

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED
OMB NO. 1004-0137
Expires July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS JUL 06 2010

Do not use this form for proposals to drill or to re-enter an
abandoned well. Use Form 3160-3 (APD) for such proposals and Management
Farmington Field Office

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

Energen Resources Corporation

3a. Address

2010 Afton Place, Farmington, NM 87401

3b. Phone No. (include area code)

505-325-6800

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SHL: 970'FSL 815'FEL; (P) SEC 30-T32N-R04W

BHL: 760'FSL 760'FEL; (P) SEC 31-T32N-R04W

5. Lease Serial No.

USA NMNM 30015

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Carracas 31B 16

9. API Well No.

30-039-30701

10. Field and Pool, or Exploratory Area
Basin Fruitland Coal

11. County or Parish, State

Rio Arriba NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice

TYPE OF ACTION

☐ Acidize☐ Deepen☐ Production (Start/Resume)☐ Water Shut-Off☐ Alter Casing☐ Fracture Treat☐ Reclamation☐ Well Integrity☐ Casing Repair☐ New Construction☐ Recomplete☐ Other☒ Change Plans☐ Plug and Abandon☐ Temporarily Abandon☐ Convert to Injection☐ Plug Back☐ Water Disposal

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the final site is ready for final inspection.)

Energen Resources plans to make the following changes to the Carracas 31B #16 well:

* The bottom hole location(BHL) has changed from 760'FSL 1880'FEL to 760'FSL 760'FEL. See attached well plat for confirmation(C-102).

* Because of the change in BHL, the casing setting depths have changed also:

Surface - Set @ 200'TVD.....no change

Intermediate - Set @ 4837'MD; 4002'TVD.....changed from 5008'MD; 4002'TVD

Prod. Liner - Set @ 9296'MD; 4002'TVD.....changed from 8831'MD; 4002'TVD

* Because the setting depths have changed, the cement volumes have changed as well:

Surface - 110 sks.....changed from 125sks

Intermediate - 580sks lead/150sks tail.....changed from 690sks lead/150sks tail

* BOP/Casing pressure testing procedure has been modified also:

BOP: Test @ 250psi low/2000psi high for 10 min.....changed from 15 min

Casing: Test Intermediate casing @ 1500psi for 30min.....changed from 1200psi

* Please see Operations & Directional Plans attached along with updated C-102 well plat

14. I hereby certify that the foregoing is true and correct

Name (Printed/Typed)

Stephen Byers

Title Drilling Engineer

Signature

Date 7/1/2010

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Troy L. Salvors

Title

Petroleum Engineer

Date

7/16/2010

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

FFO

Title 18 U.S.C. Section 1001, and Title 43 U.S.C. Section 1212, makes 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.

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

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

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

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

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87506

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ APT Number 30-039-30701	² Pool Code 71629	³ Pool Name Basin Fruitland Coal
⁴ Property Code 38897	⁵ Property Name CARRACAS 31 B	⁶ Well Number 16
⁷ OGRID No.	⁸ Operator Name ENERGEN RESOURCES CORPORATION	⁹ Elevation 7247'

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
P	30	32N	4W		970'	SOUTH	815'	EAST	RIO ARRIBA

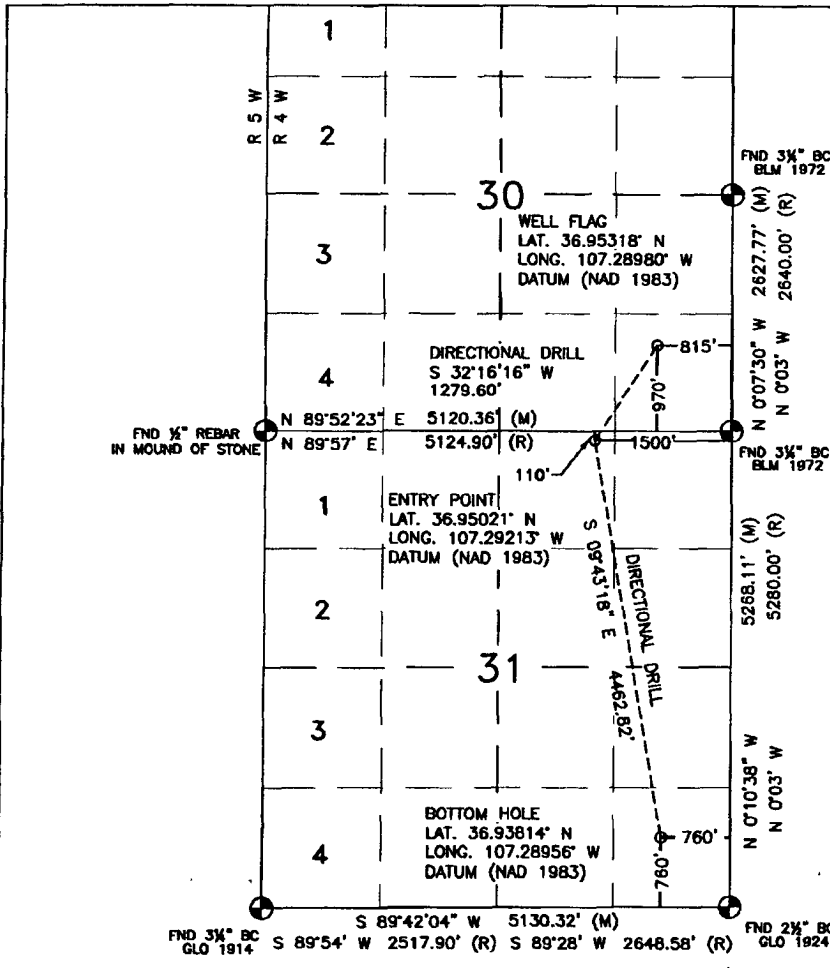
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	31	32N	4W		760'	SOUTH	760'	EAST	RIO ARRIBA

¹² Dedicated Acres 320 E/2 Sec 31	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13119
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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



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 or a compulsory pooling order heretofore entered by the division.

Stephen Byers 7-1-10
Signature Date

Stephen Byers
Printed Name

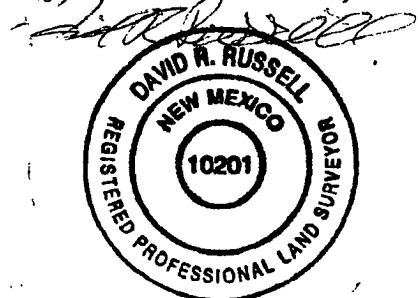
¹⁸ SURVEYOR CERTIFICATION

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.

JUNE 26, 2008

Date of Survey

Signature and Seal of Professional Surveyor:



DAVID RUSSELL
Certificate Number 10201

7/1/2010



OPERATIONS PLAN

WELL NAME.....Carracas 31B #16
JOB TYPE.....Horizontal OPE FTC
DEPT.....Drilling and Completions
PREPARED BY.....Stephen Byers

GENERAL INFORMATION

Surface Location	970 FSL 815 FEL
S-T-R	(P) Sec.30, T32N, R04W
Bottom Hole Location	760 FSL 760 FEL
S-T-R	(P) Sec.31, T32N, R04W
County, State	Rio Arriba, New Mexico
Elevations	7247' GL
Total Depth	9296' +/- (MD); 4002' (TVD)
Formation Objective	Basin Fruitland Coal

FORMATION TOPS

San Jose	Surface
Nacimiento	2282' (TVD)
Ojo Alamo Ss	3358' (TVD)
Kirtland Sh	3479' (TVD)
Fruitland Fm	3602' (TVD)
Top Target Coal	3992' (TVD)
Base Target Coal	4013' (TVD)
Pictured Cliffs	4058' (TVD)
Total Depth	4002' (TVD), 9296' (MD)

DRILLING

Surface: 12-1/4" wellbore will be drilled with a fresh water mud system (spud mud).

Intermediate: 8-3/4" wellbore will be drilled with a LSND mud system. Weighting materials will be drill cuttings and if needed barite. Mud density is expected to range from 8.5 ppg to 9.0 ppg.

Production: 6-1/8" 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.

Projected KOP is 2800' TVD with 6.57°/100' doglegs.

Blowout Control Specifications:

A 3000 psi minimum double ram or annulus BOP stack will be used following nipple up of casing head. 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. **Pressure test BOP to 250 psi for 10 min and 2000 psi for 10 min.**

Logging Program:

Open hole logs: None

Mudlogs: 3754' TVD, 4000' MD to TD

Surveys: Surface to KOP every 500' and a minimum of every 200' for directional.

7/1/2010

CASING, TUBING & CASING EQUIPMENT

String	Start Depth	End Depth	Wellbore	Size	Wt	Grade
Surface	0	200	12-1/4"	9-5/8"	32.3 lb/ft	H-40 ST&C
Intermediate TVD	0 0	4837 4002	8-3/4"	7"	23 lb/ft	J-55 LT&C
Prod. Liner TVD	4737 4000	9296 4002	6-1/4"	4-1/2"	11.6 lb/ft	J-55 LT&C
Tubing	0	4537	none	2-3/8"	4.7 lb/ft	J-55

Surface Casing: Texas Pattern Guide Shoe on bottom of first joint and an insert float valve on top of first joint. Casing centralization with a minimum of 3 standard bow spring centralizers to achieve optimal standoff.

Intermediate Casing: Self fill float shoe with self fill float collar on bottom and top of first joint. Casing centralization with double bow spring and centralizers to optimize standoff.

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

WELLHEAD

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

CEMENTING

Surface Casing: 110 sks Type V with 2.0 % CaCl₂ and ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk 130 ft³ of slurry, 100% excess to circulate to surface). WOC 12 hours. Pressure test surface casing to 750 psi for 30 min.

Intermediate Casing: Depending on wellbore conditions, cement may consist of 580 sks 65/35 with 6.0 % Bentonite, 2.0 % CaCl₂, 10 #/sk Gilsonite, and ½ #/sk Flocele (12.3 ppg, 1.93 ft³/sk) and a tail of 150 sks Class G with ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk). (1287 ft³ of slurry, 100% excess to circulate to surface). WOC 12 hours. Test casing to 1500 psi for 30 min.

Production Liner: NO CEMENT, Open Hole Completion

Set slips with full string weight

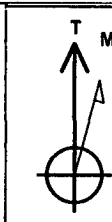
If cement does not circulate, run temperature survey in 8 hrs. to determine TOC.

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.
- 5) This gas is dedicated.

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2800.0	0.00	0.00	2800.0	0.0	0.0	0.00	0.00	0.0	KOP
3	3627.4	49.49	244.26	3528.3	-145.8	-302.3	5.98	244.26	142.7	
4	3653.3	49.49	244.26	3545.1	-154.3	-320.1	0.00	0.00	151.1	
5	4837.0	90.00	170.45	4002.0	-1080.0	-685.0	6.57	-79.32	1073.1	Land Curve
6	9296.9	90.00	170.45	4002.0	-5478.1	55.0	0.00	0.00	5478.4	TD Lateral



Azimuths to True North
Magnetic North: 9.99°

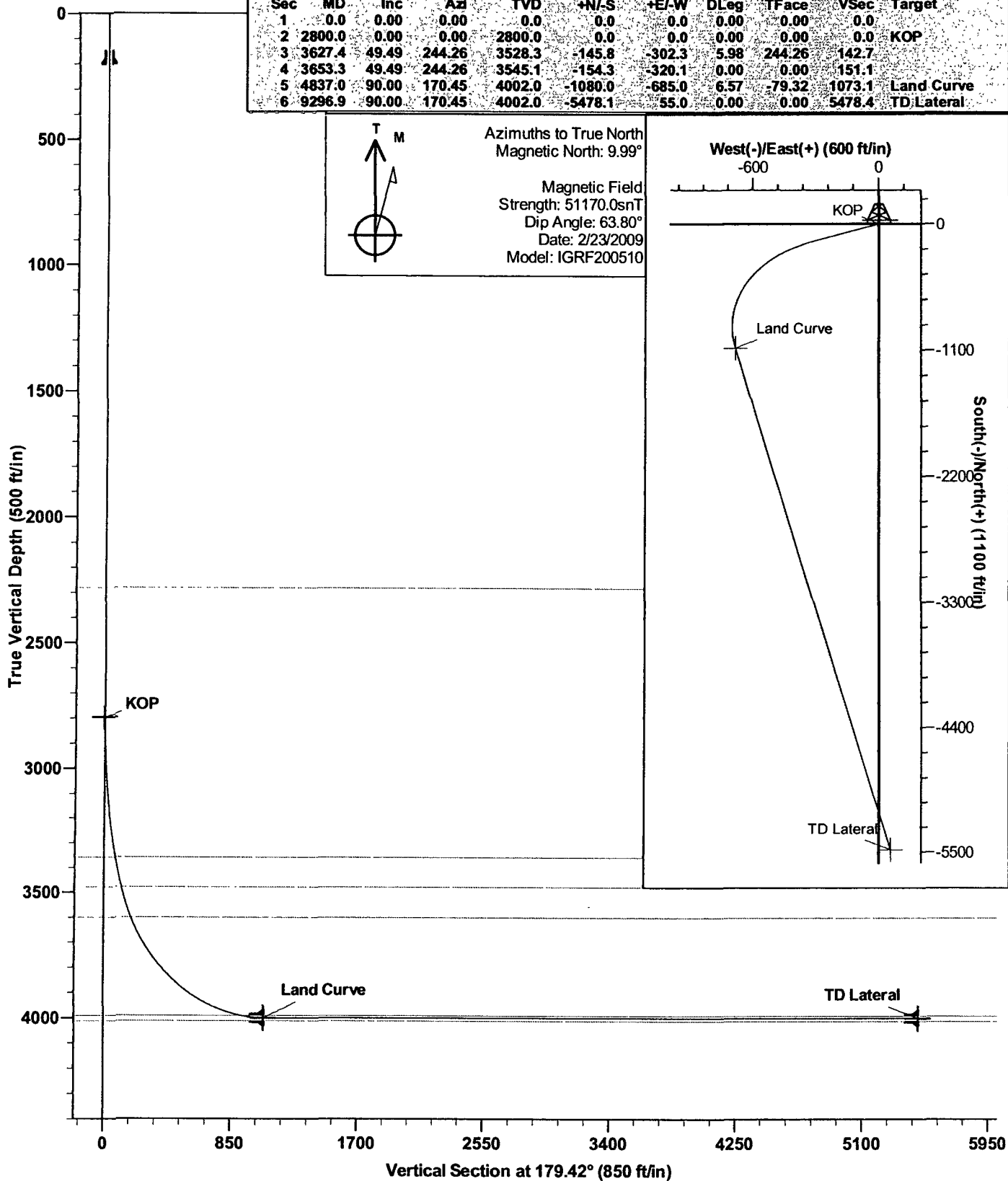
Magnetic Field
Strength: 51170.0snT
Dip Angle: 63.80°
Date: 2/23/2009
Model: IGRF200510

West(-)/East(+) (600 ft/in)
-600 0

KOP

Land Curve

TD Lateral



Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest: Sec.30-T32N-R04W
Site: Carracas: Forest Rd 218C
Well: Carracas 31B #16
Wellbore: Horizontal OPE FTC
Design: Preliminary Plan

Local Co-ordinate Reference: Well Carracas 31B #16
TVD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
MD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project	Carson National Forest: Sec.30-T32N-R04W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Carracas: Forest Rd 218C		
Site Position:		Northing:	2,167,908.53 ft
From:	Lat/Long	Easting:	1,336,600.95 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	36° 57' 11.448 N
		Longitude:	107° 17' 23.280 W
		Grid Convergence:	-0.63 °

Well	Carracas 31B #16		
Well Position	+N/-S	0.0 ft	Northing: 2,167,908.53 ft
	+E/-W	0.0 ft	Easting: 1,336,600.95 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	7,247.0 ft
		Latitude:	36° 57' 11.448 N
		Longitude:	107° 17' 23.280 W
		Ground Level:	7,247.0 ft

Wellbore	Horizontal OPE FTC				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2/23/2009	9.99	63.80	51,170

Design	Preliminary Plan			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	179.42

Survey Tool Program	Date 7/1/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	9,296.9	Preliminary Plan (Horizontal OPE FTC)	MWD	MWD - Standard

Planned Survey								
MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	
0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
100.0	100.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
200.0	200.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
300.0	300.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
400.0	400.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
500.0	500.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
600.0	600.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
700.0	700.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
800.0	800.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
900.0	900.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
1,000.0	1,000.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
1,100.0	1,100.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest: Sec.30-T32N-R04W
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MD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
1,200.0	1,200.0	0.00	0.00	0.00	0.0	0.0	0.0
1,300.0	1,300.0	0.00	0.00	0.00	0.0	0.0	0.0
1,400.0	1,400.0	0.00	0.00	0.00	0.0	0.0	0.0
1,500.0	1,500.0	0.00	0.00	0.00	0.0	0.0	0.0
1,600.0	1,600.0	0.00	0.00	0.00	0.0	0.0	0.0
1,700.0	1,700.0	0.00	0.00	0.00	0.0	0.0	0.0
1,800.0	1,800.0	0.00	0.00	0.00	0.0	0.0	0.0
1,900.0	1,900.0	0.00	0.00	0.00	0.0	0.0	0.0
2,000.0	2,000.0	0.00	0.00	0.00	0.0	0.0	0.0
2,100.0	2,100.0	0.00	0.00	0.00	0.0	0.0	0.0
2,200.0	2,200.0	0.00	0.00	0.00	0.0	0.0	0.0
2,282.0	2,282.0	0.00	0.00	0.00	0.0	0.0	0.0
Nacimiento							
2,300.0	2,300.0	0.00	0.00	0.00	0.0	0.0	0.0
2,400.0	2,400.0	0.00	0.00	0.00	0.0	0.0	0.0
2,500.0	2,500.0	0.00	0.00	0.00	0.0	0.0	0.0
2,600.0	2,600.0	0.00	0.00	0.00	0.0	0.0	0.0
2,700.0	2,700.0	0.00	0.00	0.00	0.0	0.0	0.0
2,800.0	2,800.0	0.00	0.00	0.00	0.0	0.0	0.0
KOP							
2,850.0	2,850.0	2.99	244.26	5.98	-0.6	-1.2	0.6
2,900.0	2,899.8	5.98	244.26	5.98	-2.3	-4.7	2.2
2,950.0	2,949.4	8.97	244.26	5.98	-5.1	-10.6	5.0
3,000.0	2,998.6	11.96	244.26	5.98	-9.0	-18.7	8.8
3,050.0	3,047.2	14.95	244.26	5.98	-14.1	-29.2	13.8
3,100.0	3,095.1	17.94	244.26	5.98	-20.2	-42.0	19.8
3,150.0	3,142.3	20.93	244.26	5.98	-27.5	-57.0	26.9
3,200.0	3,188.5	23.92	244.26	5.98	-35.7	-74.1	35.0
3,250.0	3,233.6	26.91	244.26	5.98	-45.1	-93.5	44.1
3,300.0	3,277.6	29.90	244.26	5.98	-55.4	-114.9	54.2
3,350.0	3,320.3	32.89	244.26	5.98	-66.7	-138.4	65.3
3,395.6	3,358.0	35.62	244.26	5.98	-77.9	-161.5	76.2
Ojo Alamo							
3,400.0	3,361.5	35.88	244.26	5.98	-79.0	-163.8	77.3
3,450.0	3,401.3	38.87	244.26	5.98	-92.1	-191.1	90.2
3,500.0	3,439.4	41.87	244.26	5.98	-106.2	-220.3	104.0
3,550.0	3,475.7	44.86	244.26	5.98	-121.1	-251.2	118.6
3,554.7	3,479.0	45.13	244.26	5.98	-122.5	-254.2	120.0
Kirtland							
3,600.0	3,510.2	47.85	244.26	5.98	-136.8	-283.8	134.0
3,627.4	3,528.3	49.49	244.26	5.98	-145.8	-302.3	142.7
3,653.3	3,545.1	49.49	244.26	0.00	-154.3	-320.1	151.1
3,700.0	3,575.3	50.12	240.33	1.36	-170.9	-351.6	167.4
3,742.0	3,602.0	50.80	236.87	1.63	-187.8	-379.3	183.9
Fruitland							

Energen DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest: Sec.30-T32N-R04W
Site: Carracas: Forest Rd 218C
Well: Carracas 31B #16
Wellbore: Horizontal OPE FTC
Design: Preliminary Plan

Local Co-ordinate Reference: Well Carracas 31B #16
TVD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
MD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
3,750.0	3,607.1	50.95	236.21	1.77	-191.2	-384.5	187.3
3,800.0	3,638.3	51.91	232.20	1.93	-214.1	-416.1	209.9
3,850.0	3,668.7	53.01	228.29	2.20	-239.4	-446.6	234.9
3,900.0	3,698.4	54.23	224.50	2.45	-267.2	-475.7	262.4
3,950.0	3,727.1	55.57	220.84	2.68	-297.2	-503.4	292.2
4,000.0	3,754.9	57.01	217.29	2.89	-329.5	-529.6	324.2
4,050.0	3,781.6	58.55	213.86	3.08	-363.9	-554.2	358.4
4,100.0	3,807.0	60.18	210.55	3.26	-400.3	-577.2	394.5
4,150.0	3,831.3	61.89	207.34	3.42	-438.6	-598.3	432.6
4,200.0	3,854.1	63.67	204.24	3.56	-478.6	-617.6	472.4
4,250.0	3,875.6	65.52	201.23	3.69	-520.3	-635.1	513.9
4,300.0	3,895.5	67.42	198.31	3.81	-563.4	-650.6	556.9
4,350.0	3,913.9	69.38	195.47	3.91	-607.9	-664.1	601.2
4,400.0	3,930.7	71.38	192.70	4.00	-653.6	-675.5	646.8
4,450.0	3,945.9	73.42	190.00	4.08	-700.3	-684.9	693.4
4,500.0	3,959.3	75.49	187.36	4.15	-747.9	-692.2	740.9
4,550.0	3,970.9	77.60	184.76	4.21	-796.3	-697.3	789.2
4,600.0	3,980.7	79.72	182.21	4.25	-845.2	-700.3	838.1
4,650.0	3,988.7	81.87	179.69	4.29	-894.5	-701.1	887.5
4,674.8	3,992.0	82.94	178.45	4.32	-919.1	-700.7	912.0
Top Target Coal							
4,700.0	3,994.9	84.03	177.20	4.33	-944.1	-699.7	937.1
4,750.0	3,999.1	86.20	174.73	4.35	-993.8	-696.2	986.8
4,800.0	4,001.5	88.39	172.27	4.36	-1,043.4	-690.6	1,036.5
4,837.0	4,002.0	90.00	170.45	4.37	-1,080.0	-685.0	1,073.1
Land Curve							
4,900.0	4,002.0	90.00	170.45	0.00	-1,142.1	-674.5	1,135.3
5,000.0	4,002.0	90.00	170.45	0.00	-1,240.8	-658.0	1,234.1
5,100.0	4,002.0	90.00	170.45	0.00	-1,339.4	-641.4	1,332.9
5,200.0	4,002.0	90.00	170.45	0.00	-1,438.0	-624.8	1,431.6
5,300.0	4,002.0	90.00	170.45	0.00	-1,536.6	-608.2	1,530.4
5,400.0	4,002.0	90.00	170.45	0.00	-1,635.2	-591.6	1,629.2
5,500.0	4,002.0	90.00	170.45	0.00	-1,733.8	-575.0	1,728.0
5,600.0	4,002.0	90.00	170.45	0.00	-1,832.4	-558.4	1,826.7
5,700.0	4,002.0	90.00	170.45	0.00	-1,931.1	-541.8	1,925.5
5,800.0	4,002.0	90.00	170.45	0.00	-2,029.7	-525.2	2,024.3
5,900.0	4,002.0	90.00	170.45	0.00	-2,128.3	-508.6	2,123.1
6,000.0	4,002.0	90.00	170.45	0.00	-2,226.9	-492.0	2,221.8
6,100.0	4,002.0	90.00	170.45	0.00	-2,325.5	-475.5	2,320.6
6,200.0	4,002.0	90.00	170.45	0.00	-2,424.1	-458.9	2,419.4
6,300.0	4,002.0	90.00	170.45	0.00	-2,522.7	-442.3	2,518.2
6,400.0	4,002.0	90.00	170.45	0.00	-2,621.4	-425.7	2,616.9
6,500.0	4,002.0	90.00	170.45	0.00	-2,720.0	-409.1	2,715.7
6,600.0	4,002.0	90.00	170.45	0.00	-2,818.6	-392.5	2,814.5
6,700.0	4,002.0	90.00	170.45	0.00	-2,917.2	-375.9	2,913.3

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest: Sec.30-T32N-R04W
Site: Carracas: Forest Rd 218C
Well: Carracas 31B #16
Wellbore: Horizontal OPE FTC
Design: Preliminary Plan

Local Co-ordinate Reference: Well Carracas 31B #16
TVD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
MD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
6,800.0	4,002.0	90.00	170.45	0.00	-3,015.8	-359.3	3,012.1
6,900.0	4,002.0	90.00	170.45	0.00	-3,114.4	-342.7	3,110.8
7,000.0	4,002.0	90.00	170.45	0.00	-3,213.0	-326.1	3,209.6
7,100.0	4,002.0	90.00	170.45	0.00	-3,311.7	-309.5	3,308.4
7,200.0	4,002.0	90.00	170.45	0.00	-3,410.3	-293.0	3,407.2
7,300.0	4,002.0	90.00	170.45	0.00	-3,508.9	-276.4	3,505.9
7,400.0	4,002.0	90.00	170.45	0.00	-3,607.5	-259.8	3,604.7
7,500.0	4,002.0	90.00	170.45	0.00	-3,706.1	-243.2	3,703.5
7,600.0	4,002.0	90.00	170.45	0.00	-3,804.7	-226.6	3,802.3
7,700.0	4,002.0	90.00	170.45	0.00	-3,903.3	-210.0	3,901.0
7,800.0	4,002.0	90.00	170.45	0.00	-4,002.0	-193.4	3,999.8
7,900.0	4,002.0	90.00	170.45	0.00	-4,100.6	-176.8	4,098.6
8,000.0	4,002.0	90.00	170.45	0.00	-4,199.2	-160.2	4,197.4
8,100.0	4,002.0	90.00	170.45	0.00	-4,297.8	-143.6	4,296.1
8,200.0	4,002.0	90.00	170.45	0.00	-4,396.4	-127.0	4,394.9
8,300.0	4,002.0	90.00	170.45	0.00	-4,495.0	-110.5	4,493.7
8,400.0	4,002.0	90.00	170.45	0.00	-4,593.6	-93.9	4,592.5
8,500.0	4,002.0	90.00	170.45	0.00	-4,692.3	-77.3	4,691.2
8,600.0	4,002.0	90.00	170.45	0.00	-4,790.9	-60.7	4,790.0
8,700.0	4,002.0	90.00	170.45	0.00	-4,889.5	-44.1	4,888.8
8,800.0	4,002.0	90.00	170.45	0.00	-4,988.1	-27.5	4,987.6
8,900.0	4,002.0	90.00	170.45	0.00	-5,086.7	-10.9	5,086.3
9,000.0	4,002.0	90.00	170.45	0.00	-5,185.3	5.7	5,185.1
9,100.0	4,002.0	90.00	170.45	0.00	-5,283.9	22.3	5,283.9
9,200.0	4,002.0	90.00	170.45	0.00	-5,382.5	38.9	5,382.7
9,296.9	4,002.0	90.00	170.45	0.00	-5,478.1	55.0	5,478.4

TD Lateral

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest: Sec.30-T32N-R04W
Site: Carracas: Forest Rd 218C
Well: Carracas 31B #16
Wellbore: Horizontal OPE FTC
Design: Preliminary Plan

Local Co-ordinate Reference: Well Carracas 31B #16
TVD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
MD Reference: KB @ 7262.0ft (Drilling Rig 15' KB)
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 (ft)	Easting (ft)	Latitude	Longitude
KOP - plan hits target - Point	0.00	0.00	2,800.0	0.0	0.0	2,167,908.53	1,336,600.95	36° 57' 11.448 N	107° 17' 23.280 W
TD Lateral - plan hits target - Point	0.00	0.00	4,002.0	-5,478.1	55.0	2,162,430.14	1,336,596.17	36° 56' 17.283 N	107° 17' 22.603 W
Land Curve - plan hits target - Point	0.00	0.00	4,002.0	-1,080.0	-685.0	2,166,836.06	1,335,904.21	36° 57' 0.769 N	107° 17' 31.719 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
200.0	200.0	Surface	9-5/8	12-1/4
4,837.0	4,002.0	Intermediate	7	8-3/4
9,296.0	4,002.0	Liner	4-1/2	6-1/8

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,674.8	3,992.0	Top Target Coal		0.00	
3,395.6	3,358.0	Ojo Alamo		0.00	
3,554.7	3,479.0	Kirtland		0.00	
3,742.0	3,602.0	Fruitland		0.00	
2,282.0	2,282.0	Nacimiento		0.00	
	4,013.0	Base Target Coal		0.00	

Checked By: _____ Approved By: _____ Date: _____