 42	-6 03	MWD ISCWSA
3408 00	13 59	161 24	3250 75	-886 39	256 68	922 81	1 94	-1 92	-0 98	MWD ISCWSA
3471 00	11 54	161 82	3312 23	-899 39	261 03	936 50	3 26	-3 25	0 92	MWD ISCWSA
3534 00	10 89	161 67	3374 03	-911 03	264 87	948 74	1 03	-1 03	-0 24	MWD ISCWSA
3544 15	10 80	161 63	3384 00	-912 84	265 47	950 65	0 86	-0 86	-0 37	PICTURED CLIFFS
3598 00	10 34	161 42	3436 93	-922 21	268 60	960 52	0 86	-0 86	-0 39	MWD ISCWSA
3662 00	10 16	164 03	3499 91	-933 08	271 98	971 90	0 78	-0 28	4 08	MWD ISCWSA
3726 00	9 92	167 81	3562 93	-943 90	274 70	983 05	1 10	-0 37	5 91	MWD ISCWSA
3736 22	9 77	168 25	3573 00	-945 60	275 06	984 79	1 65	-1 48	4 29	LEWIS
3789 00	9 00	170 74	3625 08	-954 06	276 64	993 36	1 65	-1 46	4 72	LAST MWD SURVEY
3834 00	8 55	170 74	3669 55	-960 84	277 74	1000 17	1 00	-1 00	0 00	7"
3837 49	8 45	170 74	3673 00	-961 35	277 83	1000 69	3 00	-3 00	0 00	7" CSG PT
4118 60	0 00	170 74	3953 09	-981 76	281 15	1021 22	3 00	-3 00	0 00	BLIND
5120 51	0 00	170 74	4955 00	-981 76	281 15	1021 22	0 00	0 00	0 00	CLIFF HOUSE
5443 51	0 00	170 74	5278 00	-981 76	281 15	1021 22	0 00	0 00	0 00	MENEFEE
5877 51	0 00	170 74	5712 00	-981 76	281 15	1021 22	0 00	0 00	0 00	POINT LOOKOUT
6155 51	0 00	170 74	5990 00	-981 76	281 15	1021 22	0 00	0 00	0 00	MANCOS
7523 00	0 00	170 74	7357 49	-981 76	281 15	1021 22	0 00	0 00	0 00	BLIND



Scientific Drilling

Survey Report

30 045-32875



Company: BP
Field: SAN JUAN, New Mexico
Site: SEC 25-T31N-R10W
Well: Atlantic LS #1M
Wellpath: OH

Date: 1/19/2006 Time: 17 01 18 Page: 3
Co-ordinate(NE) Reference: Well Atlantic LS #1M, Grd North
Vertical (TVD) Reference: AGL=6631+KB=13.5' 6645.0.
Section (VS) Reference: Well (0 00N,0 00E,164 02Az)
Survey Calculation Method: Minimum Curvature Db: Sybase

Targets

Name	Description Dip. Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude ---> Deg Min Sec	<--- Longitude ---> Deg Min Sec
Fruitland coal-1M		3077.00	-808 94	235 17	2134165 11	2724186 25	36 51 53 769 N	107 49 46 596 W
7" CSG PT		3673 00	-971 02	282 29	2134003 04	2724233 36	36 51 52 167 N	107 49 46 017 W
PBHL-1M		7992 00	-1015 00	295 00	2133959 06	2724246 07	36 51 51 732 N	107 49 45.860 W
-Circle (Radius. 100)								

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
200 02	200 00	9 625	12 250	9 5/8"
3834.00	3669.55	7.000	8 500	7"

Formations

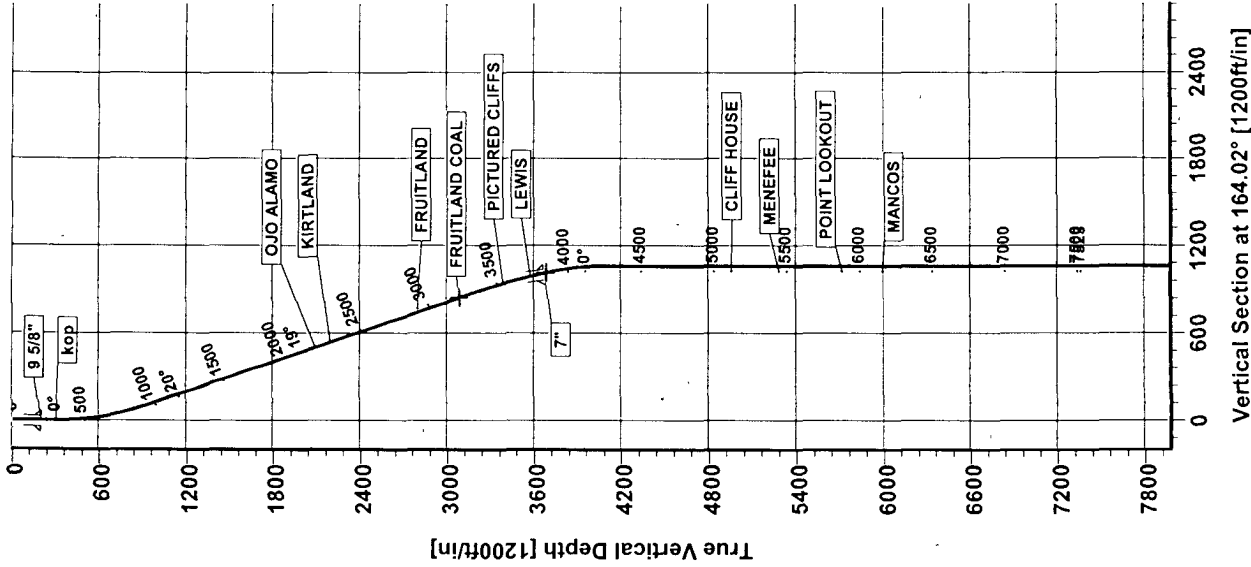
MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
2168.98	2084.00	OJO ALAMO		0.00	0.00
2278 10	2186 00	KIRTLAND		0.00	0.00
2922 03	2790 00	FRUITLAND		0 00	0 00
3228 06	3077.00	FRUITLAND COAL		0 00	0 00
3544 15	3384 00	PICTURED CLIFFS		0 00	0.00
3736.22	3573 00	LEWIS		0 00	0.00
5120 51	4955.00	CLIFF HOUSE		0 00	0.00
5443.51	5278 00	MENEFEE		0 00	0.00
5877 51	5712.00	POINT LOOKOUT		0 00	0.00
6155 51	5990.00	MANCOS		0 00	0 00
	0 00	GREENHORN		0 00	0 00
	0.00	GRANEROS		0 00	0.00
	0.00	TWO WELLS		0.00	0 00
	0 00	PAGUATE		0 00	0 00
	0.00	CUBERO		0.00	0 00
	0.00	L. CUBERO		0.00	0 00
	0 00	ENCINAL CYN		0 00	0.00

Annotation

MD ft	TVD ft	
300.00	299.95	kop
3789 00	3625 08	LAST MWD SURVEY
3834 00	3669 55	PROJECTED SURVEY



COMPARISON PLOT



Field: SAN JUAN, New Mexico
Site: SEC 25-T31N-R10W
Well: Atlantic LS #1M 30-045-32875
Wellpath: OH

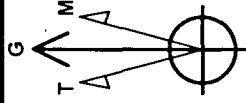


PLANNED

ACTUAL

LEGEND

— Atlantic LS #1M, OH, Plan #1
— OH



Azimuths to Grid North
True North: 0.00°
Magnetic North: 10.64°
Magnetic Field
Strength: 51420nT
Dip Angle: 63.73°
Date: 12/14/2005
Model: bggm2005

FORMATION TOP DETAILS

No.	TVDPath	MDPath	Formation
1	2084.00	2168.98	OJO ALAMO
2	2186.00	2278.10	KIRTLAND
3	2790.00	2922.03	FRUITLAND
4	3077.00	3228.06	FRUITLAND COAL
5	3384.00	3544.15	PICTURED CLIFFS
6	3573.00	3736.22	LEWIS
7	4955.00	5120.51	CLIFF HOUSE
8	5278.00	5443.51	MENEFE
9	5712.00	5877.51	POINT LOOKOUT
10	5990.00	6155.51	MANCOS

SURVEY PROGRAM

Date: 1/19/2006 Validated: No Version: 2

Depth Fm	Depth To Survey/Plan	Tool
247.00	3789.00	MWD/SCWSA
3834.00	7523.00	BLIND

SITE DETAILS

SEC 25-T31N-R10W
SAN JUAN NEW MEXICO

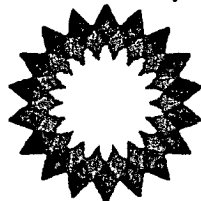
Ground Level: 6408.00
Positional Uncertainty: 0.00
Convergence: 0.00

FIELD DETAILS

SAN JUAN, New Mexico
SAN JUAN COUNTY, NEW MEXICO
USA

Geodetic System: US State Plane Coordinate System 1983
Ellipsoid: GRS 1980
Zone: New Mexico, Western Zone
Magnetic Model: bggm2005

DIRECTIONAL DRILLING END OF WELL SUMMARY



BP America Production Company

Prepared for

Harald Jordan - San Juan South

San Juan Field

San Juan County New Mexico

Atlantic LS 1M

30-045-32875

SEC 25-T31N-R10W

December 21, 2005

8 3/4" Section

Prepared by: Jonathan Lightfoot

Masoud Khodadad

(281) 443-3300



Scientific Drilling