

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No. 1004-0136  
Expires January 31, 2004

5. Lease Serial No.  
NMSF-078769  
6. If Indian, Allottee or Tribe Name

1a. Type of Work: ☒ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2. Name of Operator

Williams Production Company, LLC

3a. Address

P.O. Box 640 Aztec, NM 87410

3b. Phone No. (include area code)

(505) 634-4208

4. Location of Well (Report location clearly and in accordance with any State requirements. \*)

At surface 1455' FNL & 1780' FEL, Section 21, T. 31N., R.5W.

At proposed prod. zone 2310' FNL & 2310' FEL, Section 21, T. 31N., R.5W.

14. Distance in miles and direction from nearest town or post office\*

approximately 35 miles northeast of Blanco, New Mexico

15. Distance from proposed\*

location to nearest  
property or lease line, ft.  
(Also to nearest drig. unit line, if any)

1455'

16. No. of Acres in lease

2,560.00

17. Spacing Unit dedicated to this well

320.0 (E/2) Section 21

18. Distance from proposed location\*  
to nearest well, drilling, completed,  
applied for, on this lease, ft.

1200'

19. Proposed Depth

6,534'

20. BLM/BIA Bond No. on file

UT0847

21. Elevations (Show whether DF, KDB, RT, GL, etc.)

6589' GR

22. Approximate date work will start\*

June 1, 2007

23. Estimated duration

1 month

24. Attachments

RCVD APR 2 '08

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall be attached to this form:

OIL CONS. DIV.

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be required by the authorized officer.

DIST. 3

25. Signature

*Larry Higgins*

Name (Printed/Typed)

Larry Higgins

Date

2-2-07

Title

Drilling COM

Approved by (Signature)

*[Signature]*

Name (Printed/Typed)

Office

*PFO*

Date

4/1/08

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*(Instructions on reverse)

Williams Exploration and Production Company, LLC, proposes to drill a well to develop the Blanco Mesaverde formation at the above described location in accordance with the attached drilling and surface use plans.

The surface is under jurisdiction of the U.S. Forest Service, Jicarilla Ranger District, Carson National Forest.

This location has been archaeologically surveyed La Plata Archaeological Consultants. Copies of their report have been submitted directly to the USFS, Jicarilla Ranger District.

This APD is also serving as an application to obtain an access road and gas pipeline. Required for this location is a 1200.00-foot access road, and a gas pipeline of 1525.6 feet, to be placed adjacent to the access road.

Hold C104  
for Directional Survey  
and "As Drilled" plat

DRILLING OPERATIONS AUTHORIZED ARE  
SUBJECT TO COMPLIANCE WITH ATTACHED  
"GENERAL REQUIREMENTS".

NOTIFY AZTEC OCD 24 HRS.  
PRIOR TO CASING & CEMENT

NMOCD

APR 04 2008

This action is subject to technical and  
procedural review pursuant to 43 CFR 3165.3  
and appeal pursuant to 43 CFR 3165.4

District I  
PO Box 1980, Hobbs, NM 88241-1980

District II  
PO Drawer DD, Artesia, NM 88211-0719

District III  
1000 Rio Brazos Rd., Aztec, NM 87410

District IV  
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico  
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION  
PO Box 2088  
Santa Fe, NM 87504-2088

Form C-102  
Revised February 21, 1994  
Instructions on back  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

207 FEB -2 PM 2:08  
AMENDED REPORT

RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number <b>30-039-30186</b>		*Pool Code <b>72319</b>	*Pool Name <b>BLANCO MESAVERDE</b>
*Property Code <b>17033</b>	*Property Name <b>ROSA UNIT</b>		*Well Number <b>189</b>
*GRID No <b>120782</b>	*Operator Name <b>WILLIAMS PRODUCTION COMPANY</b>		*Elevation <b>6589'</b>

<sup>10</sup> Surface Location

UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	21	31N	5W		1455	NORTH	1780	EAST	RIO ARriba

<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	21	31N	5W		2310	NORTH	2310	EAST	RIO ARriba

<sup>12</sup> Dedicated Acres <b>320.0 Acres - (E/2)</b>	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p><sup>16</sup></p>	<p><sup>17</sup> OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief</p> <p><i>Larry Higgins</i> Signature <b>LARRY HIGGINS</b> Printed Name <b>DRILLING CO</b> Title <b>2-2-07</b> Date</p>
	<p><sup>18</sup> SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief</p> <p>Date of Survey: <b>MAY 3, 2006</b></p> <p>Signature and Seal of Professional Surveyor</p> <p></p> <p><b>JASON C. EDWARDS</b> Certificate Number 15269</p>

Submit 3 Copies To Appropriate District  
Office  
District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Ave., Artesia, NM 88210  
District III  
1000 Rio Brazos Rd., Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM  
87505

State of New Mexico  
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-103  
May 27, 2004

<b>SUNDRY NOTICES AND REPORTS ON WELLS</b> (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)		WELL API NO. <b>30-039-30186</b>
1. Type of Well: Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other		5. Indicate Type of Lease FEDERAL <input checked="" type="checkbox"/> STATE <input type="checkbox"/> FEE <input type="checkbox"/>
2. Name of Operator Williams Production Company, LLC		6. State Oil & Gas Lease No. NMSF-078769
3. Address of Operator P.O. Box 640 Aztec, NM 87410		7. Lease Name or Unit Agreement Name Rosa Unit
4. Well Location: Surface: Unit Letter G: 1455 feet from the north line and 1780 feet from the east line Section 21 Township 31N Range 5W NMPM County Rio Arriba Bottom Hole: Unit Letter G: 2310 feet from the north line and 2310 feet from the east line Section 21 Township 31N Range 5W NMPM County Rio Arriba		8. Well Number: 189
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 6,589' GR		9. OGRID Number 120782
Pit or Below-grade Tank Application <input checked="" type="checkbox"/> or Closure <input type="checkbox"/>		
Pit type <input type="checkbox"/> reserve <input type="checkbox"/> Depth to Groundwater <input type="checkbox"/> >100' Distance from nearest fresh water well <input type="checkbox"/> >1,000' Distance from nearest surface water <input type="checkbox"/> >1,000'		
Pit Liner Thickness: 12 mil Below-Grade Tank: Volume bbls; Construction Material		

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

<b>NOTICE OF INTENTION TO:</b>		<b>SUBSEQUENT REPORT OF:</b>	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input checked="" type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	P AND A <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	MULTIPLE COMPL <input type="checkbox"/>	CASING/CEMENT JOB <input type="checkbox"/>	
OTHER: <input type="checkbox"/>		OTHER: <input type="checkbox"/>	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Drilling/Completion pit to be located approximately 50 to 75 feet from well head. Pit multi-use drilling and completion to avoid additional site disturbance and pit will be considered out of service once production tubing set. Pit to be constructed, operated and closed in accordance with NMOCD guidelines and Williams procedures.

\*Pit is being permitted as a drilling pit only, if an extension is needed to facilitate completion operations please file an extension in accordance with the OCD's current pit rule.

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☒, a general permit ☐ or an (attached) alternative OCD-approved plan ☐.

SIGNATURE Larry Higgins TITLE Drilling COM DATE 2-2-07  
Type or print name Larry Higgins E-mail address: larry.higgins@williams.com Telephone No. (505) 634-4208

**For State Use Only**

APPROVED BY: [Signature] TITLE Deputy Oil & Gas Inspector, District #3 DATE APR 04 2008  
Conditions of Approval (if any):  
\*See above conditions



## WILLIAMS PRODUCTION COMPANY

### Operations Plan

(Note: This procedure will be adjusted on site based upon actual conditions)

**DATE:** 1/23/2007 **FIELD:** Blanco MV  
**WELL NAME:** Rosa #189 **SURFACE:** USFS  
**BH LOCATION:** SWNE Sec 21-31N-5W **MINERALS:** FED  
Rio Arriba, NM  
**SURF LOCATION:** SWNE Sec 21-31N-5W  
**ELEVATION:** 6,589' GR **LEASE #** SF-078769  
**MEASURED DEPTH:** 6,534

**I. GEOLOGY:** Surface formation - San Jose

**A. FORMATION TOPS:** ( KB)

Name		TVD	MD		Name		TVD	MD
Ojo Alamo		2,753	2,891		Cliff House		5,673	5,843
Kirtland		2,863	3,010		Menefee		5,718	5,888
Fruitland		3,233	3,397		Point Lookout		5,913	6,083
Picture Cliffs		3,448	3,616		Mancos		6,223	6,393
Lewis		3,748	3,918		TD		6,363	6,534

**B. MUD LOGGING PROGRAM:** none

**C. LOGGING PROGRAM:** Cased Hole logs only

**D. NATURAL GAUGES:** Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

**II. DRILLING:**

**A. MUD PROGRAM:** Clear water with benex to 7" casing point. Convert to a LSND mud to log and run pipe. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses. Use air w/Air Hammer from 7 in. csg.to TD.

**B. BOP TESTING:** While drill pipe is in use, the pipe rams and the blind rams will be function tested once each trip. The anticipated reservoir is expected to be less than 1300 psi, so the BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. **All tests and inspections will be recorded in the tour book as to time and results.**

**III. MATERIALS****A. CASING PROGRAM:**

CASING TYPE	OH SIZE (IN)	DEPTH (MD) (FT)	CASING SIZE (IN)	WEIGHT(LB)	GRADE
Surface	12 1/4	300	9 5/8	36	K-55
Intermediate	8 3/4	4,095	7	20	K-55
Liner	6 1/4	3,995 6,534	4 1/2	10.5	J-55

**B. FLOAT EQUIPMENT:**

1. **SURFACE CASING:** 9-5/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
2. **INTERMEDIATE CASING:** 7" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) Turbulent centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) Turbulent centralizer at 2,700 ft., 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. (NTL-FRA 90-1).
3. **PRODUCTION CASING:** 4-1/2" whirler type cement nose guide shoe with a latch collar on top of 20' bottom joint. Place marker joint above 5,400'. Place centralizers as needed across selected production intervals.

**IV. CEMENTING:**

*(Note: Volumes may be adjusted onsite due to actual conditions)*

1. **SURFACE:** Slurry: 150sx (205 cu.ft.) of "Type III" + 2% CaCl<sub>2</sub> + ¼ # of cello-flake/sk (Yield = 1.39 cu.ft./sk, Weight = 14.5 #/gal.). The 100% excess should circulate cement to the surface. WOC 12 hours. Test csg to 1500psi.
2. **INTERMEDIATE:** Lead - 525 sx (1090) cu.ft.) of "Premium Light" with 8% gel, 1% CaCl<sub>2</sub> and 1/4# cello-flake/sk (Yield = 2.09 cu.ft./sk, Weight = 12.1 #/gal.). Tail - 50 sx (70cu.ft.) of "Type III" with 1/4# cello-flake/sk (Yield = 1.4 cu.ft./sk, Weight = 14.5#/gal.). Use **100% excess in Lead Slurry** to circulate to surface. **No excess in Tail Slurry.** Total volume = 1,160 cu.ft. Bump Plug to 1,500 psi. Notify engineering if cement is not circulated to surface.
3. **PRODUCTION LINER:** 10 bbl Gelled Water spacer. Cement: 155 sx (325 ft<sup>3</sup>) of Premium Light HS + 1% FL-52 + .2% CD-32, 0.1% R-3, 3 #/sk CSE, ¼ #/sk cello flake and 4% Phenoseal. (Yield = 2.15 ft<sup>3</sup>/sk, Weight = 12.3 #/gal.). Displace cement at a minimum of 8 BPM. The 20% excess in lead and tail should cover 100 ft into intermediate casing. Total volume 325 ft<sup>3</sup>. WOC 12 hours

**V. IV COMPLETION****A. CBL**

1. Run Cement Bond Log across all intervals to be perforated and find Top of Cement behind all casing strings if cement is not circulated to surface.

**B. PRESSURE TEST**

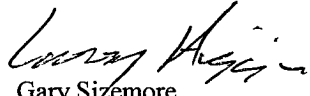
1. Pressure test 7" & 4-1/2" casing to max 3300 psi, hold at 1500 psi for 30 minutes.

**C. STIMULATION**

1. Perforate the Point Lookout as determined from the open hole logs.
2. Stimulate with approximately 9,300# of 14/30 LiteProp™ sand in slick water.
3. Isolate Point Lookout with a CIBP.
4. Perforate the Menefee/Cliff House as determined from the open hole logs.
5. Stimulate with approximately 9,300# of 14/30 LiteProp™ sand in slick water.
6. Test each zone before removing bridge plugs.

**D. RUNNING TUBING**

1. Mesa Verde: Run 2-3/8", 4.7#, J-55, EUE tubing with a SN (1.91" ID) on top of bottom joint. Land tubing approximately 25' above the bottom Point Lookout perforation.

  
for Gary Sizemore  
Sr. Drilling Engineer



Rosa Unit 189  
Sect. 21 T31N R5W  
1455' FNL & 1780' FEL  
Rio Arriba County, NM  
Plan 1



Weatherford®

#### SECTION DETAILS

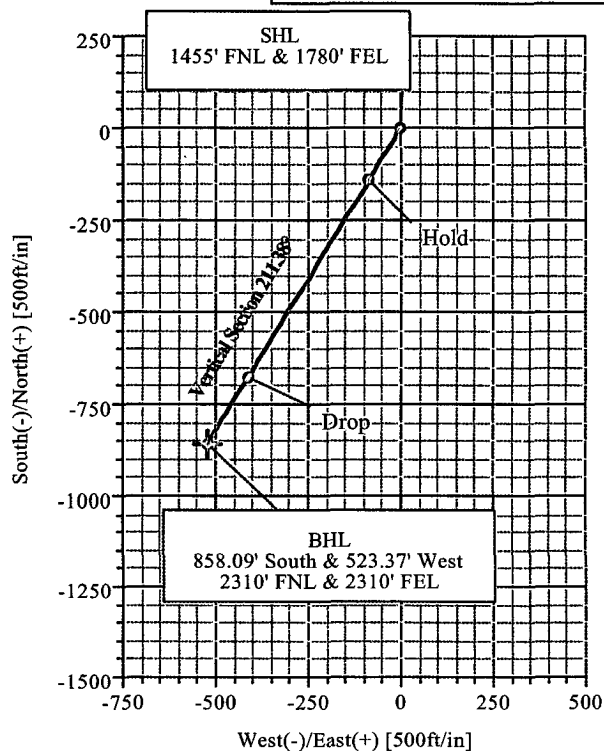
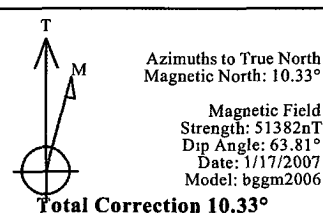
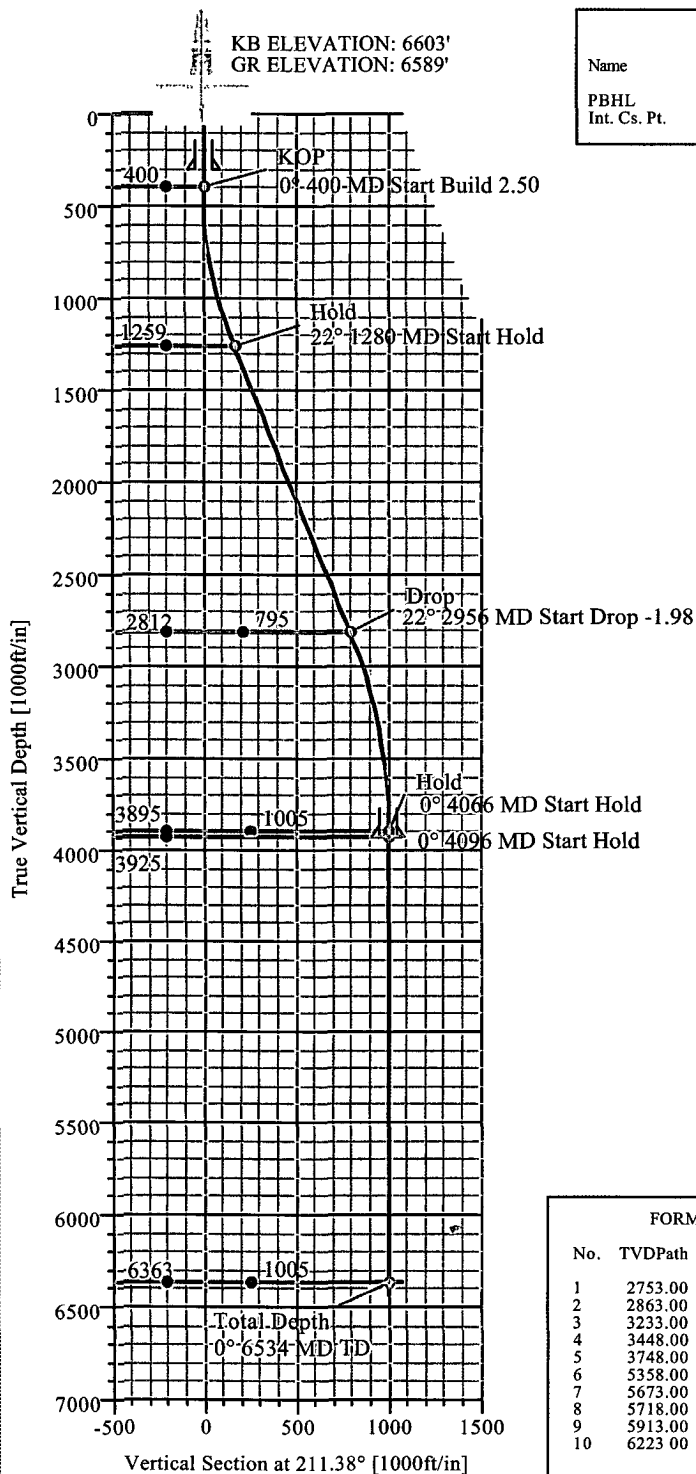
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	211.38	0.00	0.00	0.00	0.00	0.00	0.00	
2	400.00	0.00	211.38	400.00	0.00	0.00	0.00	0.00	0.00	
3	1280.00	22.00	211.38	1258.54	-142.47	-86.90	2.50	211.38	166.88	
4	2955.79	22.00	211.38	2812.30	-678.41	-413.78	0.00	0.00	794.64	
5	4065.56	0.00	211.38	3895.00	-858.09	-523.37	1.98	180.00	1005.10	
6	4095.56	0.00	211.38	3925.00	-858.09	-523.37	0.00	0.00	1005.10	Int. Cs. Pt.
7	6533.56	0.00	211.38	6363.00	-858.09	-523.37	0.00	211.38	1005.10	PBHL

#### WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Rosa Unit 189	0.00	0.00	2143018.33	2860127.80	36°53'17.988N	107°21'53.100W	N/A

#### TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL	6363.00	-858.09	-523.37	2142157.68	2859608.65	Circle (Radius: 50)
Int. Cs. Pt.	3925.00	-858.09	-523.37	2142157.68	2859608.65	Point



#### FORMATION TOP DETAILS

No.	TVDPath	MDPath	Formation
1	2753.00	2891.83	Ojo Alamo
2	2863.00	3010.27	Kirtland
3	3233.00	3397.63	Fruitland
4	3448.00	3616.76	Pictured Cliffs
5	3748.00	3918.50	Lewis
6	5358.00	5528.56	Cliff House Trans
7	5673.00	5843.56	Cliff House
8	5718.00	5888.56	Menefee
9	5913.00	6083.56	Point Lookout
10	6223.00	6393.56	Mancos

Plan Plan #1 (Rosa Unit 189)  
Created By: Jose Perez Date: 01/18/07  
Weatherford Drilling Services  
11943 FM 529  
Houston TX USA 77041  
(713) 896 8194 MAIN  
(713) 896 0498 FAX



# Weatherford Drilling Services

## Directional Plan Report



**Weatherford**

**Company:** WILLIAMS PRODUCTION  
**Field:** Rio Arriba County (NAD 83)  
**Site:** Rosa Unit 189  
**Well:** Rosa Unit 189  
**Wellpath:** 1

**Date:** 1/17/2007 **Time:** 14:36:10 **Page:** 3  
**Co-ordinate(NE) Reference:** Site: Rosa Unit 189, True North  
**Vertical (TVD) Reference:** SITE 6603.0  
**Section (VS) Reference:** Well (0.00N,0.00E,211.38Azi)  
**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	MapN ft	MapE ft	Comment
5900.00	0.00	211.38	5729.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6000.00	0.00	211.38	5829.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6083.56	0.00	211.38	5913.00	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	Point Lookout
6100.00	0.00	211.38	5929.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6200.00	0.00	211.38	6029.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6300.00	0.00	211.38	6129.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6393.56	0.00	211.38	6223.00	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	Mancos
6400.00	0.00	211.38	6229.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6500.00	0.00	211.38	6329.44	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	
6533.56	0.00	211.38	6363.00	-858.09	-523.37	1005.10	0.00	2142157.68	2859608.65	PBHL

### 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		
Int. Cs. Pt.			3925.00	-858.09	-523.37	2142157.68	2859608.65	36	53	9.503 N	107	21	59.543 W
-Plan hit target													
PBHL			6363.00	-858.09	-523.37	2142157.68	2859608.65	36	53	9.503 N	107	21	59.543 W
-Circle (Radius: 50)													
-Plan hit target													

### Annotation

MD ft	TVD ft	
400.00	400.00	KOP
1280.00	1258.54	Hold
2955.79	2812.30	Drop
4065.56	3895.00	Hold
6533.56	6363.00	Total Depth

### Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
2891.83	2753.00	Ojo Alamo		0.00	0.00
3010.27	2863.00	Kirtland		0.00	0.00
3397.63	3233.00	Fruitland		0.00	0.00
3616.76	3448.00	Pictured Cliffs		0.00	0.00
3918.50	3748.00	Lewis		0.00	0.00
5528.56	5358.00	Cliff House Trans		0.00	0.00
5843.56	5673.00	Cliff House		0.00	0.00
5888.56	5718.00	Menefee		0.00	0.00
6083.56	5913.00	Point Lookout		0.00	0.00
6393.56	6223.00	Mancos		0.00	0.00

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
300.00	300.00	9.625	12.250	9 5/8"
4095.56	3925.00	7.000	8.500	7"



# GEOLOGIC PROGNOSIS

Company: Williams Production Company, LLC  
Project: 2006 Drilling Plan  
Area: Rosa Unit

Operator: Williams Production Company, LLC  
Well Name: Rosa Unit No. 189 (Kmv-Directional)  
Location: SWNE 21-31N-05W  
Footage: 1455' FNL & 1780' FEL  
County/State: Rio Arriba/New Mexico

Surveyed GL: 6589 Estimate (14') KB: 6603

<u>Formation</u>	<u>Thickness</u>	<u>TVD</u>	<u>Struct. Elev.</u>
San Jose Fm.	2753	Surface	6589
Ojo Alamo Ss.	110	2753	3850
Kirtland Sh.	370	2863	3740
Fruitland Fm.	215	3233	3370
Pictured Cliffs Ss.	300	3448	3155
Lewis Sh.	175	3748	2855
<u>Intermediate Casing Depth</u>	1435	<u>3923</u>	2680
Cliff House Ss. Trans.	315	5358	1245
Cliff House Ss.	45	5673	930
Menefee Fm.	195	5718	885
Point Lookout Ss.	310	5913	690
Mancos Sh.	140	6223	380
<u>Total Depth</u>	NA	<u>6363</u>	240

Mechanical Logs: Cased hole (TMDL, CBL) logs only

Correlation Logs: Rosa Unit No. 132 (SWSW 22-31N-05W)

Notes: This well will be directionally drilled to a BHL  
2310' FNL & 2310' FEL 21-31N-05W

No log control in quarter section

## GENERAL ROSA DRILLING PLAN

### Rosa Unit boundries:

T31N, R4W: all except sections 32-36

T31N, R5W: all except sections 1 & 2

T31N, R6W: all except sections 6,7,18,20, & 27-36

T32N, R6W: sections 32-36

FORMATION	LITHOLOGY	WATER	GAS	OIL/COND	OVER-PRES	LOST CIRC
Nacimiento	Interbedded shales, siltstones and sandstones	Possible	Possible	No	No	No
Ojo Alamo	Sandstone and conglomerates with lenses of shale	Fresh	No	No	No	No
Kirtland	Shale W/interbedded sandstones	No	Possible	No	No	No
Fruitland	Inter, SS, SiltSt, SH & Coals w/carb, SS, SiltSt, SH	Yes	Yes	No	Possible	Possible
Pictured Cliffs	Massive Sandstone w/thin interbedded shales	Possible	Yes	Possible	No	Possible
Lewis	Shale w/thin interbedded sandstones and siltstones	No	Possible	No	No	No
Cliff House	Transgressive sandstones	Possible	Yes	No	No	No
Menefee	Sandstones, carb shales and coal	Possible	Yes	No	No	No
Point Lookout	Regressive coastal barrier sandstone	Possible	Yes	Possible	No	Yes
Mancos	Marine shale and interbedded sandstone	No	Possible	Possible	No	Possible
Upr Dadota	Marine sand and shales	No	Yes	Possible	No	Possible
Lwr Dakota	Fluvial sands, shales, & coal	Possible	Yes	Possible	No	Possible

## DRILLING

### Potential Hazards:

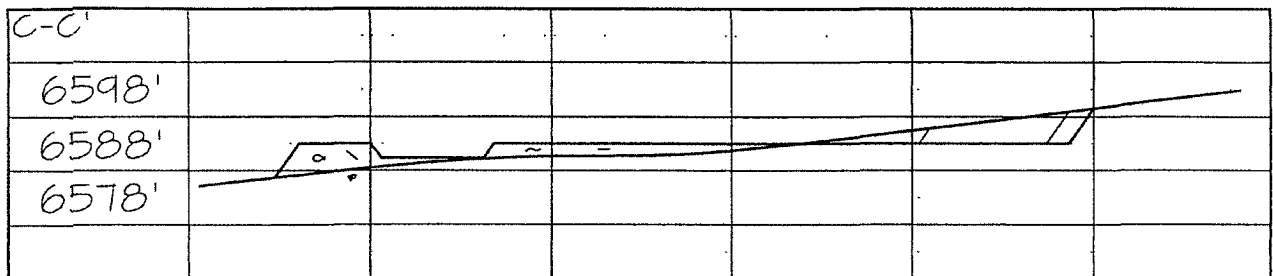
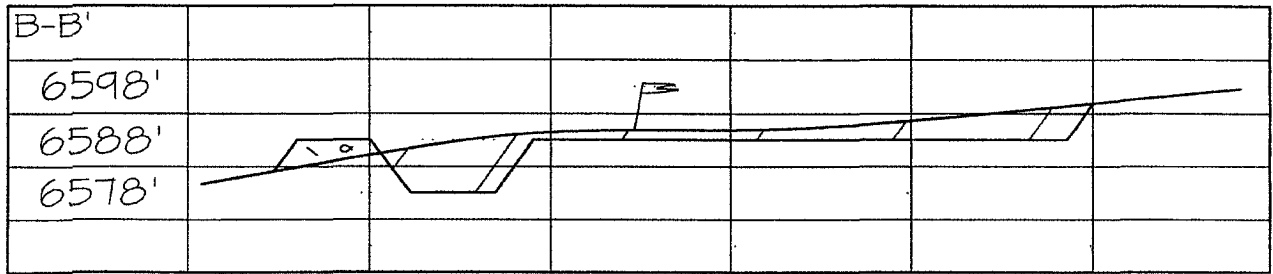
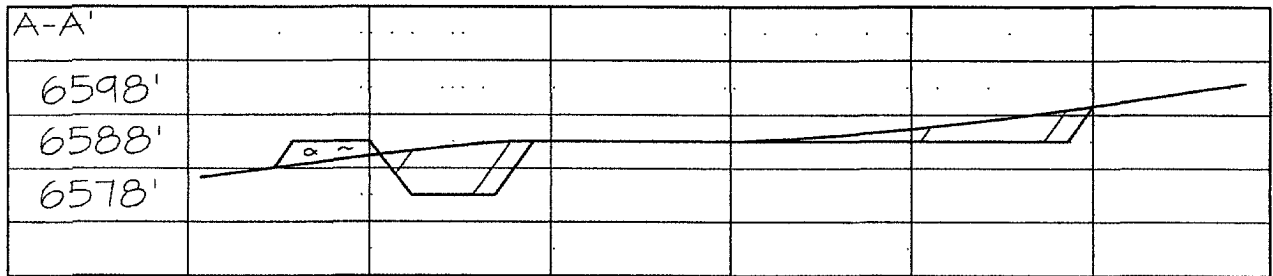
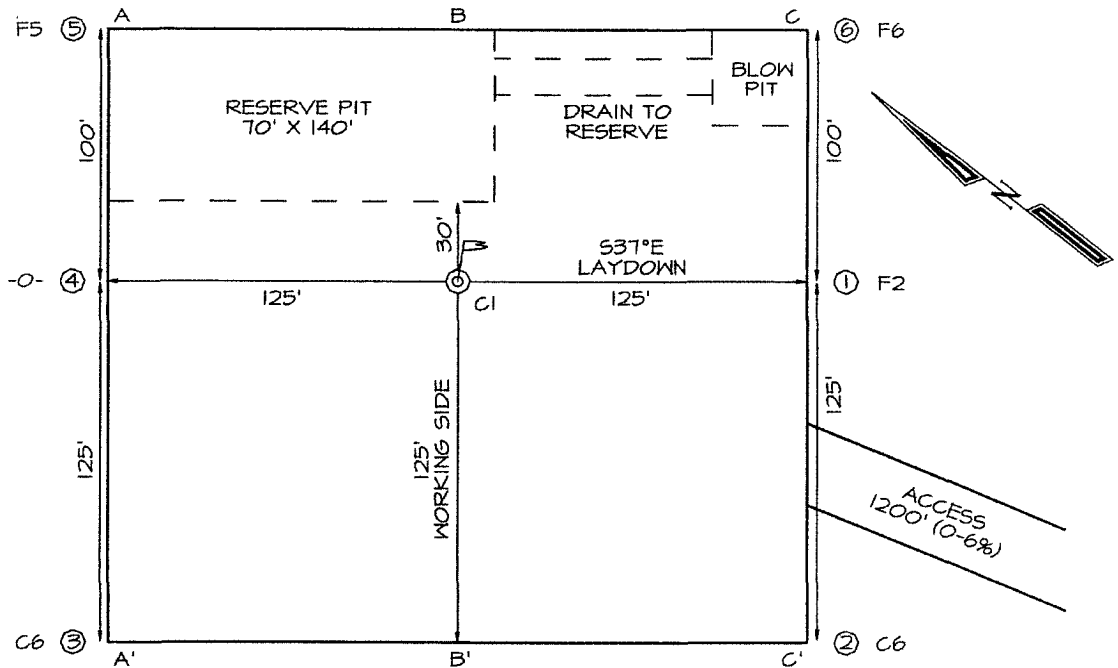
1. There are no overpressured zones expected in this well.
2. No H<sub>2</sub>S zones will be penetrated while drilling this well.

### Mud System:

1. Surface - The surface hole will be drilled with a low-solids, non-dispersed system with starch and lost circulation material as needed. Expected mud weights will be in the 8.4 to 9.0 lb per gal range. Viscosities will be in the 30 to 60 sec/qrt range as needed to remove drill cuttings.
2. Intermediate - The intermediate hole will be drilled with clear water and Benex to TD where the well will be mudded up to log and run casing. The mud system will be low-solids, non-dispersed with mud weights in the 9 to 10 lb per gal range as needed to control the well. Viscosities will be in the 45 to 55 range as needed to support any weight material. The weight material will consist of Barite.
3. Production - The well will be drilled using air from the intermediate casing point to TD. For Fruitland Coal wells, the coal section will be drilled with air/mist.

**WILLIAMS PRODUCTION COMPANY ROSA UNIT #189**  
**1455' FNL & 1780' FEL, SECTION 21, T31N, R5W, NMPM**  
**RIO ARriba COUNTY, NEW MEXICO ELEVATION: 6589'**

LATITUDE: 36.88833° N  
 LONGITUDE: 107.36475° W  
 DATUM: NAD1983



WILLIAMS PRODUCTION COMPANY, LLC

Well Control Equipment Schematic for 2M Service

Attachment to Drilling Technical Program

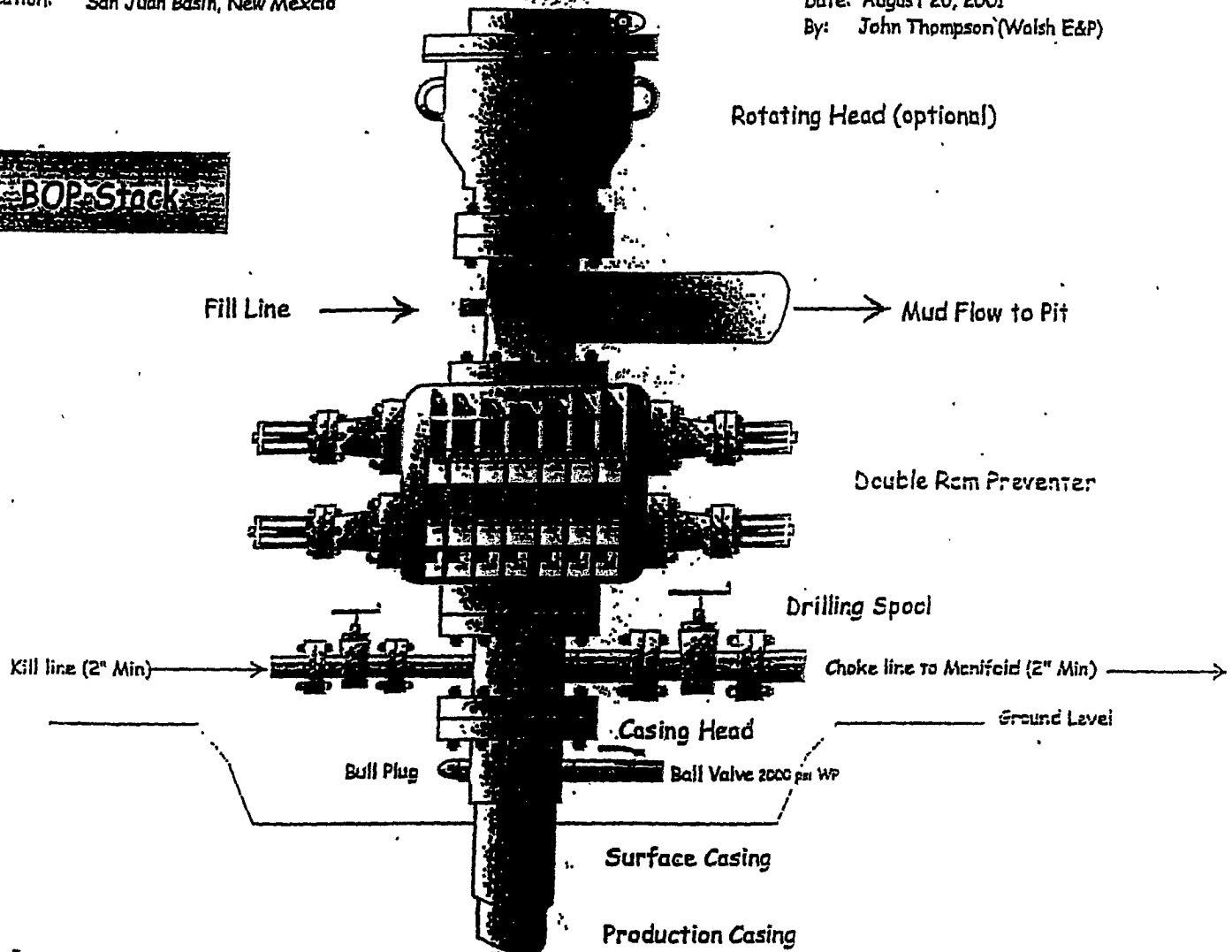
Typical BOP setup

Location: San Juan Basin, New Mexico

Date: August 20, 2001

By: John Thompson (Walsh E&P)

BOP Stack



Choke & Kill Manifold

