

# Split Estate

ATB 11-504

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD HOBBS  
HOBBS OCD

DEC 12 2011

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

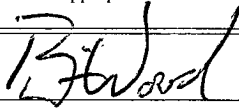
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1a. Type of work: <input type="checkbox"/> DRILL <input checked="" type="checkbox"/> REENTER NOS REV 3/7/11		5. Lease Serial No. NMNM-012612
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input checked="" type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name N/A
2. Name of Operator RESACA OPERATING COMPANY		7. If Unit or CA Agreement, Name and No. COOPER JAL NMNM-070926X
3a. Address 1331 LAMAR, SUITE 1450 HOUSTON, TX 77010-3039		8. Lease Name and Well No. <b>306443</b> COOPER JAL UNIT 147
3b. Phone No. (include area code) 713 650-1246		9. API Well No. 30-025-11166
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 2313' FNL & 326' FWL At proposed prod zone SAME		10. Field and Pool, or Exploratory JALMAT TY7RO & LANGLEIE M7RQG
11. Sec., T. R. M. or Blk. and Survey or Area Lot 2 (≈ SWNW) 19-24S-37E NMPM		11. Sec., T. R. M. or Blk. and Survey or Area Lot 2 (≈ SWNW) 19-24S-37E NMPM
14. Distance in miles and direction from nearest town or post office* 5 AIR MILES NORTH OF JAL, NM		12. County or Parish LEA
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. unit line, if any) 326'		13. State NM
16. No. of acres in lease 312.45		17. Spacing Unit dedicated to this well Lot 2 (≈ SWNW) 38.10 acres
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 663' (Cooper Jal 128)		20. BLM/BIA Bond No. on file NM B005247
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3,294.4' UNGRADED		22. Approximate date work will start* 08/15/2011
		23. Estimated duration 1 WEEK

24. Attachments

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

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature 	Name (Printed/Typed) BRIAN WOOD (505 466-8120)	Date 07/25/2011
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Title  
CONSULTANT (FAX 505 466-9682)

Approved by (Signature) /s/ James Stovall	Name (Printed/Typed) JAMES STOVALL	DEC 06 2011
Title FIELD MANAGER	Office 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)

Ka  
12/13/11

## Oil Conservation Division

Conditions of approval : Approval for drilling/workover ONLY--- CANNOT produce Downhole Commingled until DHC is approved in Santa Fe.

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

Approval Subject to General Requirements  
& Special Stipulations Attached

DEC 13 2011

## RE-ENTRY PROGNOSIS

HOBBS OCD

DEC 12 2011

Resaca Operating Co.  
**Cooper Jal Unit #147**  
API No. 30-025-11166  
2,310' FNL, 330' FWL  
Section 19, T-24S, R-37E  
Lea Co., New Mexico

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### DESCRIPTION OF OPERATION

Resaca proposes to re-enter and deepen subject well which was drilled in 1950 and plugged in 2001 as part of an effort to re-develop certain acreage within the Cooper Jal Unit, an existing Secondary Recovery project. The Unitized Interval includes both the Jalmat and the Langlie Mattix pools. Subject well will be commingled as to these intervals, and utilized as a producing well. Commingling authority will be obtained prior to production.

#### 1) SURFACE DESCRIPTION

The surface is a mildly undulating dunal plain consisting of Quaternary alluvium sediments. Vegetation is sparse, and includes snakeweed, shinoak, yucca cactus, assorted grasses and, on a more limited basis, other flora. The ground elevation at the wellsite is 3,298' above sea level.

#### 2) FORMATION TOPS

Formation	Estimated Top - MD (ft)	Lithology	Fluid Content
Alluvium	0	Sand, Caliche	Fresh Water
Ogalalla	150	Red Beds	None
Rustler	1,150	Anhydrite	None
Salado	1,255	Salt	None
Tansill	2,900	Anhydrite, Dolomite	None
Yates	3,004	Sandstone, Dolomite	Oil
Seven Rivers	3,225	Sandstone, Dolomite	Oil
Queen	3,635	Sandstone, Dolomite	Oil

The surface casing previously set and cemented in this well isolates and thereby protects the fresh water interval. The production liner previously set and cemented in this well isolates various productive intervals. It is not anticipated that any additional casing or remedial cementing will be required. The deepened portion of the well will extend the existing open-hole interval.

The Jalmat Pool is defined, in this area, as the interval from the top of the Tansill formation to a point 250' above the base of the Seven Rivers formation, thereby including all of the Yates formation. The top of the Tansill formation is at a depth of 2,900' in subject well.

The Langlie Mattix Pool is defined as the interval from 100' above the base of the Seven Rivers formation to the base of the Queen formation. The base of the Queen formation is estimated from offset well logs to be below the proposed total depth of subject well.

### 3) WELL CONTROL EQUIPMENT

A 2M system (as defined by BLM Onshore Oil and Gas Order No. 2), including a 3,000 PSI dual ram BOP dressed with 2-3/8" pipe rams and blind rams and choke manifold will be utilized throughout the proposed operations. The configuration and components of the BOP stack are set forth on Exhibit A, attached hereto. The configuration and components of the choke manifold are set forth on Exhibit B, attached hereto. The serial number and a copy of the test certificate for the rubber hose which will connect the BOP stack to the choke manifold will be provided by sundry notice prior to commencement of operations.

*See COAX* *Approval For Flex hose will Not be Approved with APD, but only with A Sundry*

All blowout prevention equipment will meet the minimum standards outlined in BLM Onshore Oil and Gas Order 2. A schematic indicating the routing to the choke manifold and the closed loop system is attached hereto as Exhibit C. A safety valve and crossovers to facilitate make-up to each workstring component will be kept on or near the rig floor.

The blowout preventers and choke manifold will be tested in accordance with the provisions of BLM Onshore Oil and Gas Order 2 upon installation. Pipe rams will be function tested once each 24-hour period, and blind rams will be function tested each time the workstring is out of the hole.

### 4) WELL CONSTRUCTION

Surface and production casing were set and cemented when the well was drilled in 1950. A 3,000 psi socket weld wellhead will be installed on the 9-5/8" surface casing, and a 3,000 psi socket weld tubing head will be installed on the 7" production casing.

Existing casing is as follows:

Hole Size (in)	Setting Depth (ft)	Outer Diameter (in)	Weight (ppf)	Grade	Threads
10.750	267	9.625	32	Unknown	Unknown
8.750	2,975	7.000	20	Unknown	Unknown
6.000	3,485	4.500	9.5	Unknown	Unknown

A casing design audit has been conducted as follows:

- Maximum collapse loading was assumed to occur at the bottom of each casing string. An external pressure equivalent to that which would be exerted by a column of 10 ppg brine water (0.520 psi/ft), and an internal pressure of 0 psi were assumed.

- Maximum burst loading was assumed to occur at the top of each casing string. An internal pressure equivalent to that which would be exerted at setting depth by a column of 10 ppg brine water (0.520 psi/ft), and an external pressure of 0 psi were assumed.
- Tensile loading was not evaluated as both casing strings have been run and are cemented in place.
- To the extent the casing grade is unknown, the lowest applicable API grade was assumed.

Based upon these evaluation criteria, the surface casing was determined to have a collapse safety factor of 10.07 and a burst safety factor of 16.39, and the production casing was determined to have a collapse safety factor of 1.28 and a burst safety factor of 1.76. The production liner was determined to have a collapse safety factor of 1.53 and a burst safety factor of 1.76.

The surface casing was cemented with 75 sacks of cement of unknown composition and yield. Available well records do not document circulation of the cement to surface; however, the calculated cement top, based on an assumed yield of 1.18 ft<sup>3</sup>/sk (neat Class A) and hole enlargement factor of 20 percent, is at the surface.

The production casing was cemented with 400 sacks of cement of unknown composition and yield. Available well records do not document the top of cement; however, the calculated cement top, based on an assumed yield of 1.18 ft<sup>3</sup>/sk (neat Class A) and hole enlargement factor of 20 percent, is at 463'. It is noted that the actual cement top is obviously below 300', as during plugging operations, the production casing was perforated at 300', and cement was circulated to the surface through the annulus.

The production liner was cemented with 400 sacks of cement of unknown composition and yield. Cement was circulated above the liner top.

## **5) WORKING FLUID**

Working fluid will be fresh water with 2% KCl, with a density of 8.4 ppg. Gelled sweeps and lost circulation material will be utilized as necessary. Working volume will be approximately 500 barrels. Given the low anticipated bottom-hole pressure, use of weighting materials is not anticipated, and no circulating system monitoring equipment will be utilized.

## **6) LOGGING, CORING AND TESTING**

No mud-logging, coring, or testing are anticipated. The Unitized Interval will be logged in whole or part. Specific logs to be run have not yet been determined.

## **7) ANTICIPATED PRESSURES AND DRILLING HAZARDS**

All formations above the Unitized Interval are cased off. The previous producing intervals, as well as the interval through which the well will be deepened, are believed to be partially pressure depleted due to production from the Unit and surrounding wells.

Based on a static fluid level survey conducted in June 2009 in an offset well (the Cooper Jal #406), reservoir pressure was 348 psi at a depth of 3,626'. Since that time, increased injection rates have been sustained, and reservoir pressure is likely to have risen; however, it is anticipated that the working fluid will create an overbalanced condition, and lost circulation may occur.

Hydrogen Sulfide may be present in the Yates and Seven Rivers. H<sub>2</sub>S equipment will be operational prior to drilling out any cement plugs, and all operations will be conducted in accordance with BLM Onshore Oil and Gas Order 6. An H<sub>2</sub>S plan is attached.

#### GENERAL PROCEDURE

- 1) Remove dry hole marker. Dress casing as necessary. Install 3,000 psi socket weld wellhead on 9-5/8" casing. Install 3,000 psi socket weld tubing head on 7" casing. Install 3,000 psi drilling flange.
- 2) MIRU pulling unit and reverse unit. Closed loop system to be utilized. Install H<sub>2</sub>S equipment.

- 3) N/U and test 2M BOP system as depicted on Exhibits A and B.

- 4) P/U 6-1/4" bit on 2-3/8" production tubing (BHA design to be determined), and drill out:

- a. Cement plug surface – 300' +/-
- b. Cement plug 995' – 1,200 +/- (previously tagged)

- \* Tag top of liner @ 2,916'. Circulate well clean. POOH & L/D 6-1/4" bit.

- 5) P/U 3-7/8" bit on 2-3/8" production tubing (BHA design to be determined), and drill out:

- a. Cement plug 2,545' – 2,950' (previously tagged)
- b. CIBP @ 2,950'.

- 6) Clean out well to 3,572' (current TD). Drill new hole to 3,730'. Circulate well clean and POOH and L/D 3-7/8" bit.

- 7) Log per supplemental procedure.

- 8) P/U 4-1/2" tension packer and RIH to 2,950'. Set packer @ 2,950' and test casing to 500 psi. If leaks occur, isolate and repair per supplemental procedure. POOH and L/D packer.

- 9) Frac well and flow back per supplemental procedure.

- 10) P/U 4-1/2" TAC and RIH w/ 2-3/8" production tubing. Space out and set TAC per supplemental procedure. Land tubing.

- 11) N/D BOPs. N/U pumping tee.

See  
COA

See  
COA

RUN CIT

See COA  
For CIT

See Email From Bob Porter

See  
COA

12) N/U rod stripper. P/U & RIH w/ downhole pump and rods (design to be determined). Seat pump.  
Hang off rods. N/D rod stripper and pack off rods.

13) RDMO pulling unit and other equipment.

# CURRENT WELLBORE SCHEMATIC

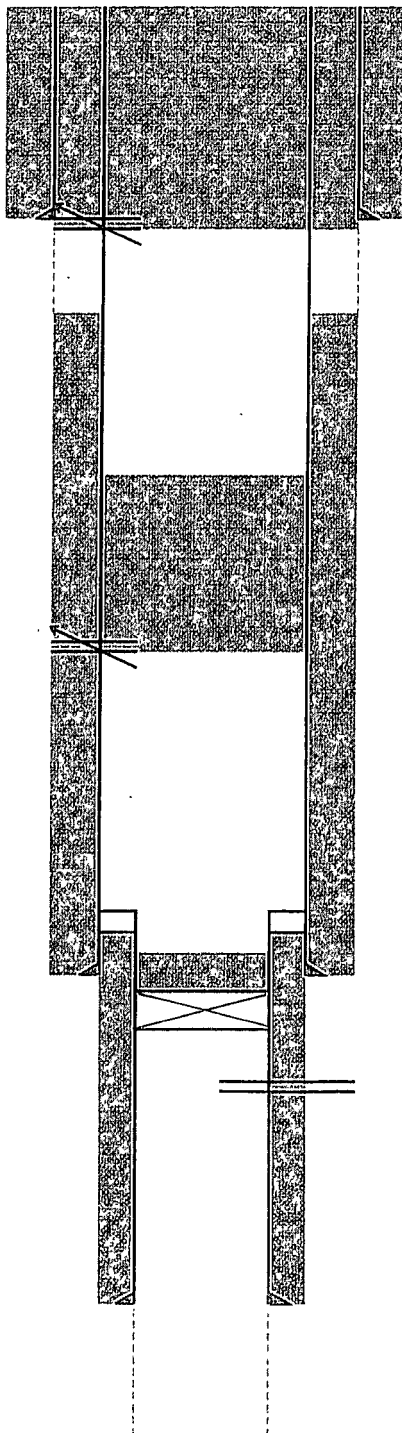
Operator Resaca Operating Co  
Well Name. Cooper Jal #147  
Well Location. 2310' FNL, 330' FWL  
Calls Unit E  
Section 19  
Township 24S  
Range 37E

perf sqz holes @ 300'  
sqz 120 sx cmt; circulated to surface

csg leak 649' - 680'  
sqz 500 sx cmt

perf sqz holes @ 1200'  
sqz 50 sx cmt  
TOC tagged inside 7" @ 995'

CIBP @ 2950 w/ 75' cmt  
TOC tagged @ 2545'



## Surface Casing

Hole Size (in). 10 3/4  
Casing Size (in). 9 5/8  
Casing Weight (ppf). 32  
Setting Depth (ft). 267  
Amount Cement (sx). 75  
Top of Cement (ft). 0  
TOC Method. Calculated

## Production Casing

Hole Size (in). 8 3/4  
Casing Size (in). 7  
Casing Weight (ppf). 20  
Setting Depth (ft). 2975  
Amount Cement (sx). 400  
Top of Cement (ft). 463  
TOC Method. Calculated

## Perforations

Top (ft). 3006  
Bottom (ft). 3468

## Liner

Casing Size (in). 4 1/2  
Casing Weight (ppf). 9 5  
Liner Top (ft). 2916  
Liner Bottom (ft). 3485  
Amount Cement (sx). 280  
Top of Cement (ft). 2916  
TOC Method. Circulated

## Open Hole

Hole Size (in). 3 7/8  
Top (ft). 3485  
Bottom (ft). 3576

Total Depth (ft). 3576

Proposed TD- 3730'

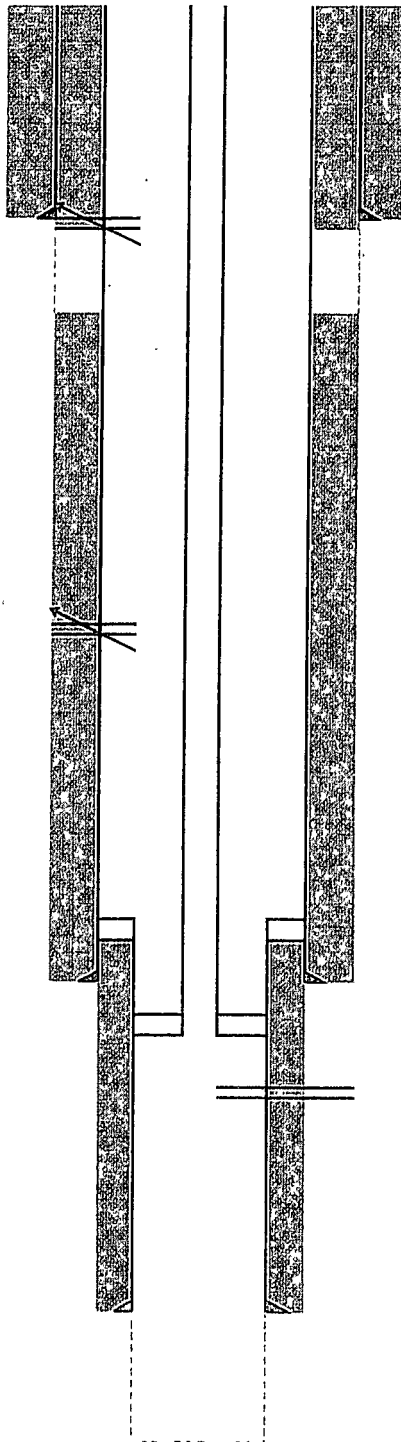
# PROPOSED WELLBORE SCHEMATIC

Operator: Resaca Operating Co  
 Well Name: Cooper Jal #147  
 Well Location: 2310' FNL, 330' FWL  
 Calls: E.  
 Unit: 19  
 Section: 24S  
 Township: 37E  
 Range:

perf sqz holes @ 300'  
 sqz 120 sx cmt, circulated to surface

csg leak 649' - 680'  
 sqz 500 sx cmt

perf sqz holes @ 1200'  
 sqz 50 sx cmt



Total Depth (ft): 3730

## Surface Casing

Hole Size (in): 10 3/4  
 Casing Size (in): 9 5/8  
 Casing Weight (ppf): 32  
 Setting Depth (ft): 267  
 Amount Cement (sx): 75  
 Top of Cement (ft): 0  
 TOC Method: Calculated

## Production Tubing

Tubing Size (in): 2 3/8  
 Tubing Weight (ppf): 4 7  
 TAC Depth (ft): 3000  
 Setting Depth (ft): 3000

## Production Casing

Hole Size (in): 8 3/4  
 Casing Size (in): 7  
 Casing Weight (ppf): 20  
 Setting Depth (ft): 2975  
 Amount Cement (sx): 400  
 Top of Cement (ft): 463  
 TOC Method: Calculated

## Perforations

Top (ft): 3006  
 Bottom (ft): 3468

## Liner

Casing Size (in): 4 1/2  
 Casing Weight (ppf): 9.5  
 Liner Top (ft): 2916  
 Liner Bottom (ft): 3485  
 Amount Cement (sx): 280  
 Top of Cement (ft): 2916  
 TOC Method: Calculated

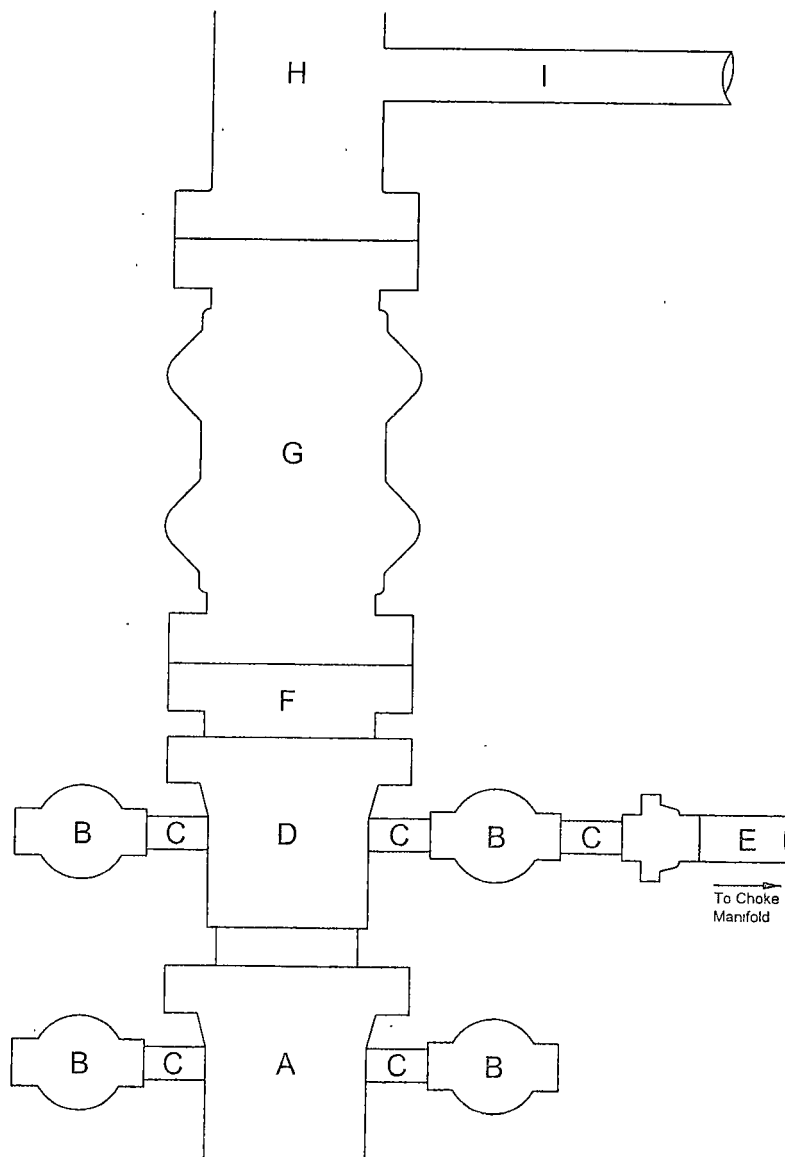
## Open Hole

Hole Size (in): 3 7/8  
 Top (ft): 3485  
 Bottom (ft): 3730

## EXHIBIT A:

### 2M BOP STACK CONFIGURATION - CJU #147

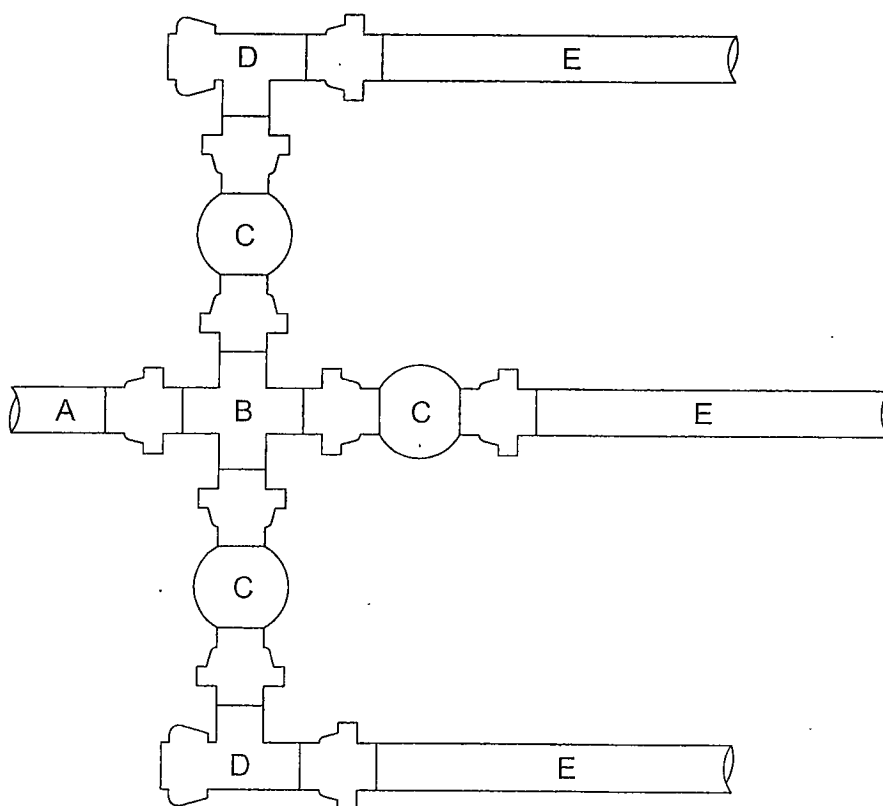
- A. 9  $\frac{5}{8}$ " SW x 11  $\frac{3}{4}$ " 3000 PSI WP Casing Mandrel w/ Threaded Outlets
- B. 2  $\frac{1}{16}$ " 3000 PSI WP Ball Valve
- C. 2" Schedule 80 Nipple
- D. 7" SW x 8  $\frac{5}{8}$ " 3000 PSI WP Tubing Head w/ Threaded Outlets
- E. 2" 2500 PSI WP Rubber Hose
- F. 8  $\frac{5}{8}$ " x 7  $\frac{1}{16}$ " 3000 PSI WP Drilling Flange
- G. 7  $\frac{1}{16}$ " 3000 PSI WP Type "U" Double Ram Type BOP w/ Blind Rams & 2  $\frac{3}{8}$ " Pipe Rams
- H. Bell Nipple
- I. Fill-Up Line



## EXHIBIT B:

### 2M CHOKE MANIFOLD CONFIGURATION

- A. 2" 2500 PSI WP Rubber Hose
- B. 2 1/16" 3000 PSI WP Cross
- C. 2 1/16" 3000 PSI WP Ball Valve
- D. 2 1/16" 3000 PSI WP Manual Choke
- E. 2" Schedule 80 Line Pipe



Note: All connections are hammer unions.