

State of New Mexico  
Energy, Minerals and Natural Resources Department

Susana Martinez  
Governor

David Martin  
Cabinet Secretary

Tony Delfin  
Deputy Cabinet Secretary

David R. Catanach, 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: 5-15-15

Well information;

Operator Energex, Well Name and Number Chaco 23 08 9 #1H

API# 30-045-35688, Section 9, Township 23 N/S, Range 08 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
- Hold C-104 for NSL, NSP, DHC
- Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
  - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
  - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
  - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- 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
- Submit Gas Capture Plan form prior to spudding or initiating recompletion operations
- Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Chuck Hen  
NMOCD Approved by Signature

5-5-16  
Date KC

OIL CONS. DIV DIST. 3

MAY 03 2016

RECEIVED

MAY 15 2015

Form 3160-3  
(August 2007)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

Farmington Field Office  
Bureau of Land Management

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM18463
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator ENERGEN RESOURCES CORPORATION		7. If Unit or CA Agreement, Name and No.
3a. Address 2010 AFTON PLACE FARMINGTON, NM 87401		8. Lease Name and Well No. CHACO 23-08 9 #1H
3b. Phone No. (include area code) 505-325-6800		9. API Well No. 30-045-35688
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1476' FSL & 210' FWL, SEC 9, T23N, R8W At proposed prod. zone 2276' FSL & 380' FEL, SEC 9, T23N, R8W		10. Field and Pool, or Exploratory NAGEEZI GALLUP
14. Distance in miles and direction from nearest town or post office* Approximately 3.1 miles southeast of Nageezi, New Mexico		11. Sec., T. R. M. or Blk. and Survey or Area SEC 9. T23N. R8W. NMPM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 210'	16. No. of acres in lease 2,243.16 ACRES	12. County or Parish SAN JUAN COUNTY
17. Spacing Unit dedicated to this well 160 ACRES	18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 50'	13. State NM
19. Proposed Depth 10,429' MD 5,438' TVD	20. BLM/BIA Bond No. on file NM2707 NMB000747	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) GL: 6,916' (NAVD 88)	22. Approximate date work will start* 07/01/2015	23. Estimated duration 45 DAYS

24. Attachments

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

- |  |   |
|--|---|
| 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 must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

25. Signature 	Name (Printed/Typed) DOUG THOMAS	Date 5-15-15
Title DRILLING SUPERINTENDENT		
Approved by (Signature) 	Name (Printed/Typed) AFM	Date 9/28/16
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.

(Continued on page 2)

\*(Instructions on page 2)

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

NMOCD  
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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

**DISTRICT I**  
 1625 N. French Dr., Hobbs, N.M. 88240  
 Phone: (575) 393-6181 Fax: (575) 393-0720

**DISTRICT II**  
 811 S. First St., Artesia, N.M. 88210  
 Phone: (575) 748-1283 Fax: (575) 748-9720

**DISTRICT III**  
 1000 Rio Brazos Rd., Aztec, N.M. 87410  
 Phone: (505) 334-6178 Fax: (505) 334-8170

**DISTRICT IV**  
 1220 S. St. Francis Dr., Santa Fe, NM 87505  
 Phone: (505) 478-3460 Fax: (505) 478-3462

**State of New Mexico**  
 Energy, Minerals & Natural Resources Department

Form C-102  
 Revised August 1, 2011

Submit one copy to appropriate  
 District Office

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

AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

<sup>1</sup> API Number <b>30-045-35688</b>		<sup>2</sup> Pool Code <b>47540</b>	<sup>3</sup> Pool Name <b>NAGEEZI GALLUP</b>
<sup>4</sup> Property Code <b>316177</b>	<sup>5</sup> Property Name <b>CHACO 23-08 9</b>		<sup>6</sup> Well Number <b>1H</b>
<sup>7</sup> OGRID No. <b>162928</b>	<sup>8</sup> Operator Name <b>ENERGEN RESOURCES CORPORATION</b>		<sup>9</sup> Elevation <b>6916.3</b>

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	9	23N	8W		1476'	SOUTH	210'	WEST	SAN JUAN

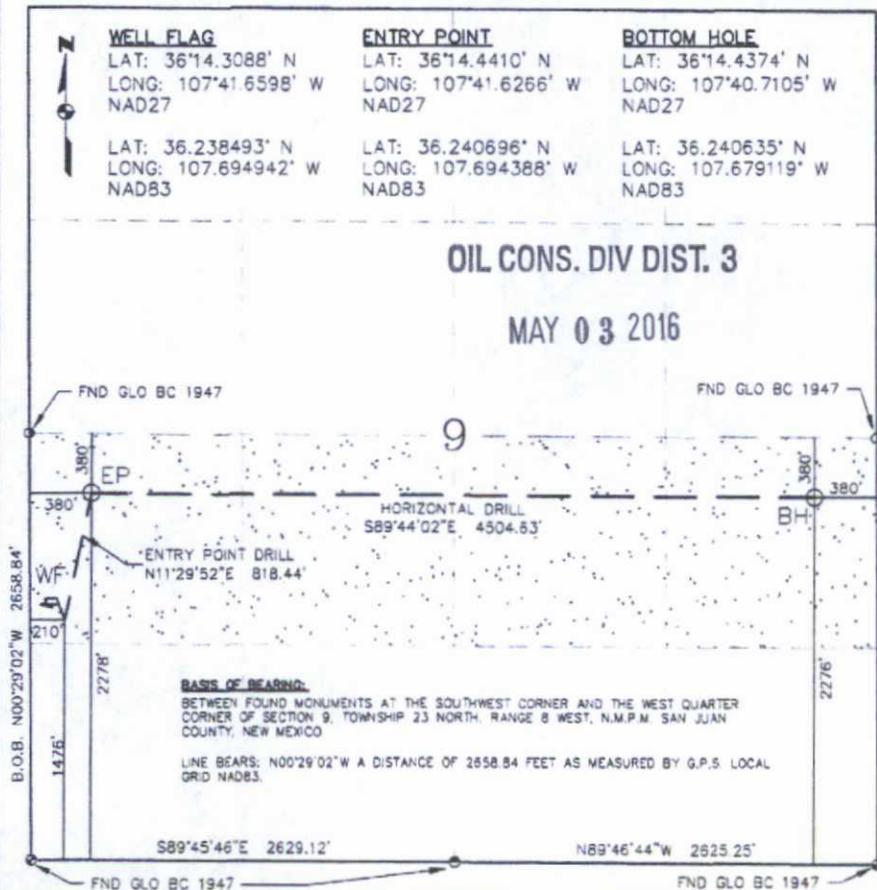
<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	9	23N	8W		2276'	SOUTH	380'	EAST	SAN JUAN

<sup>12</sup> Dedicated Acres <b>N/2 S/2 SEC 9 160 ACRES</b>	<b>PROJECT AREA</b>	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
 OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

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 of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the Division.*

*Anna Stotts* 5/5-15  
 Signature Date

**Anna Stotts**  
 Printed Name

*astotts@energen.com*  
 E-mail Address

**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.*

2-26-15  
 Date of Survey

*Glen W. Russell*  
 Signature and Seal of the Professional Surveyor



**GLEN W. RUSSELL**  
 Certificate Number 15703

**Drilling Plan**  
**Energen Resources Corporation**

**Chaco 23-08 9 #001H**

Surface Location: 1476 FSL, 210 FWL

Legal Description: Sec 9, T23N, R8W (36.238493° N, 107.694942° W – NAD83)

Bottom Hole Location: 2276 FSL, 380 FEL

Legal Description: Sec 9, T23N, R8W (36.240635° N, 107.679119° W – NAD83)

San Juan County, NM

1. The elevation of the unprepared ground is 6,916 feet above sea level.
2. The geological name of the surface formation is the Nacimiento.
3. A rotary rig will be used to drill the well to a Proposed Total Depth of 5,438' TVD/10,429' MD.
4. Estimated top of important geological markers:

<u>Formation</u>	<u>Depth (TVD)(ft)</u>	<u>Depth (MD)(ft)</u>
Nacimiento	Surface	Surface
Ojo Alamo	1,063	1,063
Kirtland	1,213	1,213
Fruitland	1,328	1,328
Pictured Cliffs	1,763	1,763
Huerfanto Bentonite	2,038	2,038
Chacra	2,553	2,566
Cliff House	3,213	3,253
Menefee	3,263	3,305
Point Lookout	4,123	4,201
Mancos	4,573	4,670
Mancos/Niobrara "C"	5,288	5,471

5. Estimated depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered:

<u>Formation</u>	<u>Depth (TVD)(ft)</u>	<u>Water/HydroCarbon</u>
Fruitland	1,328	Gas
Pictured Cliffs	1,763	Gas
Cliffhouse	3,213	Gas
Point Lookout	4,123	Gas
Mancos	4,573	Oil/Gas

6. All proposed casing is new and the program is as follows:

Casing	Size	Depth		Grade	Weight	Connection	PSI		x1000 lbs
		MD	TVD				Burst	Collapse	Tension
Surface	9-5/8"	0-500'	0-500'	J-55	36.00	STC	3520	2020	394
Intermediate	7"	0-6,000'	0-5,400'	J-55	26.00	LTC	4980	4320	367
Production	4-1/2"	5,850'-10,429'	5,400'-5,262'	L-80	11.60	Ultra DQX	7780	6350	267

## 7. Cementing Program:

- a. 12-1/4" hole x 9-5/8" casing at 500' will have cement circulated to surface with 270 sks (100% excess true hole) Class H Cement with 1.0 % CaCl<sub>2</sub>, 1/2 #/sk Poly-E-Flake 15.8 ppg, 1.17 ft<sup>3</sup>/sk.  
Note: CEMENT MUST BE CIRCULATED TO SURFACE. STANDARD BOW SPRING CENTRALIZERS SHALL BE PLACED ON THE FIRST 3 (BOTTOM 3) JOINTS OF CASING (1 PER JOINT) AND 1 EVERY 3<sup>RD</sup> JOINT TO SURFACE. 20 BBLs OF WATER FOLLOWED BY 20 BBLs OF MUDFLUSH AHEAD OF CEMENT AS SPACER. Test Surface Casing to 750 psi.
- b. 8-3/4" hole x 7" casing at 6,000'. Cement will be circulated to surface with 635 sks (50% excess true hole) of HLC with 1.0 % CaCl<sub>2</sub>, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal (Gilsonite) – 12.3 ppg, 1.95 ft<sup>3</sup>/sk followed by 115 sks (100% excess true hole) 50/50 Glass H/Poz with 0.15% Versaset, 0.30% HALAD-9, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.31 ft<sup>3</sup>/sk. ONE CENTRALIZER PER JOINT FOR THE FIRST 3 JOINTS, THEN EVERY 3<sup>RD</sup> JOINT TO SURFACE. 10 BBLs OF WATER FOLLOWED BY 30 BBLs OF MUDFLUSH AHEAD OF CEMENT AS SPACER. Test Intermediate Casing to 1500 psi. Cement additives subject to change based on wellbore conditions and cement design criteria.
- c. 6-1/4" hole x 4-1/2" liner at 10,429'. A fluid caliper will be run to determine base slurry cement to have TOC at 5,850'. Base slurry to consist of 400 sks 50/50 Class H/Poz with 0.10% Versaset, 1.5 gal/sk CHEM-FOAMER 760, 0.10% sa-1015, 0.20% HALAD-766 – 13.5 ppg, 1.27 ft<sup>3</sup>/sk, Foamed density 10.5 ppg. 50 sks of base slurry to be used as tail cement less foaming agent. CENTRALIZERS TO BE USED AT DISCRETION IN LATERAL TO ACHIEVE 70% STAND OFF. CENTRALIZERS TO BE USED TO TIE BACK DEPTH OF 6150' TO ACHIEVE 70% STAND OFF. PACKOFF SEAL ASSEMBLY TO BE USED FOR LINER TOP ISOLATION. Cement additives subject to change based on wellbore conditions and cement design criteria. Liner to be pressure tested during completion operations.

## 8. Pressure Control Equipment

- a. BOPE to be installed prior to Surface Casing drillout.
- b. Pressure control equipment will be used to meet 2,000 (2M) psi specifications.
- c. BOPE working pressure of 3,000 psi.
- d. Function test and visual inspection to be done at each casing size change prior to drill out.
- e. BOP annular to be tested to 85% of working pressure.
- f. All BOP and related equipment will be tested in accordance with the requirements outlined in Onshore Order No. 2 and Notice to Operators dated May 27, 2005.
- g. BOP remote controls to be located on rig floor and readily accessible, master control on ground at accumulator will be able to function all preventers.
- h. Kill line will be 2 in min and have two kill line valves, one being a check valve.
- i. Choke line will be 2 in min and have two choke line valves, choke manifold with have two adjustable chokes, one manual and one remote. All choke lines will be as straight as possible. Any turns will be properly targeted using block and/or running tees. Choke line and manifold to be pressure tested to 1,500 psi.
- j. Float sub and TIW valve will be on the rig floor at all times.
- k. If high pressure co-flex hoses are used, they will be run as straight as possible and anchored to prevent whip.
- l. The main discharge line (panic line) will be at least 100' from the choke manifold and discharged into an appropriately sized discharge facility.

9. Mud Program:

0' - 500'	Fresh water/Spud Mud. Paper for losses and seepage. 8.5 to 9.0 ppg, 32 to 75 vis, PV 3 to 5, YP 5 to 7, WL NC
500' - 6,000'	Fresh water/LSND. As needed LCM for losses and seepage. 8.5 to 9.5 ppg, pH 10, 28 to 60 vis, PV 1, YP 1, WL 8-15
6,000' - 10,429'	WBM with shale and clay stabilizers. As needed LCM for losses and seepage. 8.3 to 9.3 ppg, 15 to 35 vis, PV 4-6, YP 4-6, WL < 20

**\*\*During drilling operations, all necessary products will be sufficiently stored on location for abnormal situations. The characteristics, use, testing of drilling mud and the implementation of related drilling procedures shall be designed to prevent the loss of well control. Sufficient quantities of mud materials shall be maintained or readily accessible for the purpose of assuring well control.**

**\*\*A pH of 10 or above in the fresh water base mud system shall be maintained to control the effects corrosion has on metallurgy of equipment used.**

Operating and Maintenance

Energen Resources Corporation will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. Any leaks, spills or other undesirable events will be reported in accordance with BLM NTL 3A. Rig crews will monitor the tanks at all times. A trip/surge tank will be used to monitor returns for any "kicks" of formation fluids.

Equipment:

2-Mongoose Shale Shakers

2-3400 High Speed Centrifuges with stands and pumps

2-Roll off bins with Tracks

2-200 bbl Open top Frac tanks

1-Mud/Gas Separator and Degasser

1-Trip/Surge Tank

Electronic or Visual monitoring system to indicate lost returns

10. Testing, Logging and Coring Program:

- a. Testing Program: No drillstem tests are anticipated
- b. Electric Logging Program: TBD
- c. LWD Program: TBD
- d. Coring Program: None.
- e. CBL's and/or Temperature Surveys Will Be Performed as Needed or Required.

11. Bottom Hole Pressure expected to be 2,500 +/- psi

12. Bottom Hole Temperature expected to be 160 deg F.



# **Energen Resources**

**Chaco Mancos Sec 9, T23N, R8W**

**Chaco 23-08 9 #1H**

**Design #1**

**Preliminary Plan**

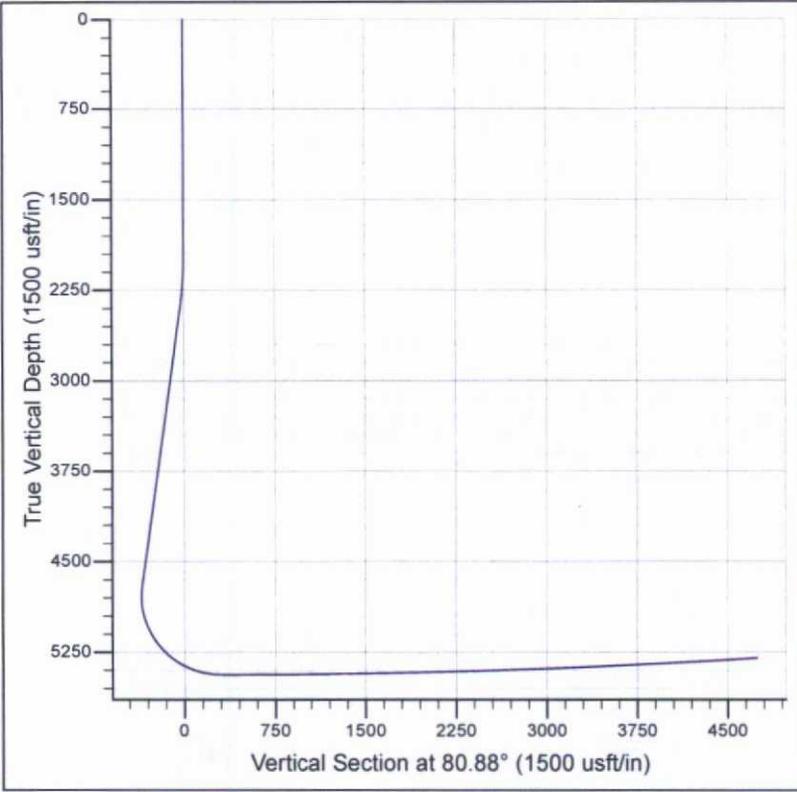
**Plan: APD Plan**

## **Preliminary Design**

**03 March, 2015**

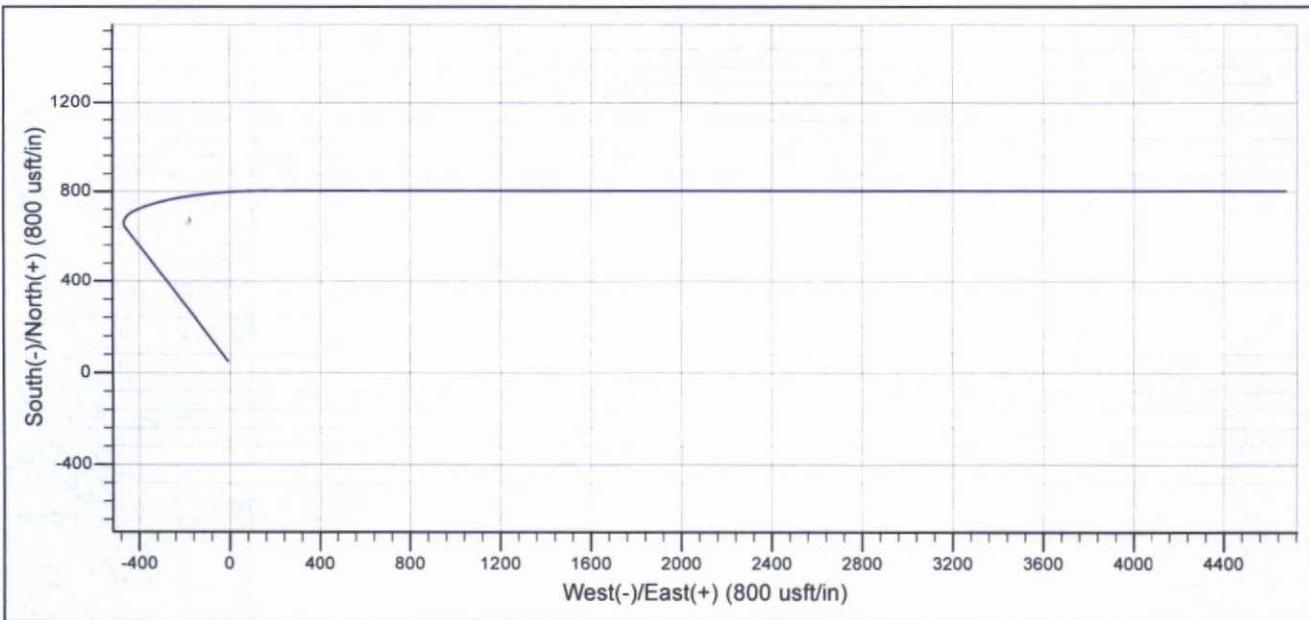
Company Name: Energen Resources

Project: Chaco Mancos Sec 9, T23N, R8W  
Site: Chaco 23-08 9 #1H  
Well: Design #1  
Wellbore: Preliminary Plan  
Design: APD Plan



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.0	0.00	0.00	0.0	50.0	-10.5	0.00	0.00	0.0
2	2000.0	0.00	0.00	2000.0	50.0	-10.5	0.00	0.00	0.0
3	2360.2	16.21	322.60	2355.4	90.2	-41.2	4.50	322.60	-24.0
4	4814.9	16.21	322.60	4712.5	634.5	-457.4	0.00	0.00	-348.6
5	5923.3	90.00	90.00	5438.0	802.0	170.0	9.00	126.29	297.4
6	10429.3	93.50	90.00	5300.4	802.0	4673.2	0.08	0.00	4743.6



# Energen

## Preliminary Design

Company: Energen Resources	Local Co-ordinate Reference: Site Chaco 23-08 9 #1H
Project: Chaco Mancos Sec 9, T23N, R8W	TVD Reference: WELL @ 0.0usft (Original Well Elev)
Site: Chaco 23-08 9 #1H	MD Reference: WELL @ 0.0usft (Original Well Elev)
Well: Design #1	North Reference: Grid
Wellbore: Preliminary Plan	Survey Calculation Method: Minimum Curvature
Design: APD Plan	Database: EDM 5000.1 Single User Db

Project: Chaco Mancos Sec 9, T23N, R8W			
Map System: US State Plane 1983	System Datum: Mean Sea Level		
Geo Datum: North American Datum 1983			
Map Zone: New Mexico Central Zone			

Site: Chaco 23-08 9 #1H					
Site Position:		Northing:	1,909,254.59 usft	Latitude:	36° 14' 18.575 N
From: Lat/Long		Easting:	1,214,305.01 usft	Longitude:	107° 41' 41.791 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.85 °

Well: Design #1						
Well Position	+N/-S	50.0 usft	Northing:	1,909,304.64 usft	Latitude:	36° 14' 19.068 N
	+E/-W	-10.5 usft	Easting:	1,214,294.54 usft	Longitude:	107° 41' 41.928 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore: Preliminary Plan					
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.97	63.09	50,680

Design: APD Plan					
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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	50.0	-10.5	80.88

Survey Tool Program					
		Date:	3/3/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	10,429.3	APD Plan (Preliminary Plan)	MWD	MWD - Standard	

TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)
0.0	0.0	0.00	0.00	50.0	-10.5	0.00	0.0
100.0	100.0	0.00	0.00	50.0	-10.5	0.00	0.0
200.0	200.0	0.00	0.00	50.0	-10.5	0.00	0.0
300.0	300.0	0.00	0.00	50.0	-10.5	0.00	0.0
400.0	400.0	0.00	0.00	50.0	-10.5	0.00	0.0
500.0	500.0	0.00	0.00	50.0	-10.5	0.00	0.0
<b>9 5/8"</b>							
600.0	600.0	0.00	0.00	50.0	-10.5	0.00	0.0
700.0	700.0	0.00	0.00	50.0	-10.5	0.00	0.0
800.0	800.0	0.00	0.00	50.0	-10.5	0.00	0.0
900.0	900.0	0.00	0.00	50.0	-10.5	0.00	0.0
1,000.0	1,000.0	0.00	0.00	50.0	-10.5	0.00	0.0

## Energen Preliminary Design

<b>Company:</b>	Energen Resources	<b>Local Co-ordinate Reference:</b>	Site Chaco 23-08 9 #1H
<b>Project:</b>	Chaco Mancos Sec 9, T23N, R8W	<b>TVD Reference:</b>	WELL @ 0.0usft (Original Well Elev)
<b>Site:</b>	Chaco 23-08 9 #1H	<b>MD Reference:</b>	WELL @ 0.0usft (Original Well Elev)
<b>Well:</b>	Design #1	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Preliminary Plan	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	APD Plan	<b>Database:</b>	EDM 5000.1 Single User Db

Planned Survey									
TVD (usft)	MD (usft)	Inc (")	Azi (azimuth) (")	N/S (usft)	E/W (usft)	Build ("/100usft)	V. Sec (usft)		
1,100.0	1,100.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,200.0	1,200.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,300.0	1,300.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,400.0	1,400.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,500.0	1,500.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,600.0	1,600.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,700.0	1,700.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,800.0	1,800.0	0.00	0.00	50.0	-10.5	0.00	0.0		
1,900.0	1,900.0	0.00	0.00	50.0	-10.5	0.00	0.0		
2,000.0	2,000.0	0.00	0.00	50.0	-10.5	0.00	0.0		
2,099.9	2,100.0	4.50	322.60	53.2	-12.8	4.50	-1.9		
2,199.2	2,200.0	9.00	322.60	62.5	-20.0	4.50	-7.4		
2,297.2	2,300.0	13.50	322.60	78.0	-31.8	4.50	-16.7		
2,355.4	2,360.2	16.21	322.60	90.2	-41.2	4.50	-24.0		
2,393.6	2,400.0	16.21	322.60	99.1	-48.0	0.00	-29.2		
2,489.7	2,500.0	16.21	322.60	121.2	-64.9	0.00	-42.5		
2,585.7	2,600.0	16.21	322.60	143.4	-81.9	0.00	-55.7		
2,681.7	2,700.0	16.21	322.60	165.6	-98.8	0.00	-68.9		
2,777.7	2,800.0	16.21	322.60	187.8	-115.8	0.00	-82.1		
2,873.8	2,900.0	16.21	322.60	209.9	-132.7	0.00	-95.4		
2,969.8	3,000.0	16.21	322.60	232.1	-149.7	0.00	-108.6		
3,065.8	3,100.0	16.21	322.60	254.3	-166.6	0.00	-121.8		
3,161.8	3,200.0	16.21	322.60	276.5	-183.6	0.00	-135.1		
3,257.9	3,300.0	16.21	322.60	298.6	-200.6	0.00	-148.3		
3,353.9	3,400.0	16.21	322.60	320.8	-217.5	0.00	-161.5		
3,449.9	3,500.0	16.21	322.60	343.0	-234.5	0.00	-174.7		
3,545.9	3,600.0	16.21	322.60	365.1	-251.4	0.00	-188.0		
3,642.0	3,700.0	16.21	322.60	387.3	-268.4	0.00	-201.2		
3,738.0	3,800.0	16.21	322.60	409.5	-285.3	0.00	-214.4		
3,834.0	3,900.0	16.21	322.60	431.7	-302.3	0.00	-227.6		
3,930.0	4,000.0	16.21	322.60	453.8	-319.2	0.00	-240.9		
4,026.1	4,100.0	16.21	322.60	476.0	-336.2	0.00	-254.1		
4,122.1	4,200.0	16.21	322.60	498.2	-353.1	0.00	-267.3		
4,218.1	4,300.0	16.21	322.60	520.4	-370.1	0.00	-280.5		
4,314.1	4,400.0	16.21	322.60	542.5	-387.1	0.00	-293.8		
4,410.2	4,500.0	16.21	322.60	564.7	-404.0	0.00	-307.0		
4,506.2	4,600.0	16.21	322.60	586.9	-421.0	0.00	-320.2		
4,602.2	4,700.0	16.21	322.60	609.1	-437.9	0.00	-333.4		
4,698.2	4,800.0	16.21	322.60	631.2	-454.9	0.00	-346.7		
4,712.5	4,814.9	16.21	322.60	634.5	-457.4	0.00	-348.6		
4,746.4	4,850.0	14.56	332.78	642.3	-462.4	-4.70	-352.3		
4,795.0	4,900.0	13.17	350.74	653.6	-466.2	-2.78	-354.3		
4,843.7	4,950.0	13.22	10.55	664.8	-466.1	0.10	-352.4		
4,892.2	5,000.0	14.69	28.27	676.0	-462.0	2.95	-346.6		

## Energen Preliminary Design

<b>Company:</b>	Energen Resources	<b>Local Co-ordinate Reference:</b>	Site Chaco 23-08 9 #1H
<b>Project:</b>	Chaco Mancos Sec 9, T23N, R8W	<b>TVD Reference:</b>	WELL @ 0.0usft (Original Well Elev)
<b>Site:</b>	Chaco 23-08 9 #1H	<b>MD Reference:</b>	WELL @ 0.0usft (Original Well Elev)
<b>Well:</b>	Design #1	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Preliminary Plan	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	APD Plan	<b>Database:</b>	EDM 5000.1 Single User Db

Planned Survey								
TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)	
4,940.3	5,050.0	17.23	41.86	687.1	-454.1	5.07	-337.0	
4,987.6	5,100.0	20.43	51.70	698.0	-442.3	6.41	-323.6	
5,033.9	5,150.0	24.04	58.83	708.7	-426.7	7.22	-306.5	
5,078.9	5,200.0	27.90	64.14	719.1	-407.4	7.71	-285.9	
5,122.2	5,250.0	31.91	68.23	729.1	-384.6	8.03	-261.8	
5,163.7	5,300.0	36.03	71.49	738.7	-358.4	8.24	-234.4	
5,203.0	5,350.0	40.22	74.15	747.8	-328.9	8.38	-203.8	
5,239.9	5,400.0	44.46	76.39	756.3	-296.4	8.48	-170.3	
5,274.3	5,450.0	48.74	78.31	764.2	-260.9	8.56	-134.1	
5,305.8	5,500.0	53.04	79.99	771.5	-222.8	8.61	-95.3	
5,334.4	5,550.0	57.37	81.50	778.1	-182.3	8.66	-54.3	
5,359.7	5,600.0	61.71	82.86	784.0	-139.6	8.69	-11.2	
5,381.7	5,650.0	66.07	84.12	789.0	-95.0	8.71	33.7	
5,400.2	5,700.0	70.44	85.29	793.3	-48.8	8.73	80.0	
5,415.1	5,750.0	74.81	86.41	796.8	-1.2	8.75	127.5	
5,426.4	5,800.0	79.19	87.47	799.4	47.4	8.76	175.9	
5,433.9	5,850.0	83.57	88.51	801.1	96.8	8.76	225.0	
5,437.6	5,900.0	87.95	89.53	801.9	146.7	8.77	274.3	
5,438.0	5,923.3	90.00	90.00	802.0	170.0	8.77	297.4	
5,438.0	6,000.0	90.06	90.00	802.0	246.7	0.08	373.1	
7"								
5,437.8	6,100.0	90.14	90.00	802.0	346.7	0.08	471.8	
5,437.5	6,200.0	90.21	90.00	802.0	446.7	0.08	570.6	
5,437.0	6,300.0	90.29	90.00	802.0	546.7	0.08	669.3	
5,436.5	6,400.0	90.37	90.00	802.0	646.7	0.08	768.0	
5,435.7	6,500.0	90.45	90.00	802.0	746.7	0.08	866.8	
5,434.9	6,600.0	90.53	90.00	802.0	846.6	0.08	965.5	
5,433.9	6,700.0	90.60	90.00	802.0	946.6	0.08	1,064.2	
5,432.8	6,800.0	90.68	90.00	802.0	1,046.6	0.08	1,162.9	
5,431.5	6,900.0	90.76	90.00	802.0	1,146.6	0.08	1,261.7	
5,430.1	7,000.0	90.84	90.00	802.0	1,246.6	0.08	1,360.4	
5,428.6	7,100.0	90.91	90.00	802.0	1,346.6	0.08	1,459.1	
5,427.0	7,200.0	90.99	90.00	802.0	1,446.6	0.08	1,557.8	
5,425.2	7,300.0	91.07	90.00	802.0	1,546.6	0.08	1,656.6	
5,423.2	7,400.0	91.15	90.00	802.0	1,646.6	0.08	1,755.3	
5,421.2	7,500.0	91.22	90.00	802.0	1,746.5	0.08	1,854.0	
5,418.9	7,600.0	91.30	90.00	802.0	1,846.5	0.08	1,952.7	
5,416.6	7,700.0	91.38	90.00	802.0	1,946.5	0.08	2,051.4	
5,414.1	7,800.0	91.46	90.00	802.0	2,046.5	0.08	2,150.1	
5,411.5	7,900.0	91.54	90.00	802.0	2,146.4	0.08	2,248.8	
5,408.8	8,000.0	91.61	90.00	802.0	2,246.4	0.08	2,347.5	
5,405.9	8,100.0	91.69	90.00	802.0	2,346.3	0.08	2,446.2	
5,402.9	8,200.0	91.77	90.00	802.0	2,446.3	0.08	2,544.9	
5,399.7	8,300.0	91.85	90.00	802.0	2,546.2	0.08	2,643.6	
5,396.4	8,400.0	91.92	90.00	802.0	2,646.2	0.08	2,742.3	

# Energen

## Preliminary Design

<b>Company:</b> Energen Resources	<b>Local Co-ordinate Reference:</b> Site Chaco 23-08 9 #1H
<b>Project:</b> Chaco Mancos Sec 9, T23N, R8W	<b>TVD Reference:</b> WELL @ 0.0usft (Original Well Elev)
<b>Site:</b> Chaco 23-08 9 #1H	<b>MD Reference:</b> WELL @ 0.0usft (Original Well Elev)
<b>Well:</b> Design #1	<b>North Reference:</b> Grid
<b>Wellbore:</b> Preliminary Plan	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> APD Plan	<b>Database:</b> EDM 5000.1 Single User Db

Planned Survey								
TVD (usft)	MD (usft)	Inc (")	Azi (azimuth) (")	N/S (usft)	E/W (usft)	Build ("/100usft)	V. Sec (usft)	
5,393.0	8,500.0	92.00	90.00	802.0	2,746.1	0.08	2,841.0	
5,389.4	8,600.0	92.08	90.00	802.0	2,846.1	0.08	2,939.6	
5,385.7	8,700.0	92.16	90.00	802.0	2,946.0	0.08	3,038.3	
5,381.9	8,800.0	92.23	90.00	802.0	3,045.9	0.08	3,137.0	
5,377.9	8,900.0	92.31	90.00	802.0	3,145.8	0.08	3,235.6	
5,373.8	9,000.0	92.39	90.00	802.0	3,245.8	0.08	3,334.3	
5,369.6	9,100.0	92.47	90.00	802.0	3,345.7	0.08	3,432.9	
5,365.2	9,200.0	92.55	90.00	802.0	3,445.6	0.08	3,531.6	
5,360.7	9,300.0	92.62	90.00	802.0	3,545.5	0.08	3,630.2	
5,356.1	9,400.0	92.70	90.00	802.0	3,645.4	0.08	3,728.8	
5,351.3	9,500.0	92.78	90.00	802.0	3,745.3	0.08	3,827.4	
5,346.4	9,600.0	92.86	90.00	802.0	3,845.1	0.08	3,926.1	
5,341.3	9,700.0	92.93	90.00	802.0	3,945.0	0.08	4,024.7	
5,336.2	9,800.0	93.01	90.00	802.0	4,044.9	0.08	4,123.3	
5,330.8	9,900.0	93.09	90.00	802.0	4,144.7	0.08	4,221.9	
5,325.4	10,000.0	93.17	90.00	802.0	4,244.6	0.08	4,320.5	
5,319.8	10,100.0	93.24	90.00	802.0	4,344.4	0.08	4,419.0	
5,314.1	10,200.0	93.32	90.00	802.0	4,444.3	0.08	4,517.6	
5,308.2	10,300.0	93.40	90.00	802.0	4,544.1	0.08	4,616.2	
5,302.2	10,400.0	93.48	90.00	802.0	4,643.9	0.08	4,714.7	
5,300.4	10,429.0	93.50	90.00	802.0	4,672.9	0.08	4,743.3	
<b>4 1/2"</b>								
5,300.4	10,429.3	93.50	90.00	802.0	4,673.2	0.08	4,743.6	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
10,429.0	5,300.4	4 1/2"	4-1/2	6-1/4	
6,000.0	5,438.0	7"	7	8-3/4	
500.0	500.0	9 5/8"	9-5/8	12-1/4	

Checked By: _____	Approved By: _____	Date: _____
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Produced water from nearby existing gas wells will also be utilized for completions operations if such activity proves practicable.

The water hauler(s) will access the proposed well pad via the roads described in Section A: *Existing Access Roads* and Section B: *New or Reconstructed Access Roads*.

No water supply well will be drilled on this lease.

## **F. Construction Plan and Materials**

The BLM-FFO (505-564-7600) will be notified at least 48 hours prior to the start of construction activities; approximately 3-6 weeks of construction will be required for the construction phase of the proposed project.

The well pad will be leveled with heavy equipment to provide space and a level surface for vehicles and equipment. All native excavated material will be used on the well pad. Excavated materials from the cuts will be used for fill in order to level the proposed well pad. Approximately 11.6 feet of cut and 13.1 feet of fill will be needed to create a level well pad. No additional materials will be required for construction of the proposed well pad.

Activity will cease when construction equipment cause ruts in the soil 6 inches in depth and/or when equipment can no longer move or operate under its own power on access road surfaces.

Construction plats are provided in the APD and ROW grant permit packages.

## **G. Methods for Handling Waste**

✓ Drilling operations will utilize a closed-loop system. Drilling of the horizontal lateral will be done using a water-based mud system. All water-based mud cuttings will be stored in metal containment bins until hauled to a commercial disposal facility. No reserve pit will be needed for this project. The drilling operations area will be enclosed by a containment berm and ditches, and the containment berm will be ramped to allow access to the solids control area. The contained operations area will drain gradually to one area of the pad which will be contoured for spill prevention and control.

Energen will follow New Mexico Oil Conservation Division Pit Rule and Onshore Orders No. 1 and No. 7 regarding placement, operation, and closure of the closed-loop system. No blow pit will be used.

All refuse will be placed in metal trash basket and will be hauled off site and properly disposed in an approved landfill.

Portable toilets will be provided and maintained during all construction, drilling and completion operations.

## **H. Ancillary Facilities**

No ancillary facilities will be associated with the well pad.

## **I. Well Site Layout**

The approximate cuts, fills, and orientation for the proposed well pad are depicted on the construction plats in the APD package. The location of drilling equipment, rig orientation, and the location of topsoil stockpiles are provided in Appendix C.

## **J. Plans for Surface Reclamation**

Please see Appendix A: *Reclamation Plan*.

# ENERGEN RESOURCES CORPORATION

## CHACO 23-08 9 #1H

1476' FSL & 210' FWL  
SEC. 9, T-23-N, R-8-W, N.M.P.M.  
SAN JUAN COUNTY, NEW MEXICO

WELL FLAG LOCATED AT  
36.238493° N  
107.694942° W  
NAD 83

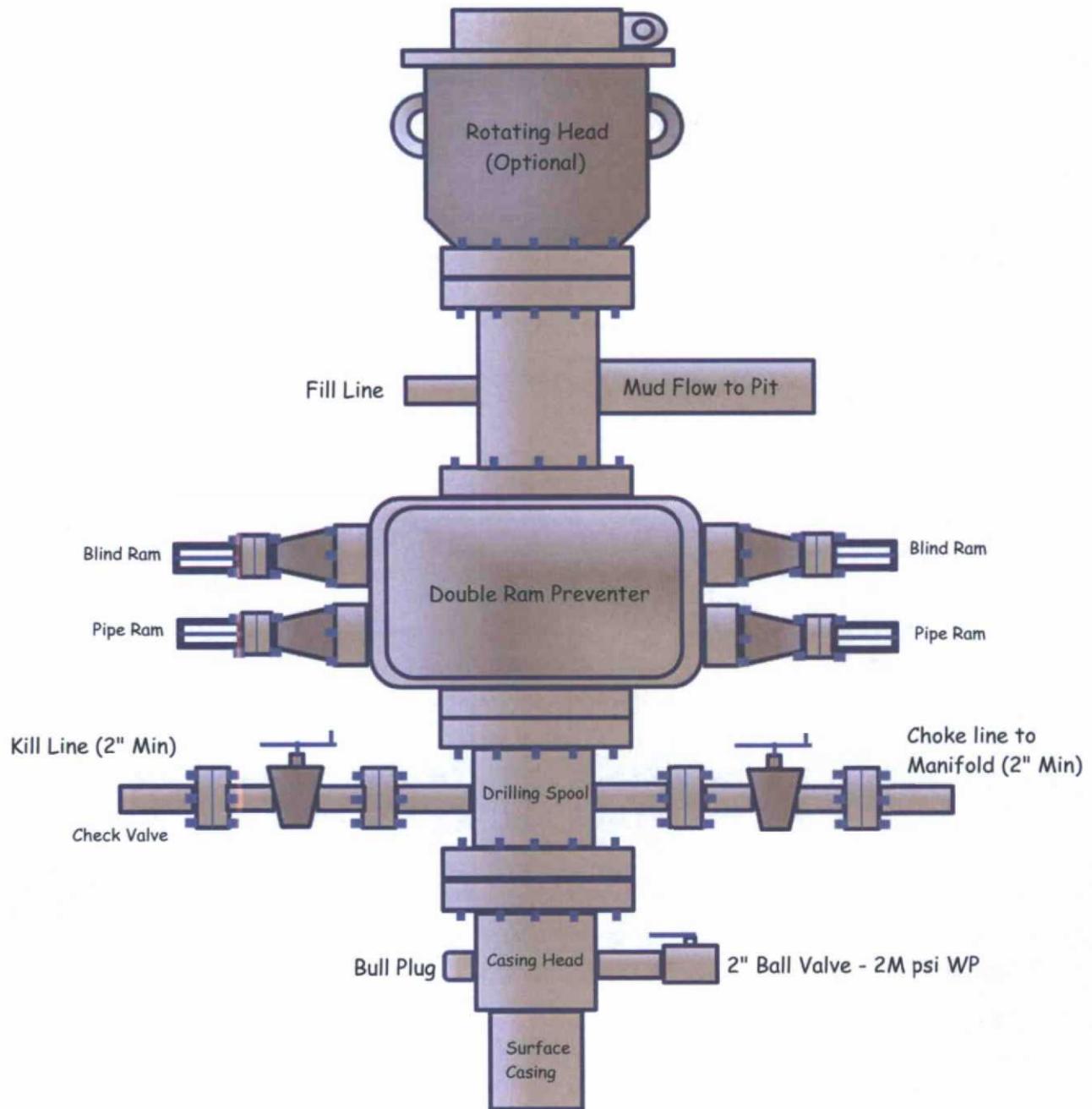
### DIRECTIONS

1. FROM THE INTERSECTION OF HWY 64 AND US-550 IN BLOOMFIELD, NEW MEXICO, TRAVEL SOUTH ON US-550 FOR 39.7 MILES TO M.P. 112; CONTINUE 0.1 MILES
2. TO THE BEGINNING OF NEW ACCESS ON THE RIGHT (SOUTH) SIDE OF HWY 550 WHICH CONTINUES SOUTH-SOUTHWESTERLY FOR 2651.2' TO THE NEW WELL LOCATION.

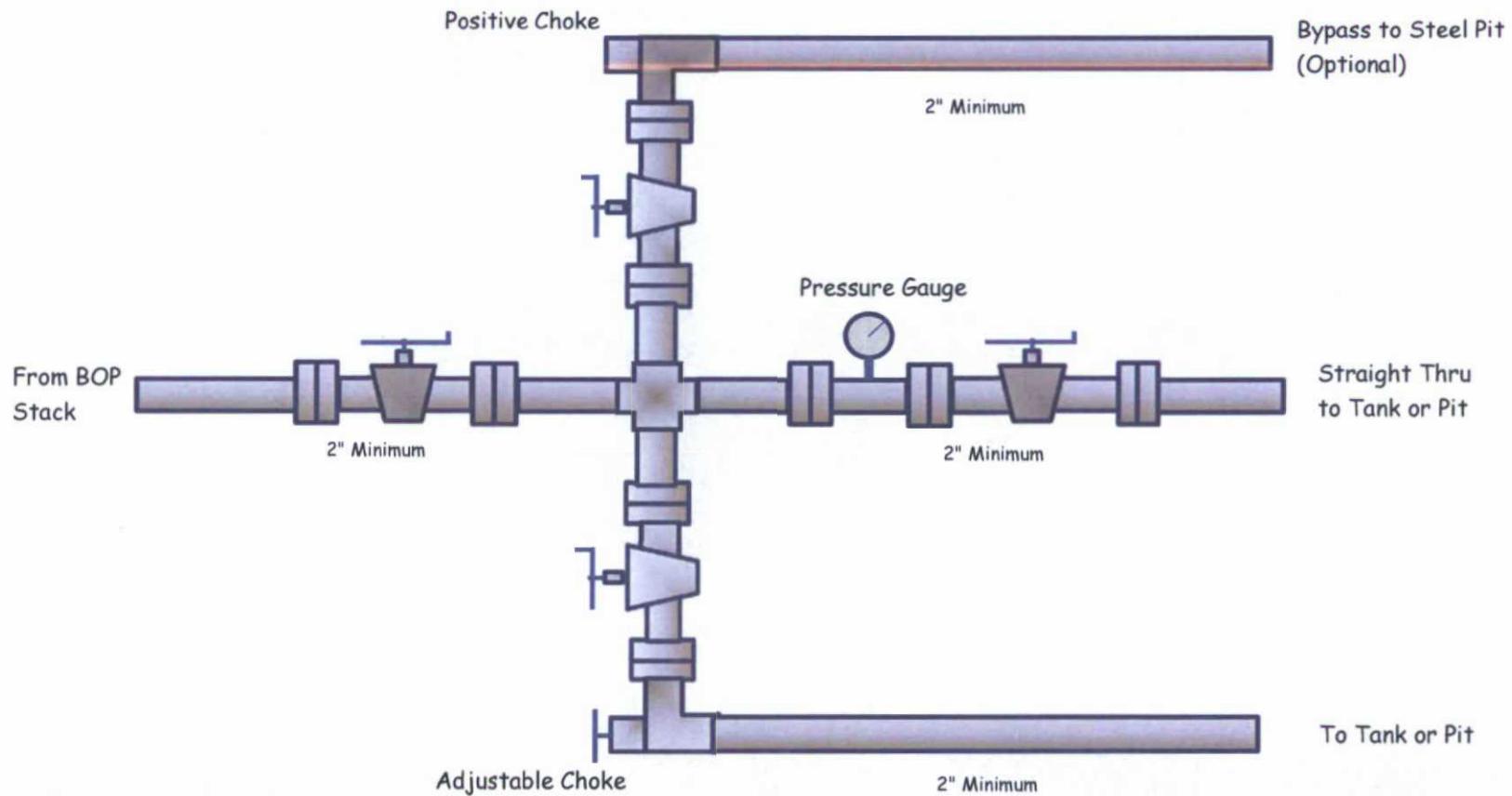
 <small>Integrity · respect · responsibility</small>	ENERGEN RESOURCES CORPORATION CHACO 23-08 9 #1H, 1476' FSL & 210' FWL SEC. 9, T-23-N, R-8-W, N.M.P.M., SAN JUAN CO, NM GROUND ELEVATION: 6916.3' DESIGN ELEVATION: 6913.0'				SHEET 1 OF 1
	PROJ. NO 3040914	CLIENT			
1199 MAIN AVENUE SUITE 101 DURANGO, COLORADO 81301 (970)828-4732	DRAWN BY M.J.W	DATE 01/14/15	CHECKED BY G.W.R	DATE 01/14/15	



# Typical BOP Schematic - 3M psi System



## 2M Choke & Kill Manifold



Note: All connections are bolted flange  
Working pressure for all equipment is  
2,000 psi or greater