

SEP 07 2011

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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD-HOBBS

Split Estate

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

|   |  |  |  |
|---|--|--|--|
| 1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER  |  | 5. Lease Serial No.<br>NMLC031695B 03670801  |  |
| 1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone |  | 6. If Indian, Allottee or Tribe Name   |  |
| 2. Name of Operator<br>ConocoPhillips Company   |  | 7. If Unit or CA Agreement, Name and No.<br>Warren Unit NM 71052x  |  |
| 3a. Address<br>3300 N "A" St, Bldg 6 Midland, TX 79705  |  | 8. Lease Name and Well No.<br>Warren Unit B1-Tu WF 353   |  |
| 3b. Phone No. (include area code)<br>(432)688-6913  |  | 9. API Well No.<br>30-025-40283  |  |
| 4. Location of Well (Report location clearly and in accordance with any State requirements.)<br>At surface 1160 FNL 300 FEL Unit A UNORTHODOX LOCATION<br>At proposed prod. zone 1160 FNL 300 FEL           |  | 10. Field and Pool, or Exploratory<br>Warren; Blinbry-Tubb B.G.  |  |
| 14. Distance in miles and direction from nearest town or post office*<br>7.8 miles north of Eunice, NM  |  | 11. Sec., T. R. M. or Blk. and Survey or Area<br>27,20S,38E  |  |
| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)   |  | 12. County or Parish<br>Lea  |  |
| 16. No. of acres in lease<br>5120   |  | 13. State<br>NM  |  |
| 17. Spacing Unit dedicated to this well<br>40   |  | 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.<br>610 ft from Warren #68 |  |
| 19. Proposed Depth<br>7143'   |  | 20. BLM/BIA Bond No. on file<br>ES 0085  |  |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3558' GL   |  | 22. Approximate date work will start*<br>09/19/2011  |  |
| 23. Estimated duration<br>09/26/2011  |  | 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<br><i>B. D. Maiorino</i>             | Name (Printed/Typed)<br>Brian D Maiorino        | Date<br>06/29/2011   |
| Title<br>Regulatory Specialist                     |   |                      |
| Approved by (Signature)<br><i>/s/ Don Peterson</i> | Name (Printed/Typed)<br><i>/s/ Don Peterson</i> | Date<br>SEP - 6 2011 |
| Title<br>FIELD MANAGER                             |   |                      |
| Office<br>CARLSBAD FIELD OFFICE                    |   |                      |

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.

APPROVAL FOR TWO YEARS

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)

Kx 09/13/11

Lea County Controlled Water Basin

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED

SEP 14 2011

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SELF-CERTIFICATION STATEMENT  
FROM LESSEE/OPERATOR

SURFACE OWNER IDENTIFICATION

Federal or Indian Lease No. NMCC031695B  
Well(s) Number and Location WARRIOR UNIT # 353  
1160 FNL 300 FGL 27, 205, 326

I hereby certify to the Authorized Officer of the Bureau of Land Management that I have reached one of the following agreements with the Surface Owner; or after failure of my good-faith effort to come to an agreement of any kind with the Surface Owner, I will provide a bond:


- 1) X I have a signed access agreement to enter the leased lands;
- 2) \_\_\_\_\_ I have a signed waiver from the surface owner;
- 3) \_\_\_\_\_ I have entered into an agreement regarding compensation to the surface owner for damages for loss of crops and tangible improvements.
- 4) \_\_\_\_\_ Because I have been unable to reach either 1), 2), or 3) with the surface owner, I will obtain a bond to cover loss of crops and damages to tangible improvements.

Surface owner information: (if available after diligent effort)

Surface Owner Name: Robert McCasland

Surface Owner Address: PO Box 206 Eunice, NM 88231

Surface Owner Phone Number: 575-394-3022

  
Signed this 16 - day of August -, 20011.

ConocoPhillips Company  
(Name of lessee/operator)

## Warren Unit 353

| Formation Tops and Planned Total Depth |             |
|--|-------------|
| Formation Call Points                  | Top (ft MD) |
| Rustler                                | 1543        |
| Salado                                 | 1633        |
| Tansill                                | 2703        |
| Yates                                  | 2838        |
| Seven Rivers                           | 3100        |
| Queen                                  | 3717        |
| Penrose                                | 3847        |
| Grayburg                               | 4001        |
| San Andres                             | 4232        |
| Glorieta                               | 5565        |
| Paddock                                | 5613        |
| Blinebry                               | 5778        |
| Tubb                                   | 6468        |
| Drinkard                               | 6825        |
| Deepest Estimated Perforation          | 6943        |
| Abo                                    | 6963        |
| Total Depth (minimum)                  | 7098        |
| Total Depth (maximum)                  | 7143        |

| Casing Depths     |               |               |
|-------------------|---------------|---------------|
| String            | Minimum Depth | Maximum Depth |
| Surface Casing    | 1568          | 1613          |
| Production Casing | 7088          | 7133          |

Note: The Surface Casing and the Production Casing programs reflect an uncertainty of 45' in the setting depth for the shoe because that is the approximate length of a full joint of Range 3 casing. This range for the setting depth will allow us to drill the hole to fit the casing string based on how the tally comes out and will provide for the cementing head to be positioned at the rig floor for safety and efficiency in cementing operations. The casing will be set approximately 10 ft off bottom.

Master Drilling Plan  
ConocoPhillips Company  
Warren Unit  
June 28, 2011  
Warren Field  
Lea County, New Mexico

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**1. Estimated tops of geological markers and estimated depths to water, oil, or gas formations:**

The names, estimated tops, and thicknesses of the formations expected to be encountered, and the zones potentially containing usable water, oil, gas, or prospectively valuable deposits of other minerals, will be provided for each well on a separate document.

The ranges of depths for the formation tops, thicknesses, and planned Total Depths for the wells to be drilled under this Master Drilling Plan are presented in the table below.

The datum for these depths is RKB (which is 14' above Ground Level).

| Formation Call                | Formation Top<br>FT MD | Thickness<br>ft | Contents   |
|-------------------------------|------------------------|-----------------|--|
| Quaternary                    | Surface                |                 | Fresh Water  |
| Rustler                       | 1413 - 1543            | 65 - 90         | Anhydrite  |
| Salado (top of salt)          | 1493 - 1633            | 1033 - 1070     | Salt   |
| Tansill (base of salt)        | 2544 - 2703            | 135 - 154       | Gas, Oil and Water   |
| Yates                         | 2698 - 2838            | 258 - 282       | Gas, Oil and Water   |
| Seven Rivers                  | 2961 - 3100            | 548 - 617       | Gas, Oil and Water   |
| Queen                         | 3521 - 3717            | 130 - 166       | Gas, Oil and Water   |
| Penrose                       | 3675 - 3847            | 154 - 179       | Gas, Oil and Water   |
| Grayburg                      | 3846 - 4001            | 226 - 260       | Gas, Oil and Water   |
| San Andres                    | 4088 - 4232            | 1274 - 1333     | Gas, Oil and Water   |
| Glorieta                      | 5375 - 5565            | 48 - 160        | Gas, Oil and Water   |
| Paddock                       | 5515 - 5613            | 85 - 218        | Gas, Oil and Water   |
| Blaine                        | 5622 - 5801            | 658 - 740       | Gas, Oil and Water   |
| Tubb                          | 6312 - 6468            | 304 - 357       | Gas, Oil and Water   |
| Drinkard                      | 6630 - 6825            | 138 - 296       | Gas, Oil and Water   |
| Deepest estimated perforation | 6902 - 7000            |                 | Deepest estimated perforation is ~ 20' above Top of Abo      |
| Abo                           | 6922 - 7020            |                 | TD is in the Abo to provide rathole below objective horizons |
| Total Depth (minimum)         | 7057 - 7155            |                 | 155' below deepest estimated perforation                     |
| Total Depth (maximum)         | 7102 - 7200            |                 | 200' below deepest estimated perforation                     |

Protection of fresh water will be accomplished by setting the surface casing at least 25' into the Rustler Anhydrite formation, but above the top of the Salado Salt, and **cementing** the surface casing from the casing shoe **to the surface of ground** in accordance with the provisions of Onshore Oil and Gas Order No. 2 and New Mexico Oil Conservation Division Title 19.

Protection of oil and gas resources will be accomplished by setting the production casing approximately 10' off bottom and cementing it in accordance with the provisions Onshore Oil and Gas Order No. 2 and New Mexico Oil Conservation Division Title 19.

## 2. Proposed casing program:

| Type      | Hole Size | Interval MD RKB (ft) |                      | OD       | Wt        | Gr   | Conn      | Condition | Safety Factors Calculated per BLM Load Formulas |          |                     |
|-----------|-----------|----------------------|----------------------|----------|-----------|------|-----------|-----------|---|----------|---------------------|
|           | (in)      | From                 | To                   | (inches) | (lb/ft)   |      |           |           | Burst   | Collapse | Tension Dry/Buoyant |
| Cond      | 20"       | 0                    | ~ 73'<br>(~ 57' BGL) | 16"      | 0.5" wall | B    | Line Pipe | New       | NA  | NA       | NA                  |
| Alt. Cond | 20"       | 0                    | ~ 73'<br>(~ 57' BGL) | 13-3/8"  | 48#       | H-40 | PE        | New       | NA  | NA       | NA                  |
| Surf      | 12-1/4"   | 0                    | 1438' - 1613'        | 8-5/8"   | 24#       | J-55 | STC       | New       | 4.22  | 1.92     | 6.30 / 7.24         |
| Prod      | 7-7/8"    | 0                    | 7057' - 7200'        | 5-1/2"   | 17#       | L-80 | LTC       | New       | 2.41  | 1.68     | 2.76 / 3.25         |

The casing will be suitable for H<sub>2</sub>S Service.

The surface casing will be set at least 25' into the Rustler Anhydrite formation, but above the top of the Salado Salt, and **cemented to the surface of ground** in accordance with the provisions of Onshore Oil and Gas Order No. 2 and New Mexico Oil Conservation Division Title 19.

The production casing will be set 155' to 200' below the deepest estimated perforation to provide rathole for the pumping completion and for the logs to get deep enough to log the interval of interest.

The perforations will be above the top of the Abo and the deepest estimated perforation is estimated to be approximately 20' above the top of the Abo.

The surface and production casing will be set approximately 10' off bottom and we will drill the hole to fit the casing string so that the cementing head is positioned at the floor for the cement job.

### **Casing Design (Safety) Factors – BLM Criteria:**

Joint Strength Design (Safety) Factor: SFt

$$SFt = Fj / Wt;$$

Where

- Fj is the rated pipe Joint Strength in pounds (lbs)
- Wt is the weight of the casing string in pounds (lbs)

The Minimum Acceptable Joint Strength Design (Safety) Factor SFt = 1.6 dry or 1.8 buoyant

Collapse Design (Safety) Factor: SFc

$$SFc = Pc / (MW \times .052 \times Ls)$$

Where

- Pc is the rated pipe Collapse Pressure in pounds per square inch (psi)
- MW is mud weight in pounds per gallon (ppg)
- Ls is the length of the string in feet (ft)

The Minimum Acceptable Collapse Design (Safety) Factor SFc = 1.125

Burst Design (Safety) Factor: SFb

$$SFb = Pi / BHP$$

Where

- Pi is the rated pipe Burst (Minimum Internal Yield) Pressure in pounds per square inch (psi)
- BHP is bottom hole pressure in pounds per square inch (psi)

The Minimum Acceptable Burst Design (Safety) Factor SFb = 1.0

### **Joint Strength Design (Safety) Factors – BLM Criteria**

Surface Casing:

- SFj Dry = 244,000 lbs / (1613 ft x 24 lb/ft) = 244,000 lbs / 38,712 lbs = 6.30 Dry
- SFj Bouyant = 244,000 lbs / (1613 ft x 24 lb/ft) [1-(8.5/65.5)] = 244,000 lbs / 33,688 lbs = 7.24 Buoyant

Production Casing:

- SFj Dry = 338,000 lbs / (7200 ft x 17 lb/ft) = 338,000 lbs / 122,400 lbs = 2.76 Dry
- SFj Bouyant = 338,000 lbs / (7200 ft x 17 lb/ft) [1-(10.0/65.5)] = 338,000 lbs / 103,713 lbs = 3.25 Buoyant

### **Collapse Design (Safety) Factors – BLM Criteria**

Surface Casing:

$$SFc = 1370 \text{ psi} / (8.5 \text{ ppg} \times .052 \times 1613 \text{ ft}) = 1370 \text{ psi} / 713 \text{ psi} = 1.92$$

Production Casing:

$$SFc = 6290 \text{ psi} / (10 \text{ ppg} \times .052 \times 7200 \text{ ft}) = 6290 \text{ psi} / 3744 \text{ psi} = 1.68$$

### **Burst Design (Safety) Factors – BLM Criteria**

Surface Casing:

$$SFb = 2950 \text{ psi} / (8.33 \text{ ppg} \times .052 \times 1613 \text{ ft}) = 2950 \text{ psi} / 698 \text{ psi} = 4.22$$

Production Casing:

$$SFb = 7740 \text{ psi} / (8.5 \text{ ppg} \times .052 \times 7200 \text{ ft}) = 7740 \text{ psi} / 3201 \text{ psi} = 2.41 \text{ based on est. reservoir pressure data}$$

### Casing Design (Safety) Factors – Additional ConocoPhillips Criteria:

ConocoPhillips casing design policy establishes Corporate Minimum Design Factors (see table below) and requires that service life load cases be considered and provided for in the casing design.

ConocoPhillips Corporate Criteria for Minimum Design Factors

|                       | Burst | Collapse | Axial |
|-----------------------|-------|----------|-------|
| Casing Design Factors | 1.15  | 1.05     | 1.4   |

#### Surface Casing:

The maximum internal (burst) load on the Surface Casing occurs when the surface casing is tested to 1500 psi. We will pressure up to 1600 psi and let the pressure settle for 1 minute after shutting down the pump. Then we will begin the 30 minute test period. Therefore the maximum pressure that the surface casing will be exposed to will be 1600 psi.

#### Surface Casing Burst Design Factor

$$\text{DF Burst} = \text{Burst Rating} / \text{Maximum Pressure During Casing Pressure Test} = 2950 \text{ psi} / 1600 \text{ psi} = 1.84$$

The maximum collapse load on the Surface Casing occurs when we release the pressure after bumping the plug on the surface casing cement job.

#### Surface Casing Collapse Design Factor

$$\text{DF Collapse} = \text{Collapse Rating} / (\text{Cement Column Hydrostatic Pressure} - \text{Displacement Fluid Hydrostatic Pressure})$$

$$\text{DF Collapse} = 1370 \text{ psi} / \{[(350 \text{ ft} \times .052 \times 14.8 \text{ ppg}) + (1263 \text{ ft} \times .052 \times 13.6 \text{ ppg})] - (1613 \text{ ft} \times .052 \times 8.33 \text{ ppg})\}$$

$$\text{DF Collapse} = 1370 \text{ psi} / 463 \text{ psi}$$

$$\text{DF Collapse} = 2.95$$

The maximum axial load on the Surface Casing would occur if we were to get the surface casing stuck and pull on it to try to get it unstuck.

#### Surface Casing Axial (Tension) Maximum Allowable Hook Load Case:

$$\text{Maximum Allowable Hookload} = \text{Joint Strength Rating} / \text{Axial Design Factor}$$

$$\text{Maximum Allowable Hookload} = 244,000 / 1.4$$

$$\text{Maximum Allowable Hookload} = 174,286$$

$$\text{Overpull Margin} = \text{Maximum Allowable Hook Load} - \text{Air Wt of the String}$$

$$\text{Overpull Margin} = 174,286 \text{ lbs} - (1613' \times 24 \text{ lb/ft})$$

$$\text{Overpull Margin} = 174,286 \text{ lbs} - 38,712 \text{ lbs}$$

$$\text{Overpull Margin} = 135,574 \text{ lbs}$$

Production Casing:

The maximum internal (burst) load would occur in the fracture stimulation either during fracture initiation or screen out.

The Maximum Allowable Working Pressure (MAWP) that we would impose in the fracture stimulation load case is the pressure that would result in a 1.15 burst design factor at surface.

For this well

MAWP for the Fracture Stimulation = Minimum Internal Yield / 1.15

MAWP for the Fracture Stimulation = 7740 psi / 1.15

MAWP for the Fracture Stimulation = 6730 psi

A pressure relief valve and pump truck kill settings will also be used to prevent overpressuring the production casing in the event of a screen out.

The maximum collapse load on the production casing occurs with the well pumped off on production.

DF Collapse = Collapse Rating / Bottom Hole Pressure

DF Collapse = 6290 psi / (8.5 ppg x .052 x 7200 ft) = 6290 psi / 3182 psi = 1.97

The maximum axial load on the Production Casing would occur if we were to get the Production Casing stuck and pull on it to try to get it unstuck.

Production Casing Axial (Tension) Maximum Hook Load Case:

Maximum Allowable Hookload = Joint Strength Rating / Axial Design Factor

Maximum Allowable Hookload = 338,000 lbs / 1.4

Maximum Allowable Hookload = 241,428 lbs

Overpull Margin = Maximum Allowable Hook Load - Air Wt of the String

Overpull Margin = 241,428 lbs - (7200' x 17 lb/ft)

Overpull Margin = 241,428 lbs - 122,400 lbs

Overpull Margin = 119,028 lbs



### 3. Proposed cementing program:

#### 16" or 13-3/8" Conductor:

Cement to surface with rat hole mix, ready mix or Class C Neat cement.

(Note: The gravel used in the cement is not to exceed 3/8" dia)

TOC at surface.

#### 8-5/8" Surface Casing:

The intention for the cementing program for the Surface Casing is to:

- Place the Tail Slurry from the casing shoe to 350' above the casing shoe,
- Bring the Lead Slurry to surface.

Spacer: 20 bbls Fresh Water

| Lead Slurry  |                |                   |                |                  |                    |                   |   |                    |
|--|----------------|-------------------|----------------|------------------|--------------------|-------------------|---|--------------------|
| Volume (sx)<br>& Recipe & Excess %   | Top<br>(ft MD) | Bottom<br>(ft MD) | Length<br>(ft) | Density<br>(ppg) | Yield<br>(cuft/sx) | Mix Wtr<br>gal/sx | Compressive Strengths<br>@ 90 deg F by UCA Method |                    |
| 500-550 sx<br>Class C<br>+ 4% bentonite<br>+ 2% CaCl <sub>2</sub><br>+ 0.125% Polyflake<br>+ 0.2% Antifoam<br><br>Excess = 68% | Surface        | 1088<br>(min)     | 1088<br>(min)  | 13.6             | 1.71               | 8.923             | Time<br>2 hrs 15 min                              | Strength<br>50 psi |
|  |                |                   |                |                  |                    |                   | 7 hrs 52 min                                      | 500 psi            |
|  |                |                   |                |                  |                    |                   | 24 hrs  | 1173 psi           |
|  |                |                   |                |                  |                    |                   | 48 hrs  | 1542 psi           |
|  |                |                   |                |                  |                    |                   | 72 hrs  | 1739 psi           |
|  |                | 1263<br>(max)     | 1263<br>(max)  |                  |                    |                   |   |                    |

| Tail Slurry  |                |                   |                |                  |                    |                   |   |                    |
|--|----------------|-------------------|----------------|------------------|--------------------|-------------------|---|--------------------|
| Volume (sx)<br>& Recipe & Excess %                               | Top<br>(ft MD) | Bottom<br>(ft MD) | Length<br>(ft) | Density<br>(ppg) | Yield<br>(cuft/sx) | Mix Wtr<br>gal/sx | Compressive Strengths<br>@ 90 deg F by UCA Method |                    |
| 250 sx<br>Class C<br>+ 1% CaCl <sub>2</sub><br><br>Excess = 100% | 1088<br>(min)  | 1438<br>(min)     | 350            | 14.8             | 1.34               | 6.371             | Time<br>2 hrs 36 min                              | Strength<br>50 psi |
|  |                |                   |                |                  |                    |                   | 5 hrs 17 min                                      | 500 psi            |
|  |                |                   |                |                  |                    |                   | 24 hrs  | 2026 psi           |
|  |                |                   |                |                  |                    |                   | 48 hrs  | 2572 psi           |
|  |                |                   |                |                  |                    |                   | 72 hrs  | 2846 psi           |
|  |                | 1263<br>(max)     |                |                  |                    |                   |   |                    |

Displacement: Fresh Water

The calculated average hole size for the surface hole for wells in the Warren Unit is 13.22" to 13.88" diameter based on volume of cement pumped and volume of cement returns to surface. Therefore this volume of cement should result in approximately 35 - 40 bbls of cement returns to surface.

**Note: In accordance with the Pecos District Conditions of Approval, we will Wait on Cement (WOC) for a period of not less than 18 hrs after placement or until at least 500 psi compressive strength has been reached in both the Lead Slurry and Tail Slurry cements on the Surface Casing, whichever is greater.**

### **5-1/2" Production Casing Cementing Program:**

The intention for the cementing program for the Production Casing is to:

- Place the Tail Slurry from the casing shoe to a point approximately 200' above the top of the Paddock,
- Bring the Lead Slurry to surface.

Spacer: 20 bbls Fresh Water.

| Lead Slurry   |                |                                    |                                    |                  |                    |                   |  |  |
|---|----------------|------------------------------------|------------------------------------|------------------|--------------------|-------------------|--|--|
| Volume (sx)<br>& Recipe & Excess %  | Top<br>(ft MD) | Bottom<br>(ft MD)                  | Length<br>(ft)                     | Density<br>(ppg) | Yield<br>(cuft/sx) | Mix Wtr<br>gal/sx | Compressive Strengths<br>@ 113 deg F by Crush Method |  |
| 700 sx<br>50% Class C<br>50% POZ<br>+ 10% bentonite<br>+ 8 lb/sx Salt<br>+ 0.2% Fluid Loss Additive<br>+ 0.125% LCM if needed | Surface        | 5315<br>(min)<br><br>5413<br>(max) | 5315<br>(min)<br><br>5413<br>(max) | 11.8             | 2.55               | 14.88             | Time<br>12 hrs<br>24 hrs<br>48 hrs<br>72 hrs         | Strength<br>100 psi<br>200 psi<br>245 psi<br>310 psi |
| Excess = 40% or more if needed based on caliper if available. Estimated average hole size = 9"                                |                |                                    |                                    |                  |                    |                   |  |  |
| Note: This compressive strength data is from an old pilot test (20-Feb-2007) for this slurry and will be updated.             |                |                                    |                                    |                  |                    |                   |  |  |

| Tail Slurry  |                                    |                                    |                                    |                  |                    |                   |  |   |
|--|------------------------------------|------------------------------------|------------------------------------|------------------|--------------------|-------------------|--|---|
| Volume (sx)<br>& Recipe & Excess %   | Top<br>(ft MD)                     | Bottom<br>(ft MD)                  | Length<br>(ft)                     | Density<br>(ppg) | Yield<br>(cuft/sx) | Mix Wtr<br>gal/sx | Compressive Strengths<br>@ 113 deg F by Crush Method |   |
| 350 sx<br>50% Class H<br>50% POZ<br>+ 2% Bentonite<br>+ 5% Salt<br>+ 0.4% Fluid Loss Additive<br>+ 0.2% Dispersant<br>+ Retarder if needed<br>+ Antifoam if needed | 5315<br>(min)<br><br>5413<br>(max) | 7057<br>(min)<br><br>7200<br>(max) | 1742<br>(min)<br><br>1828<br>(max) | 14.2             | 1.32               | 6.20              | Time<br>12 hrs<br>24 hrs<br>48 hrs<br>72 hrs         | Strength<br>800 psi<br>1100 psi<br>1410 psi<br>1720 psi |
| Excess = 40% or more if needed based on caliper if available. Estimated average hole size = 8.2"   |                                    |                                    |                                    |                  |                    |                   |  |   |
| Note: This compressive strength data is from an old pilot test (20-Feb-2007) for this slurry and will be updated.  |                                    |                                    |                                    |                  |                    |                   |  |   |

Displacement: Fresh Water with approximately 250 ppm gluteraldehyde biocide.

### **Proposal for Option to Adjust Production Casing Cement Volumes:**

The production casing cement volumes presented above are estimates based on data from previous wells. We will adjust these volumes based on the caliper log data for each well and our trends for amount of cement returns to surface and possibly reduce the excess % if we observe that we are getting excessive amounts of cement back to surface.

#### 4. Pressure Control Equipment:

The blowout preventer equipment (BOP) will conform to the requirements for a 2M System as described in Onshore Oil and Gas Order No. 2. However we will substitute higher rated BOP equipment and use additional equipment not required for a 2M System.

Our BOP equipment will be:

- Rotating Head
- Annular BOP, 11" 3M
- Blind Ram, 11" 3M
- Pipe Ram, 11" 3M

The blowout preventer equipment will be installed after running and cementing the surface casing and installing the wellhead on the surface casing.

Testing of the BOP equipment will be as follows:

- The appropriate BLM office shall be notified a minimum 4 hours in advance for a representative to witness the tests.
- The tests shall be done by an independent service company.
- The results of the test shall be reported to the appropriate BLM office.
- All tests are required to be recorded on a calibrated test chart.
- A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.
- Ram type preventers and associated equipment shall be tested to approved stack working pressure of 3000 psi. The Annular type preventer will be tested to 50 percent of rated working pressure, and therefore will be tested to 1500 psi. The above tests will be performed:
  - When initially installed
  - Whenever any seal subject to test pressure is broken
  - Following related repairs, and
  - At 30 day intervals
- Annular preventers, if used, will be functionally operated at least weekly.
- Pipe and Blind rams shall be activated each trip, but not more than once per day.
- All of the above described tests will be recorded in the drilling log.

A diagram of the proposed BOPs and choke manifold is attached.

The Working Pressure Requirement for the BOP equipment is calculated per Onshore Order 2 as follows:

- Expected bottom hole pressure = 8.5 ppg gradient
- Required Working Pressure for BOP Eqpt =  $(8.5 \times .052 \times 7200) - (.22 \text{ psi/ft} \times 7200)$
- Required Working Pressure for BOP Eqpt =  $3182 - (.22 \text{ psi/ft} \times 7200) = 1598 \text{ psi}$

## 5. Proposed Wellhead Program:

The wellhead equipment will be suitable for H<sub>2</sub>S service.

We propose to use a Woodgroup S95 11" 5M casing head and T-S95 7-1/16" 10M Tubing Head, Material Class DD-NL, Temperature Class P.

We also propose that we have the option to use the following standard / conventional wellhead as an option:

- Casing Head: 8-5/8" Slip on and Weld x 11" 5M Casing Head, API 6A, Material Class DD-NL, Temperature Class P, installed on 8-5/8" surface casing.
- Tubing Head: 11" 5M x 7-1/16" 10M Tubing Head, API 6A, Material Class DD-NL, Temperature Class P, installed after setting 5-1/2" production casing

## 6. Proposed Mud System

The mud systems that are proposed for use are as follows:

| DEPTH                      | TYPE                                     | Density<br>ppg | FV<br>sec/qt | API Fluid Loss<br>cc/30 min | pH      |
|----------------------------|--|----------------|--------------|-----------------------------|---------|
| 0 – Surface Casing Point   | Fresh Water or<br>Fresh Water Native Mud | 8.5 – 9.0      | 28 – 40      | N.C.                        | N.C.    |
| Surface Casing Point to TD | Brine (Saturated NaCl <sub>2</sub> )     | 10             | 29           | N.C.                        | 10 - 11 |
| Conversion to Mud at TD    | Brine Based Mud (NaCl <sub>2</sub> )     | 10             | 34 – 45      | 5 – 10                      | 10 - 11 |

12-1/4" hole from surface of ground to surface casing point: The circulating media will be either a native mud or fresh water with high viscosity sweeps. The mud components will be:

- Fresh Water
- Bentonite (if needed)
- Lime
- Soda Ash
- Starch (if needed)
- Drilling Paper
- Other loss of circulation material if needed (nut plug or fibrous material)
- Soap sticks (if needed)

7-7/8" hole from the surface casing shoe to TD: The circulating media will be 10 ppg saturated NaCl<sub>2</sub> brine and will be converted to a mud with starch, attapulgate, lime, and asphalt for additional fluid loss control if needed upon reaching Total Depth (TD). The mud components will be:

- Brine (approximately 10 lb/gal density, saturated NaCl<sub>2</sub>)
- Attapulgate
- Lime
- Starch
- Asphalt (if needed for additional fluid loss control)
- Drilling Paper, Walnut Hulls, and Fibrous LCM material such as BaroSeal if needed
- Soap Sticks if needed
- Lease crude oil or diesel with Pipe-Lax or EZ-Spot as a spotting fluid if needed in the event of differential sticking

Drilling mud containing H<sub>2</sub>S shall be degassed in accordance with API RP-49, item 5.14. The gases shall be piped into the flare system.

Sufficient quantities of mud additives shall be maintained on location to scavenge and/or neutralize H<sub>2</sub>S. We will inject into our flow stream while circulating from the corrosion trailer we have from Baroid ~10 gpd BaraScav L, SI-430, Baracor 100, and DA3-20 to scavenge H<sub>2</sub>S and to protect the tubulars from corrosion. No barite or other weighting material will be on location.

#### 7. Logging, Coring, and Testing Program:

- a. No drill stem tests will be done
- b. No mud logging is planned, but might possibly be done if it is determined that this data is needed;
- c. No whole cores are planned
- d. The open hole electrical logging program is planned to be as follows:
  - Total Depth to 2500': Resistivity, Density, and Gamma Ray.
  - Total Depth to surface Casing Shoe: Caliper
  - Total Depth to surface, Gamma Ray and Neutron
  - Formation pressure data (XPT) on electric line if needed (optional)
  - Rotary Sidewall Cores on electric line if needed (optional)
  - BHC or Dipole Sonic if needed (optional)
  - Spectral Gamma Ray if needed (optional)

#### 8. Abnormal Pressures and Temperatures:

- We do not expect to encounter any abnormal pressures or abnormally pressured horizons.
- The expected Bottom Hole Temperature is 113 degrees F.
- Loss of circulation is a possibility in the horizons below the Top of Grayburg. We expect that normal Loss of Circulation Material will be successful in healing any such loss of circulation events.
- The bottom hole pressure is expected to be 8.5 ppg gradient. The calculation of Required Working Pressure for the BOP Equipment is presented below:
  - Required Working Pressure for BOP Eqpt =  $(8.5 \times .052 \times 7200) - (.22 \text{ psi/ft} \times 7200)$
  - Required Working Pressure for BOP Eqpt =  $3182 - (.22 \text{ psi/ft} \times 7200) = 1598 \text{ psi}$
- The estimated H<sub>2</sub>S concentrations and ROE calculations for the gas in the zones to be penetrated are presented in the table below for the various producing horizons in this area:

| FORMATION / ZONE      | H2S<br>(PPM) | Gas Rate<br>(MCFD) | ROE<br>100 PPM | ROE<br>500 PPM |
|-----------------------|--------------|--------------------|----------------|----------------|
| Seven Rivers (Eumont) | 30,000       | 100                | 200            | 92             |
| San Andres            | 33,000       | 30                 | 100            | 46             |
| Yeso Group            | 1000         | 300                | 47             | 22             |

ConocoPhillips will comply with the provisions of Oil and Gas Order # 6, Hydrogen Sulfide Operations and will provide H<sub>2</sub>S monitoring equipment which will be rigged up, tested, and operational prior to drilling out from surface casing.

All persons arriving on location will have H<sub>2</sub>S certification & training that occurred within the last year.

Each occurrence of H<sub>2</sub>S gas at surface is to be noted on the daily reports and any occurrence of H<sub>2</sub>S in excess of 100 ppm will be reported to the authorized officer as soon as possible but no later than the next business day per the provisions of Oil and Gas Order # 6, Hydrogen Sulfide Operations.

ConocoPhillips will provide an H<sub>2</sub>S Contingency Plan and will keep this plan updated and posted at the wellsite during drilling operations.

All equipment that has the potential to be exposed to H<sub>2</sub>S will be suitable for H<sub>2</sub>S service.

**9. Anticipated starting date and duration of operations:**

Road and location construction will begin after the BLM and NMOCD have approved the APD and will take into account any closure stipulations that may be attached or specified in order to avoid operations in any closure period. Also, rig availability may impact our schedule. With consideration of these limiting factors, we would intend / plan to drill this well within two years after receiving approval of the APD.

**Attachments:**

- Attachment # 1.....Proposed Casing and Cementing Program
- Attachment # 2.....Diagram of Choke Manifold Equipment (Excerpted from 54 FR 39528, Sept 27, 1989)
- Attachment # 3.....BOP and Choke Manifold Schematic – 2M System (Figure 3-1, Appendix G, from BLM)
- Attachment # 4.....BOP and Choke Manifold Schematic – 2M System (Figure 3-1A, Appendix G, from BLM)

**Contact Information:**

Program prepared by:  
Steven O. Moore  
Staff Drilling Engineer, ConocoPhillips Company  
Phone (832) 486-2459  
Cell (281) 467-7596  
Date: June 28, 2011

**Proposed Casing & Cementing Program**

Datum: RKB (14' above ground level)

Conductor: 13-3/8" 48# H-40 casing  
or 16" x 1/2" wall Grade B Line Pipe  
Set 30' to 85' below ground level  
(44' to 99' MD RKB) in 20" hole  
and cemented to surface.

Surface Casing: 8-5/8" 24# J-55 ST&C  
set at least 25' into the Rustler formation  
and above the salt in 12-1/4" hole and  
cemented single-stage to surface..

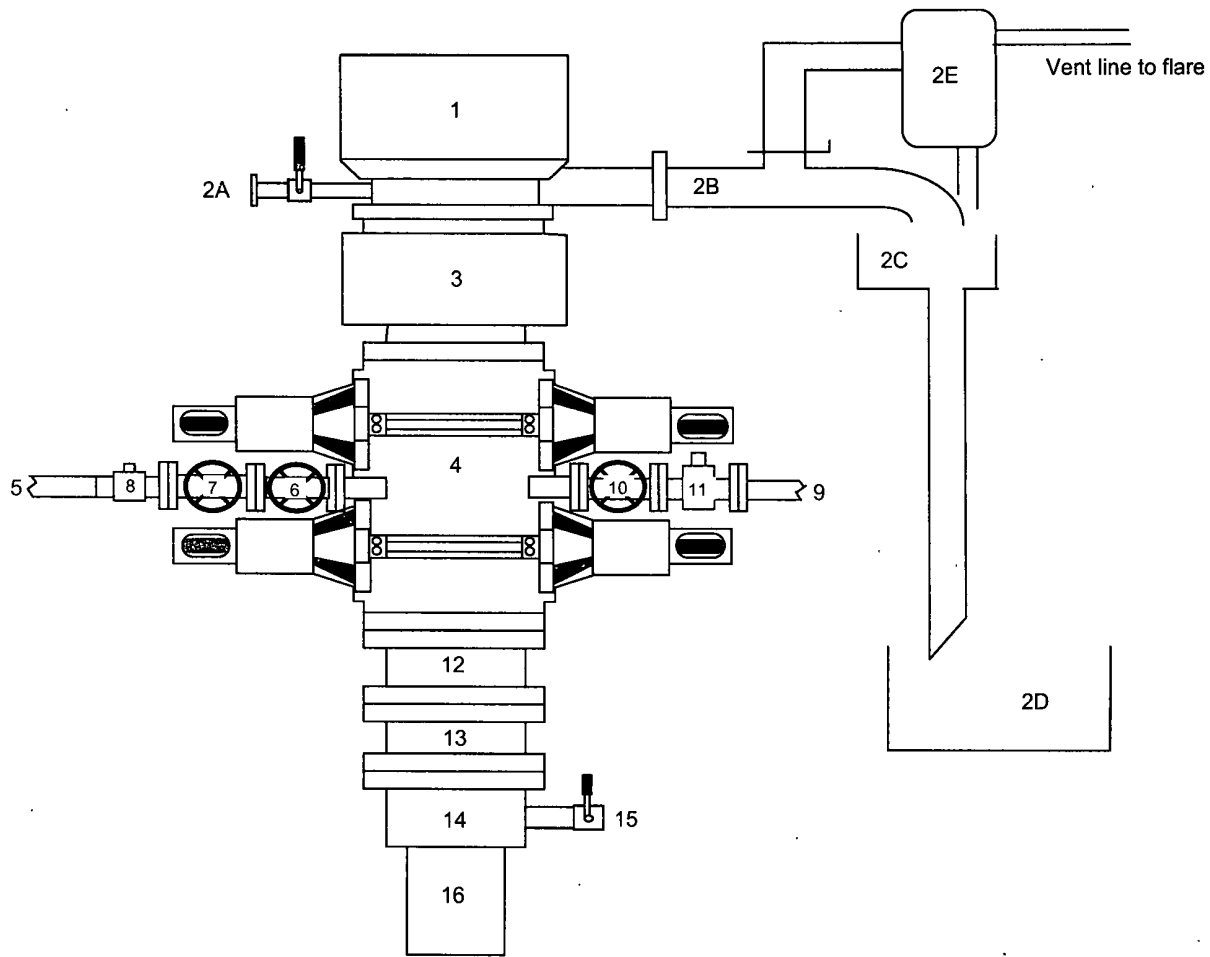
Cement Wiper Plug

Float Shoe, one joint of casing, and Float Collar

Schematic prepared by.  
Steven O. Moore, Staff Drilling Engineer  
28-June-2011

Production casing: 5-1/2" 17# L-80 LT&C  
set 10' above TD in 7-7/8" hole and  
cemented single -stage to surface

# BLOWOUT PREVENTER ARRANGEMENT



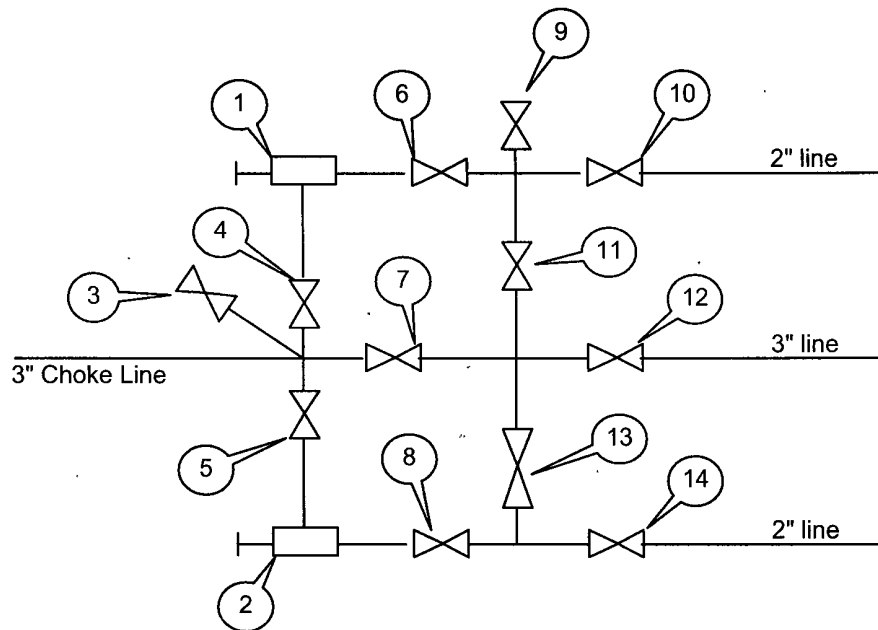
| Item | Description   |
|------|---|
| 1    | Rotating Head (11")   |
| 2A   | Fill up Line and Valve  |
| 2B   | Flow Line (8")  |
| 2C   | Shale Shakers and Solids Settling Tank  |
| 2D   | Cuttings Bins for Zero Discharge  |
| 2E   | Mud Gas Separator with vent line to flare and return line to mud system                 |
| 3    | Annular BOP (11", 3000 psi)   |
| 4    | Double Ram BOP (11", 3000 psi, with Blind Rams in Upper Set and Pipe Rams in Lower Set) |
| 5    | Kill Line (2" Flexible Hose, 3000 psi WP)   |
| 6    | Kill Line Valve, Inner (2-1/6" 3000 / 5000 psi WP)                                      |
| 7    | Kill Line Valve, Outer (2-1/16", 3000 / 5000 psi WP)                                    |
| 8    | Kill Line Check Valve (2-1/16", 3000 / 5000 psi WP)                                     |
| 9    | Choke Line (3" Steel Line, 3000 psi WP)   |
| 10   | Choke Line Valve, Inner (3-1/8", 3000 psi WP)   |
| 11   | Choke Line Valve, Outer, (Hydraulically operated, 3-1/8", 3000 psi WP)                  |
| 12   | Spacer Spool (11" 3M x 3M)  |
| 13   | Spacer Spool (11" 3M x 5M)  |
| 14   | Casing Head (11" 5M)  |
| 15   | Ball Valve and Threaded Nipple on Casing Head Outlet, 2" 5M                             |
| 16   | Surface Casing  |

Drawn by: Steven O. Moore, Chief Drilling Engineer, Mid-Continent Business Unit, ConocoPhillips Company, 12-July-2011

15% 0.000000



# CHOKE MANIFOLD ARRANGEMENT



| Item | Description                          |
|------|--------------------------------------|
| 1    | Manual Adjustable Choke, 2-1/16", 5M |
| 2    | Manual Adjustable Choke, 2-1/16", 5M |
| 3    | Gate Valve, 2-1/16" 5M               |
| 4    | Gate Valve, 2-1/16" 5M               |
| 5    | Gate Valve, 2-1/16" 5M               |
| 6    | Gate Valve, 2-1/16" 5M               |
| 7    | Gate Valve, 3-1/8" 3M                |
| 8    | Gate Valve, 2-1/16" 5M               |
| 9    | Gate Valve, 2-1/16" 5M               |
| 10   | Gate Valve, 2-1/16" 5M               |
| 11   | Gate Valve, 2-1/16" 5M               |
| 12   | Gate Valve, 3-1/8" 3M                |
| 13   | Gate Valve, 2-1/16" 5M               |
| 14   | Gate Valve, 2-1/16" 5M               |

Drawn by:

Steven O. Moore

Chief Drilling Engineer, Mid-Continent Business Unit, ConocoPhillips Company

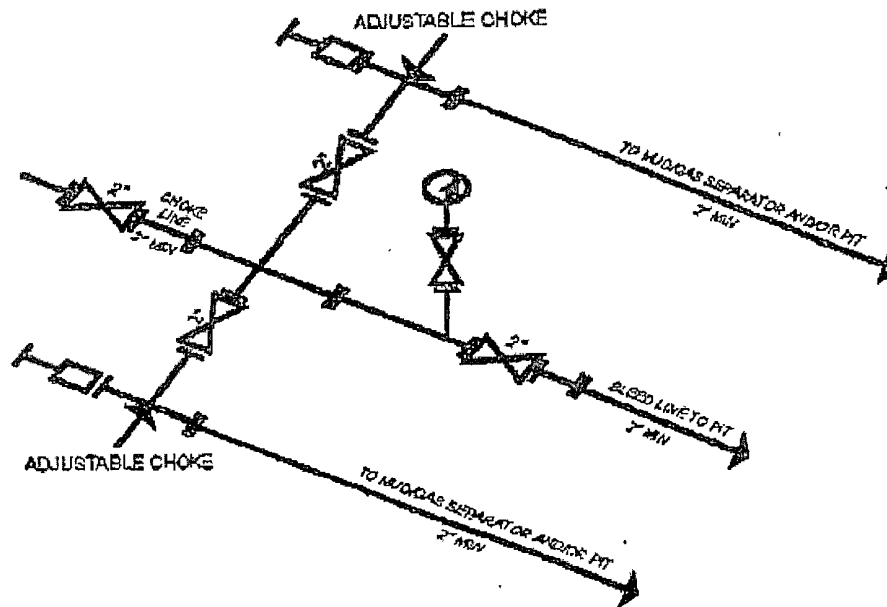
Date: 12-July-2011

REVISIONS DUE TO CHANGE  
DATE: 07/12/11

DATE: 07/12/11  
BY: bndshof

Attachment # 2

Attachment I. Diagrams of Choke Manifold Equipment



2M CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

### 2000 psi System

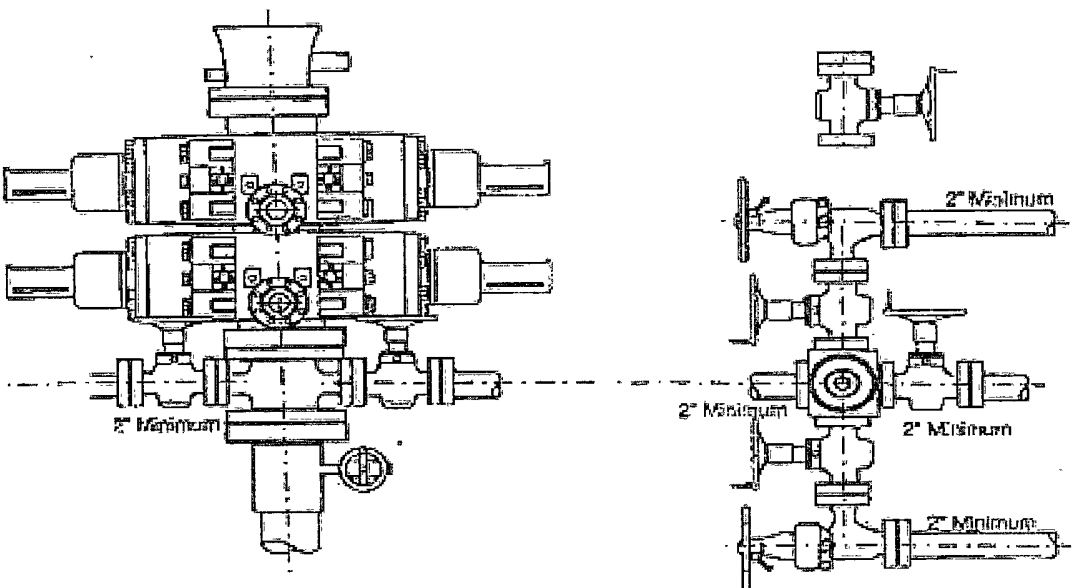


Figure 3-1

Appendix G

## 2000 psi System

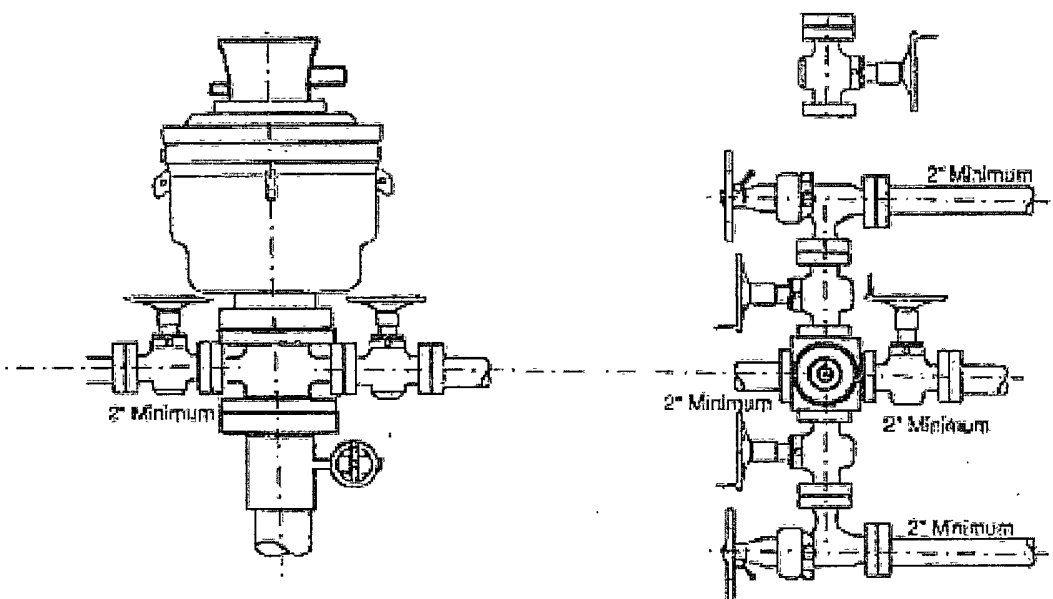


Figure 3-1A

Appendix G