



Scientific Drilling Survey Report



30-045-33076

Company: BP Date: 11/8/2005 Time: 12:17:54 Page: 1
Field: SAN JUAN, New Mexico Co-ordinate(NE) Reference: Well: State Gas Com K #1N, Grid North
Site: SEC 16-T31N-R11W Vertical (TVD) Reference: SITE 5961.0
Well: State Gas Com K #1N Section (VS) Reference: Well (0.00N,0.00E,113.00Azi)
Wellpath: actual 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 16-T31N-R11W

SAN JUAN NEW MEXICO

Site Position: Northing: 2145194.83 ft Latitude: 36 53 41.620 N
From: Geographic Easting: 2640247.56 ft Longitude: 108 6 59.999 W
Position Uncertainty: 0.00 ft North Reference: Grid
Ground Level: 5947.00 ft Grid Convergence: -0.17 deg

Well: State Gas Com K #1N

Slot Name:

Well Position: +N/-S 0.00 ft Northing: 2145194.83 ft Latitude: 36 53 41.620 N
+E/-W 0.00 ft Easting: 2640247.56 ft Longitude: 108 6 59.999 W
Position Uncertainty: 0.00 ft

Wellpath: actual

Drilled From: Surface
Tie-on Depth: 0.00 ft
Above System Datum: Mean Sea Level
Declination: 10.80 deg
Mag Dip Angle: 63.70 deg
Direction: deg

Current Datum: SITE Height 5961.00 ft
Magnetic Data: 9/14/2005
Field Strength: 51415 nT
Vertical Section: Depth From (TVD) +N/-S ft
0.00 0.00 0.00 113.00

Survey Program for Definitive Wellpath

Date: 11/8/2005 Validated: No
Actual From To Survey
ft ft

Version: 1
Toolcode Tool Name

251.00 3113.00 MWD Survey (251.00-3113.00) MWD ISCWSA MWD - Standard
3143.00 7398.00 Projected Survey (3143.00-7398) INC+TREND Inclinator + known azi trend

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
200.03	1.85	277.29	200.00	0.41	-3.20	-3.11	0.92	0.92	0.00	9 5/8"
251.00	2.32	277.29	250.93	0.64	-5.04	-4.89	0.92	0.92	0.00	MWD ISCWSA
311.00	1.61	285.71	310.90	1.03	-7.06	-6.90	1.27	-1.18	14.03	MWD ISCWSA
372.00	0.92	196.47	371.89	0.79	-8.02	-7.69	3.02	-1.13	-146.30	MWD ISCWSA
433.00	2.42	140.38	432.86	-0.67	-7.34	-6.49	3.37	2.46	-91.95	MWD ISCWSA
495.00	4.51	133.70	494.74	-3.37	-4.74	-3.05	3.43	3.37	-10.77	MWD ISCWSA
587.00	7.53	133.66	586.23	-10.03	2.24	5.98	3.28	3.28	-0.04	MWD ISCWSA
648.00	9.52	135.78	646.55	-16.40	8.65	14.37	3.30	3.26	3.48	MWD ISCWSA
709.00	11.54	128.56	706.52	-23.82	16.94	24.90	3.95	3.31	-11.84	MWD ISCWSA
770.00	13.19	119.83	766.11	-31.09	27.75	37.69	4.08	2.70	-14.31	MWD ISCWSA
831.00	15.14	119.13	825.25	-38.43	40.75	52.52	3.21	3.20	-1.15	MWD ISCWSA
895.00	16.94	116.76	886.76	-46.70	56.37	70.14	2.99	2.81	-3.70	MWD ISCWSA
959.00	18.69	114.96	947.69	-55.22	74.00	89.69	2.87	2.73	-2.81	MWD ISCWSA
980.49	19.45	115.12	968.00	-58.19	80.36	96.71	3.55	3.54	0.75	OJO ALAMO
1022.00	20.92	115.40	1006.96	-64.31	93.31	111.02	3.55	3.54	0.67	MWD ISCWSA
1065.10	22.50	116.15	1047.00	-71.24	107.67	126.94	3.72	3.66	1.73	KIRTLAND
1085.00	23.23	116.46	1065.34	-74.67	114.60	134.66	3.72	3.67	1.57	MWD ISCWSA
1148.00	24.87	112.99	1122.87	-85.38	137.92	160.31	3.44	2.60	-5.51	MWD ISCWSA
1212.00	25.68	114.65	1180.74	-96.42	162.91	187.63	1.68	1.27	2.59	MWD ISCWSA
1275.00	26.56	113.83	1237.31	-107.80	188.20	215.36	1.51	1.40	-1.30	MWD ISCWSA
1338.00	26.86	114.70	1293.58	-119.44	214.02	243.67	0.78	0.48	1.38	MWD ISCWSA

Surface 1300/S 875/W
B/L 862/S 1720/W

Scientific Drilling

Survey Report

Company: BP	Date: 11/8/2005	Time: 12:17:54	Page: 2
Field: SAN JUAN, New Mexico	Co-ordinate(NE) Reference:	Well: State Gas Com K #1N, Grid North	
Site: SEC 16-T31N-R11W	Vertical (TVD) Reference:	SITE 5961.0	
Well: State Gas Com K #1N	Section (VS) Reference:	Well (0.00N,0.00E,113.00Azi)	
Wellpath: actual	Survey Calculation Method:	Minimum Curvature	Db: Sybase

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
1401.00	26.01	113.35	1350.00	-130.86	239.63	271.71	1.65	-1.35	-2.14	MWD ISCWSA
1465.00	26.22	113.77	1407.46	-142.13	265.45	299.88	0.44	0.33	0.66	MWD ISCWSA
1527.00	27.21	112.00	1462.85	-152.96	291.13	327.75	2.05	1.60	-2.85	MWD ISCWSA
1591.00	27.20	109.91	1519.77	-163.42	318.45	356.99	1.49	-0.02	-3.27	MWD ISCWSA
1654.00	26.31	110.21	1576.02	-173.15	345.09	385.31	1.43	-1.41	0.48	MWD ISCWSA
1718.00	26.57	109.67	1633.33	-182.86	371.88	413.77	0.55	0.41	-0.84	MWD ISCWSA
1781.00	25.99	108.64	1689.82	-192.02	398.23	441.60	1.17	-0.92	-1.63	MWD ISCWSA
1844.00	26.10	109.60	1746.42	-201.08	424.36	469.19	0.69	0.17	1.52	MWD ISCWSA
1908.00	26.61	110.46	1803.77	-210.81	451.05	497.57	1.00	0.80	1.34	MWD ISCWSA
1971.00	26.95	111.07	1860.01	-220.88	477.59	525.93	0.69	0.54	0.97	MWD ISCWSA
2034.00	26.65	111.72	1916.24	-231.24	504.04	554.32	0.67	-0.48	1.03	MWD ISCWSA
2071.73	26.38	112.47	1950.00	-237.57	519.65	571.16	1.14	-0.72	1.99	FRUITLAND
2098.00	26.19	113.00	1973.56	-242.07	530.38	582.80	1.14	-0.71	2.02	MWD ISCWSA
2162.00	26.14	113.58	2031.00	-253.23	556.30	611.02	0.41	-0.08	0.91	MWD ISCWSA
2226.00	25.13	117.93	2088.70	-265.23	581.23	638.66	3.34	-1.58	6.80	MWD ISCWSA
2260.44	24.22	119.39	2120.00	-272.12	593.84	652.96	3.19	-2.65	4.25	Fruitland coal
2289.00	23.47	120.69	2146.12	-277.90	603.84	664.42	3.19	-2.61	4.54	MWD ISCWSA
2353.00	21.00	121.48	2205.36	-290.40	624.58	688.40	3.89	-3.86	1.23	MWD ISCWSA
2417.00	19.91	120.50	2265.32	-301.92	643.75	710.54	1.79	-1.70	-1.53	MWD ISCWSA
2480.00	17.80	119.70	2324.94	-312.13	661.36	730.75	3.37	-3.35	-1.27	MWD ISCWSA
2544.00	16.52	119.18	2386.09	-321.42	677.80	749.51	2.01	-2.00	-0.81	MWD ISCWSA
2606.00	16.04	118.98	2445.60	-329.87	692.99	766.79	0.78	-0.77	-0.32	MWD ISCWSA
2669.00	15.25	117.69	2506.27	-337.93	707.94	783.71	1.37	-1.25	-2.05	MWD ISCWSA
2733.00	14.97	117.58	2568.06	-345.67	722.72	800.33	0.44	-0.44	-0.17	MWD ISCWSA
2736.05	15.02	117.53	2571.00	-346.04	723.42	801.12	1.69	1.64	-1.54	PICTURED CLIFFS
2795.00	15.99	116.68	2627.81	-353.21	737.45	816.84	1.69	1.65	-1.45	MWD ISCWSA
2859.00	16.04	117.87	2689.32	-361.30	753.14	834.45	0.52	0.08	1.86	MWD ISCWSA
2923.00	15.92	119.02	2750.85	-369.70	768.64	851.98	0.53	-0.19	1.80	MWD ISCWSA
2973.98	14.84	123.48	2800.00	-376.69	780.20	865.36	3.14	-2.12	8.74	LEWIS
2986.00	14.60	124.62	2811.63	-378.40	782.73	868.36	3.14	-2.00	9.51	MWD ISCWSA
3050.00	14.18	127.67	2873.62	-387.77	795.57	883.84	1.35	-0.66	4.77	MWD ISCWSA
3077.20	14.08	129.17	2900.00	-391.90	800.77	890.24	1.40	-0.37	5.52	Csg pt.
3113.00	13.96	131.18	2934.73	-397.49	807.40	898.53	1.40	-0.33	5.61	MWD ISCWSA
3143.00	13.66	131.18	2963.87	-402.21	812.79	905.33	1.00	-1.00	0.00	7"
3599.00	0.00	131.18	3415.56	-437.83	853.51	956.73	3.00	-3.00	0.00	INC+TREND
4209.44	0.00	131.18	4026.00	-437.83	853.51	956.73	0.00	0.00	0.00	CLIFF HOUSE
4580.44	0.00	131.18	4397.00	-437.83	853.51	956.73	0.00	0.00	0.00	MENELEE
4967.44	0.00	131.18	4784.00	-437.83	853.51	956.73	0.00	0.00	0.00	POINT LOOKOUT
5342.44	0.00	131.18	5159.00	-437.83	853.51	956.73	0.00	0.00	0.00	MANCOS
7054.44	0.00	131.18	6871.00	-437.83	853.51	956.73	0.00	0.00	0.00	GREENHORN
7111.44	0.00	131.18	6928.00	-437.83	853.51	956.73	0.00	0.00	0.00	GRANEROS
7167.44	0.00	131.18	6984.00	-437.83	853.51	956.73	0.00	0.00	0.00	TWO WELLS
7245.44	0.00	131.18	7062.00	-437.83	853.51	956.73	0.00	0.00	0.00	PAGUATE
7276.44	0.00	131.18	7093.00	-437.83	853.51	956.73	0.00	0.00	0.00	CUBERO
7318.44	0.00	131.18	7135.00	-437.83	853.51	956.73	0.00	0.00	0.00	L. CUBERO
7358.44	0.00	131.18	7175.00	-437.83	853.51	956.73	0.00	0.00	0.00	ENCINAL CYN
7398.00	0.00	0.00	7214.56	-437.83	853.51	956.73	0.00	0.00	0.00	INC+TREND

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			2120.00	-254.73	588.93	2144940.12	2640836.44	36	53	39.119 N	108	6	52.740 W
Csg pt.			2900.00	-369.83	855.05	2144825.03	2641102.54	36	53	37.988 N	108	6	49.460 W



Scientific Drilling Survey Report



Company:	BP	Date:	11/8/2005	Time:	12:17:54	Page:	3
Field:	SAN JUAN, New Mexico	Co-ordinate(NE) Reference:	Well: State Gas Com K #1N, Grid North				
Site:	SEC 16-T31N-R11W	Vertical (TVD) Reference:	SITE 5961.0				
Well:	State Gas Com K #1N	Section (VS) Reference:	Well (0.00N,0.00E,113.00Azi)				
Wellpath:	actual	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
PBHL			7234.00	-400.00	925.00	2144794.86	2641172.49	36 53 37.692 N	108 6 48.597 W
-Circle (Radius: 100)									

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
200.03	200.00	9.625	12.250	9 5/8"
3143.00	2963.87	7.000	8.500	7"

Formations

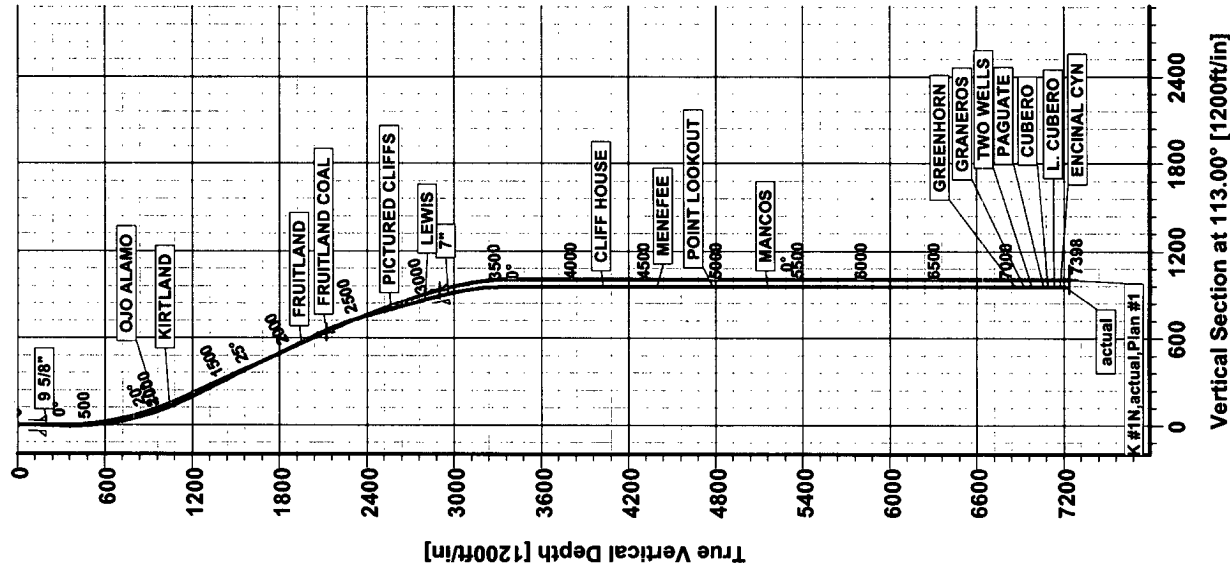
MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
980.49	968.00	OJO ALAMO		0.00	0.00
1065.10	1047.00	KIRTLAND		0.00	0.00
2071.73	1950.00	FRUITLAND		0.00	0.00
2260.44	2120.00	FRUITLAND COAL		0.00	0.00
2736.05	2571.00	PICTURED CLIFFS		0.00	0.00
2973.98	2800.00	LEWIS		0.00	0.00
4209.44	4026.00	CLIFF HOUSE		0.00	0.00
4580.44	4397.00	MENEFEE		0.00	0.00
4967.44	4784.00	POINT LOOKOUT		0.00	0.00
5342.44	5159.00	MANCOS		0.00	0.00
7054.44	6871.00	GREENHORN		0.00	0.00
7111.44	6928.00	GRANEROS		0.00	0.00
7167.44	6984.00	TWO WELLS		0.00	0.00
7245.44	7062.00	PAGUATE		0.00	0.00
7276.44	7093.00	CUBERO		0.00	0.00
7318.44	7135.00	L. CUBERO		0.00	0.00
7358.44	7175.00	ENCINAL CYN		0.00	0.00



Field: SAN JUAN, New Mexico
Site: SEC 16-T31N-R11W
Well: State Gas Com K #1N
Wellpath: actual



COMPARISON PLOT

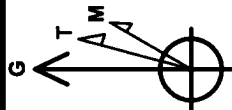


PLANNED

ACTUAL

LEGEND

— State Gas Com K #1N, actual, Plan #1
— actual



Azimuths to Grid North
True North: 0.17°
Magnetic North: 10.97°

Magnetic Field
Strength: 51415nT
Dip Angle: 63.70°
Date: 9/14/2005
Model: bggm2005

FORMATION TOP DETAILS

No.	TVDP	MDPath	Formation
1	968.00	980.49	OJO ALAMO
2	1047.00	1065.10	KIRTLAND
3	1950.00	2071.73	FRUITLAND COAL
4	2120.00	2260.44	FRUITLAND COAL
5	2571.00	2736.05	PICTURED CLIFFS
6	2800.00	2973.98	LEWIS
7	4026.00	4209.44	CLIFF HOUSE
8	4397.00	4580.44	MENELEE
9	4784.00	4967.44	POINT LOOKOUT
10	5159.00	5342.44	MANCOS
11	6871.00	7054.44	GREENHORN
12	6928.00	7111.44	GRANEROS
13	6984.00	7167.44	TWO WELLS
14	7062.00	7245.44	PAGUATE
15	7093.00	7276.44	CUBERO
16	7135.00	7318.44	L. CUBERO
17	7175.00	7358.44	ENCINAL CYN

South(-)/North(+) [400ft/in]

West(-)/East(+) [400ft/in]

SURVEY PROGRAM

Date: 11/8/2005 Validated: No Version: 1

Depth Fm	Depth To	Survey/Plan	Tool
251.00	3113.00	MWD Survey	MWD ISCWSA
3143.00	7398.00	Projected Survey	INC-TREND

SITE DETAILS

SEC 16-T31N-R11W
SAN JUAN NEW MEXICO
Site Centre Latitude: 36°53'41.620N
Longitude: 108°06'59.999W

Ground Level: 5947.00
Positional Uncertainty: 0.00
Convergence: -0.17

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