Form 3160-3
(September 2001)

RECEIVED
FEB 28 2012
Farmington Field Office
Bureau of Land Management

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SF-078765

6. If Indian, Allottee or Tribe Name

7. If Unit or CA Agreement, Name and No.
Rosa Unit

1a. Type of Work: ☒ DRILL ☐ REENTER

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

8. Lease Name and Well No.
Rosa Unit 04 #001H

2. Name of Operator
WPX Energy Production, LLC (aka) Williams Production Company, LLC

9. API Well No.
30-045-38357

3a. Address
P.O. Box 640 Aztec, NM 87410

3b. Phone No. *(include area code)*
(505) 333-1808

10. Field and Pool, or Exploratory
Basin Mancos

4. Location of Well *(Report location clearly and in accordance with any State requirements. *)*
At surface N 290" FSL & 1621" FWL, sec 4, T31N, R6W
At proposed prod. zone C 502' FNL & 2353' FWL, sec 1, T31N, R6W

11. Sec., T., R., M., or Blk. and Survey or Area
Section 4, 31N, 6W

14. Distance in miles and direction from nearest town or post office*
approximately 30 miles northeast of Blanco, New Mexico

12. County or Parish
San Juan

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 290'

16. No. of Acres in lease
2460.23

17. Spacing Unit dedicated to this well
54,209.49 (R-13068)

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
10'

19. Proposed Depth
7188' TVD / 13657' MD

20. BLM/BIA Bond No. on file
UTB000178

RCVD JAN 23 '13
OIL CONS. DIV.
DIST. 3

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6421' GR

22. Approximate date work will start*
April 1, 2012

23. Estimated duration
1 month

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

24. Attachments

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

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

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.

25. Signature — Name *(Printed/Typed)*: Larry Higgins — Date: 2/27/12

Title: Permit Supervisor

Approved by *(Signature)* — Name *(Printed/Typed)* — Date: 1/18/13

Title: AFM — Office: FFO

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)*

WPX Energy Production, LLC, proposes to develop the Basin Mancos formation at the above described location in accordance with the attached drilling and surface use plans.

The well pad surface is under jurisdiction of the BLM.

This location has been archaeologically surveyed by La Plata Archaeological Consultants. Copies of their report have been submitted directly to the BLM.

No new access road is needed. A pipeline tie of 89.6 feet would be required for this well. The proposed pipeline would also be located on Public lands.

Hold C104 for Directional Survey and "As Drilled" plat

Hold C104
for Directional Survey
and "As Drilled" plat

A COMPLETE C-144 MUST BE SUBMITTED TO AND APPROVED BY THE NMOCD FOR: A PIT, CLOSED LOOP SYSTEM, BELOW GRADE TANK, OR PROPOSED ALTERNATIVE METHOD, PURSUANT TO NMOCD PART 19.15.17, PRIOR TO THE USE OR CONSTRUCTION OF THE ABOVE APPLICATIONS.

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

NOTIFY AZTEC OCD 24 HRS. PRIOR TO CASING & CEMENT

NMOCD

FEB 0 1 2013 ca

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
	97232	BASIN MANCOS

4 Property Code	5 Property Name	6 Well Number
	ROSA UNIT 04	001H

7 OGRID No.	8 Operator Name	9 Elevation
120782	WPX ENERGY PRODUCTION	6421'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	4	31N	6W		290	SOUTH	1621	WEST	SAN JUAN

11 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
C	10	31N	6W		502	NORTH	2353	WEST	SAN JUAN

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
54,209.49 Acres			R-13068

SURFACE LOCATION
290 FSL 1621 FWL
SEC. 4, T31N, R6W
LAT: 36.92210 °N
LONG: 107.47104 °W
DATUM: NAD1927

LAT: 36.92211 °N
LONG: 107.47154 °W
DATUM: NAD1983

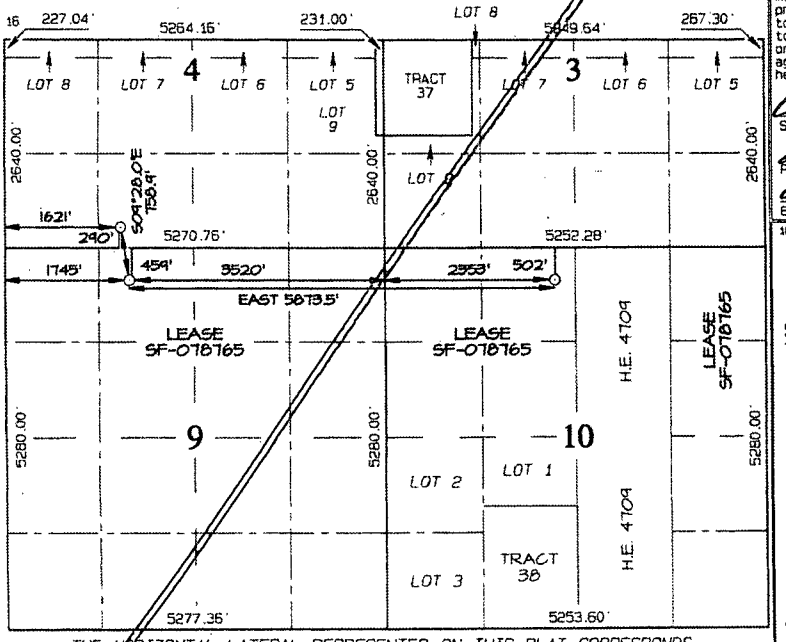
POINT-OF-ENTRY
459 FNL 1745 FWL
SEC. 9, T31N, R6W
LAT: 36.92005 °N
LONG: 107.47062 °W
DATUM: NAD1927

LAT: 36.92005 °N
LONG: 107.47122 °W
DATUM: NAD1983

END-OF-LATERAL
502 FNL 2353 FWL
SEC. 10, T31N, R6W
LAT: 36.91998 °N
LONG: 107.45053 °W
DATUM: NAD1927

LAT: 36.91999 °N
LONG: 107.45113 °W
DATUM: NAD1983

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



THE HORIZONTAL LATERAL REPRESENTED ON THIS PLAT CORRESPONDS TO THE OLIVE SEGMENT WHICH VARIES IN VERTICAL DEPTH.

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Larry Higgins 3/27/12
Signature Date

Larry Higgins
Printed Name

Larry.Higgins@WPXEnergy.com
E-mail Address

18 SURVEYOR CERTIFICATION

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.

Survey Date: DECEMBER 15, 2011

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

WPXENERGY

WPX Energy Production

Operations Plan

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

DATE:	12/05/2011	**FIELD:**	Basin Mancos
WELL NAME:	Rosa Unit 04 #001H	**SURFACE:**	BLM
BH LOCATION:	SESW Sec 4-31N-6W San Juan, NM	**MINERALS:**	FED
ELEVATION:	6,421' GR	**LEASE #**	SF-078765
MEASURED DEPTH:	**13,657'**		

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

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

Name		TVD	MD		Name		TVD	MD
Ojo Alamo		2,369	2,493		Point Lookout		5,680	5,918
Kirtland		2,485	2,618		Mancos		6,076	6,314
Fruitland		2,941	3,112		**Kickoff Point**		**6,808**	**7,047**
Pictured Cliffs		3,200	3,393		Target Top		7,141	7,415
Lewis		3,510	3,727		**Landing Point**		**7,288**	**7,807**
Cliff House		5,391	5,629		Target Base		7,305	
Menefee		5,433	5,671					
					TD		**7,188**	**13,657**

B. **MUD LOGGING PROGRAM:** Mudlogger on location from intermediate csg to TD.

C. **LOGGING PROGRAM:** LWD GR from surface csg to TD, LWD resistivity from intermediate csg to TD.

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:** LSND to intermediate casing point. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses. Use synthetic base invert emulsion fluid from intermediate casing point 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 5000 psi, so the BOPE will be tested to **250 psi (Low) for 5 minutes** and **5000 psi (High) for 10 minutes**. Pressure test surface casing to **600psi for 30 minutes** and intermediate casing to **1500 psi for 30 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	320	9 5/8	36	K-55
Intermediate	8 3/4	6,514	7	23	N-80
Longstring	6 1/4	13,657	4 1/2	11.6	P-110

B. FLOAT EQUIPMENT:

1. SURFACE CASING: 9-5/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (4) 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).** Place 1 Standard Centralizer on the 2 joints above and below the Inflatable external casing packer and stage collar at +/-5,100'.

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 5,500'. Run one spiral type solid body centralizer on every joint in lateral and around curve.

C. CEMENTING:

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

1. SURFACE: 10 bbl F. Water spacer + 190sx (222.3 cu.ft.) of "Premium Cement" + 2% Calcium Chloride Cement + 0.125# pps of Poly-E-Flake (Yield = 1.17 cu-ft./sk, / Weight 15.8 #/gal. / Vol 222.3 cu-ft / 39.58 bbls.). The 100% excess should circulate cement to the surface. WOC 12 hours. Test csg to 600psi. (Total Volume 222.3 cu-ft / 39.6 bbls)

2. INTERMEDIATE: **2 STAGE CEMENT JOB: STAGE 1**: 20 bbl F. Water spacer + 293 sx 50/50/ Poz Premium + 0.15% CFR-3 + 0.2% Halad R-9 + 5 pps Kol-Seal + 0.125 pps Poly-E-Flake (Yield 1.32 cu-ft/sk / Weight 13.5 ppg / Vol 387 cu-ft/ 68.9 bbls). **STAGE 2:** 10 bbl F. Water spacer + 634 sx Halliburton Light Premium + 0.2% HR-5 + 5 pps Kol-Seal + 0.125 pps Poly-E-Flake (Yield 1.94 cu-ft/sk / Weight 12.3 ppg / Vol 1230 cu-ft / 219 bbls). **STAGE 2 TAIL:** 100 sx Premium Cement + 0.1 % Halad (R)-9 (Yield 1.15 cu-ft / sk / Weight 15.8 ppg / Vol 115 cu-ft / 20.48 bbls). (Total Volume 1732 cu-ft / 308.49 bbls). WOC 12 hours. Test csg to 1500psi.

3. PRODUCTION CASING: **STAGE 1**: 20 bbl Oil Base Spacer. **STAGE 2**: 40 bbl Tuned Spacer III + 0.2 gal/bbl Musol + 233.2 ppb Barite + .02 gal/bbl SEM-7. **STAGE 3**: 259 sx 50/50 Poz Standard + 0.2% Versaset + 0.1% HALAD-766 + 1.5% Chem-Foamer 760 / (Yield 1.43 cu-ft/sk / Weight 13.0 ppg / Vol 370 cu-ft / 65.98 bbls). **STAGE 4**: 449sx 50/50 Poz Standard Foamed Lead + 0.2% Versaset + 0.1% HALAD-766 + 1.5% Chem-Foamer 760 w / 50,900 scf Nitrogen (Yield 2.06 cu-ft/sk / Weight-10.0 ppg / Vol 925 cu-ft / 164.77 bbls). **STAGE 5**: 40 sx 50/50 Poz Standard + 0.2% Versaset + 0.1% HALAD-766 / (Yield 1.43 cu-ft/sk / 13.0 ppg / Vol 57 cu-ft / 10.19 bbls). (Total Volume 1352 cu-ft / 240.94 bbls).

IV. IV COMPLETION

A. CBL

1. Run Cement Bond Log down lateral and ensure top of cement is above 7" casing shoe.

B. PRESSURE TEST

1. Pressure test 4-1/2" casing to 6000 psi max, hold at 1500 psi for 30 minutes.

C. STIMULATION

1. Stimulate Mancos (first stage) with approximately 5000# 100 mesh sand and 300,000# 40/70 Ottawa Sand in slick water.
2. Isolate first stage with flow through frac plug.
3. Repeat process for 12 stages.
4. Drill out frac plugs and flowback lateral

D. RUNNING TUBING

1. *Production Tubing:* Run 2-3/8", 4.7#, N-80, EUE tubing with a SN (1.91" ID) on top of bottom joint. Land tubing at landing point of curve (~7,807' MD)

Larry Higgins
Permit Supervisor

Williams®

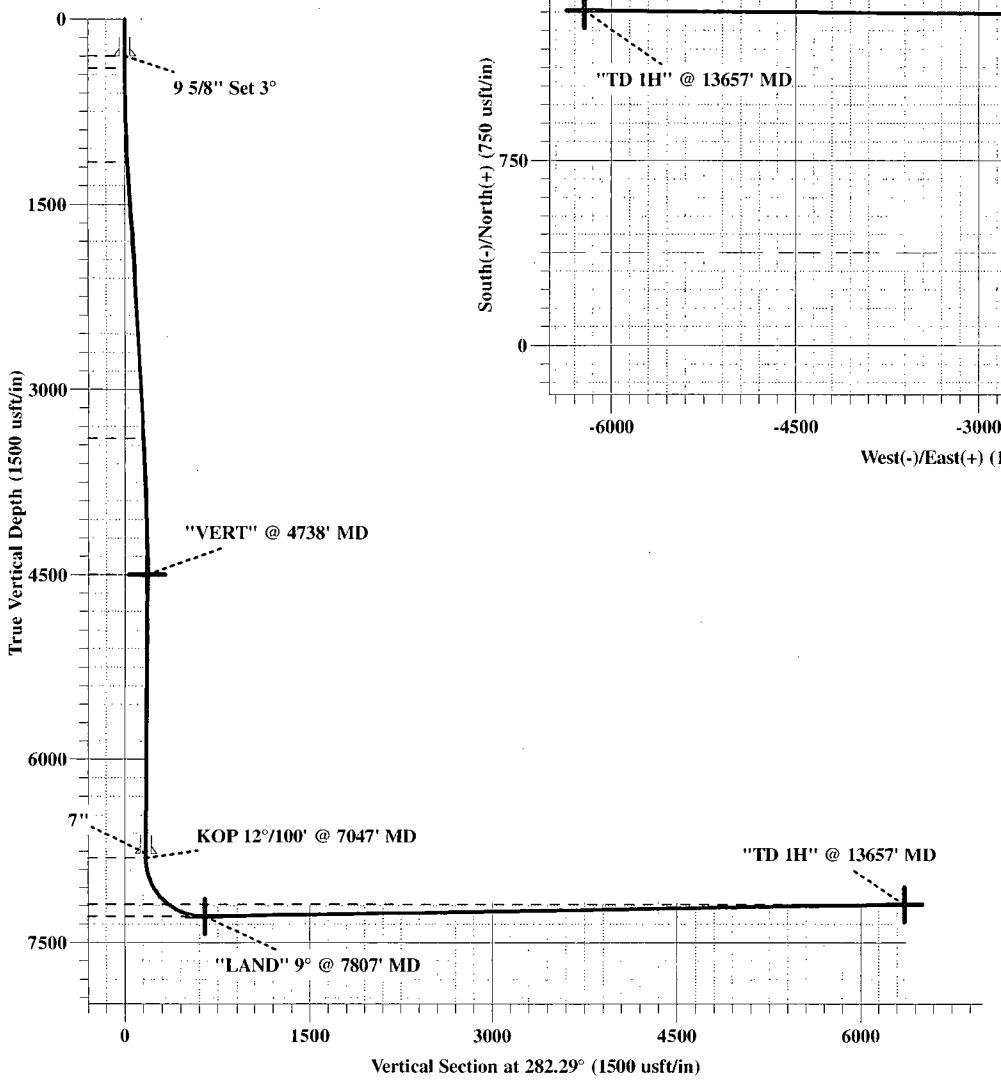
Rosa Unit 04-1H
Sec04 T31N R06W-1H
Rio Arriba Co., NM

PATHFINDER®
A Schlumberger Company

GE: 6421' / KB: 22'

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Vert-1H	4500.0	1332.9	105.2	2156445.71	606004.43	Point
EOL-1H	7188.0	1355.1	-6219.1	2156443.86	599680.12	Point
POE-1H	7288.0	1332.8	-370.2	2156443.87	605529.09	Point



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
300.0	3.00	4.51	299.9	7.8	0.6	1.00	4.51	1.1	Vert-1H
400.0	3.00	4.51	399.7	13.0	1.0	0.00	0.00	1.8	
1183.4	22.58	4.51	1159.9	185.1	14.6	2.50	0.00	25.1	
3609.3	22.58	4.51	3399.8	1113.9	87.9	0.00	0.00	151.2	
4738.5	0.00	0.00	4500.0	1332.9	105.2	2.00	180.00	181.0	Vert-1H
4740.6	0.26	98.61	4502.2	1332.9	105.2	12.00	98.61	181.0	
7047.0	0.26	98.61	6808.5	1331.3	115.4	0.00	0.00	170.6	
7807.3	90.98	270.22	7288.0	1332.8	-370.2	12.00	171.61	645.4	POE-1H
13657.8	90.98	270.22	7188.0	1355.1	-6219.8	0.00	0.00	6365.7	EOL-1H

Plan: Design #2 (Rosa Unit 04-1H/Wellbore #1)

Created By: Breck Enoch Date: 29-Nov-2011

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Sec04 T31N R06W-1H
Company:	Williams Production Co.	**TVD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Project:	San Juan Co., NM	**MD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Site:	Sec04 T31N R06W-1H	**North Reference:**	True
Well:	Rosa Unit 04-1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Project San Juan Co., NM

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site Sec04 T31N R06W-1H

Site Position:		**Northing:**	2,155,112.44 usft	**Latitude:**	36° 55' 19.577 N
From:	Lat/Long	**Easting:**	605,904.34 usft	**Longitude:**	107° 28' 15.730 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.22 °

Well Rosa Unit 04-1H

Well Position	**+N/-S**	0.0 usft	**Northing:**	2,155,112.44 usft	**Latitude:**	36° 55' 19.577 N
	+E/-W	0.0 usft	**Easting:**	605,904.34 usft	**Longitude:**	107° 28' 15.730 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	6,421.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/17/2011	9.74	63.66	50,836

Design Design #2

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	282.29

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	3.00	4.51	299.9	7.8	0.6	1.00	1.00	0.00	4.51	Vert-1H
400.0	3.00	4.51	399.7	13.0	1.0	0.00	0.00	0.00	0.00	
1,183.4	22.58	4.51	1,159.9	185.1	14.6	2.50	2.50	0.00	0.00	
3,609.3	22.58	4.51	3,399.8	1,113.9	87.9	0.00	0.00	0.00	0.00	
4,738.5	0.00	0.00	4,500.0	1,332.9	105.2	2.00	-2.00	0.00	180.00	Vert-1H
4,740.6	0.26	98.61	4,502.2	1,332.9	105.2	12.00	12.00	0.00	98.61	
7,047.0	0.26	98.61	6,808.5	1,331.3	115.4	0.00	0.00	0.00	0.00	
7,807.3	90.98	270.22	7,288.0	1,332.8	-370.2	12.00	11.93	22.57	171.61	POE-1H
13,657.8	90.98	270.22	7,188.0	1,355.1	-6,219.8	0.00	0.00	0.00	0.00	EOL-1H

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Sec04 T31N R06W-1H
Company:	Williams Production Co.	**TVD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Project:	San Juan Co., NM	**MD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Site:	Sec04 T31N R06W-1H	**North Reference:**	True
Well:	Rosa Unit 04-1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	1.00	4.51	100.0	0.9	0.1	0.1	1.00	1.00	0.00
200.0	2.00	4.51	200.0	3.5	0.3	0.5	1.00	1.00	0.00
300.0	3.00	4.51	299.9	7.8	0.6	1.1	1.00	1.00	0.00
400.0	3.00	4.51	399.7	13.0	1.0	1.8	0.00	0.00	0.00
500.0	5.50	4.51	499.4	20.4	1.6	2.8	2.50	2.50	0.00
600.0	8.00	4.51	598.7	32.1	2.5	4.4	2.50	2.50	0.00
700.0	10.50	4.51	697.4	48.2	3.8	6.5	2.50	2.50	0.00
800.0	13.00	4.51	795.3	68.5	5.4	9.3	2.50	2.50	0.00
900.0	15.50	4.51	892.2	93.0	7.3	12.6	2.50	2.50	0.00
1,000.0	18.00	4.51	988.0	121.7	9.6	16.5	2.50	2.50	0.00
1,100.0	20.50	4.51	1,082.4	154.6	12.2	21.0	2.50	2.50	0.00
1,183.4	22.58	4.51	1,159.9	185.1	14.6	25.1	2.50	2.50	0.00
1,200.0	22.58	4.51	1,175.3	191.5	15.1	26.0	0.00	0.00	0.00
1,300.0	22.58	4.51	1,267.6	229.8	18.1	31.2	0.00	0.00	0.00
1,400.0	22.58	4.51	1,360.0	268.1	21.1	36.4	0.00	0.00	0.00
1,500.0	22.58	4.51	1,452.3	306.3	24.2	41.6	0.00	0.00	0.00
1,600.0	22.58	4.51	1,544.6	344.6	27.2	46.8	0.00	0.00	0.00
1,700.0	22.58	4.51	1,637.0	382.9	30.2	52.0	0.00	0.00	0.00
1,800.0	22.58	4.51	1,729.3	421.2	33.2	57.2	0.00	0.00	0.00
1,900.0	22.58	4.51	1,821.6	459.5	36.3	62.4	0.00	0.00	0.00
2,000.0	22.58	4.51	1,913.9	497.8	39.3	67.6	0.00	0.00	0.00
2,100.0	22.58	4.51	2,006.3	536.1	42.3	72.8	0.00	0.00	0.00
2,200.0	22.58	4.51	2,098.6	574.3	45.3	78.0	0.00	0.00	0.00
2,300.0	22.58	4.51	2,190.9	612.6	48.3	83.2	0.00	0.00	0.00
2,400.0	22.58	4.51	2,283.3	650.9	51.4	88.4	0.00	0.00	0.00
2,500.0	22.58	4.51	2,375.6	689.2	54.4	93.6	0.00	0.00	0.00
2,600.0	22.58	4.51	2,467.9	727.5	57.4	98.8	0.00	0.00	0.00
2,700.0	22.58	4.51	2,560.3	765.8	60.4	104.0	0.00	0.00	0.00
2,800.0	22.58	4.51	2,652.6	804.0	63.4	109.2	0.00	0.00	0.00
2,900.0	22.58	4.51	2,744.9	842.3	66.5	114.4	0.00	0.00	0.00
3,000.0	22.58	4.51	2,837.3	880.6	69.5	119.6	0.00	0.00	0.00
3,100.0	22.58	4.51	2,929.6	918.9	72.5	124.8	0.00	0.00	0.00
3,200.0	22.58	4.51	3,021.9	957.2	75.5	130.0	0.00	0.00	0.00
3,300.0	22.58	4.51	3,114.3	995.5	78.5	135.2	0.00	0.00	0.00
3,400.0	22.58	4.51	3,206.6	1,033.8	81.6	140.4	0.00	0.00	0.00
3,500.0	22.58	4.51	3,298.9	1,072.0	84.6	145.6	0.00	0.00	0.00
3,600.0	22.58	4.51	3,391.3	1,110.3	87.6	150.8	0.00	0.00	0.00
3,609.3	22.58	4.51	3,399.8	1,113.9	87.9	151.2	0.00	0.00	0.00
3,700.0	20.77	4.51	3,484.1	1,147.3	90.5	155.8	2.00	-2.00	0.00
3,800.0	18.77	4.51	3,578.2	1,181.0	93.2	160.4	2.00	-2.00	0.00
3,900.0	16.77	4.51	3,673.4	1,211.4	95.6	164.5	2.00	-2.00	0.00
4,000.0	14.77	4.51	3,769.7	1,238.5	97.7	168.2	2.00	-2.00	0.00
4,100.0	12.77	4.51	3,866.8	1,262.2	99.6	171.4	2.00	-2.00	0.00
4,200.0	10.77	4.51	3,964.7	1,282.6	101.2	174.1	2.00	-2.00	0.00
4,300.0	8.77	4.51	4,063.2	1,299.5	102.5	176.4	2.00	-2.00	0.00
4,400.0	6.77	4.51	4,162.3	1,313.0	103.6	178.3	2.00	-2.00	0.00
4,500.0	4.77	4.51	4,261.8	1,323.0	104.4	179.6	2.00	-2.00	0.00
4,600.0	2.77	4.51	4,361.6	1,329.5	104.9	180.5	2.00	-2.00	0.00
4,700.0	0.77	4.51	4,461.5	1,332.6	105.1	180.9	2.00	-2.00	0.00
4,738.5	0.00	0.00	4,500.0	1,332.9	105.2	181.0	2.00	-2.00	0.00
4,740.6	0.26	98.61	4,502.2	1,332.9	105.2	181.0	12.00	12.00	0.00
4,800.0	0.26	98.61	4,561.5	1,332.8	105.4	180.7	0.00	0.00	0.00
4,900.0	0.26	98.61	4,661.5	1,332.8	105.9	180.3	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Sec04 T31N R06W-1H
Company:	Williams Production Co.	**TVD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Project:	San Juan Co., NM	**MD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Site:	Sec04 T31N R06W-1H	**North Reference:**	True
Well:	Rosa Unit 04-1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,000.0	0.26	98.61	4,761.5	1,332.7	106.3	179.8	0.00	0.00	0.00
5,100.0	0.26	98.61	4,861.5	1,332.6	106.8	179.4	0.00	0.00	0.00
5,200.0	0.26	98.61	4,961.5	1,332.6	107.2	178.9	0.00	0.00	0.00
5,300.0	0.26	98.61	5,061.5	1,332.5	107.7	178.5	0.00	0.00	0.00
5,400.0	0.26	98.61	5,161.5	1,332.4	108.1	178.0	0.00	0.00	0.00
5,500.0	0.26	98.61	5,261.5	1,332.4	108.6	177.6	0.00	0.00	0.00
5,600.0	0.26	98.61	5,361.5	1,332.3	109.0	177.1	0.00	0.00	0.00
5,700.0	0.26	98.61	5,461.5	1,332.2	109.4	176.7	0.00	0.00	0.00
5,800.0	0.26	98.61	5,561.5	1,332.2	109.9	176.2	0.00	0.00	0.00
5,900.0	0.26	98.61	5,661.5	1,332.1	110.3	175.8	0.00	0.00	0.00
6,000.0	0.26	98.61	5,761.5	1,332.0	110.8	175.3	0.00	0.00	0.00
6,100.0	0.26	98.61	5,861.5	1,332.0	111.2	174.9	0.00	0.00	0.00
6,200.0	0.26	98.61	5,961.5	1,331.9	111.7	174.4	0.00	0.00	0.00
6,300.0	0.26	98.61	6,061.5	1,331.8	112.1	174.0	0.00	0.00	0.00
6,400.0	0.26	98.61	6,161.5	1,331.8	112.6	173.5	0.00	0.00	0.00
6,500.0	0.26	98.61	6,261.5	1,331.7	113.0	173.1	0.00	0.00	0.00
6,600.0	0.26	98.61	6,361.5	1,331.6	113.5	172.6	0.00	0.00	0.00
6,700.0	0.26	98.61	6,461.5	1,331.6	113.9	172.2	0.00	0.00	0.00
6,800.0	0.26	98.61	6,561.5	1,331.5	114.3	171.7	0.00	0.00	0.00
6,900.0	0.26	98.61	6,661.5	1,331.4	114.8	171.3	0.00	0.00	0.00
7,000.0	0.26	98.61	6,761.5	1,331.4	115.2	170.8	0.00	0.00	0.00
7,047.0	0.26	98.61	6,808.5	1,331.3	115.4	170.6	0.00	0.00	0.00
7,100.0	6.11	269.87	6,861.4	1,331.3	112.7	173.2	12.00	11.03	322.97
7,200.0	18.11	270.10	6,959.0	1,331.3	91.8	193.7	12.00	12.00	0.24
7,300.0	30.11	270.15	7,050.1	1,331.4	51.0	233.6	12.00	12.00	0.05
7,400.0	42.11	270.18	7,130.8	1,331.6	-7.8	291.1	12.00	12.00	0.02
7,500.0	54.11	270.19	7,197.4	1,331.8	-82.1	363.7	12.00	12.00	0.01
7,600.0	66.11	270.20	7,247.2	1,332.1	-168.6	448.3	12.00	12.00	0.01
7,700.0	78.11	270.21	7,277.8	1,332.4	-263.6	541.2	12.00	12.00	0.01
7,800.0	90.11	270.22	7,288.1	1,332.8	-362.9	638.3	12.00	12.00	0.01
7,807.3	90.98	270.22	7,288.0	1,332.8	-370.2	645.4	12.00	12.00	0.01
7,900.0	90.98	270.22	7,286.4	1,333.2	-462.9	736.1	0.00	0.00	0.00
8,000.0	90.98	270.22	7,284.7	1,333.6	-562.9	833.9	0.00	0.00	0.00
8,100.0	90.98	270.22	7,283.0	1,334.0	-662.9	931.6	0.00	0.00	0.00
8,200.0	90.98	270.22	7,281.3	1,334.3	-762.9	1,029.4	0.00	0.00	0.00
8,300.0	90.98	270.22	7,279.6	1,334.7	-862.8	1,127.2	0.00	0.00	0.00
8,400.0	90.98	270.22	7,277.9	1,335.1	-962.8	1,225.0	0.00	0.00	0.00
8,500.0	90.98	270.22	7,276.2	1,335.5	-1,062.8	1,322.7	0.00	0.00	0.00
8,600.0	90.98	270.22	7,274.5	1,335.9	-1,162.8	1,420.5	0.00	0.00	0.00
8,700.0	90.98	270.22	7,272.7	1,336.2	-1,262.8	1,518.3	0.00	0.00	0.00
8,800.0	90.98	270.22	7,271.0	1,336.6	-1,362.8	1,616.1	0.00	0.00	0.00
8,900.0	90.98	270.22	7,269.3	1,337.0	-1,462.7	1,713.8	0.00	0.00	0.00
9,000.0	90.98	270.22	7,267.6	1,337.4	-1,562.7	1,811.6	0.00	0.00	0.00
9,100.0	90.98	270.22	7,265.9	1,337.8	-1,662.7	1,909.4	0.00	0.00	0.00
9,200.0	90.98	270.22	7,264.2	1,338.1	-1,762.7	2,007.1	0.00	0.00	0.00
9,300.0	90.98	270.22	7,262.5	1,338.5	-1,862.7	2,104.9	0.00	0.00	0.00
9,400.0	90.98	270.22	7,260.8	1,338.9	-1,962.7	2,202.7	0.00	0.00	0.00
9,500.0	90.98	270.22	7,259.1	1,339.3	-2,062.7	2,300.5	0.00	0.00	0.00
9,600.0	90.98	270.22	7,257.4	1,339.7	-2,162.6	2,398.2	0.00	0.00	0.00
9,700.0	90.98	270.22	7,255.6	1,340.0	-2,262.6	2,496.0	0.00	0.00	0.00
9,800.0	90.98	270.22	7,253.9	1,340.4	-2,362.6	2,593.8	0.00	0.00	0.00
9,900.0	90.98	270.22	7,252.2	1,340.8	-2,462.6	2,691.6	0.00	0.00	0.00
10,000.0	90.98	270.22	7,250.5	1,341.2	-2,562.6	2,789.3	0.00	0.00	0.00
10,100.0	90.98	270.22	7,248.8	1,341.6	-2,662.6	2,887.1	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Sec04 T31N R06W-1H
Company:	Williams Production Co.	**TVD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Project:	San Juan Co., NM	**MD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Site:	Sec04 T31N R06W-1H	**North Reference:**	True
Well:	Rosa Unit 04-1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,200.0	90.98	270.22	7,247.1	1,341.9	-2,762.5	2,984.9	0.00	0.00	0.00
10,300.0	90.98	270.22	7,245.4	1,342.3	-2,862.5	3,082.7	0.00	0.00	0.00
10,400.0	90.98	270.22	7,243.7	1,342.7	-2,962.5	3,180.4	0.00	0.00	0.00
10,500.0	90.98	270.22	7,242.0	1,343.1	-3,062.5	3,278.2	0.00	0.00	0.00
10,600.0	90.98	270.22	7,240.3	1,343.5	-3,162.5	3,376.0	0.00	0.00	0.00
10,700.0	90.98	270.22	7,238.6	1,343.8	-3,262.5	3,473.8	0.00	0.00	0.00
10,800.0	90.98	270.22	7,236.8	1,344.2	-3,362.5	3,571.5	0.00	0.00	0.00
10,900.0	90.98	270.22	7,235.1	1,344.6	-3,462.4	3,669.3	0.00	0.00	0.00
11,000.0	90.98	270.22	7,233.4	1,345.0	-3,562.4	3,767.1	0.00	0.00	0.00
11,100.0	90.98	270.22	7,231.7	1,345.4	-3,662.4	3,864.9	0.00	0.00	0.00
11,200.0	90.98	270.22	7,230.0	1,345.7	-3,762.4	3,962.6	0.00	0.00	0.00
11,300.0	90.98	270.22	7,228.3	1,346.1	-3,862.4	4,060.4	0.00	0.00	0.00
11,400.0	90.98	270.22	7,226.6	1,346.5	-3,962.4	4,158.2	0.00	0.00	0.00
11,500.0	90.98	270.22	7,224.9	1,346.9	-4,062.3	4,256.0	0.00	0.00	0.00
11,600.0	90.98	270.22	7,223.2	1,347.2	-4,162.3	4,353.7	0.00	0.00	0.00
11,700.0	90.98	270.22	7,221.5	1,347.6	-4,262.3	4,451.5	0.00	0.00	0.00
11,800.0	90.98	270.22	7,219.8	1,348.0	-4,362.3	4,549.3	0.00	0.00	0.00
11,900.0	90.98	270.22	7,218.0	1,348.4	-4,462.3	4,647.0	0.00	0.00	0.00
12,000.0	90.98	270.22	7,216.3	1,348.8	-4,562.3	4,744.8	0.00	0.00	0.00
12,100.0	90.98	270.22	7,214.6	1,349.1	-4,662.3	4,842.6	0.00	0.00	0.00
12,200.0	90.98	270.22	7,212.9	1,349.5	-4,762.2	4,940.4	0.00	0.00	0.00
12,300.0	90.98	270.22	7,211.2	1,349.9	-4,862.2	5,038.1	0.00	0.00	0.00
12,400.0	90.98	270.22	7,209.5	1,350.3	-4,962.2	5,135.9	0.00	0.00	0.00
12,500.0	90.98	270.22	7,207.8	1,350.7	-5,062.2	5,233.7	0.00	0.00	0.00
12,600.0	90.98	270.22	7,206.1	1,351.0	-5,162.2	5,331.5	0.00	0.00	0.00
12,700.0	90.98	270.22	7,204.4	1,351.4	-5,262.2	5,429.2	0.00	0.00	0.00
12,800.0	90.98	270.22	7,202.7	1,351.8	-5,362.2	5,527.0	0.00	0.00	0.00
12,900.0	90.98	270.22	7,201.0	1,352.2	-5,462.1	5,624.8	0.00	0.00	0.00
13,000.0	90.98	270.22	7,199.2	1,352.6	-5,562.1	5,722.6	0.00	0.00	0.00
13,100.0	90.98	270.22	7,197.5	1,352.9	-5,662.1	5,820.3	0.00	0.00	0.00
13,200.0	90.98	270.22	7,195.8	1,353.3	-5,762.1	5,918.1	0.00	0.00	0.00
13,300.0	90.98	270.22	7,194.1	1,353.7	-5,862.1	6,015.9	0.00	0.00	0.00
13,400.0	90.98	270.22	7,192.4	1,354.1	-5,962.1	6,113.7	0.00	0.00	0.00
13,500.0	90.98	270.22	7,190.7	1,354.5	-6,062.0	6,211.4	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Vert-1H - plan hits target center - Point	0.00	0.00	4,500.0	1,332.9	105.2	2,156,445.70	606,004.44	36° 55' 32.757 N	107° 28' 14.435 W
EOL-1H - plan misses target center by 157.1usft at 13500.0usft MD (7190.7 TVD, 1354.5 N, -6062.0 E) - Point	0.00	0.00	7,188.0	1,355.1	-6,219.1	2,156,443.86	599,680.12	36° 55' 32.970 N	107° 29' 32.325 W
POE-1H - plan hits target center - Point	0.00	0.00	7,288.0	1,332.8	-370.2	2,156,443.87	605,529.10	36° 55' 32.757 N	107° 28' 20.289 W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Site Sec04 T31N R06W-1H
Company:	Williams Production Co.	**TVD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Project:	San Juan Co., NM	**MD Reference:**	WELL @ 6443.0usft (Original Well Elev)
Site:	Sec04 T31N R06W-1H	**North Reference:**	True
Well:	Rosa Unit 04-1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
300.0	299.9	9 5/8"	9-5/8	12-1/4
7,007.0	6,768.5	7"	7	8-3/4

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
300.0	299.9	7.8	0.6	Casing Set 3°
400.0	399.7	13.0	1.0	"Nudge" 2.5°/100'
1,183.4	1,159.9	185.1	14.6	Hold 22.6° @ 1183' MD
3,609.3	3,399.8	1,113.9	87.9	Drop 2°/100'
4,738.5	4,500.0	1,332.9	105.2	"VERT" @ 4738' MD
4,740.6	4,502.2	1,332.9	105.2	Hold
7,047.0	6,808.5	1,331.3	115.4	KOP 12°/100' @ 7047' MD
7,807.3	7,288.0	1,332.8	-370.2	"LAND" 9° @ 7807' MD
13,657.8	7,188.0	1,355.1	-6,219.8	"TD 1H" @ 13657' MD

5,000 psi BOP Schematic