State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division

New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 2/1/13

Well information;
Operator EnerVest, Well Name and Number Jicarilla Apache 102 #12N
API# 30-039-31179, Section 9, Township 26 (N)/S, Range 4 (E)/W

Conditions of Approval:
(See the below checked and handwritten conditions)

- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Hold C-104 for directional survey & "As Drilled" Plat
- o Hold C-104 for NSL, NSP, DHC
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ✓ 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
- o Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string

Charlie Perrin
NMOCD Approved by Signature

6-20-2013
Date

JUN 2 1 2013 ca

Form 3160-3
(April 2004)

RECEIVED

FEB 04 2013

Farmington Field Office
Bureau of Land Management

FORM APPROVED
OMB NO. 1004-0137
Expires: March 31,2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
Jicarilla Contract 102

6. If Indian, Allottee or Tribe Name
Jicarilla Apache

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

1a. Type of Work: [X] DRILL [ ] REENTER

1b. Type of Well: [ ] Oil Well [X] Gas Well [ ] Other [ ] Single Zone [ ] Multiple Zone

8. Lease Name and Well No.
Jicarilla Apache 102 #12N

2. Name of Operator
EnerVest Operating, L.L.C.

9. API Well No.
30-039-31179

3a. Address
1001 Fannin St. Suite 800, Houston, Tx 77034

3b. Phone No. *(include area code)*
713-495-5355

10. Field and Pool, or Exploratory
Blanco Mesa Verde/Basin Dakota

4. Location of well *(Report location clearly and In accordance with any State requirements.*)*
At surface **1387' FNL, 304' FEL (Unit H)**
Sec 9 T26N R04W
At proposed prod. zone **1070' FNL, 670' FEL (Unit A)**
Sec 9 T26N R04W

11. Sec., T., R., M., or Blk. And Survey or Area
Sec. 9 T26N R04W

14. Distance in miles and direction from the nearest town or post office*
30 miles from Lindrith, NM

12. County or Parish
Rio Arriba

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any)	16. No. of acres in lease	17. Spacing Unit dedicated to this well
304'	**2567.94**	**MV - N/320** **DK - E/320**
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/ BIA Bond No. on file
891'	**8131'**	**RLB0007886**
21. Elevations (Show whether DF. RT, GR, etc.)	22. Aproximate date work will start*	23. Estimated duration
6946' GL	**4/1/2013**	**5 weeks**

RCVD JUN 7 '13
OIL CONS. DIV.
DIST. 3

24. Attachments

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 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 a authorized officer.

25. Signature	Name *(Printed/ Typed)*	Date
	Bart Trevino	**2/1/2013**

Title
Regulatory Analyst

Approved By *(Signature)*	Name *(Printed/ Typed)*	Date
/s/ Maclaverro		6/5/13
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 conduc 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)*

NMOCD

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

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

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

RECEIVED

FEB 04 2013

Farmington Field Office
Bureau of Land Management

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

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
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
30-039- 31179	72319/71599	BLANCO MESAVERDE/BASIN DAKOTA

[4] Property Code	[5] Property Name	[6] Well Number
306751	JICARILLA Apache 102	12N

[7] OGRID No.	[8] Operator Name	[9] Elevation
143199	ENERVEST OPERATING, LLC.	6946'

[10] Surface Location

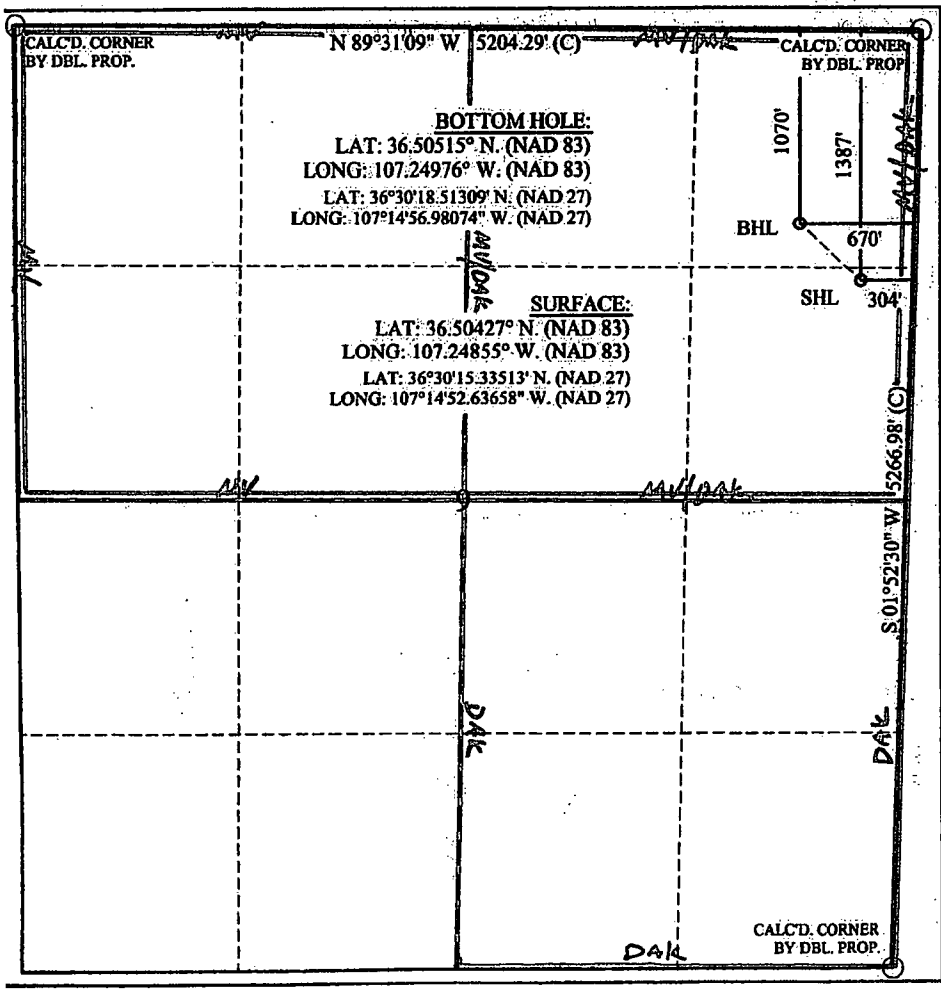
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	9	26-N	4-W		1387	NORTH	304	EAST	RIO ARRIBA

[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
A	9	26-N	4-W		1070	NORTH	670	EAST	RIO ARRIBA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
MV - N/320 DK - E/320	Y		

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.



[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.

Signature — Date: 12/6/12

Bart Trevino
Printed Name

btrevino@enervest.net
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.

Date of Survey: AUGUST 29, 2012

Signature and Seal of Professional Surveyor:

NEW MEXICO — 8894 — REGISTERED PROFESSIONAL LAND SURVEYOR

11-2-12

Certificate Number

EnerVest Operating, LLC

Jicarilla Apache 102 # 12N

Surface: 1387' FNL, 304' FEL Unit H, Sec. 9, T26N R04W
Botton Hole: 1070' FNL, 670' FEL Unit A, Sec 9, T26N, R05W
Rio Arriba County, NM
GL Elev: 6946'

Drilling Plan

All Lease and /or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations, BLM Onshore orders and EnerVest's approved Further Development Project Plan. The operator is fully responsible for the actions of its subcontractors. A copy of the APD and Conditions of Approval will be available to the field representatives to ensure compliance.

4.1, 4.2 ESTIMATED (TVD) FORMATION TOPS (KB) and NOTABLE ZONES:

The following are estimates of formation and proposed casing depths.

Formation Name	Depth (TVD)	Rock Type	Comments
San Jose	Surface	Sandstone	
Ojo Alamo	2948'	Sandstone	Possible Gas, Water
Kirtland	3452'	Shale	
Fruitland	3498'	Coal, Shale, Sandstone	Possible Lost Circ, Gas, Water
Pictured Cliffs	3688'	Sandstone	Possible Lost Circ, Gas, water
Lewis	3935'	Shale	Sloughing Shale
Mesa Verde (Cliffhouse)	5363'	Sandstone	Possible Lost Circ, Gas, Water
Mesa Verde (Menefee)	5454''	Coal, Sandstone, Shale	Possible Lost Circ, Gas, Water
Mesa Verde (Point Lookout)	5874'	Sandstone	Possible Lost Circ, Gas, Water
Mancos	5940'	Shale	Sloughing Shale
Greenhorn	7788'	Limestone	Gas, Oil
Graneros	7823'	Shale	Gas, Oil, Water
Dakota	7841'	Sandstone	Gas, Oil, Water
Proposed Total Depth	8131'		

Fresh water zones will be adequately protected by setting and cementing the surface casing. All zones containing commercial quantities of oil or gas will be cased and cemented.

This well is to be drilled as a directionally drilled "S-shaped" well. The well is to be drilled vertically from surface to a kick off point at +/- 600 ft. The well will be directionally drilled at a 311 degree azimuth to a point approx 485 ft north west east of the surface location and at an estimated MD of +/- 3500 ft. The well will be drilled vertically from that point to the estimated TD.

4.3 PRESSURE CONTROL:

Maximum expected pressure is ~1789 (.22 pressure gradient) psi. The drilling contract has not yet been awarded, thus the exact BOP and Choke Manifold model to be used is not yet known. A typical 11" 2000 psi model is pictured in Exhibits A & B.
A remote accumulator will be used, the pressures, capacities location of the remote and manual controls will be identified at the time of the BLM supervised BOP test.

BOP equipment, accumulator, choke manifold and all accessories will meet or exceed BLM requirements as listed in Onshore Order #2 for the 2M systems. The pressure control equipment considerations include but will not be limited to:

1. BOP will be a double gate ram preventer with a set of blind rams and a set of properly-sized pipe rams.
2. Accumulator will have sufficient capacity to close the BOP rams and retain 200 psi above pre charge.
3. Accumulator fluid volume is to be maintained at manufacturer's recommendations.
4. BOP will also have manual closing handles available.
5. 2" minimum kill line and kill line valves (2).
6. Choke manifold (2" lines) with 2 adjustable chokes with valves and gauge.
7. Manually operated Kelly cocks available.
8. Safety valve and sub(s) with adequate opening for all drill strings used.
9. Fill line and flow line above the upper-most BOP rams.

BOPs will be pressure tested; after initial installation, before drilling out from under all set and cemented casing strings and any time a seal is broken. The BOPs will also be pressure tested a minimum of once every 21 days by a 3rd party. Additionally, the BOPs will be operationally checked every 24 hours.
All tests and pressure tests will be recorded on IADC log.

Ram type preventors, choke manifold and related pressure control equipment will be pressure tested to the rated working pressure of 2000 psi (high) and 250 psi (low).

The casing strings will be pressure tested per BLM Onshore Order #2 for 30 min as follows:

a. Surface casing tested to 600 psi prior to drilling out the shoe.
b. Intermediate casing tested to 1500 psi prior to drilling out the shoe. **(If intermediate casing is used.)**
c. Production casing will be tested to 6000 psi (either 4 ½" 11.6# N-80 or 5 ½" 17# N-80) at the commencement of completion operations.

EnerVest Operating, LLC
Jicarilla Apache 102 # 12N
Surface: 1387' FNL, 304' FEL Unit H, Sec. 9, T26N R04W
Botton Hole: 1070' FNL, 670' FEL Unit A, Sec 9, T26N, R05W
Rio Arriba County, NM
GL Elev: 6946'

4.4 PROPOSED CASING PROGRAM (S):

The casings program is designed to use **Option A** below. If while drilling the hole conditions indicate that an intermediate casing may be needed then **Option B** will be used.

Casing Option A

Hole/Casing Description	Hole Size	Casing OD	Weight lb/ft	Grade	Age	Connection	Top	Bottom
Surface	12 1/4"	9 5/8"	36	J-55	New	ST&C	0	500'
Prod Csg(1)MD TVD	8 3/4"	5 1/2"	17	N-80	New	LT&C	0	4072' 4025'
Prod Csg(2)MD TVD	7 7/8"	5 1/2"	17	N-80	New	LT&C	4072' 4025'	8178' 8131'

Surface casing is to be cemented to surface. The production casing is to be cemented in 3 stages covering all zones of production potential and the 3rd stage is intended to circulate cement to surface.

Casing Option B

Hole/Casing Description	Hole Size	Casing OD	Weight lb/ft	Grade	Age	Connection	Top MD	Bottom MD
Surface	12 1/4"	9 5/8"	36	J-55	New	ST&C	0	500'
Inter MD TVD	8 3/4"	7"	23	J-55	New	LT&C	0	4072' 4025'
Prod Csg MD TVD	6 1/4"	4 1/2"	11.6	N-80	New	LT&C	0	8178' 8131'

Surface and Intermediate casings are to be cemented to surface, production casing is intended to be cemented with a 200' overlap into the intermediate casing.

4.5 CASING CEMENT:

A prototypical cementing program is listed as follows, site-specific cement designs will be produced for each well as the hole conditions warrant. The cement program will designed to meet the BLM Onshore Order #2 and NMOCD requirements.

Surface casing will be cemented to the surface.
Cement and properties; Mix and pump 225 sacks (313 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). Volume will include 100% excess. Cement is to be displaced using a top plug.

Two centralizers will be run on the shoe joint, one centralizer each on the next two joints and then one centralizer on every third joint thereafter.
The surface casing will be pressure tested to 600 psi prior to drilling out the shoe.

Production casing (for Casing Option A only) will be cemented in 3 stages covering all zones of production potential and the 3rd stage is intended to circulate cement to surface. Volumes based on 50% OH excess cement for stage 1 and 45% for stages 2 and 3.

Stage 1 Lead cement; mix and pump 107 sacks (228 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 1 Tail cement; mix and pump 418 sacks (840 cu ft) premium lite high strength cement with CaCl2, cellophane, gilsonite and fluid loss agent. Slurry density is to be 12.5 (yield = 2.01 cu ft/sx).

DV tool at +/- 4072 ft. MD

Stage 2 Lead cement; mix and pump 120 sacks (255 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 2 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

DV tool at +/- 3185 ft. MD

Stage 3 Lead cement; mix and pump 492 sacks (1048 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 3 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

Two centralizers will be run on the shoe joint, one centralizer on every third joint into the surface casing.

Intermediate casing (for Casing Option B only) will be cemented to surface in 2 stages, stage tool to be set at +/- 3185' MD. Cement will be designed to circulate to surface. Volumes will be based on 45% excess in OH.

Stage 1 Lead cement; mix and pump 58 sacks (123 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 1 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

DV tool @ +/- 3185 ft. MD

Stage 2 Lead cement; mix and pump 266 sacks (566 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 2 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

Two centralizers will be run on the shoe joint, one centralizer on every other joint for 14 joints and then one centralizer on every third joint thereafter.

The Intermediate casing will be pressure tested to 1500 psi prior to drilling out the shoe.

Production casing (for Casing Option B only) will be cemented into the intermediate casing with a minimum of 200 ft overlap. Volumes based on 45% excess in OH.

Lead cement; mix and pump 117 sacks (250 cu ft) premium lite slurry with CaCl2, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Tail cement; mix and pump 239 sacks (481 cu ft) premium lite high strength cement with CaCl2, cellophane, gilsonite and fluid loss agent. Slurry density is to be 12.5 (yield = 2.01 cu ft/sx).

Two centralizers will be run on the shoe joint, one centralizer on every other joint into the intermediate casing, then every 3rd joint to surface.

The production casing will be pressure tested for 30 minutes at the commencement of completion operations as outlined above

Where cement has not been circulated to surface (or to planned depth) a CBL or temperature survey will be run to determine the TOC for that casing string. A CBL log will be run in the production casing prior to the commencement of completion operations.

Cement specifications may vary slightly due to cement type and cement contractor availability.

4.6 MUD PROGRAM

Depth	Type	Wt / pp	Visc	Fluid Loss
0-500'	FW gel/Lime Spud Mud	8.4-9.0	30-40	N/C
500'-4072'	LSND/Gel sweeps, LCM as needed	8.5-9.4	40-60	20-40 cc
4072'- 8178'	LSND/Gel sweeps, LCM as needed	8.5-9.4	20-40	6-10 cc

The well will be drilled utilizing a closed loop mud handling system. The closed loop system will comply with the NMOCD pit rules pertaining to the use of the system and disposal of the drill cuttings and waste. Drilling mud will be moved for re-use to drill subsequent wells whenever possible.
Viscosity, mud weight and other physical and chemical characteristics of the drilling mud will be varied as required to keep the hole clean, circulate drill cuttings, prevent caving, prevent lost circulation and maximize penetration rate.

Sufficient mud and materials will be kept on site to maintain mud properties and meet lost circulation or mud weight requirements at all times.
Mud design may change depending on well conditions, LCM, fluid loss and viscosity will be determined by the EnerVest representative and the mud engineer on site.

4.7 CORING, TESTING, & LOGGING

No cores or drill stem tests are planned. Well logs to be run are:

Casing Option A

500' to TD; GR/ Cement Bond Log, at the commencement of completion operations.
1000' to TD; GR/Induction/Density Neutron. (Cased hole GR/Neutron will be run if the hole conditions do not allow the use of the open hole logs)

Casing Option B

500' to 4072'; GR/ Cement Bond Log, if cement is not circulated to surface in intermediate casing.
4072' to TD; GR/Induction/Density Neutron. (Cased hole GR/Neutron will be run if the hole conditions do not allow the use of the open hole logs)

This well will be directionally drilled and a record of the deviation will be run while drilling. A deviation survey will be submitted at the conclusion of the well completion.

4.8 ANTICIPATED PRESSURES AND TEMPERATURES:

a.	Expected bottom hole pressure:	< 1789 psi
b.	Anticipated abnormal pressure:	None
c.	Anticipated abnormal temperatures:	None
d.	Anticipated hazardous gas (H2S):	None

If any of the foregoing conditions are unexpectedly encountered, suitable steps will be taken to mitigate according to accepted industry best practices.

4.9 OTHER INFORMATION:

The anticipated spud date is spring 2013. The spud date will be dependent on the weather conditions, road conditions and the Conditions of Approval.

The dirt work for road and well pad construction will commence upon approval of the APD and will be dependent on weather conditions.

The well will be spud after well pad construction is complete and a suitable rig becomes available. The duration of drilling operations is expected to be from two to three weeks. The drilling rig and associated equipment will be removed and preparations will be made for the completion of the well.

Completion will start about one to four weeks after the finish of the drilling operations. A completion rig will be moved in for the completion phase. The completion phase of the well is expected to +/- two weeks. The completion phase will include; perforating, acidizing, fracture stimulation and well testing.

Some events/situations may arise that could potentially change the starting date or project duration that are out of EnerVest's control. If such events/situations arise, the proper officials will be promptly notified.

Scientific Drilling

Company: EnerVest Operating LLC
Project: Rio Arriba County, NM (NAD83)
Site: Jicarilla

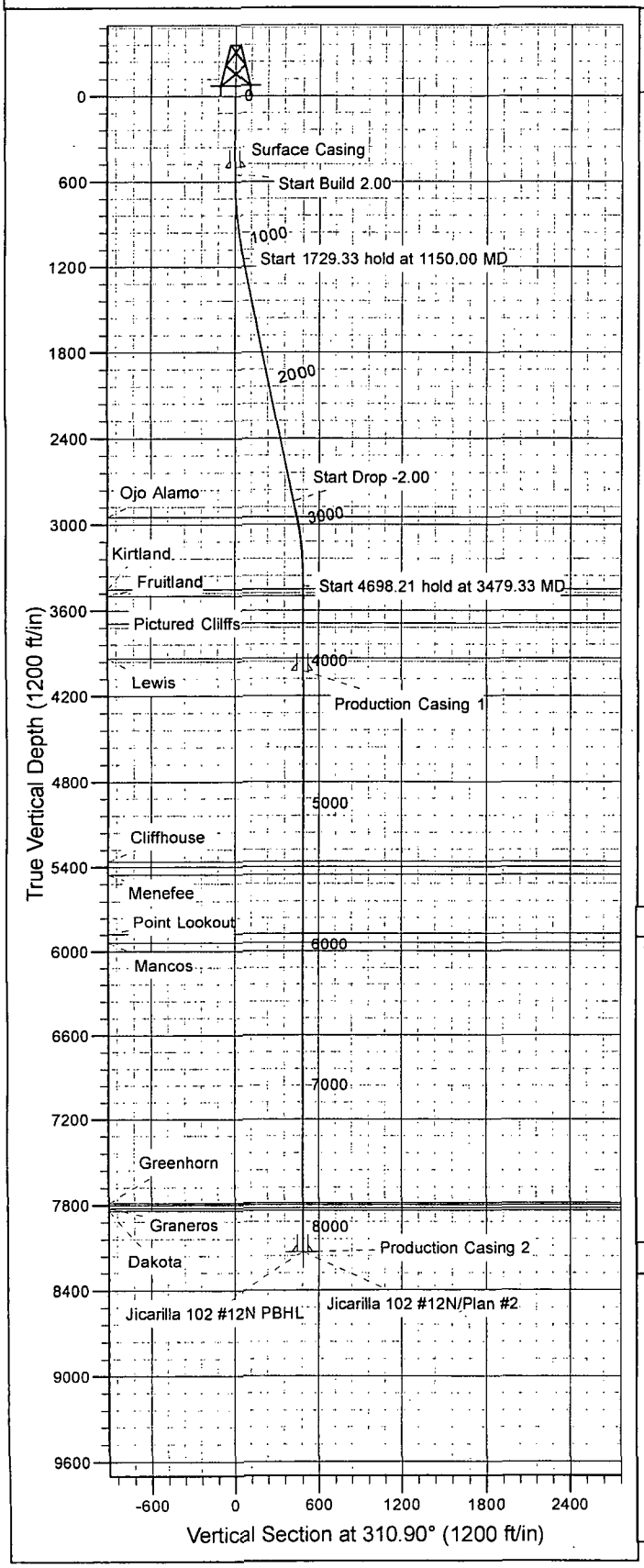
Well Details: Jicarilla 102 #12N

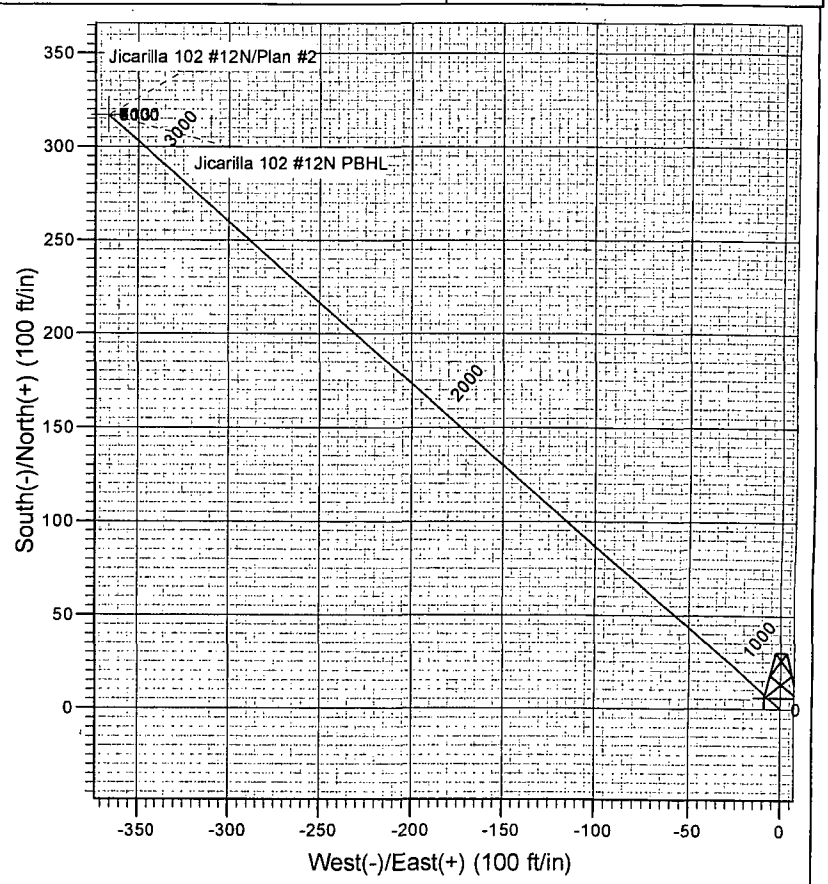
TVD Reference: WELL @ 6946.00ft (Original Well Elev) Ground Level: 6946.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	2004348.56	1346950.48	36° 30' 15.372 N	107° 14' 54.780 W	

T M Azimuths to True North
Magnetic North: 9.45°

Magnetic Field
Strength: 50508.1snT
Dip Angle: 63.32°
Date: 01/10/2013
Model: IGRF2010





FORMATION TOP DETAILS

TVD Path	MD Path	Formation
2948.00	2992.18	Ojo Alamo
3452.00	3498.49	Kirtland
3498.00	3544.49	Fruitland
3688.00	3734.49	Pictured Cliffs
3935.00	3981.49	Lewis
5363.00	5409.49	Cliffhouse
5454.00	5500.49	Menefee
5874.00	5920.49	Point Lookout
5940.00	5986.49	Mancos
7788.00	7834.49	Greenhorn
7823.00	7869.49	Graneros
7841.00	7887.49	Dakota

Plan: Plan #2

22:26, January 10, 2013
Created By: Janie Collins

PROJECT DETAILS: Rio Arriba County, NM (NAD83)

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	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	
3	1150.00	12.00	310.90	1145.62	40.99	-47.32	2.00	310.90	62.60	
4	2876.65	12.00	310.90	2834.54	276.01	-318.68	0.00	0.00	421.59	
5	3476.65	0.00	0.00	3430.16	317.00	-366.00	2.00	180.00	484.20	
6	8177.49	0.00	0.00	8131.00	317.00	-366.00	0.00	0.00	484.20	Jicarilla 102 #12N PBHL

Database:	Rockies Compass Server	**Local Co-ordinate Reference:**	Well Jicarilla 102 #12N
Company:	EnerVest Operating LLC	**TVD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	**MD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Site:	Jicarilla	**North Reference:**	True
Well:	Jicarilla 102 #12N	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Project	Rio Arriba County, NM (NAD83)		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Jicarilla				
Site Position:		**Northing:**	-274,017,644.35 usft	**Latitude:**	7° 5' 24.101 S
From:	Lat/Long	**Easting:**	372,015,898.75 usft	**Longitude:**	42° 3' 21.841 E
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.00 °

Well	Jicarilla 102 #12N				
Well Position	**+N/-S** 460,408,938.99 ft	**Northing:**	2,004,348.56 usft	**Latitude:**	36° 30' 15.372 N
	+E/-W 40,100,785.62 ft	**Easting:**	1,346,950.48 usft	**Longitude:**	107° 14' 54.780 W
Position Uncertainty	0.00 ft	**Wellhead Elevation:**		**Ground Level:**	6,946.00 ft

Wellbore	OH			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	11/02/2012	9.48	63.32	50,527

Design	Plan #2				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	310.90	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,150.00	12.00	310.90	1,145.62	40.99	-47.32	2.00	2.00	0.00	310.90	
2,876.65	12.00	310.90	2,834.54	276.01	-318.68	0.00	0.00	0.00	0.00	
3,476.65	0.00	0.00	3,430.16	317.00	-366.00	2.00	-2.00	0.00	180.00	
8,177.49	0.00	0.00	8,131.00	317.00	-366.00	0.00	0.00	0.00	0.00	Jicarilla 102 #12N PB

Database:	Rockies Compass Server	**Local Co-ordinate Reference:**	Well Jicarilla 102 #12N
Company:	EnerVest Operating LLC	**TVD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	**MD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Site:	Jicarilla	**North Reference:**	True
Well:	Jicarilla 102 #12N	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing									
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	1.00	310.90	600.00	0.29	-0.33	0.44	2.00	2.00	0.00
700.00	3.00	310.90	699.93	2.57	-2.97	3.93	2.00	2.00	0.00
800.00	5.00	310.90	799.68	7.14	-8.24	10.90	2.00	2.00	0.00
900.00	7.00	310.90	899.13	13.98	-16.14	21.35	2.00	2.00	0.00
1,000.00	9.00	310.90	998.15	23.09	-26.66	35.27	2.00	2.00	0.00
1,100.00	11.00	310.90	1,096.63	34.46	-39.79	52.63	2.00	2.00	0.00
1,150.00	12.00	310.90	1,145.62	40.99	-47.32	62.60	2.00	2.00	0.00
Start 1729.33 hold at 1150.00 MD									
1,200.00	12.00	310.90	1,194.53	47.79	-55.18	73.00	0.00	0.00	0.00
1,300.00	12.00	310.90	1,292.35	61.40	-70.89	93.79	0.00	0.00	0.00
1,400.00	12.00	310.90	1,390.16	75.02	-86.61	114.58	0.00	0.00	0.00
1,500.00	12.00	310.90	1,487.97	88.63	-102.33	135.37	0.00	0.00	0.00
1,600.00	12.00	310.90	1,585.79	102.24	-118.04	156.16	0.00	0.00	0.00
1,700.00	12.00	310.90	1,683.60	115.85	-133.76	176.95	0.00	0.00	0.00
1,800.00	12.00	310.90	1,781.42	129.46	-149.47	197.75	0.00	0.00	0.00
1,900.00	12.00	310.90	1,879.23	143.07	-165.19	218.54	0.00	0.00	0.00
2,000.00	12.00	310.90	1,977.05	156.69	-180.91	239.33	0.00	0.00	0.00
2,100.00	12.00	310.90	2,074.86	170.30	-196.62	260.12	0.00	0.00	0.00
2,200.00	12.00	310.90	2,172.68	183.91	-212.34	280.91	0.00	0.00	0.00
2,300.00	12.00	310.90	2,270.49	197.52	-228.05	301.70	0.00	0.00	0.00
2,400.00	12.00	310.90	2,368.31	211.13	-243.77	322.49	0.00	0.00	0.00
2,500.00	12.00	310.90	2,466.12	224.75	-259.49	343.28	0.00	0.00	0.00
2,600.00	12.00	310.90	2,563.94	238.36	-275.20	364.07	0.00	0.00	0.00
2,700.00	12.00	310.90	2,661.75	251.97	-290.92	384.87	0.00	0.00	0.00
2,800.00	12.00	310.90	2,759.57	265.58	-306.63	405.66	0.00	0.00	0.00
2,876.65	12.00	310.90	2,834.54	276.01	-318.68	421.59	0.00	0.00	0.00
2,879.33	11.95	310.90	2,837.17	276.38	-319.10	422.15	2.00	-2.00	0.00
Start Drop -2.00									
2,900.00	11.53	310.90	2,857.40	279.13	-322.28	426.35	2.00	-2.00	0.00
2,992.18	9.69	310.90	2,948.00	290.24	-335.11	443.33	2.00	-2.00	0.00
Ojo Alamo									
3,000.00	9.53	310.90	2,955.71	291.10	-336.10	444.63	2.00	-2.00	0.00
3,100.00	7.53	310.90	3,054.60	300.81	-347.31	459.47	2.00	-2.00	0.00
3,200.00	5.53	310.90	3,153.94	308.26	-355.91	470.85	2.00	-2.00	0.00
3,300.00	3.53	310.90	3,253.63	313.44	-361.88	478.75	2.00	-2.00	0.00
3,400.00	1.53	310.90	3,353.52	316.33	-365.22	483.17	2.00	-2.00	0.00
3,476.65	0.00	0.00	3,430.16	317.00	-366.00	484.20	2.00	-2.00	0.00
3,479.33	0.00	0.00	3,432.85	317.00	-366.00	484.20	0.00	0.00	0.00
Start 4698.21 hold at 3479.33 MD									
3,498.49	0.00	0.00	3,452.00	317.00	-366.00	484.20	0.00	0.00	0.00
Kirtland									
3,500.00	0.00	0.00	3,453.51	317.00	-366.00	484.20	0.00	0.00	0.00
3,544.49	0.00	0.00	3,498.00	317.00	-366.00	484.20	0.00	0.00	0.00
Fruitland									

Database:	Rockies Compass Server	**Local Co-ordinate Reference:**	Well Jicarilla 102 #12N
Company:	EnerVest Operating LLC	**TVD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	**MD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Site:	Jicarilla	**North Reference:**	True
Well:	Jicarilla 102 #12N	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,600.00	0.00	0.00	3,553.51	317.00	-366.00	484.20	0.00	0.00	0.00
3,700.00	0.00	0.00	3,653.51	317.00	-366.00	484.20	0.00	0.00	0.00
3,734.49	0.00	0.00	3,688.00	317.00	-366.00	484.20	0.00	0.00	0.00
Pictured Cliffs									
3,800.00	0.00	0.00	3,753.51	317.00	-366.00	484.20	0.00	0.00	0.00
3,900.00	0.00	0.00	3,853.51	317.00	-366.00	484.20	0.00	0.00	0.00
3,981.49	0.00	0.00	3,935.00	317.00	-366.00	484.20	0.00	0.00	0.00
Lewis									
4,000.00	0.00	0.00	3,953.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,071.49	0.00	0.00	4,025.00	317.00	-366.00	484.20	0.00	0.00	0.00
Production Casing 1									
4,100.00	0.00	0.00	4,053.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,200.00	0.00	0.00	4,153.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,300.00	0.00	0.00	4,253.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,400.00	0.00	0.00	4,353.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,500.00	0.00	0.00	4,453.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,600.00	0.00	0.00	4,553.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,700.00	0.00	0.00	4,653.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,800.00	0.00	0.00	4,753.51	317.00	-366.00	484.20	0.00	0.00	0.00
4,900.00	0.00	0.00	4,853.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,000.00	0.00	0.00	4,953.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,100.00	0.00	0.00	5,053.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,200.00	0.00	0.00	5,153.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,300.00	0.00	0.00	5,253.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,400.00	0.00	0.00	5,353.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,409.49	0.00	0.00	5,363.00	317.00	-366.00	484.20	0.00	0.00	0.00
Cliffhouse									
5,500.00	0.00	0.00	5,453.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,500.49	0.00	0.00	5,454.00	317.00	-366.00	484.20	0.00	0.00	0.00
Menefee									
5,600.00	0.00	0.00	5,553.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,700.00	0.00	0.00	5,653.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,800.00	0.00	0.00	5,753.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,900.00	0.00	0.00	5,853.51	317.00	-366.00	484.20	0.00	0.00	0.00
5,920.49	0.00	0.00	5,874.00	317.00	-366.00	484.20	0.00	0.00	0.00
Point Lookout									
5,986.49	0.00	0.00	5,940.00	317.00	-366.00	484.20	0.00	0.00	0.00
Mancos									
6,000.00	0.00	0.00	5,953.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,100.00	0.00	0.00	6,053.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,200.00	0.00	0.00	6,153.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,300.00	0.00	0.00	6,253.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,400.00	0.00	0.00	6,353.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,500.00	0.00	0.00	6,453.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,600.00	0.00	0.00	6,553.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,700.00	0.00	0.00	6,653.51	317.00	-366.00	484.20	0.00	0.00	0.00
6,800.00	0.00	0.00	6,753.52	317.00	-366.00	484.20	0.00	0.00	0.00
6,900.00	0.00	0.00	6,853.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,000.00	0.00	0.00	6,953.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,100.00	0.00	0.00	7,053.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,200.00	0.00	0.00	7,153.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,300.00	0.00	0.00	7,253.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,400.00	0.00	0.00	7,353.52	317.00	-366.00	484.20	0.00	0.00	0.00

Database:	Rockies Compass Server	**Local Co-ordinate Reference:**	Well Jicarilla 102 #12N
Company:	EnerVest Operating LLC	**TVD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	**MD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Site:	Jicarilla	**North Reference:**	True
Well:	Jicarilla 102 #12N	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,500.00	0.00	0.00	7,453.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,600.00	0.00	0.00	7,553.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,700.00	0.00	0.00	7,653.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,800.00	0.00	0.00	7,753.52	317.00	-366.00	484.20	0.00	0.00	0.00
7,834.49	0.00	0.00	7,788.00	317.00	-366.00	484.20	0.00	0.00	0.00
Greenhorn									
7,869.49	0.00	0.00	7,823.00	317.00	-366.00	484.20	0.00	0.00	0.00
Graneros									
7,887.49	0.00	0.00	7,841.00	317.00	-366.00	484.20	0.00	0.00	0.00
Dakota									
7,900.00	0.00	0.00	7,853.52	317.00	-366.00	484.20	0.00	0.00	0.00
8,000.00	0.00	0.00	7,953.52	317.00	-366.00	484.20	0.00	0.00	0.00
8,100.00	0.00	0.00	8,053.52	317.00	-366.00	484.20	0.00	0.00	0.00
8,177.49	0.00	0.00	8,131.00	317.00	-366.00	484.20	0.00	0.00	0.00
Jicarilla 102 #12N PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Jicarilla 102 #12N PBHL - plan hits target center - Point	0.00	0.00	8,131.00	317.00	-366.00	2,004,669.34	1,346,587.79	36° 30' 18.507 N	107° 14' 59.263 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	Surface Casing	9.625	12.250
4,071.49	4,025.00	Production Casing 1	5.500	8.750
8,177.49	8,131.00	Production Casing 2	5.500	7.875

Database:	Rockies Compass Server	**Local Co-ordinate Reference:**	Well Jicarilla 102 #12N
Company:	EnerVest Operating LLC	**TVD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	**MD Reference:**	WELL @ 6946.00ft (Original Well Elev)
Site:	Jicarilla	**North Reference:**	True
Well:	Jicarilla 102 #12N	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,992.18	2,948.00	Ojo Alamo		0.00	
3,498.49	3,452.00	Kirtland		0.00	
3,544.49	3,498.00	Fruitland		0.00	
3,734.49	3,688.00	Pictured Clilffs		0.00	
3,981.49	3,935.00	Lewis		0.00	
5,409.49	5,363.00	Cliffhouse		0.00	
5,500.49	5,454.00	Menefee		0.00	
5,920.49	5,874.00	Point Lookout		0.00	
5,986.49	5,940.00	Mancos		0.00	
7,834.49	7,788.00	Greenhorn		0.00	
7,869.49	7,823.00	Graneros		0.00	
7,887.49	7,841.00	Dakota		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
550.00	550.00	0.00	0.00	Start Build 2.00
1,150.00	1,145.62	41.20	-47.14	Start 1729.33 hold at 1150.00 MD
2,879.33	2,837.17	277.80	-317.86	Start Drop -2.00
3,479.33	3,432.79	319.00	-365.00	Start 4698.21 hold at 3479.33 MD
8,177.54	8,131.00	319.00	-365.00	TD at 8177.54

EnerVest Operating, LLC
Jicarilla Apache 102 # 12N

SHL: 1387' FNL, 304' FEL, Unit H Sec 9, T26N, R04W
BHL: 1070' FNL, 670' FEL, Unit N Sec 9, T26N, R04W
Rio Arriba, NM

Surface Use Plan

1. DIRECTIONS & EXISTING ROADS (See attached Vicinity map)

The location is approximately 29 miles NW of the intersection of US Hwy 550 and NM Hwy 537
Latitude: N 36.50427
Latitude: W 107.24855

From Intersection of US Hwy 550 and NM State Hwy 537: Turn north on Hwy 537 for 28 miles, turn left on J-6, go 2.5 mi, turn right on J-64, go 1.0 mi, the location is on the right.

2. ROAD TO BE BUILT OR UPGRADED

A. Drilling of this well will require the construction of 179' of new access road from J-64. The access is shown on the Access Plat and Vicinity map. After the well is completed as a commercial producer, the need for a pipeline is ascertained, a pipeline will be constructed from the north corner of location to an existing Williams pipeline.
B. Width: 20 ft running surface; 40 ft total ROW with is applied for to accommodate access and drainage installation along the road.
C. Maximum grade: 0-1%.
D. Turnouts: No turnouts are planned for this access road.
E. Drainage design: The drainage design for the proposed new access road will be in conformance with Jicarilla Apache Tribal and BIA standards – with the agreement of the of the Jicarilla Apache Tribe. It is proposed to build a drainage holding and diversion pond near location if needed to prevent location erosion and divert drainage around the location. Any area used in this fashion will have been reviewed and given clearance for the possible archaeological and environmental impact.
F. Location and size of culverts: None are required.
G. Surface Materials: No gates, cattle guards or fences to be installed along the access road or the location. Road base material may be used as necessary during the drilling and completion phases of this project.

3. SURFACE OWNERSHIP

The surface ownership of the well site location and access roads are all on Jicarilla Apache Nation land.

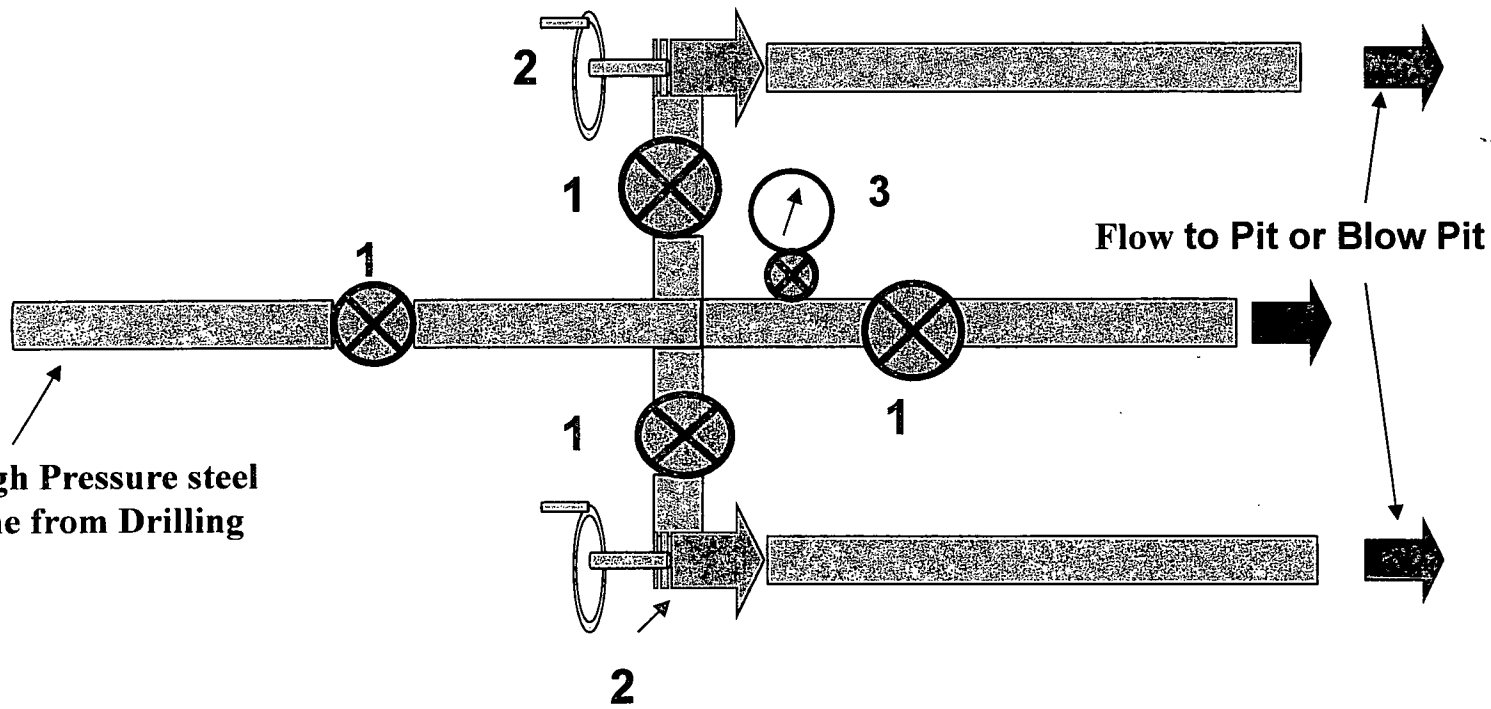
4. EXISTING WELLS (See the Vicinity map)

This is a development location. There are thirty-four existing wells within a one-mile radius of the proposed location as shown on the Vicinity map.

Exhibit B

EnerVest
Jicarilla 2013 Drilling Program
2000 psi Choke Manifold

Components
1. 2" Valves (2M)
2. Adjustable Chokes
3. Gauge



EnerVest
Jicarilla 2013
Drilling Program
Blowout Preventer
2000 psi

Exhibit A

Components

1. Wellhead 9 5/8"
2. Drilling Spool
3. Pipe Rams
4. Blind Rams
5. Spool
6. 2" Check Valve
7. 2" Manual Valves