



Weatherford[®]

Drilling Services

10-30-07

Final Survey @ TD

30-039-29984



WILLIAMS PRODUCTION COMPANY

ROSA UNIT #370

RCVD OCT 30 '07
OIL CONS. DIV.
DIST. 3

Prepared by: Jose A Perez

Submitted: 09/25/07

*Surface 10/S 1635/W
BHL 1198/S 1950/W*

NSL-446' from section line

Weatherford Drilling Services

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Houston, TX 77041 USA
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HOLD C104 FOR *NSL*
"as drilled" plat.

B 10/30



Weatherford

ROSA UNIT 370
Section 19 T31N R 4W
10' FSL & 1635' FWL
RIO ARriba COUNTY, NM
PLAN VS ACTUAL

LEGEND

== Rosa Unit 370,1,Plan #1
== MWD Surveys

TARGET DETAILS

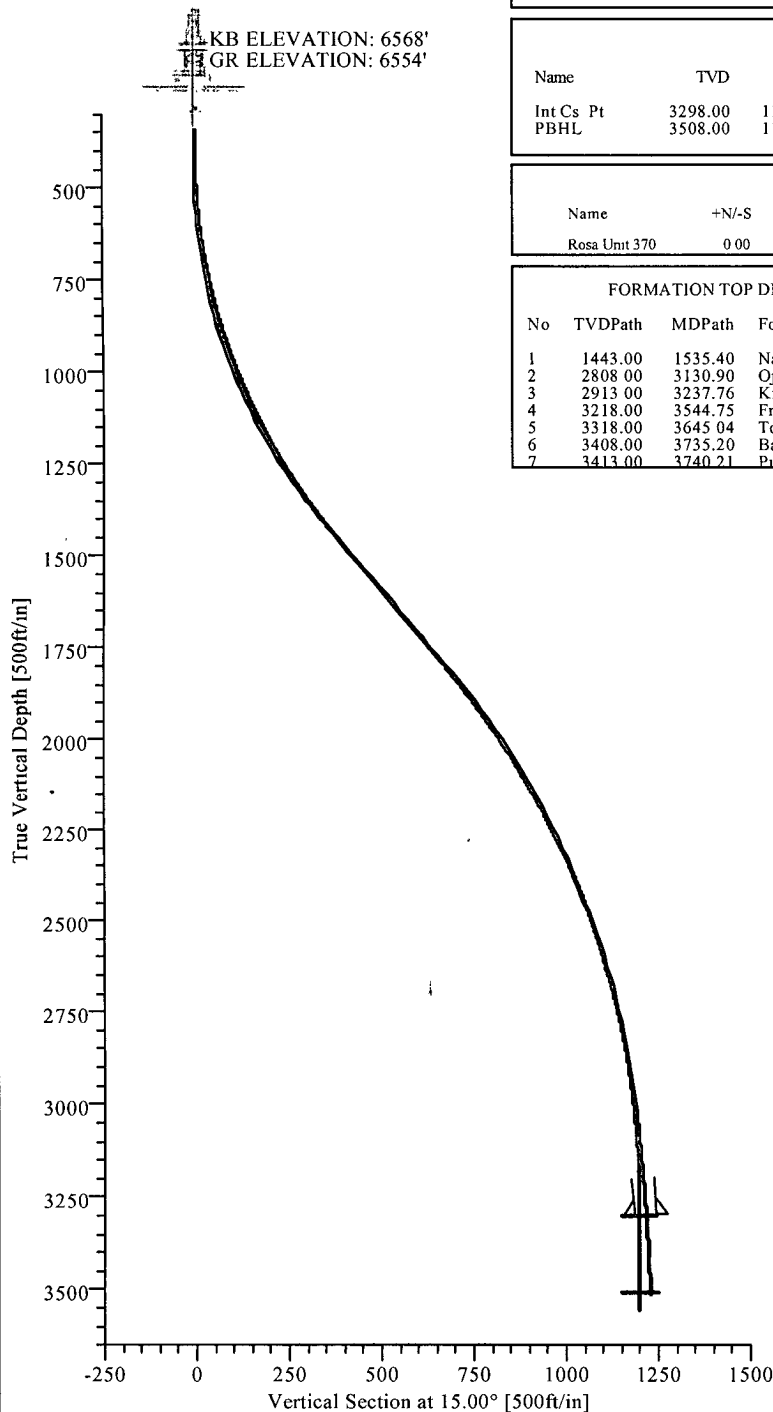
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Int Cs Pt	3298.00	1159.11	310.58	36°52'51.541N	107°17'52.397W	Point
PBHL	3508.00	1159.11	310.58	36°52'51.541N	107°17'52.397W	Circle (Radius: 50)

WELL DETAILS

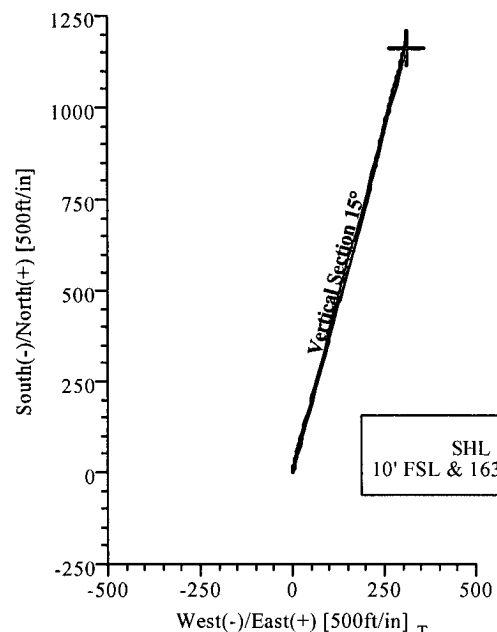
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Rosa Unit 370	0.00	0.00	2139285.80	2879391.70	36°52'40.080N	107°17'56.220W	N/A

FORMATION TOP DETAILS

No	TVDPath	MDPath	Formation
1	1443.00	1535.40	Nacimiento
2	2808.00	3130.90	Ojo Alamo
3	2913.00	3237.76	Kirtland
4	3218.00	3544.75	Fruitland
5	3318.00	3645.04	Top Coal Interval
6	3408.00	3735.20	Base Coal Interval
7	3413.00	3740.21	Pictured Cliffs



BHL
1159.11' North & 310.58' East
1170' FSL & 1945' FWL



Azimuths to True North
Magnetic North. 10.25°
Magnetic Field
Strength: 51337nT
Dip Angle: 63.80°
Date: 7/17/2007
Model: bggm2006
Total Correction 10.25°

Plan Plan #1 (Rosa Unit 320/1) p1

Created By Jose Perez Date: 09/25/07
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	Date: 9/25/2007	Time: 08:20:42	Page: 1
Field: Rio Arriba County (NAD 83)	Co-ordinate(NE) Reference: Site: Rosa Unit 370, True North		
Site: Rosa Unit 370	Vertical (TVD) Reference: SITE 6568.0		
Well: Rosa Unit 370	Section (VS) Reference: Well (0.00N,0.00E,15.00Azi)		
Wellpath: 1	Survey Calculation Method: Minimum Curvature	Db: Sybase	

Field: Rio Arriba County (NAD 83)			
Map System: US State Plane Coordinate System 1983	Map Zone: New Mexico, Western Zone		
Geo Datum: GRS 1980	Coordinate System: Site Centre		
Sys Datum: Mean Sea Level	Geomagnetic Model: bggm2006		

Site: Rosa Unit 370 10' FSL & 1635' FWL Rio Arriba County, NM			
Site Position:	Northing: 2139285.80 ft	Latitude: 36 52 40.080 N	
From: Geographic	Easting: 2879391.70 ft	Longitude: 107 17 56.220 W	
Position Uncertainty: 0.00 ft		North Reference: True	
Ground Level: 6554.00 ft		Grid Convergence: 0.32 deg	

Well: Rosa Unit 370 S well	Slot Name:		
Well Position: +N/-S 0 00 ft	Northing: 2139285.80 ft	Latitude: 36 52 40.080 N	
+E/-W 0 00 ft	Easting: 2879391.70 ft	Longitude: 107 17 56.220 W	
Position Uncertainty: 0 00 ft			

Wellpath: 1	Drilled From: Surface		
Current Datum: SITE	Tie-on Depth: 0.00 ft		
Magnetic Data: 7/17/2007	Above System Datum: Mean Sea Level		
Field Strength: 51337 nT	Declination: 10 25 deg		
Vertical Section: Depth From (TVD)	Mag Dip Angle: 63 80 deg		
ft	+N/-S	+E/-W	Direction
	ft	ft	deg
0.00	0.00	0.00	15.00

Survey: MWD Surveys	Start Date: 7/23/2007		
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	
387.00	0.56	230.13	386.99	-1.21	-1.45	-1.55	0.14	0.14	0.00	
418.00	0.81	303.75	417.99	-1.19	-1.75	-1.60	2.73	0.81	237.48	
448.00	1.25	2.63	447.99	-0.74	-1.91	-1.21	3.61	1.47	196.27	
479.00	1.88	1.13	478.98	0.10	-1.89	-0.39	2.04	2.03	-4.84	
509.00	2.75	11.63	508.95	1.30	-1.73	0.81	3.21	2.90	35.00	
540.00	3.63	10.13	539.90	2.99	-1.41	2.53	2.85	2.84	-4.84	
569.00	4.69	8.63	568.83	5.07	-1.07	4.62	3.67	3.66	-5.17	
600.00	5.50	13.63	599.70	7.77	-0.53	7.37	2.98	2.61	16.13	
630.00	6.81	17.25	629.53	10.86	0.34	10.58	4.55	4.37	12.07	
661.00	7.94	16.63	660.27	14.67	1.50	14.56	3.65	3.65	-2.00	
692.00	8.94	16.25	690.94	19.03	2.78	19.11	3.23	3.23	-1.23	
722.00	9.88	13.75	720.53	23.77	4.05	24.01	3.42	3.13	-8.33	
753.00	11.13	14.13	751.01	29.26	5.41	29.66	4.04	4.03	1.23	
783.00	12.00	14.13	780.40	35.09	6.88	35.67	2.90	2.90	0.00	
814.00	13.50	14.38	810.64	41.72	8.56	42.51	4.84	4.84	0.81	
846.00	14.86	14.38	841.66	49.31	10.51	50.35	4.25	4.25	0.00	
878.00	16.00	14.68	872.51	57.55	12.65	58.87	3.57	3.56	0.94	
909.00	16.75	15.75	902.25	65.99	14.94	67.61	2.61	2.42	3.45	
939.00	18.19	15.75	930.87	74.66	17.39	76.61	4.80	4.80	0.00	
970.00	19.81	15.63	960.18	84.37	20.11	86.70	5.23	5.23	-0.39	
1002.00	21.19	16.13	990.15	95.15	23.18	97.91	4.35	4.31	1.56	
1033.00	23.00	15.88	1018.87	106.36	26.40	109.57	5.85	5.84	-0.81	
1065.00	24.31	15.63	1048.18	118.71	29.88	122.40	4.11	4.09	-0.78	

Weatherford Drilling Services

Survey Report

Company: WILLIAMS PRODUCTION				Date: 9/25/2007		Time: 08:20:42		Page: 2		
Field: Rio Arriba County (NAD 83)				Co-ordinate(NE) Reference:		Site: Rosa Unit 370, True North				
Site: Rosa Unit 370				Vertical (TVD) Reference:		SITE 6568.0				
Well: Rosa Unit 370				Section (VS) Reference:		Well (0.00N;0.00E;15.00Azi)				
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
1095.00	25.44	15.88	1075.40	130.86	33.31	135.02	3.78	3.77	0.83	
1127.00	26.69	15.63	1104.14	144.39	37.13	149.08	3.92	3.91	-0.78	
1159.00	27.88	16.00	1132.58	158.51	41.12	163.75	3.76	3.72	1.16	
1190.00	29.00	16.00	1159.84	172.70	45.19	178.51	3.61	3.61	0.00	
1222.00	30.56	15.50	1187.61	187.99	49.51	194.40	4.94	4.87	-1.56	
1253.00	31.13	15.50	1214.23	203.31	53.75	210.29	1.84	1.84	0.00	
1284.00	31.75	15.75	1240.68	218.88	58.11	226.46	2.04	2.00	0.81	
1316.00	33.06	15.50	1267.69	235.40	62.73	243.61	4.12	4.09	-0.78	
1348.00	34.25	15.38	1294.33	252.49	67.45	261.34	3.72	3.72	-0.37	
1379.00	35.50	15.25	1319.76	269.59	72.13	279.07	4.04	4.03	-0.42	
1411.00	36.81	15.00	1345.60	287.81	77.05	297.95	4.12	4.09	-0.78	
1441.00	37.56	15.38	1369.50	305.31	81.81	316.08	2.61	2.50	1.27	
1472.00	38.44	15.00	1393.93	323.73	86.81	335.16	2.94	2.84	-1.23	
1501.00	39.44	14.75	1416.48	341.34	91.48	353.39	3.49	3.45	-0.86	
1533.00	39.69	14.50	1441.15	361.06	96.63	373.77	0.93	0.78	-0.78	
1562.00	39.81	14.88	1463.45	379.00	101.33	392.32	0.93	0.41	1.31	
1591.00	40.50	14.88	1485.61	397.08	106.14	411.02	2.38	2.38	0.00	
1623.00	40.94	15.25	1509.87	417.23	111.56	431.89	1.57	1.37	1.16	
1654.00	41.56	15.25	1533.17	436.95	116.94	452.33	2.00	2.00	0.00	
1684.00	41.31	15.50	1555.67	456.10	122.20	472.18	1.00	-0.83	0.83	
1716.00	40.81	15.63	1579.79	476.34	127.84	493.20	1.59	-1.56	0.41	
1748.00	40.38	15.63	1604.09	496.40	133.45	514.02	1.34	-1.34	0.00	
1780.00	39.69	15.63	1628.59	516.22	139.00	534.61	2.16	-2.16	0.00	
1811.00	39.06	14.75	1652.56	535.20	144.15	554.27	2.72	-2.03	-2.84	
1843.00	39.50	14.50	1677.33	554.80	149.27	574.53	1.46	1.37	-0.78	
1872.00	39.56	15.25	1699.69	572.64	154.01	592.99	1.66	0.21	2.59	
1903.00	39.31	15.88	1723.64	591.61	159.29	612.68	1.52	-0.81	2.03	
1934.00	39.56	16.13	1747.58	610.54	164.72	632.37	0.96	0.81	0.81	
1965.00	40.18	15.88	1771.37	629.64	170.20	652.24	2.07	2.00	-0.81	
1996.00	40.13	16.38	1795.07	648.84	175.75	672.22	1.05	-0.16	1.61	
2026.00	39.56	16.00	1818.10	667.30	181.11	691.44	2.07	-1.90	-1.27	
2057.00	39.56	15.63	1842.00	686.30	186.49	711.18	0.76	0.00	-1.19	
2093.00	38.81	15.38	1869.90	708.22	192.57	733.93	2.13	-2.08	-0.69	
2125.00	37.38	15.13	1895.09	727.26	197.77	753.67	4.49	-4.47	-0.78	
2156.00	35.81	14.25	1919.97	745.14	202.46	772.15	5.34	-5.06	-2.84	
2188.00	34.75	14.13	1946.10	763.06	206.99	790.63	3.32	-3.31	-0.37	
2220.00	34.56	13.88	1972.42	780.71	211.39	808.82	0.74	-0.59	-0.78	
2251.00	34.25	13.63	1998.00	797.72	215.56	826.33	1.10	-1.00	-0.81	
2283.00	32.25	13.38	2024.76	814.78	219.65	843.87	6.26	-6.25	-0.78	
2314.00	31.56	12.68	2051.07	830.75	223.35	860.24	2.53	-2.23	-2.26	
2344.00	30.94	12.63	2076.72	845.93	226.76	875.80	2.07	-2.07	-0.17	
2375.00	30.00	12.88	2103.44	861.26	230.23	891.50	3.06	-3.03	0.81	
2406.00	28.88	13.38	2130.44	876.10	233.69	906.73	3.70	-3.61	1.61	
2437.00	28.00	13.50	2157.69	890.46	237.12	921.49	2.84	-2.84	0.39	
2469.00	26.94	14.00	2186.09	904.80	240.63	936.25	3.39	-3.31	1.56	
2500.00	26.75	14.00	2213.74	918.38	244.01	950.24	0.61	-0.61	0.00	
2532.00	25.88	14.50	2242.43	932.13	247.50	964.43	2.81	-2.72	1.56	
2563.00	24.56	15.00	2270.47	944.90	250.87	977.64	4.31	-4.26	1.61	
2594.00	23.81	15.13	2298.75	957.17	254.17	990.34	2.43	-2.42	0.42	
2626.00	22.44	15.00	2328.18	969.30	257.43	1002.90	4.28	-4.28	-0.41	
2657.00	21.81	15.25	2356.90	980.57	260.48	1014.58	2.05	-2.03	0.81	
2689.00	21.56	15.38	2386.63	991.98	263.60	1026.40	0.80	-0.78	0.41	
2720.00	21.56	15.25	2415.46	1002.96	266.61	1037.79	0.15	0.00	-0.42	

Weatherford Drilling Services

Survey Report

Company: WILLIAMS PRODUCTION Field: Rio Arriba County (NAD 83) Site: Rosa Unit 370 Well: Rosa Unit 370 Wellpath: 1	Date: 9/25/2007 Co-ordinate(NE) Reference: Site: Rosa Unit 370, True North Vertical (TVD) Reference: SITE 6568.0 Section (VS) Reference: Well (0.00N;0.00E;15.00Azi) Survey Calculation Method: Minimum Curvature Db: Sybase
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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
2752.00	20.88	15.25	2445.29	1014.14	269.66	1049.38	2.12	-2.12	0.00	
2783.00	20.56	15.50	2474.29	1024.71	272.57	1060.34	1.07	-1.03	0.81	
2814.00	20.75	14.88	2503.30	1035.27	275.43	1071.28	0.93	0.61	-2.00	
2845.00	19.38	14.63	2532.41	1045.55	278.14	1081.91	4.43	-4.42	-0.81	
2877.00	18.19	14.88	2562.71	1055.52	280.76	1092.22	3.73	-3.72	0.78	
2908.00	18.06	15.50	2592.17	1064.82	283.29	1101.86	0.75	-0.42	2.00	
2939.00	16.56	16.38	2621.77	1073.69	285.82	1111.08	4.91	-4.84	2.84	
2970.00	15.50	16.50	2651.56	1081.90	288.24	1119.64	3.42	-3.42	0.39	
3001.00	14.44	15.88	2681.51	1089.59	290.48	1127.65	3.46	-3.42	-2.00	
3033.00	13.75	15.00	2712.54	1097.10	292.55	1135.44	2.26	-2.16	-2.75	
3064.00	13.56	13.25	2742.67	1104.20	294.34	1142.76	1.47	-0.61	-5.65	
3096.00	12.38	13.00	2773.85	1111.19	295.97	1149.93	3.69	-3.69	-0.78	
3126.00	11.56	13.63	2803.20	1117.25	297.40	1156.15	2.77	-2.73	2.10	
3156.00	11.25	14.50	2832.61	1123.00	298.84	1162.08	1.18	-1.03	2.90	
3187.00	10.81	16.50	2863.03	1128.72	300.43	1168.01	1.88	-1.42	6.45	
3219.00	10.06	16.75	2894.50	1134.27	302.08	1173.81	2.35	-2.34	0.78	
3250.00	8.81	14.88	2925.08	1139.16	303.47	1178.89	4.15	-4.03	-6.03	
3280.00	7.69	14.38	2954.77	1143.32	304.56	1183.19	3.74	-3.73	-1.67	
3312.00	7.31	12.13	2986.50	1147.39	305.52	1187.37	1.50	-1.19	-7.03	
3343.00	6.69	12.63	3017.27	1151.08	306.33	1191.14	2.01	-2.00	1.61	Last MWD Survey
3842.00	2.00	12.63	3514.69	1187.96	314.60	1228.90	0.94	-0.94	0.00	TD Survey

Annotation

MD ft	TVD ft	
3343.00	3017.27	Last MWD Survey
3842.00	3514.69	TD Survey

Surface Location:

10' FSL and 1635' FWL
SE/4 SW/4 Sec 19(N), T31N, R04W
Rio Arriba, NM

Bottom Hole Location:

1188' FSL and 1950' FWL
SE/4 SW/4 Sec 19(N), T31N, R04W
Rio Arriba, NM

Elevation: 6554' GR
API # 30-039-29984

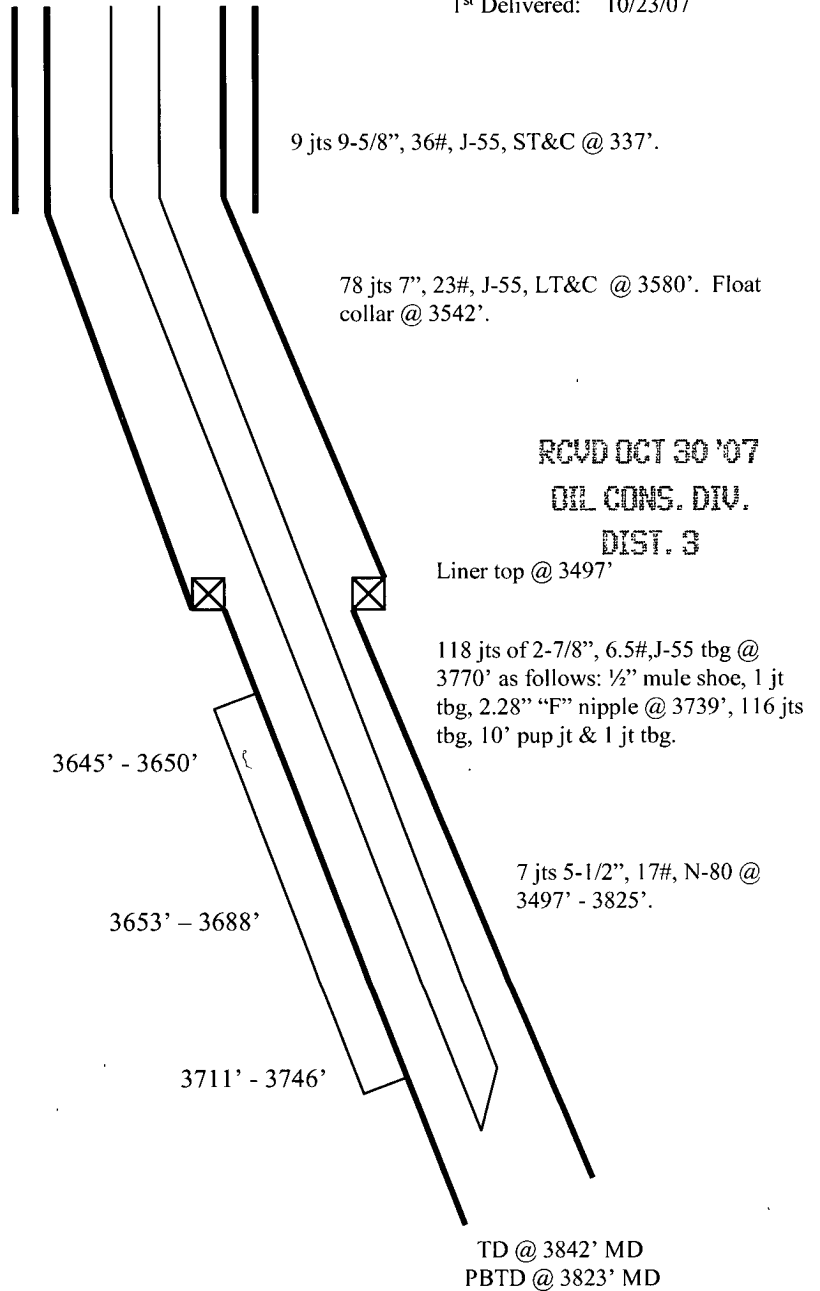
ROSA UNIT #370
BASIN FRUITLAND COAL

Spud: 07/19/07

Completed: 10/20/07

1st Delivered: 10/23/07

Top	MD Depth
Ojo Alamo	3131'
Kirtland	3238'
Fruitland	3545'
Base of Coal	3735'
Pictured Cliffs	3740'



Hole Size	Casing	Cement	Volume	Top of Cmt
12-1/4"	9-5/8", 36#	261 sxs	368 cu.ft.	Surface
8-3/4"	7", 23#	575 sxs	1176 cu.ft.	Surface
6-1/4"	5-1/2", 17#	Did Not Cmt		