



Scientific Drilling



Survey Report

Company: BP Date: 4/7/2006 Time: 14:37:15 Page: 1
Field: SAN JUAN, New Mexico Co-ordinate(NE) Reference: Well: Sellers LS 6N, Grid North
Site: SEC 30-T30N-R10W Vertical (TVD) Reference: AGL=6107'+KB=14' 6121.0
Well: Sellers LS 6N Section (VS) Reference: Well (0.00N,0.00E,103.75Azi)
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 30-T30N-R10W
SAN JUAN NEW MEXICO

MD 7290
TVD 7231

Surface 2000/N 1035/W Sec 80
BHL 2158/N 1679/W

Site Position: Northing: ft Latitude: ft
From: Lease Line Easting: ft Longitude: ft
Position Uncertainty: 0.00 ft North Reference: Grid
Ground Level: 9113.00 ft Grid Convergence: -0.06 deg

Well: Sellers LS 6N

Slot Name:

Well Position: +N/-S -270.00 ft Northing: 2104880.43 ft Latitude: 36 47 4.047 N
+E/-W 50.00 ft Easting: 2694847.39 ft Longitude: 107 55 47.296 W
Position Uncertainty: 0.00 ft

Wellpath: ACTUAL

Drilled From: Surface
Tie-on Depth: 0.00 ft
Above System Datum: Mean Sea Level
Declination: 10.65 deg
Mag Dip Angle: 63.63 deg
+E/-W Direction deg

Current Datum: AGL=6107'+KB=14' Height 6121.00 ft
Magnetic Data: 3/6/2006
Field Strength: 51332 nT
Vertical Section: Depth From (TVD) ft
+N/-S ft

0.00 0.00 0.00 103.75

Survey Program for Definitive Wellpath

Date: 4/7/2006 Validated: No
Actual From To Survey
ft ft

Version: 3
Toolcode

Tool Name

363.00 4014.00 MWD Survey (363.00-4014.00) MWD ISCWSA MWD - Standard
4150.00 7290.00 Projected Survey (4521.70-7290) 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
200.00	0.26	145.25	200.00	-0.37	0.26	0.34	0.13	0.13	0.00	9 5/8"
363.00	0.47	145.25	363.00	-1.22	0.85	1.12	0.13	0.13	0.00	MWD ISCWSA
394.00	1.15	111.96	393.99	-1.44	1.21	1.52	2.58	2.19	-107.39	MWD ISCWSA
424.00	2.07	111.36	423.98	-1.75	1.99	2.35	3.07	3.07	-2.00	MWD ISCWSA
455.00	3.13	114.75	454.95	-2.31	3.28	3.74	3.45	3.42	10.94	MWD ISCWSA
485.00	4.15	104.54	484.89	-2.93	5.08	5.63	4.02	3.40	-34.03	MWD ISCWSA
515.00	4.97	103.11	514.79	-3.50	7.39	8.01	2.76	2.73	-4.77	MWD ISCWSA
546.00	5.67	103.30	545.66	-4.15	10.19	10.89	2.26	2.26	0.61	MWD ISCWSA
576.00	6.70	101.48	575.48	-4.84	13.35	14.12	3.49	3.43	-6.07	MWD ISCWSA
607.00	7.89	104.48	606.23	-5.73	17.18	18.05	4.03	3.84	9.68	MWD ISCWSA
638.00	8.87	103.41	636.90	-6.82	21.57	22.57	3.20	3.16	-3.45	MWD ISCWSA
669.00	9.92	103.35	667.48	-7.99	26.49	27.63	3.39	3.39	-0.19	MWD ISCWSA
699.00	10.86	103.87	696.99	-9.26	31.75	33.04	3.15	3.13	1.73	MWD ISCWSA
730.00	11.26	103.65	727.42	-10.68	37.53	38.99	1.30	1.29	-0.71	MWD ISCWSA
761.00	11.57	102.58	757.80	-12.07	43.50	45.12	1.21	1.00	-3.45	MWD ISCWSA
791.00	11.55	102.78	787.19	-13.39	49.37	51.13	0.15	-0.07	0.67	MWD ISCWSA
822.00	11.28	102.93	817.58	-14.75	55.35	57.27	0.88	-0.87	0.48	MWD ISCWSA
852.00	11.56	101.73	846.99	-16.02	61.15	63.21	1.22	0.93	-4.00	MWD ISCWSA
917.00	11.24	103.40	910.71	-18.81	73.69	76.05	0.71	-0.49	2.57	MWD ISCWSA
980.00	11.19	102.88	972.50	-21.60	85.62	88.30	0.18	-0.08	-0.83	MWD ISCWSA
1043.00	11.33	102.10	1034.29	-24.26	97.63	100.60	0.33	0.22	-1.24	MWD ISCWSA



Scientific Drilling Survey Report



Company: BP
Field: SAN JUAN, New Mexico
Site: SEC 30-T30N-R10W
Well: Sellers LS 6N
Wellpath: ACTUAL

Date: 4/7/2006 Time: 14:37:15 Page: 2
Co-ordinate(N/E) Reference: Well: Sellers LS 6N, Grid North
Vertical (TVD) Reference: AGL=6107'+KB=14' 6121.0
Section (VS) Reference: Well (0.00N,0.00E,103.75Azi)
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
1106.00	11.69	102.09	1096.02	-26.89	109.92	113.17	0.57	0.57	-0.02	MWD ISCWSA
1169.00	11.82	101.37	1157.70	-29.50	122.49	125.99	0.31	0.21	-1.14	MWD ISCWSA
1233.00	11.40	100.92	1220.39	-31.99	135.13	138.86	0.67	-0.66	-0.70	MWD ISCWSA
1238.72	11.35	100.91	1226.00	-32.21	136.23	139.99	0.84	-0.84	-0.16	OJO ALAMO
1294.00	10.89	100.82	1280.24	-34.22	146.71	150.63	0.84	-0.84	-0.16	MWD ISCWSA
1360.00	10.70	103.56	1345.07	-36.82	158.79	162.99	0.83	-0.29	4.15	MWD ISCWSA
1368.07	10.69	103.80	1353.00	-37.18	160.24	164.48	0.57	-0.13	2.96	KIRTLAND
1424.00	10.62	105.47	1407.97	-39.79	170.25	174.82	0.57	-0.12	2.99	MWD ISCWSA
1489.00	11.06	106.62	1471.81	-43.17	181.99	187.04	0.75	0.68	1.77	MWD ISCWSA
1553.00	11.48	107.49	1534.58	-46.84	193.95	199.52	0.71	0.66	1.36	MWD ISCWSA
1617.00	11.76	105.68	1597.26	-50.52	206.30	212.40	0.72	0.44	-2.83	MWD ISCWSA
1678.00	12.10	104.38	1656.95	-53.79	218.48	225.00	0.71	0.56	-2.13	MWD ISCWSA
1739.00	12.04	104.17	1716.60	-56.93	230.84	237.76	0.12	-0.10	-0.34	MWD ISCWSA
1803.00	12.42	104.28	1779.15	-60.26	243.98	251.32	0.59	0.59	0.17	MWD ISCWSA
1867.00	12.33	104.86	1841.66	-63.71	257.26	265.03	0.24	-0.14	0.91	MWD ISCWSA
1931.00	11.94	103.58	1904.23	-67.02	270.30	278.48	0.74	-0.61	-2.00	MWD ISCWSA
1994.00	11.53	104.70	1965.91	-70.15	282.72	291.29	0.74	-0.65	1.78	MWD ISCWSA
2005.32	11.45	104.39	1977.00	-70.71	284.91	293.55	0.90	-0.71	-2.77	FRUITLAND
2058.00	11.08	102.87	2028.67	-73.14	294.91	303.84	0.90	-0.70	-2.88	MWD ISCWSA
2122.00	11.01	104.27	2091.48	-76.02	306.82	316.10	0.43	-0.11	2.19	MWD ISCWSA
2185.00	10.84	104.32	2153.34	-78.96	318.39	328.04	0.27	-0.27	0.08	MWD ISCWSA
2249.00	10.64	100.18	2216.22	-81.50	330.04	339.95	1.25	-0.31	-6.47	MWD ISCWSA
2313.00	10.56	100.00	2279.13	-83.56	341.63	351.70	0.14	-0.12	-0.28	MWD ISCWSA
2343.38	10.54	100.44	2309.00	-84.55	347.11	357.25	0.27	-0.08	1.43	FRUITLAND COAL
2377.00	10.51	100.92	2342.05	-85.68	353.14	363.38	0.27	-0.08	1.44	MWD ISCWSA
2440.00	9.99	102.08	2404.05	-87.92	364.12	374.59	0.89	-0.83	1.84	MWD ISCWSA
2504.00	10.32	103.19	2467.04	-90.39	375.13	385.87	0.60	0.52	1.73	MWD ISCWSA
2567.00	10.53	103.94	2529.00	-93.06	386.22	397.27	0.40	0.33	1.19	MWD ISCWSA
2592.43	10.59	104.10	2554.00	-94.19	390.74	401.93	0.25	0.22	0.65	PICTURED CLIFFS
2631.00	10.67	104.35	2591.91	-95.94	397.63	409.04	0.25	0.22	0.64	MWD ISCWSA
2695.00	10.74	104.58	2654.80	-98.91	409.14	420.93	0.13	0.11	0.36	MWD ISCWSA
2758.00	10.87	106.94	2716.68	-102.12	420.51	432.73	0.73	0.21	3.75	MWD ISCWSA
2822.00	10.35	105.21	2779.59	-105.38	431.83	444.50	0.95	-0.81	-2.70	MWD ISCWSA
2834.62	10.28	105.27	2792.00	-105.98	434.01	446.76	0.58	-0.58	0.44	LEWIS
2886.00	9.98	105.50	2842.58	-108.37	442.72	455.79	0.58	-0.58	0.46	MWD ISCWSA
2949.00	9.00	105.35	2904.72	-111.14	452.73	466.17	1.56	-1.56	-0.24	MWD ISCWSA
3012.00	8.27	107.68	2967.00	-113.82	461.80	475.62	1.28	-1.16	3.70	MWD ISCWSA
3075.00	8.47	106.22	3029.33	-116.49	470.57	484.77	0.46	0.32	-2.32	MWD ISCWSA
3138.00	9.18	104.82	3091.59	-119.07	479.89	494.43	1.18	1.13	-2.22	MWD ISCWSA
3200.00	8.96	107.46	3152.81	-121.78	489.27	504.20	0.76	-0.35	4.26	MWD ISCWSA
3263.00	9.87	105.05	3214.96	-124.66	499.17	514.49	1.57	1.44	-3.83	MWD ISCWSA
3295.00	10.13	103.56	3246.48	-126.03	504.55	520.05	1.15	0.81	-4.66	MWD ISCWSA
3325.00	10.32	105.00	3276.00	-127.34	509.71	525.37	1.06	0.63	4.80	MWD ISCWSA
3356.00	10.84	105.57	3306.47	-128.85	515.20	531.06	1.71	1.68	1.84	MWD ISCWSA
3389.00	9.96	107.17	3338.93	-130.52	520.92	537.01	2.81	-2.67	4.85	MWD ISCWSA
3452.00	9.38	109.06	3401.04	-133.81	530.98	547.56	1.05	-0.92	3.00	MWD ISCWSA
3516.00	9.10	106.89	3464.21	-136.98	540.75	557.81	0.70	-0.44	-3.39	MWD ISCWSA
3580.00	9.15	100.85	3527.40	-139.41	550.59	567.94	1.50	0.08	-9.44	MWD ISCWSA
3643.00	10.02	101.45	3589.52	-141.44	560.88	578.42	1.39	1.38	0.95	MWD ISCWSA
3707.00	9.75	105.12	3652.57	-143.96	571.57	589.41	1.07	-0.42	5.73	MWD ISCWSA
3739.00	9.94	104.90	3684.10	-145.37	576.85	594.88	0.61	0.59	-0.69	MWD ISCWSA
3802.00	10.24	102.78	3746.12	-148.01	587.57	605.91	0.76	0.48	-3.37	MWD ISCWSA
3834.00	10.38	100.56	3777.61	-149.17	593.18	611.63	1.32	0.44	-6.94	MWD ISCWSA

Scientific Drilling Survey Report

Company: BP	Date: 4/7/2006	Time: 14:37:15	Page: 3
Field: SAN JUAN, New Mexico	Co-ordinate(NE) Reference:	Well: Sellers LS 6N, Grid North	
Site: SEC 30-T30N-R10W	Vertical (TVD) Reference:	AGL=6107'+KB=14' 6121.0	
Well: Sellers LS 6N	Section (VS) Reference:	Well (0.00N,0.00E,103.75Azi)	
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
3866.00	9.96	100.47	3809.10	-150.20	598.73	617.27	1.31	-1.31	-0.28	MWD ISCWSA
3898.00	9.00	98.74	3840.67	-151.08	603.93	622.53	3.13	-3.00	-5.41	MWD ISCWSA
3931.00	7.46	98.13	3873.32	-151.78	608.60	627.23	4.67	-4.67	-1.85	MWD ISCWSA
3963.00	5.65	99.47	3905.11	-152.33	612.21	630.87	5.68	-5.66	4.19	MWD ISCWSA
4014.00	5.65	99.47	3955.87	-153.16	617.16	635.88	0.00	0.00	0.00	MWD ISCWSA
4039.25	5.40	99.47	3981.00	-153.56	619.56	638.30	1.00	-1.00	0.00	cliff house-6N
4415.02	1.62	99.47	4356.00	-157.34	642.24	661.23	1.00	-1.00	0.00	MENEFE
4515.04	0.62	99.47	4456.00	-157.66	644.17	663.18	1.00	-1.00	0.00	CSG PT.
4521.70	0.55	99.47	4462.66	-157.67	644.24	663.25	1.00	-1.00	0.00	7"
4576.50	0.00	0.00	4517.46	-157.72	644.49	663.51	1.00	-1.00	0.00	INC+TREND
4924.04	0.00	0.00	4865.00	-157.72	644.49	663.51	0.00	0.00	0.00	POINT LOOKOUT
5315.04	0.00	0.00	5256.00	-157.72	644.49	663.51	0.00	0.00	0.00	MANCOS
6901.04	0.00	0.00	6842.00	-157.72	644.49	663.51	0.00	0.00	0.00	GREENHORN
6963.04	0.00	0.00	6904.00	-157.72	644.49	663.51	0.00	0.00	0.00	GRANEROS
7012.04	0.00	0.00	6953.00	-157.72	644.49	663.51	0.00	0.00	0.00	TWO WELLS
7084.04	0.00	0.00	7025.00	-157.72	644.49	663.51	0.00	0.00	0.00	PAGUATE
7143.04	0.00	0.00	7084.00	-157.72	644.49	663.51	0.00	0.00	0.00	CUBERO
7165.04	0.00	0.00	7106.00	-157.72	644.49	663.51	0.00	0.00	0.00	L. CUBERO
7199.04	0.00	0.00	7140.00	-157.72	644.49	663.51	0.00	0.00	0.00	ENCINAL CYN
7282.04	0.00	0.00	7223.00	-157.72	644.49	663.51	0.00	0.00	0.00	PBHL-6N
7290.00	0.00	0.00	7230.96	-157.72	644.49	663.51	0.00	0.00	0.00	5 1/2"

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		
cliff house-6N			3981.00	-151.92	639.16	2104728.52	2695486.50	36	47	2.551 N	107	55	39.437 W
CSG PT.			4456.00	-167.78	705.92	2104712.66	2695553.25	36	47	2.395 N	107	55	38.616 W
PBHL-6N			7223.00	-170.00	715.00	2104710.44	2695562.33	36	47	2.373 N	107	55	38.505 W
-Circle (Radius: 100)													

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
200.00	200.00	9.625	13.500	9 5/8"
4521.70	4462.66	7.000	8.750	7"
7290.00	7230.96	5.500	6.000	5 1/2"

Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
1238.72	1226.00	OJO ALAMO		0.00	0.00
1368.07	1353.00	KIRTLAND		0.00	0.00
2005.32	1977.00	FRUITLAND		0.00	0.00
2343.38	2309.00	FRUITLAND COAL		0.00	0.00
2592.43	2554.00	PICTURED CLIFFS		0.00	0.00
2834.62	2792.00	LEWIS		0.00	0.00
4039.25	3981.00	CLIFF HOUSE		0.00	0.00
4415.02	4356.00	MENEFE		0.00	0.00
4924.04	4865.00	POINT LOOKOUT		0.00	0.00
5315.04	5256.00	MANCOS		0.00	0.00
6901.04	6842.00	GREENHORN		0.00	0.00
6963.04	6904.00	GRANEROS		0.00	0.00
7012.04	6953.00	TWO WELLS		0.00	0.00
7084.04	7025.00	PAGUATE		0.00	0.00
7143.04	7084.00	CUBERO		0.00	0.00
7165.04	7106.00	L. CUBERO		0.00	0.00

Scientific Drilling Survey Report

Company: BP Field: SAN JUAN, New Mexico Site: SEC 30-T30N-R10W Well: Sellers LS 6N Wellpath: ACTUAL	Date: 4/7/2006 Co-ordinate(NE) Reference: Vertical (TVD) Reference: Section (VS) Reference: Survey Calculation Method:	Time: 14:37:15 Well: Sellers LS 6N, Grid North AGL=6107'+KB=14' 6121.0 Well (0.00N,0.00E,103.75Azi) Minimum Curvature	Page: 4 Db: Sybase
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Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
7199.04	7140.00	ENCINAL CYN		0.00	0.00

Annotation

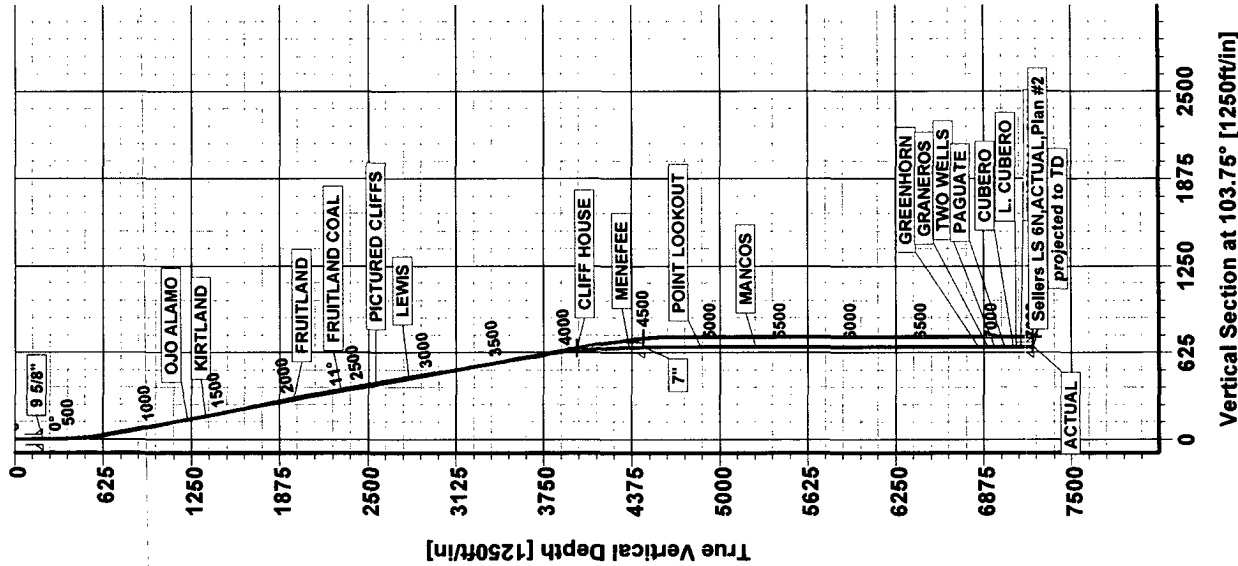
MD ft	TVD ft	
7290.00	7230.96	projected to TD



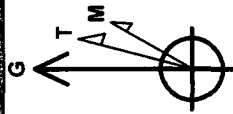
Field: SAN JUAN, New Mexico
Site: SEC 30-T30N-R10W
Well: Sellers LS 6N
Wellpath: ACTUAL



COMPARISON PLOT



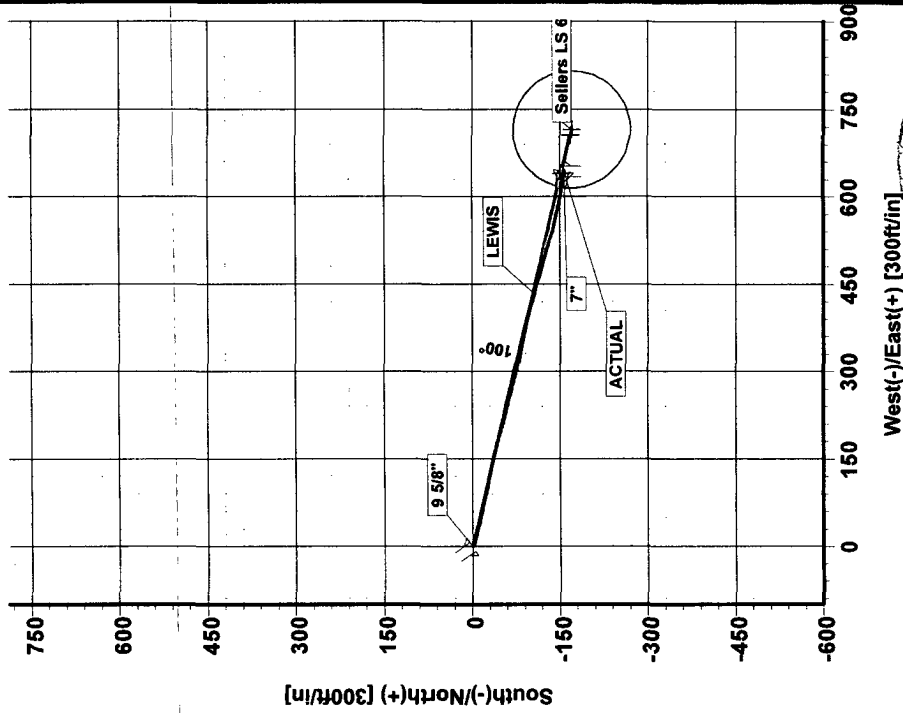
LEGEND
— Sellers LS 6N ACTUAL Plan #2
--- ACTUAL



Azimuths to Grid North
True North: 0.06°
Magnetic North: 10.71°
Magnetic Field
Strength: 51332nT
Dip Angle: 63.63°
Date: 3/6/2006
Model: bggm2005

FORMATION TOP DETAILS

No.	TVDPath	MDPath	Formation
1	1226.00	1238.72	OJO ALAMO
2	1353.00	1368.07	KIRTLAND
3	1977.00	2005.32	FRUITLAND
4	2309.00	2343.38	FRUITLAND COAL
5	2554.00	2592.43	PICTURED CLIFFS
6	2792.00	2834.62	LEWIS
7	3981.00	4039.25	CLIFF HOUSE
8	4356.00	4415.02	MENEFE
9	4865.00	4924.04	POINT LOOKOUT
10	5256.00	5315.04	MANCOS
11	6842.00	6901.04	GREENHORN
12	6904.00	6963.04	GRANEROS
13	6953.00	7012.04	TWO WELLS
14	7025.00	7084.04	PAGUATE
15	7084.00	7143.04	CUBERO
16	7106.00	7165.04	L. CUBERO
17	7140.00	7199.04	ENCINAL CYN



SURVEY PROGRAM

Date: 4/7/2006 Validated: No Version: 3

Depth From Depth To Survey/Plan
363.00 4014.00 MWD Survey
4150.00 7290.00 Projected Survey

Tool

MWD ISCWSA
INC+TREND

SITE DETAILS

SEC 30-T30N-R10W
SAN JUAN NEW MEXICO

Ground Level: 9113.00
Positional Uncertainty: 0.00
Convergence: -0.06

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

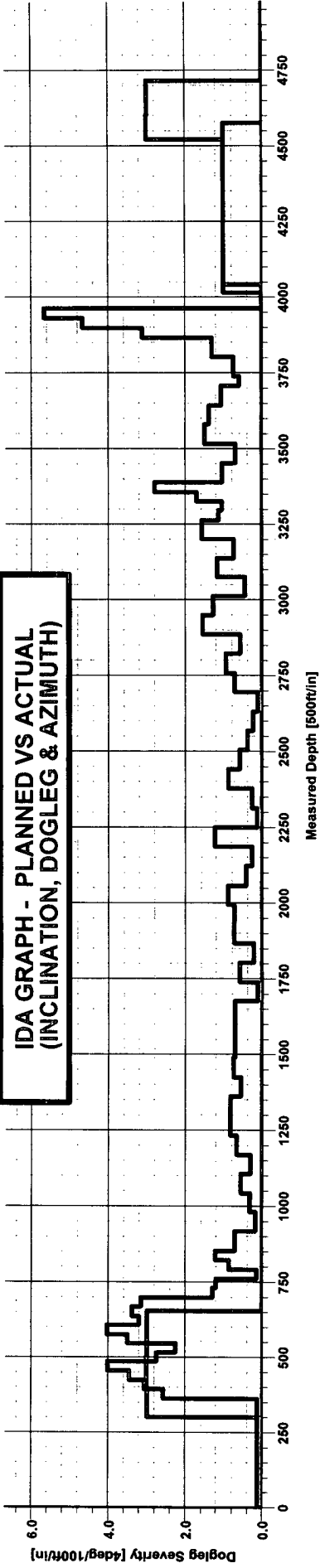


Scientific Drilling
Directional Drilling Operations

Field: SAN JUAN, New Mexico
Site: SEC 30-T30N-R10W
Well: Sellers LS 6N
Wellpath: ACTUAL



IDA GRAPH - PLANNED VS ACTUAL
(INCLINATION, DOGLEG & AZIMUTH)



LEGEND
— Sellers LS 6N, ACTUAL, Plan #2
— ACTUAL

