



Weatherford™

Drilling Services



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Final Survey Report



WILLIAMS PRODUCTION COMPANY

ROSA UNIT 312 A

30-039-29908

28-31N-4W

SURF 2060/N 1050/W

BHL 1273/N 1967/W

MD 3746

Tvd 3485

Prepared by: Jose A Perez

Submitted: 10/04/06

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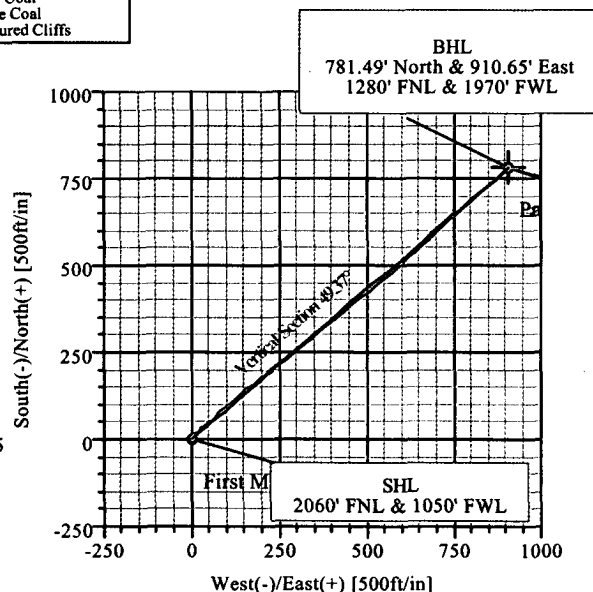
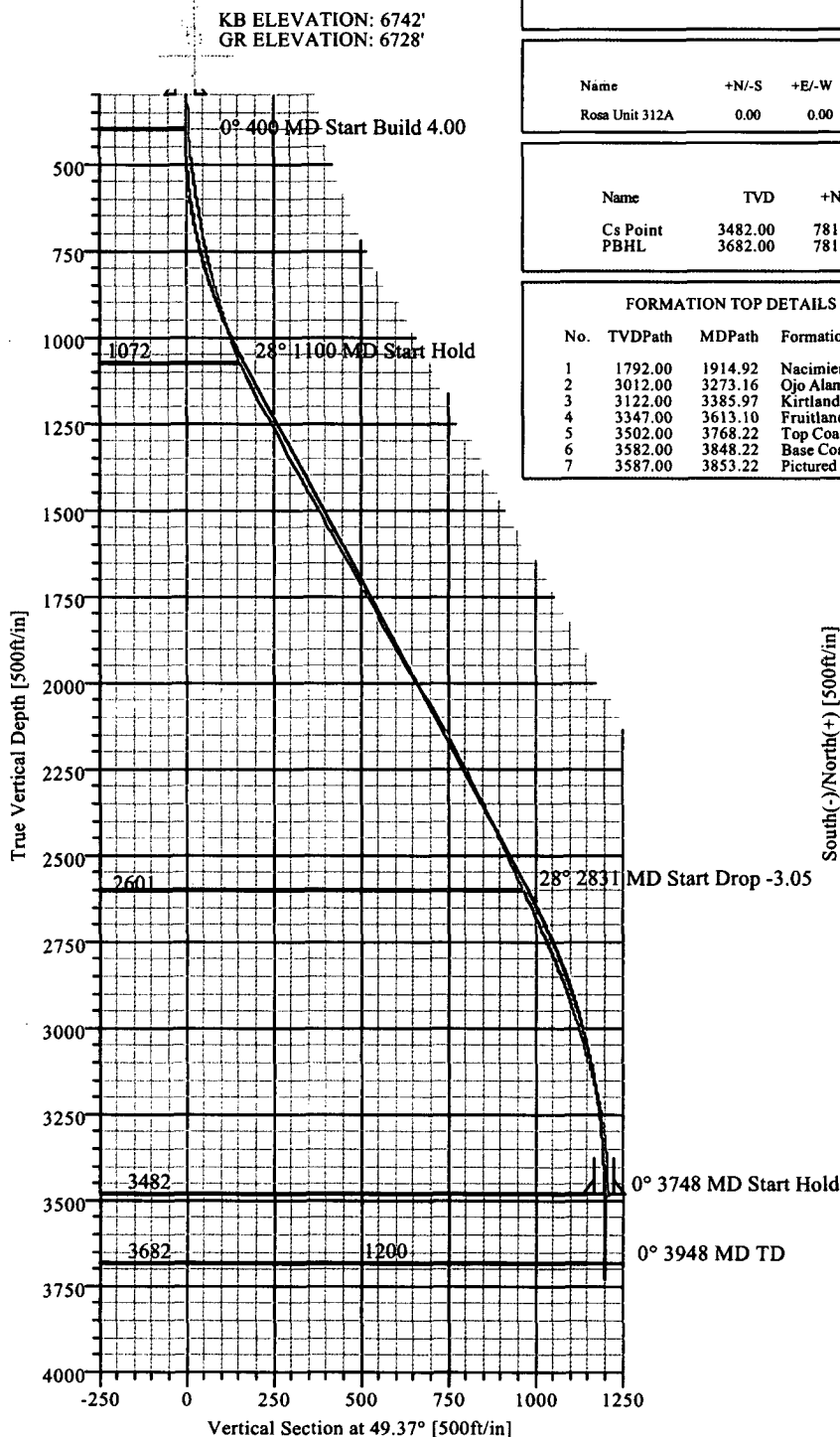
ROSA UNIT 312 A
Section 28 T 31N R 4W
2060' FNL & 1050' FWL
RIO ARriba COUNTY, NM
Plan vs. Actual

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec Target
1	0.00	0.00	49.37	0.00	0.00	0.00	0.00	0.00	0.00
2	400.00	0.00	49.37	400.00	0.00	0.00	0.00	0.00	0.00
3	1100.00	28.00	49.37	1072.47	109.19	127.24	4.00	49.37	167.67
4	2830.94	28.00	49.37	2600.80	638.40	743.92	0.00	0.00	980.29
5	3748.22	0.00	49.37	3482.00	781.49	910.65	3.05	180.00	1200.00
6	3948.22	0.00	49.37	3682.00	781.49	910.65	0.00	49.37	1200.00

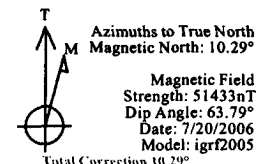
WELL DETAILS							
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Rosa Unit 312A	0.00	0.00	2137246.10	666240.05	36°52'20.000N	107°15'54.000W	N/A

TARGET DETAILS						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Cs Point	3482.00	781.49	910.65	36°52'27.727N	107°15'42.792W	Point
PBHL	3682.00	781.49	910.65	36°52'27.727N	107°15'42.792W	Point

FORMATION TOP DETAILS			
No.	TVDPath	MDPath	Formation
1	1792.00	1914.92	Nacimiento
2	3012.00	3273.16	Ojo Alamo
3	3122.00	3385.97	Kirtland
4	3347.00	3613.10	Fruitland
5	3502.00	3768.22	Top Coal
6	3582.00	3848.22	Base Coal
7	3587.00	3853.22	Pictured Cliffs



Plan ---
Actual ---



Plan: Plan #1 (Rosa Unit 312A/1) pva
Created By: Jose Perez Date: 10/04/06
Weatherford Drilling Services
3611 Plaza East Court
Granbury TX 76049
(817) 573 8500 MAIN
(817) 573 8001 FAX



Weatherford Drilling Services

Survey Report



Company: WILLIAMS PRODUCTION
Field: RIO ARRIBA COUNTY (NAD 27)
Site: Rosa Unit 312 A
Well: Rosa Unit 312A
Wellpath: 1

Date: 10/4/2006
Time: 15:24:58
Page: 1
Co-ordinate(N/E) Reference: Site: Rosa Unit 312 A, True North
Vertical (TVD) Reference: SITE 6742.0
Section (VS) Reference: Well (0.00N,0.00E,49.37Azi)
Survey Calculation Method: Minimum Curvature
Db: Sybase

Field: RIO ARRIBA COUNTY (NAD 27)
 NEW MEXICO

Map System: US State Plane Coordinate System 1927
Geo Datum: NAD27 (Clarke 1866)
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Western Zone
Coordinate System: Site Centre
Geomagnetic Model: igrf2005

Site: Rosa Unit 312 A
 Well Pad 28
 Rio Arriba County, NM

Site Position: Northing: 2137246.10 ft Latitude: 36 52 20.000 N
From: Geographic Easting: 666240.05 ft Longitude: 107 15 54.000 W
Position Uncertainty: 0.00 ft North Reference: True
Ground Level: 6728.00 ft Grid Convergence: 0.34 deg

Well: Rosa Unit 312A
 S well

Slot Name:

Well Position: +N/-S 0.00 ft Northing: 2137246.10 ft Latitude: 36 52 20.000 N
 +E/-W 0.00 ft Easting: 666240.05 ft Longitude: 107 15 54.000 W
Position Uncertainty: 0.00 ft

Wellpath: 1

2060' FNL & 1050' FWL

Current Datum: SITE

Height: 6742.00 ft

Magnetic Data: 7/20/2006

Field Strength: 51433 nT

Vertical Section: Depth From (TVD)

+N/-S
ft

Drilled From: Surface

Tie-on Depth: 0.00 ft

Above System Datum: Mean Sea Level

Declination: 10.29 deg

Mag Dip Angle: 63.79 deg

+E/-W Direction
ft deg

0.00

0.00

0.00

49.37

Survey: MWD Surveys

Start Date: 8/13/2006

Company: Weatherford Drilling Services

Engineer:

Tool:

Tied-to:

From Surface

Survey: MWD Surveys

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	First MWD Survey
354.00	2.19	27.17	353.91	6.02	3.09	6.26	0.62	0.62	0.00	
417.00	3.44	44.54	416.84	8.44	4.96	9.26	2.38	1.98	27.57	
478.00	6.81	48.42	477.59	12.14	8.95	14.70	5.55	5.52	6.36	
539.00	7.94	46.92	538.08	17.42	14.74	22.53	1.88	1.85	-2.46	
600.00	9.19	50.29	598.40	23.41	21.56	31.61	2.21	2.05	5.52	
662.00	10.13	50.04	659.52	30.08	29.55	42.01	1.52	1.52	-0.40	
723.00	10.88	50.29	719.50	37.20	38.09	53.13	1.23	1.23	0.41	
784.00	12.44	47.92	779.24	45.28	47.40	65.46	2.67	2.56	-3.89	
844.00	14.06	46.29	837.64	54.65	57.46	79.20	2.77	2.70	-2.72	
904.00	16.00	49.67	895.58	65.04	69.04	94.74	3.55	3.23	5.63	
964.00	18.69	50.04	952.85	76.57	82.71	112.63	4.49	4.48	0.62	
1025.00	20.94	48.17	1010.23	90.11	98.33	133.30	3.83	3.69	-3.07	
1085.00	22.63	48.92	1065.95	104.85	115.02	155.57	2.85	2.82	1.25	
1146.00	24.75	49.54	1121.80	120.85	133.58	180.07	3.50	3.48	1.02	
1209.00	27.13	50.54	1178.45	138.54	154.71	207.63	3.84	3.78	1.59	
1271.00	28.50	51.04	1233.29	156.83	177.13	236.55	2.24	2.21	0.81	
1334.00	28.44	51.54	1288.67	175.61	200.56	266.56	0.39	-0.10	0.79	
1397.00	28.44	52.67	1344.07	194.04	224.24	296.53	0.85	0.00	1.79	
1459.00	28.44	53.04	1398.58	211.86	247.77	326.00	0.28	0.00	0.60	
1522.00	28.75	51.67	1453.90	230.28	271.65	356.11	1.15	0.49	-2.17	
1584.00	29.38	49.42	1508.09	249.42	294.89	386.22	2.03	1.02	-3.63	
1647.00	29.00	50.04	1563.09	269.28	318.34	416.95	0.77	-0.60	0.98	
1709.00	29.19	49.29	1617.27	288.80	341.32	447.09	0.66	0.31	-1.21	



Weatherford Drilling Services Survey Report



Company: WILLIAMS PRODUCTION Date: 10/4/2006 Time: 15:24:58 Page: 2
Field: RIO ARRIBA COUNTY (NAD 27) Co-ordinate(NE) Reference: Site: Rosa Unit 312 A, True North
Site: Rosa Unit 312 A Vertical (TVD) Reference: SITE 6742.0
Well: Rosa Unit 312A Section (VS) Reference: Well (0.00N,0.00E,49.37Azi)
Wellpath: 1 Survey Calculation Method: Minimum Curvature Db: Sybase

Survey: MWD Surveys

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
1770.00	29.13	50.54	1670.54	307.94	364.06	476.81	1.00	-0.10	2.05	
1831.00	29.19	50.67	1723.81	326.80	387.02	506.53	0.14	0.10	0.21	
1894.00	29.00	50.79	1778.86	346.19	410.74	537.15	0.32	-0.30	0.19	
1956.00	29.50	50.92	1832.95	365.31	434.24	567.44	0.81	0.81	0.21	
2019.00	29.44	50.92	1887.80	384.85	458.30	598.42	0.10	-0.10	0.00	
2081.00	29.25	51.29	1941.85	403.93	481.94	628.79	0.42	-0.31	0.60	
2143.00	29.25	51.29	1995.94	422.88	505.58	659.07	0.00	0.00	0.00	
2205.00	29.38	50.17	2050.00	442.09	529.08	689.41	0.91	0.21	-1.81	
2267.00	29.50	49.92	2104.00	461.66	552.44	719.88	0.28	0.19	-0.40	
2330.00	28.88	48.79	2159.00	481.67	575.76	750.61	1.32	-0.98	-1.79	
2393.00	27.88	47.54	2214.42	501.64	598.07	780.54	1.85	-1.59	-1.98	
2455.00	26.94	48.29	2269.46	520.77	619.25	809.08	1.62	-1.52	1.21	
2516.00	26.50	48.17	2323.95	539.04	639.70	836.50	0.73	-0.72	-0.20	
2578.00	25.94	48.29	2379.57	557.29	660.13	863.89	0.91	-0.90	0.19	
2641.00	25.31	47.79	2436.37	575.50	680.40	891.12	1.06	-1.00	-0.79	
2704.00	24.75	46.92	2493.46	593.56	700.00	917.76	1.06	-0.89	-1.38	
2765.00	24.44	47.42	2548.92	610.82	718.62	943.13	0.61	-0.51	0.82	
2827.00	24.69	47.54	2605.31	628.24	737.62	968.89	0.41	0.40	0.19	
2890.00	24.50	47.29	2662.59	645.98	756.92	995.10	0.34	-0.30	-0.40	
2952.00	23.75	47.54	2719.18	663.13	775.58	1020.42	1.22	-1.21	0.40	
3013.00	22.38	47.17	2775.30	679.32	793.16	1044.31	2.26	-2.25	-0.61	
3075.00	21.94	48.54	2832.72	695.01	810.50	1067.68	1.09	-0.71	2.21	
3137.00	20.75	49.67	2890.47	709.79	827.55	1090.25	2.03	-1.92	1.82	
3200.00	18.56	50.92	2949.79	723.33	843.84	1111.43	3.54	-3.48	1.98	
3261.00	17.13	51.04	3007.86	735.10	858.37	1130.12	2.35	-2.34	0.20	
3324.00	15.50	51.29	3068.32	746.20	872.15	1147.81	2.59	-2.59	0.40	
3386.00	13.31	51.42	3128.37	755.84	884.20	1163.22	3.53	-3.53	0.21	
3449.00	12.25	46.79	3189.81	764.93	894.74	1177.15	2.34	-1.68	-7.35	
3512.00	9.50	48.79	3251.67	772.94	903.52	1189.02	4.41	-4.37	3.17	
3574.00	7.13	47.79	3313.01	778.89	910.22	1197.99	3.83	-3.82	-1.61	
3637.00	4.69	36.42	3375.67	783.59	914.65	1204.41	4.28	-3.87	-18.05	
3700.00	1.56	36.04	3438.57	786.36	916.68	1207.75	4.97	-4.97	-0.60	Last MWD Survey
3746.00	1.56	36.04	3484.56	787.37	917.42	1208.97	0.00	0.00	0.00	Projection to Bit

Annotation

MD ft	TVD ft	
354.00	353.91	First MWD Survey
3700.00	3438.57	Last MWD Survey
3746.00	3484.56	Projection to Bit