

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTFORM APPROVED  
OMB NO. 1004-0137  
Expires March 31, 2007

RECEIVED

## APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. <b>MMM 30014</b>	
1b. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator <b>Energen Resources Corporation</b>		7. Unit or CA Agreement Name and No.	
3a. Address <b>2010 Afton Place Farmington, New Mexico 87401</b>		8. Lease Name and Well No. <b>Carracas 16 B #15</b>	
3b. Phone No. (include area code) <b>(505) 325-6800</b>		9. API Well No. <b>36-039-30464</b>	
4. Location of Well (Report location clearly and in accordance with any State requirements)* At surface <b>1705'FSL, 940'FWL</b> At proposed prod zone <b>1880'FSL, 760'FEL</b>		10. Field and Pool, or Exploratory <b>Basin Fruitland Coal</b>	
14. Distance in miles and direction from nearest town or post office* <b>36.5 miles NE of Gobernador, NM</b>		11. Sec., T., R., M., or Blk. and Survey or Area <b>(L) Sec. 16, T32N, 4W NMM</b>	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg unit line, if any) <b>940'</b>	16. No. of Acres in lease <b>2480</b>	17. Spacing Unit dedicated to this well <b>320</b> <b>317.48 acres S/2</b>	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. <b>50'</b>	19. Proposed Depth <b>6393'MD</b>	20. BLM/BIA Bond No. on file <b>NM2707</b>	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) <b>6802'GL</b>	22. Approximate date work will start* <b>April 1, 2008</b>	23. Estimated duration <b>25</b>	

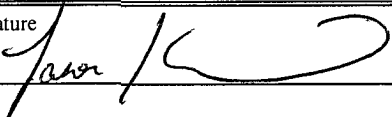
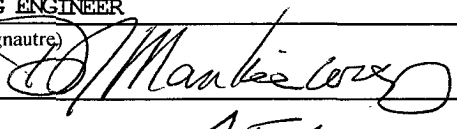
## 24. Attachments

RCVD JUN 2 '09

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   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).    |
| 2. A Drilling Plan  | 5. Operator certification.   |
| 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). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |
- DIST. 3**

25. Signature 	Name (Printed/Typed) <b>Jason Kincaid</b>	Date <b>1/11/2008</b>
Title <b>DRILLING ENGINEER</b>		
Approved by (Signature) 	Name (Printed/Typed) <b>AFM</b>	Date <b>6/1/09</b>
Title <b>AFM</b>	Office <b>FEO</b>	

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 page 2)

**NOTIFY AZTEC OGD 24 HRS  
PRIOR TO CASING & CEMENT****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****SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**Hold C104  
for Directional Survey  
and "As Drilled" plat

NMOC

JUN 10 2009

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

DISTRICT I  
1625 N. French Dr., Hobbs, N.M. 88240

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised October 12, 2005

DISTRICT II  
1301 W. Grand Avenue, Artesia, N.M. 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, N.M. 87410

DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

RCVD AUG 25 '08  
AMENDED REPORT  
OIL CONS. DIV.  
DIST. 3

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number 30039-30464	<sup>2</sup> Pool Code 71629	<sup>3</sup> Pool Name BASIN FRUITLAND COAL
<sup>4</sup> Property Code 35656	<sup>5</sup> Property Name CARRACAS 16B	<sup>6</sup> Well Number 15
<sup>7</sup> GRID No. 162928	<sup>8</sup> Operator Name ENERGEN RESOURCES CORPORATION	<sup>9</sup> Elevation 6802'

<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
L	16	32N	4W		1705'	SOUTH	940'	WEST	RIO ARRIBA

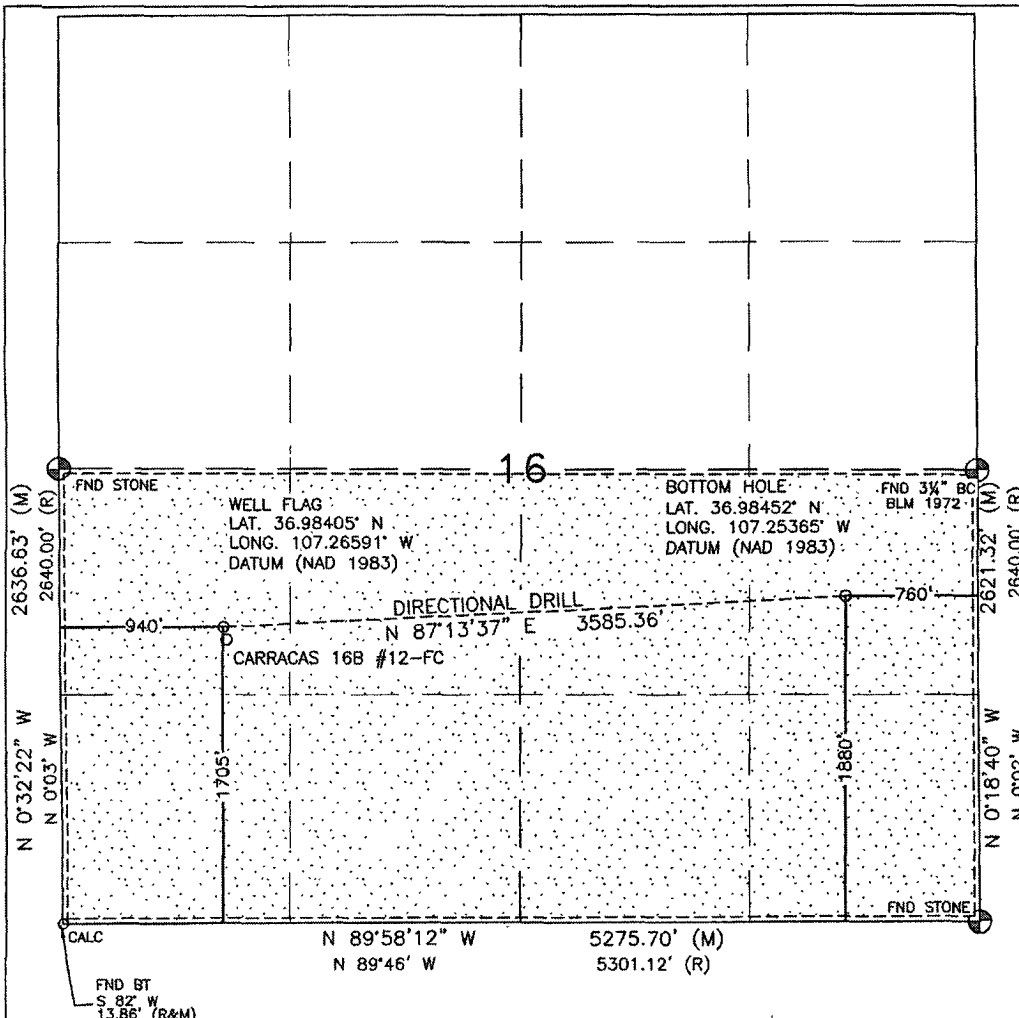
<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	16	32N	4W		1880'	SOUTH	760'	EAST	RIO ARRIBA

<sup>12</sup> Dedicated Acres 317.48 ACRES - (S/2)	<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

16



<sup>17</sup> 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 or a compulsory pooling order heretofore entered by the division.

*[Signature]* 8/22/08  
Signature Date

*Nathan Smith*  
Printed Name

<sup>18</sup> 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.

JUNE 21, 2007

Date of Survey

Signature and Seal of Professional Surveyor:

*David R. Russell*  
DAVID R. RUSSELL  
NEW MEXICO  
REGISTERED PROFESSIONAL LAND SURVEYOR  
10201

DAVID RUSSELL

Certificate Number 10201

## Operations Plan

January 11, 2008

### **Carracas 16 B #15**

#### **General Information**

Location	1705' fsl, 940' fwl at surface 1880' fsl, 760' fel at bottom 16, T32N, R4W Rio Arriba County, New Mexico
Elevations	6802' GL
Total Depth	6393' (MD), 3548' (TVD)
Formation Objective	Basin Fruitland Coal

#### **Formation Tops.**

San Jose	Surface
Nacimiento	1727' (TVD)
Ojo Alamo Ss	3001' (TVD), 3117' (MD)
Kirtland Sh	3139' (TVD), 3317' (MD)
Fruitland Fm	3251' (TVD), 3501' (MD)
Top Coal	3537' (TVD), 4331' (MD)
Bottom Coal	3560' (TVD)
<b>Total Depth</b>	<b>3560' (TVD), 6393' (MD)</b>

#### **Drilling**

The 12 ¼" wellbore will be drilled with a fresh water mud system.

The 8 ¾" wellbore will be drilled with a low solids fresh water/polymer mud system. Weighting materials will be drill cuttings and if needed barite. Mud density is expected to range from 8.9 ppg to 9.5 ppg.

**Projected KOP is 1836' TVD with 3.35°/100' doglegs.**

The 6 ¼" wellbore will be drilled with a fresh water or brine water system depending on reservoir characteristics. Anticipated BHP can be as high as 1100 psi.

Blowout Control Specifications:

A 2000 psi minimum double ram or annulus BOP stack will be used following nipple up of casing head. During air drilling operations, a Shaffer Type 50 or equivalent rotating head will be installed on top of the stack. A 2" nominal, 2000 psi minimum choke manifold will also be used. An upper Kelly Cock valve handle and drill string valve should be available to fit each drill string and be available on the rig floor during drilling operations.

Logging Program:

Open hole logs: None

Mud logs: From 3251' (TVD), 3501' (MD) to TD.

Surveys: Surface to KOP every 500' and a minimum of every 250' for directional.

## Tubulars

### Casing, Tubing, & Casing Equipment:

String	Interval	Wellbore	Casing	Csg Wt	Grade
Surface	0'-200'	12 ¼"	9 5/8"	32.3 ppf	H-40 ST&C
Intermediate	0'-3548' (TVD) 4525' (MD)	8 ¾"	7"	23.0 ppf	J-55 LT&C
Production	3537'-3560' (TVD) 4331'-6393' (MD)	6 ¼"	4 ½"	11.6 ppf	J-55 LT&C
Tubing	0'-4500' (MD)		2 3/8"	4.7 ppf	J-55

### Casing Equipment:

Surface Casing: Depending on wellbore conditions, a Texas Pattern Guide Shoe on bottom. Casing centralization with standard bow spring centralizers to achieve optimal standoff.

Intermediate Casing: Depending on wellbore conditions, a Cement nose guide shoe with self fill insert float collar on top of bottom joint and casing centralization with standard bow spring and rigid centralizers to optimize standoff. Two turbolating centralizers at the base of the Ojo Alamo are recommended.

Liner: Bull nose guide shoe on bottom of first joint, H-Latch liner drop off tool on top of last joint.

## Wellhead

3000 psi 11" x 9 5/8" casing head. 9 5/8" x 7"x 2 3/8" 3000 psi Flanged Wellhead .

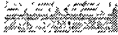
## Cementing

Surface Casing: 125 sks Std (class B) with 2.0 % CaCl<sub>2</sub> and ¼ #/sk Flocele (15.6 ppg, 1.18 ft<sup>3</sup>/sk 148 ft<sup>3</sup> of slurry, 100% excess to circulate to surface). WOC 12 hours. Pressure test surface casing to 600 psi for 30 min.

Intermediate Casing: Before cementing, circulate hole at least 1 ½ hole volumes of mud and reduce funnel viscosity to minimum to aide in hole cleanout. Depending on wellbore conditions, cement may consist of 775 sks 65/35 with 6.0 % Bentonite, 2.0 % CaCl<sub>2</sub>, 10 #/sk Gilsonite, and ½ #/sk Flocele (12.3 ppg, 1.96 ft<sup>3</sup>/sk) and a tail of 125 sks Type V with ¼ #/sk Flocele (15.6 ppg, 1.18 ft<sup>3</sup>/sk). (1643 ft<sup>3</sup> of slurry, 100 % excess to circulate to surface). Test casing to 1200 psi for 30 min.

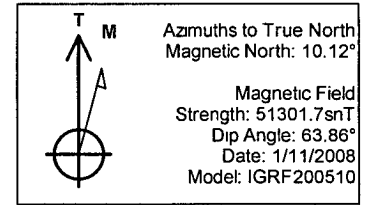
## Other Information

- 1) This well will be an open hole completion lined with an uncemented pre-drilled liner.
- 2) If lost circulation is encountered, sufficient LCM will be added to the mud system to maintain well control. The intermediate string may need to be cemented in multiple stages with a slurry design deviated from that listed above.
- 3) If high reservoir pressures or water flows are encountered slurry design may need to be deviated to from those listed above to satisfy wellbore and formation conditions.
- 4) No abnormal temperatures or pressures are anticipated. This gas is dedicated.

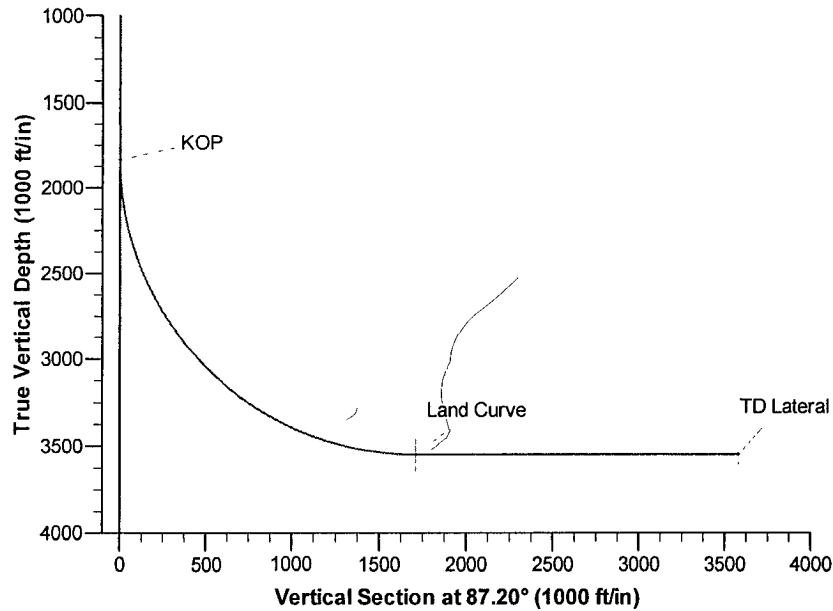
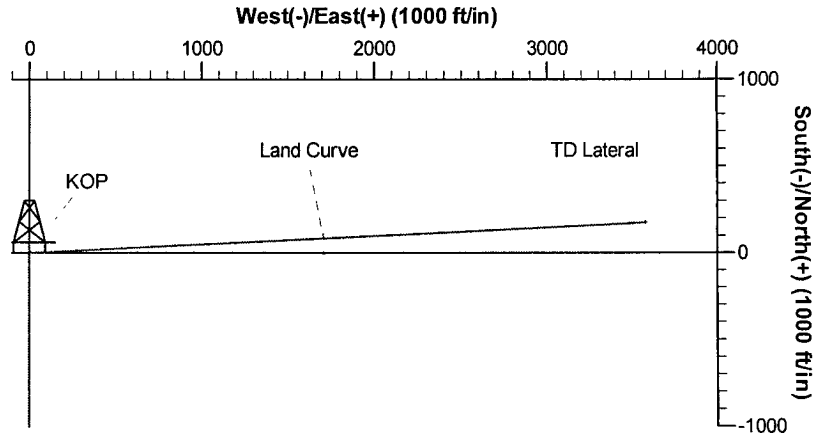


**Project:** Carson Natl Forest - S16, T32N, 4W  
**Site:** Carracas Mesa  
**Well:** Carracas 16 B #15  
**Wellbore:** Horizontal Completion  
**Plan:** Preliminary Plan (Carracas 16 B #15/Horizontal Completion)

PROJECT DETAILS: Carson Natl Forest - S16, T32N, 4W											
Geodetic System: US State Plane 1983											
Datum: North American Datum 1983											
Ellipsoid: GRS 1980											
Zone: New Mexico Central Zone											
System Datum: Mean Sea Level											



SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLog	TFace	VSec	Target	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP	
2	1836.0	0.00	0.00	1836.0	0.0	0.0	0.00	0.00	0.0	KOP	
3	4525.2	90.00	87.20	3548.0	83.6	1710.0	3.35	87.20	1712.0	Land Curve	
4	6393.5	90.00	87.19	3548.0	175.0	3576.0	0.00	-104.94	3580.3	TD Lateral	



# Energen

## Plan Design

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**Design:** Preliminary Plan

**Local Co-ordinate Reference:** Well Carracas 16 B #15  
**TVD Reference:** KB @ 6819.0ft (Drilling Rig)  
**MD Reference:** KB @ 6819.0ft (Drilling Rig)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 2003.16 Single User Db

### Planned Survey

MD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
1,200.0	0.00	0.00	0.00	0.0	0.0	0.0
1,300.0	0.00	0.00	0.00	0.0	0.0	0.0
1,400.0	0.00	0.00	0.00	0.0	0.0	0.0
1,500.0	0.00	0.00	0.00	0.0	0.0	0.0
1,600.0	0.00	0.00	0.00	0.0	0.0	0.0
1,700.0	0.00	0.00	0.00	0.0	0.0	0.0
1,727.0	0.00	0.00	0.00	0.0	0.0	0.0
Nacimiento						
1,800.0	0.00	0.00	0.00	0.0	0.0	0.0
1,836.0	0.00	0.00	0.00	0.0	0.0	0.0
KOP						
1,900.0	2.14	87.20	3.35	0.1	1.2	1.2
2,000.0	5.49	87.20	3.35	0.4	7.8	7.8
2,100.0	8.84	87.20	3.35	1.0	20.3	20.3
2,200.0	12.18	87.20	3.35	1.9	38.5	38.6
2,300.0	15.53	87.20	3.35	3.1	62.4	62.5
2,400.0	18.88	87.20	3.35	4.5	92.0	92.1
2,500.0	22.22	87.20	3.35	6.2	127.0	127.2
2,600.0	25.57	87.20	3.35	8.2	167.5	167.7
2,700.0	28.92	87.20	3.35	10.4	213.2	213.4
2,800.0	32.26	87.20	3.35	12.9	264.0	264.3
2,900.0	35.61	87.20	3.35	15.6	319.7	320.1
3,000.0	38.96	87.20	3.35	18.6	380.2	380.7
3,100.0	42.30	87.20	3.35	21.8	445.3	445.8
3,117.3	42.88	87.20	3.35	22.3	457.0	457.5
Ojo Alamo						
3,200.0	45.65	87.20	3.35	25.2	514.6	515.2
3,300.0	49.00	87.20	3.35	28.7	588.0	588.7
3,316.9	49.56	87.20	3.35	29.4	600.8	601.5
Kirtland						
3,400.0	52.34	87.20	3.35	32.5	665.3	666.1
3,500.0	55.69	87.20	3.35	36.5	746.1	747.0
3,600.0	59.04	87.20	3.35	40.6	830.2	831.2
3,700.0	62.38	87.20	3.35	44.8	917.3	918.4
3,800.0	65.73	87.20	3.35	49.2	1,007.1	1,008.3
3,900.0	69.08	87.20	3.35	53.7	1,099.3	1,100.6
4,000.0	72.42	87.20	3.35	58.4	1,193.6	1,195.0
4,100.0	75.77	87.20	3.35	63.0	1,289.6	1,291.2
4,200.0	79.12	87.20	3.35	67.8	1,387.1	1,388.7
4,300.0	82.46	87.20	3.35	72.6	1,485.7	1,487.4
4,331.0	83.50	87.20	3.35	74.1	1,516.4	1,518.2
Top Target Coal						
4,400.0	85.81	87.20	3.35	77.5	1,585.0	1,586.9
4,500.0	89.16	87.20	3.35	82.4	1,684.8	1,686.8

# Energen

## Plan Design

**Company:** Energen Resources  
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**Site:** Carracas Mesa  
**Well:** Carracas 16 B #15  
**Wellbore:** Horizontal Completion  
**Design:** Preliminary Plan

**Local Co-ordinate Reference:** Well Carracas 16 B #15  
**TVD Reference:** KB @ 6819.0ft (Drilling Rig)  
**MD Reference:** KB @ 6819 0ft (Drilling Rig)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 2003.16 Single User Db

### Planned Survey

MD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
4,525.2	90 00	87.20	3.35	83.6	1,710.0	1,712.0
Land Curve						
4,600.0	90.00	87.20	0.00	87.3	1,784.7	1,786 8
4,700.0	90.00	87 20	0 00	92 1	1,884 5	1,886 8
4,800 0	90 00	87.20	0.00	97.0	1,984.4	1,986 8
4,900.0	90.00	87 20	0.00	101.9	2,084.3	2,086 8
5,000 0	90 00	87 20	0.00	106.8	2,184 2	2,186 8
5,100.0	90.00	87.20	0.00	111.7	2,284 1	2,286 8
5,200.0	90 00	87 20	0.00	116.6	2,383.9	2,386 8
5,300.0	90 00	87 20	0.00	121.5	2,483.8	2,486 8
5,400.0	90 00	87 20	0.00	126.4	2,583.7	2,586.8
5,500.0	90 00	87.20	0.00	131.2	2,683 6	2,686.8
5,600 0	90 00	87 19	0 00	136.1	2,783 5	2,786.8
5,700 0	90.00	87.19	0 00	141.0	2,883.3	2,886.8
5,800.0	90 00	87.19	0.00	145.9	2,983 2	2,986 8
5,900 0	90 00	87 19	0.00	150 8	3,083.1	3,086 8
6,000.0	90 00	87.19	0.00	155 7	3,183.0	3,186 8
6,100.0	90.00	87 19	0.00	160.6	3,282.9	3,286 8
6,200 0	90.00	87 19	0.00	165.5	3,382.7	3,386.8
6,300.0	90.00	87 19	0.00	170.4	3,482 6	3,486.8
6,393.5	90 00	87 19	0.00	175.0	3,576.0	3,580.3

TD Lateral

# Energen Plan Design

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**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 2003.16 Single User Db

## Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
Land Curve - plan hits target - Point	0.00	0.00	3,548.0	83.6	1,710.0	664,202.48	410,082.44	36° 59' 3.406 N	107° 15' 36.201 W
KOP - plan hits target - Point	0.00	0.00	1,836.0	0.0	0.0	664,182.56	409,560.99	36° 59' 2.580 N	107° 15' 57.276 W
TD Lateral - plan hits target - Point	0.00	0.00	3,548.0	175.0	3,576.0	664,224.27	410,651.46	36° 59' 4.308 N	107° 15' 13.202 W

## Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,316.9	3,139.0	Kirtland		0.00	
4,331.0	3,537.0	Top Target Coal		0.00	
	3,560.0	Base Target Coal		0.00	
1,727.0	1,727.0	Nacimiento		0.00	
3,117.3	3,001.0	Ojo Alamo		0.00	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



## **SURFACE USE PLAN OF OPERATIONS**

### **Energen Resources Corporation Carracas 16B #15**

#### **A. Existing Roads – Refer to Exhibit A**

Directions to the location are as follows:

From the intersection of US Hwy 64 & Forest Road 310 (approximately 47 miles east of Bloomfield New Mexico);

Travel north on Forest Road 310 for 19.3 miles;

Turn left on Forest Road 218 and travel 6.6 miles;

Turn right on Forest Road 218A and travel 2.3 miles;

Turn right on Forest Road 218A2 and travel 0.4 mile to the Carracas Unit 16B #12 well pad.

The proposed well will twin the existing Carracas Unit 16B #12 well.

All existing roads used to access the location shall be maintained in the same or better condition than presently maintained.

#### **B. New or Reconstructed Access Roads**

No new access road construction will be required as the proposed well would twin an existing location.

#### **C. Location of Existing Wells – Refer to Exhibit B**

There are 6 existing wells within 1 mile of the proposed location. Five of the wells are currently active and one is plugged and abandoned.

#### **D. Location of Existing and/or Proposed Production Facilities**

On the Well Pad – Refer to Well Pad Cut and Fill Plats and Exhibit C. The proposed well will twin the existing Carracas Unit 16B #12. Existing facilities on the Carracas Unit 16B #12 include, but are not limited to, the well head, storage tanks, a separator unit, automation and gas measurement equipment, meter run, and associated lines. If the proposed well is productive, it will initially be equipped with similar facilities. If necessary, a wellhead compressor and pumping unit may be installed at some future date. All equipment will be installed in an appropriate manner within the boundaries of the well pad. A minimum distance of 50 feet will be maintained between individual production facilities. Specific location of equipment on the pad will be determined after the well is drilled.

Pipelines – Refer to Pipeline Plat (Russell Surveying, Inc. August 8, 2007). The proposed pipeline will be approximately 2,118 feet long and will take-off from an existing Energen Resources pipeline in the southeast quarter of the northwest quarter of Section 16. A water pipeline would also be laid in the trench along with the proposed gas pipeline. Additional facilities off the well pad will be applied for as required.

#### **E. Location and Types of Water Supply**

Due to the presence of adequate clay material on the location site, produced water will be utilized in the drilling operations of this well according to the terms of the Beneficial Use Permit on file with

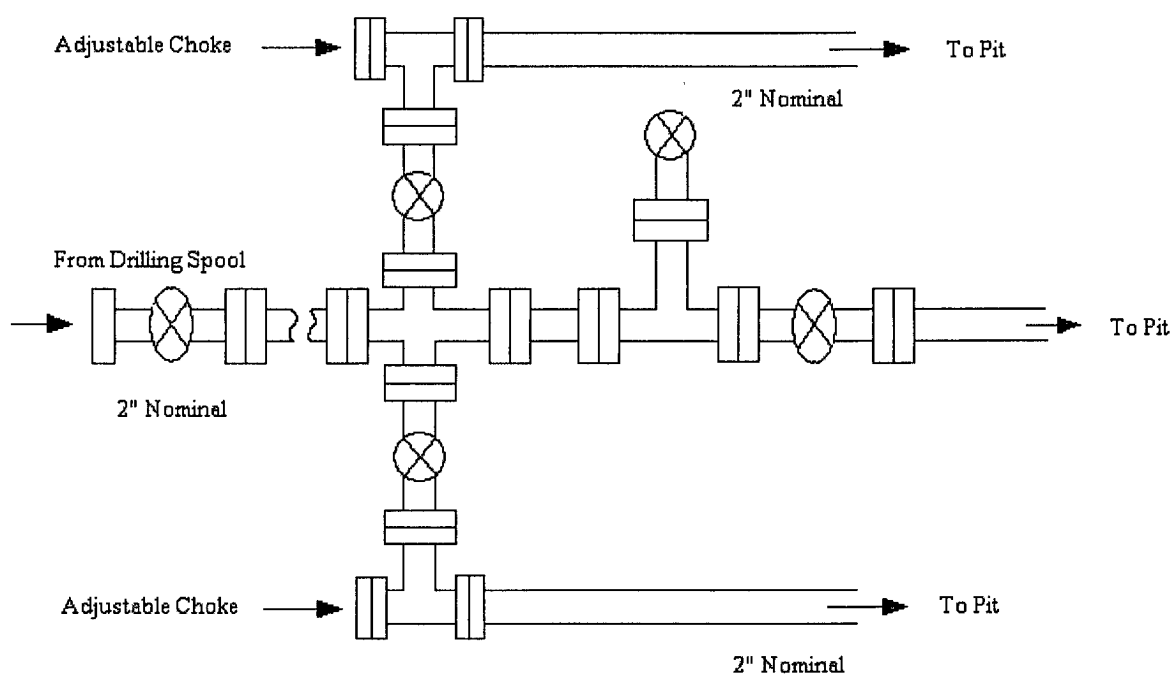
## **DRILLING CONDITIONS OF APPROVAL**

**Operator:** Energen Resources  
**Lease No.:** NMNM-30014  
**Well Name:** Carracas 16 B #15  
**Well Location:** Sec. 16, T32N, R04W; 1705' FSL & 940' FWL

1. Since no BOPE test pressures were proposed, it is recommended that Energen Resources test the BOP and related equipment according to Onshore Order No. 2 *Minimum Standards and Enforcement Provisions For Well Control Equipment Testing.*

## Energen Resources Corporation

### Typical 2000 psi Choke Manifold Configuration



Choke manifold installed from surface to TD

## Energen Resources Corporation

### Typical BOP Configuration for Gas Drilling

