# COG Operating, LLC - Stove Pipe Fed Com #1H

## 1. Geologic Formations

| | | | |
|---|---|---|---|
| TVD of target | 12,514' EOL | Pilot hole depth | NA |
| MD at TD: | 22,300' | Deepest expected fresh water: | 230' |

| Formation | Depth (TVD) from KB | Water/Mineral Bearing/ Target Zone? | Hazards* |
|---|---|---|---|
| Quaternary Fill | Surface | Water | |
| Rustler | 831 | Water | |
| Top of Salt | 1273 | Salt | |
| Base of Salt | 5126 | Salt | |
| Lamar | 5440 | Salt Water | |
| Bell Canyon | 5481 | Salt Water | |
| Cherry Canyon | 6445 | Oil/Gas | |
| Brushy Canyon | 8045 | Oil/Gas | |
| Bone Spring Lime | 9315 | Oil/Gas | |
| U. Avalon Shale | 9360 | Oil/Gas | |
| L. Avalon Shale | 9565 | Oil/Gas | |
| 1st Bone Spring Sand | 10572 | Oil/Gas | |
| 2nd Bone Spring Sand | 11104 | Oil/Gas | |
| 3rd Bone Spring Sand | 12107 | Oil/Gas | |
| Wolfcamp | 12559 | Oil/Gas | |

## 2. Casing Program

| Hole Size | Casing Interval From | Casing Interval To | Csg. Size | Weight (lbs) | Grade | Conn. | SF Collapse | SF Burst | SF Body |
|---|---|---|---|---|---|---|---|---|---|
| 17.5" | 0 | 860 | 13.375" | 68 | J55 | STC | 4.96 | 0.79 | 11.54 |
| 12.25" | 0 | 11,939 | 9.625" | 47 | L80 | BTC | 1.27 | 1.23 | 1.94 |
| 8.5" | 0 | 22,300 | 5.5" | 23 | P110 | BTC | 2.13 | 2.26 | 2.53 |
| | | | BLM Minimum Safety Factor | | | | 1.125 | 1 | 1.6 Dry<br>1.8 Wet |

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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| | Y or N |
|---|---|
| Is casing new? If used, attach certification as required in Onshore Order #1 | Y |
| Does casing meet API specifications? If no, attach casing specification sheet. | Y |
| Is premium or uncommon casing planned? If yes attach casing specification sheet. | N |
| Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria). | Y |
| Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing? | Y |
| | |
| Is well located within Capitan Reef? | N |
| If yes, does production casing cement tie back a minimum of 50' above the Reef? | |
| Is well within the designated 4 string boundary? | |
| | |
| Is well located in SOPA but not in R-111-P? | N |
| If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing? | |
| | |
| Is well located in R-111-P and SOPA? | N |
| If yes, are the first three strings cemented to surface? | |
| Is 2nd string set 100' to 600' below the base of salt? | |
| | |
| Is well located in high Cave/Karst? | N |
| If yes, are there two strings cemented to surface? | |
| (For 2 string wells) If yes, is there a contingency casing if lost circulation occurs? | |
| | |
| Is well located in critical Cave/Karst? | N |
| If yes, are there three strings cemented to surface? | |

### 3. Cementing Program

| Casing | # Sks | Wt. lb/ gal | Yld ft3/ sack | $H_20$ gal/sk | 500# Comp. Strength (hours) | Slurry Description |
|---|---|---|---|---|---|---|
| Surf. | 330 | 13.5 | 1.75 | 9 | 12 | Lead: Class C + 4% Gel + 1% CaCl2 |
| | 250 | 14.8 | 1.34 | 6.34 | 8 | Tail: Class C + 2% CaCl2 |
| Inter. | 2600 | 12.7 | 2.0 | 9.6 | 16 | Lead: 35:65:6 C Blend |
| | 250 | 14.8 | 1.34 | 6.34 | 8 | Tail: Class C + 2% CaCl |
| 5.5 Prod | 120 | 11.9 | 2.5 | 19 | 72 | Lead: 50:50:10 H Blend |
| | 2720 | 14.4 | 1.24 | 5.7 | 19 | Tail: 50:50:2 Class H Blend |

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

| Casing String | TOC | % Excess |
|---|---|---|
| Surface | 0' | 50% |
| 1st Intermediate | 0' | 50% |
| Production | 11,439' | 30% OH in Lateral (KOP to EOL) – 40% OH in Vertical |

## 4. Pressure Control Equipment

| | |
|---|---|
| N | A variance is requested for the use of a diverter on the surface casing. See attached for schematic. |

SEE COA

| BOP installed and tested before drilling which hole? | Size? | Min. Required WP | Type | x | Tested to: |
|---|---|---|---|---|---|
| 12-1/4" | 13-5/8" | ~~2M~~ 5M | Annular | x | ~~2000~~ psi |
| | | | Blind Ram | X | 2500 |
| | | | Pipe Ram | X | |
| | | | Double Ram | | ~~2M~~ 5M |
| | | | Other* | | |
| 8-3/4" | 13-5/8" | 5M | Annular | x | 50% testing pressure |
| | | | Blind Ram | x | 5M |
| | | | Pipe Ram | x | |
| | | | Double Ram | | |
| | | | Other* | | |

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

| | | |
|---|---|---|
| SEE COA | X | Formation integrity test will be performed per Onshore Order #2.<br>On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i. |
| SEE COA | Y | A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart. |
| | N | Are anchors required by manufacturer? |
| | N | A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. |

**4. Pressure Control Equipment**

| | |
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| N | A variance is requested for the use of a diverter on the surface casing. See attached for schematic. |

| BOP installed and tested before drilling which hole? | Size? | Min. Required WP | Type | x | Tested to: |
|---|---|---|---|---|---|
| 12-1/4" | 13-5/8" | 2M | Annular | x | 2000 psi |
| | | | Blind Ram | | 2M |
| | | | Pipe Ram | | |
| | | | Double Ram | | |
| | | | Other* | | |
| 8-3/4" | 13-5/8" | 5M | Annular | x | 50% testing pressure |
| | | | Blind Ram | x | 5M |
| | | | Pipe Ram | x | |
| | | | Double Ram | | |
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## 5. Mud Program

| Depth | | Type | Weight (ppg) | Viscosity | Water Loss |
|---|---|---|---|---|---|
| From | To | | | | |
| 0 | Surf. Shoe | FW Gel | 8.6 - 8.8 | 28-34 | N/C |
| Surf csg | 9-5/8" Int shoe | Brine Diesel Emulsion | 8.4 - 9 | 28-34 | N/C |
| 9-5/8" Int shoe | Lateral TD | OBM | 9.6 - 10.5 | 35-45 | <20 |

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

| | |
|---|---|
| What will be used to monitor the loss or gain of fluid? | PVT/Pason/Visual Monitoring |

## 6. Logging and Testing Procedures

| Logging, Coring and Testing. | |
|---|---|
| Y | Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM. |
| Y | No Logs are planned based on well control or offset log information. |
| N | Drill stem test? If yes, explain. |
| N | Coring? If yes, explain. |

| Additional logs planned | | Interval |
|---|---|---|
| N | Resistivity | Pilot Hole TD to ICP |
| N | Density | Pilot Hole TD to ICP |
| Y | CBL | Production casing (If cement not circulated to surface) |
| Y | Mud log | Intermediate shoe to TD |
| N | PEX | |

**7. Drilling Conditions**

| Condition | Specify what type and where? |
|---|---|
| BH Pressure at deepest TVD | 6835 psi at 12514' TVD |
| Abnormal Temperature | NO 180 Deg. F. |

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

| Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM. | |
|---|---|
| N | H2S is present |
| Y | H2S Plan attached |

**8. Other Facets of Operation**

| | |
|---|---|
| Y | Is it a walking operation? |
| N | Is casing pre-set? |

| | |
|---|---|
| x | H2S Plan. |
| x | BOP & Choke Schematics. |
| x | Directional Plan |

Midwest Hose
& Specialty, Inc.

# Internal Hydrostatic Test Certificate

| General Information | | Hose Specifications | |
|---|---|---|---|
| Customer | Odessa | Hose Assembly Type | Choke & Kill |
| MWH Sales Representative | Charles Ash | Certification | API 7K/FSL LEVEL2 |
| Date Assembled | 11/11/2016 | Hose Grade | Mud |
| Location Assembled | OKC | Hose Working Pressure | 100000 |
| Sales Order # | 308747 | Hose Lot # and Date Code | 12354-09/15 |
| Customer Purchase Order # | 345144 | Hose I.D. (Inches) | 3.5" |
| Assembly Serial # (Pick Ticket #) | 371501 | Hose O.D. (Inches) | 5.87" |
| Hose Assembly Length | 35 Feet | Armor (yes/no) | No |

| Fittings | | | |
|---|---|---|---|
| End A | | End B | |
| Stem (Part and Revision #) | R3.5X64WB | Stem (Part and Revision #) | R3.5X64WB |
| Stem (Heat #) | A112669 | Stem (Heat #) | A112669 |
| Ferrule (Part and Revision #) | RF3.5X5750 | Ferrule (Part and Revision #) | RF3.5X5750 |
| Ferrule (Heat #) | 41632 | Ferrule (Heat #) | 41632 |
| Connection . Flange Hammer Union Part | 4-1/16 10K | Connection (Part #) | 4-1/16 10K |
| Connection (Heat #) | | Connection (Heat #) | |
| Nut (Part #) | | Nut (Part #) | |
| Nut (Heat #) | | Nut (Heat #) | |
| Dies Used | 5.80" | Dies Used | 5.80" |

| Hydrostatic Test Requirements | | |
|---|---|---|
| Test Pressure (psi) | 15,000 | Hose assembly was tested with ambient water temperature. |
| Test Pressure Hold Time (minutes) | 24 1/2 | |

| Date Tested | Tested By | Approved By |
|---|---|---|
| 11/11/2016 | Richard Dair | Charles Ash |

Midwest Hose
& Specialty, Inc.

## Certificate of Conformity

| | |
|---|---|
| *Customer:* **Odessa** | *Customer P.O.#* **345144** |
| *Sales Order #* **308747** | *Date Assembled:* **11/11/2016** |

## Specifications

| | | | |
|---|---|---|---|
| *Hose Assembly Type:* | **Choke & Kill** | *Rig #* | **N/A** |
| *Assembly Serial #* | **371501** | *Hose Lot # and Date Code* | **12354-09/15** |
| *Hose Working Pressure (psi)* | **100000** | *Test Pressure (psi)* | **15000** |
| *Hose Assembly Description:* | **CK56-SS-10K-6410K-6410K-35.00' FT-W/LIFTERS** | | |

*We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.*

*Supplier:*
***Midwest Hose & Specialty, Inc.***
***3312 S I-35 Service Rd***
***Oklahoma City, OK 73129***

*Comments:*

| *Approved By* | *Date* |
|---|---|
| Candice Ash | 11/11/2016 |

Midwest Hose & Specialty, Inc.

# Internal Hydrostatic Test Graph

November 11, 2016

**Customer:** Odessa

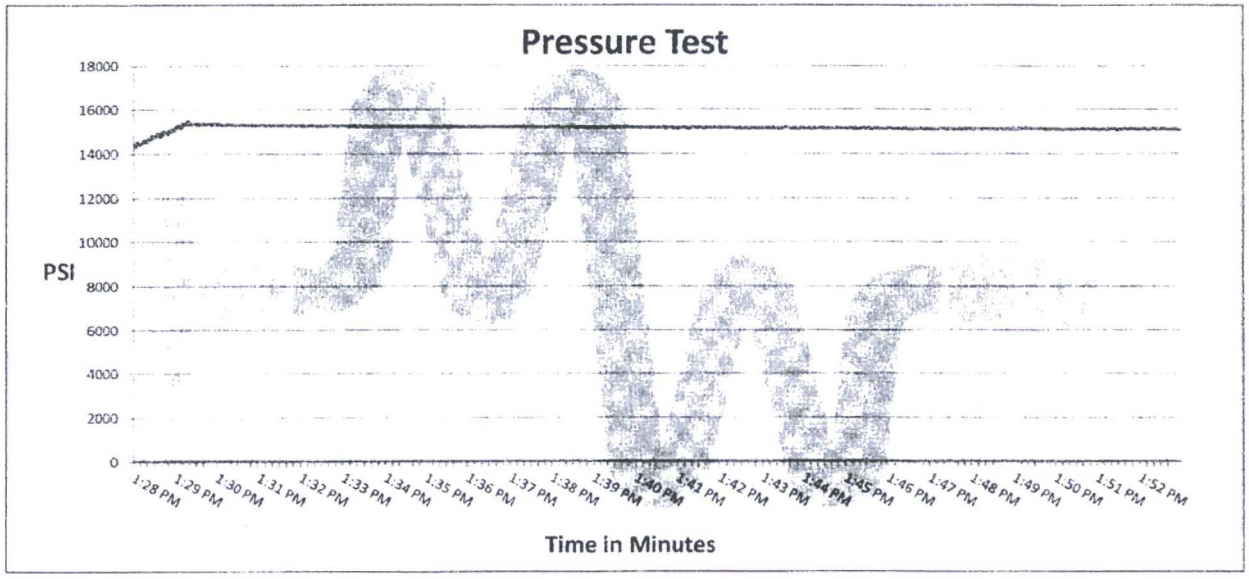
**Pick Ticket #:** 371501

## Hose Specifications

| Hose Type | Length |
|---|---|
| Ck | 35' |
| **I.D.** | **O.D.** |
| 3.5"" | 5.30" |
| **Working Pressure** | **Burst Pressure** |
| 10000 PSI | Standard Safety Multiplier Applies |

## Verification

| Type of Fitting | Coupling Method |
|---|---|
| 4 1/16 10K | Swage |
| **Die Size** | **Final O.D.** |
| 5.80" | 5.83" |
| **Hose Serial #** | **Hose Assembly Serial #** |
| 12354 | 371501 |




| Test Pressure | Time Held at Test Pressure | Actual Burst Pressure | Peak Pressure |
|---|---|---|---|
| 15000 PSI | 24 2/4 Minutes | | 15512 PSI |

**Comments:** Hose assembly pressure tested with water at ambient temperature.

**Tested By:** *Richard Davis*

x

**Approved By:** *Charles Ash*

x

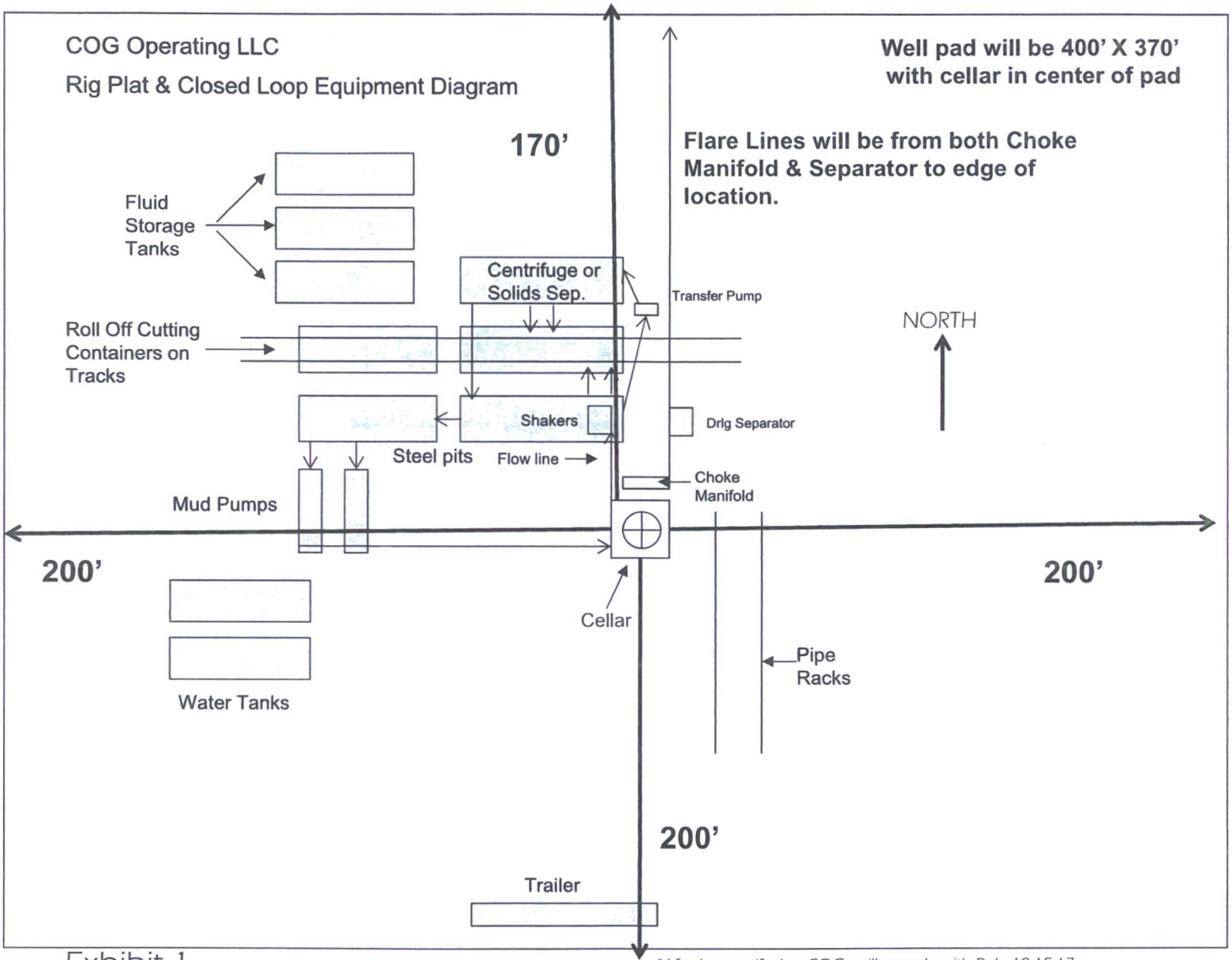



Exhibit 1

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

*Surface Use Plan*
*COG Operating LLC*
*Stove Pipe Federal Com #1H*
*SHL: 420' FNL & 515' FEL UL A*
*Section 6, T25S, R35E*
*BHL: 200' FSL & 660' FEL UL H*
*Section 7, T25S, R35E*
*Lea County, New Mexico*

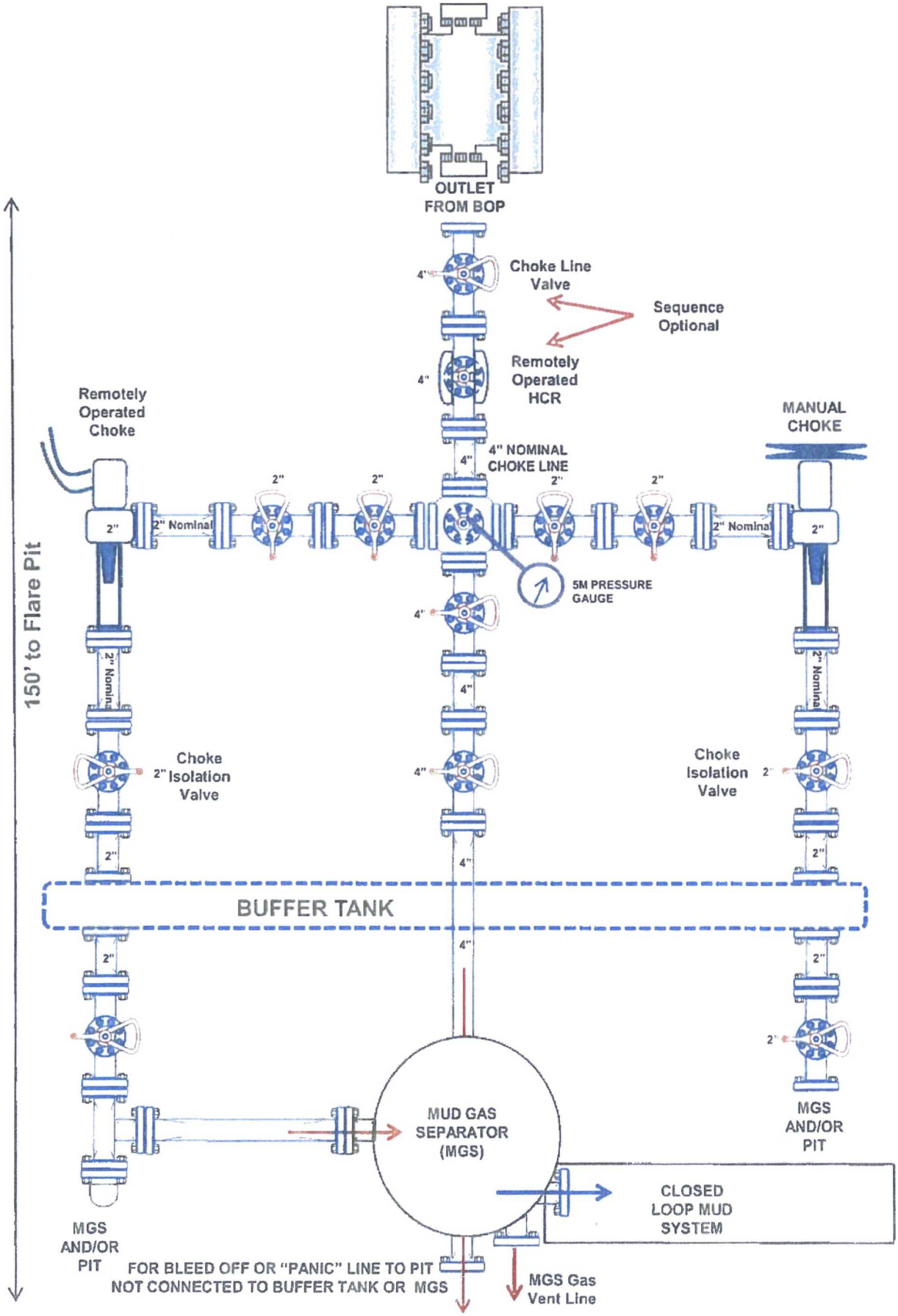
## OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this _____ day of _____, 2017.

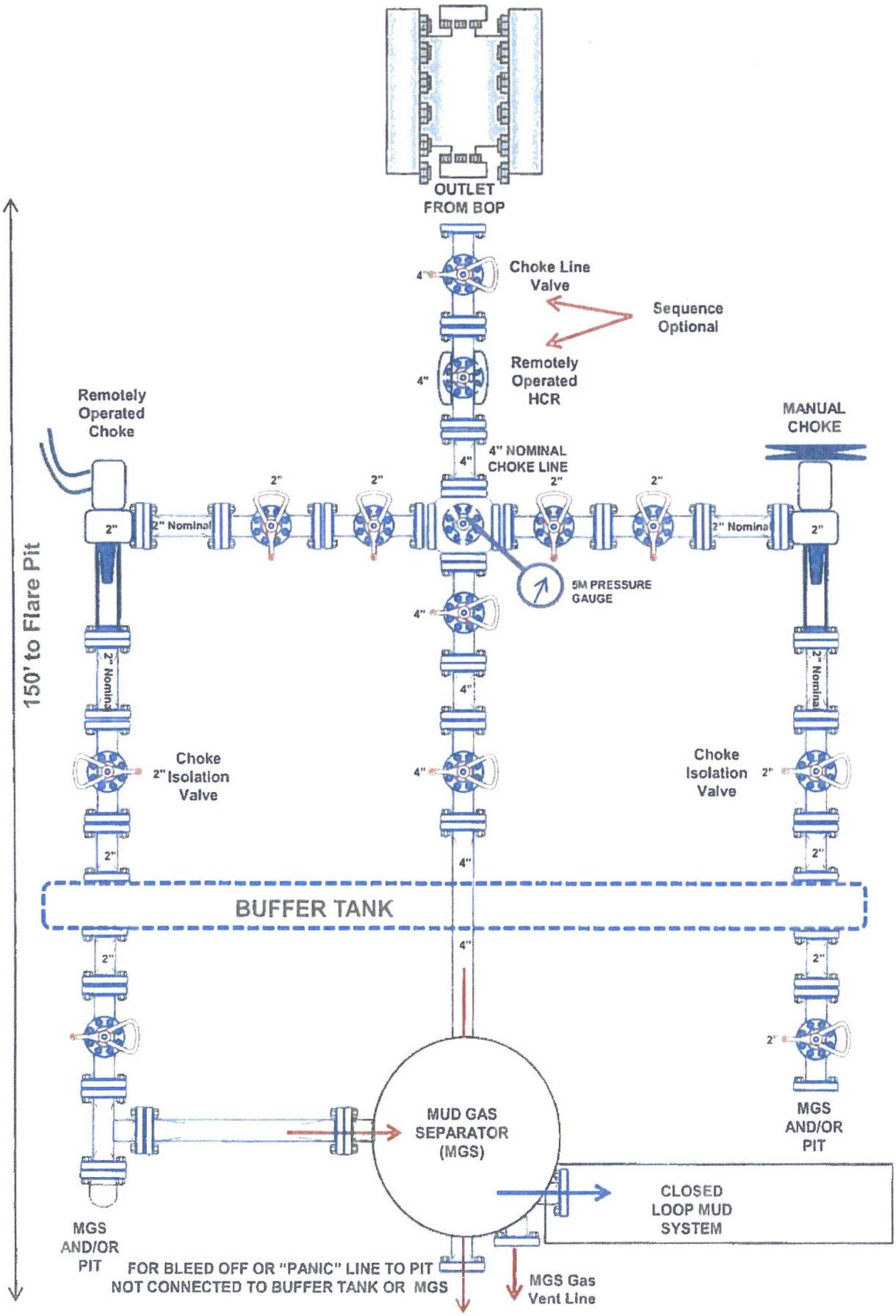
Signed:_____

Printed Name: Mayte Reyes
Position: Regulatory Analyst
Address: 2208 W. Main Street, Artesia, NM 88210
Telephone: (575) 748-6945
E-mail: mreyes1@concho.com
Field Representative (if not above signatory): Rand French
Telephone: (575) 748-6940. E-mail: rfrench@concho.com

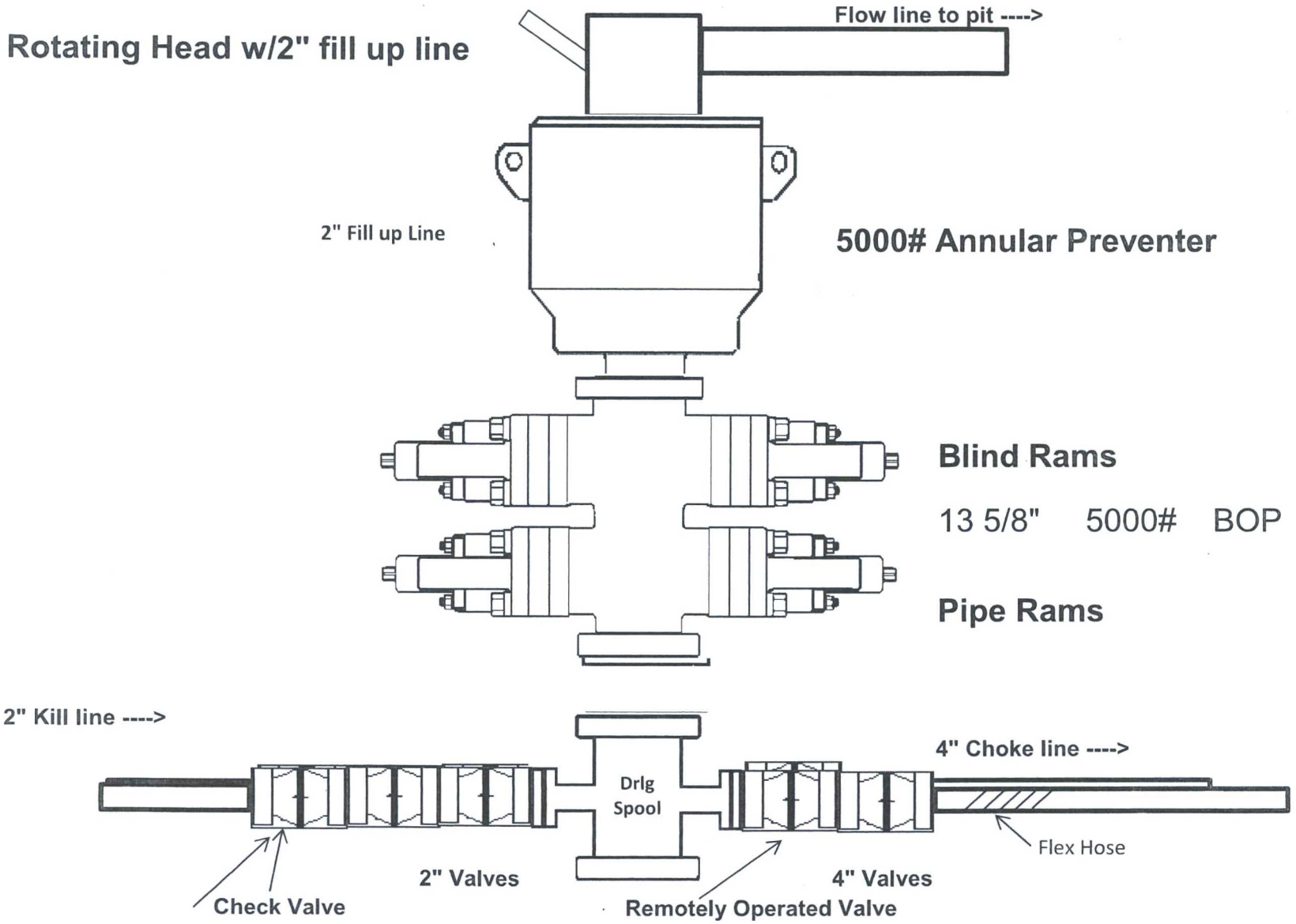
# 5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



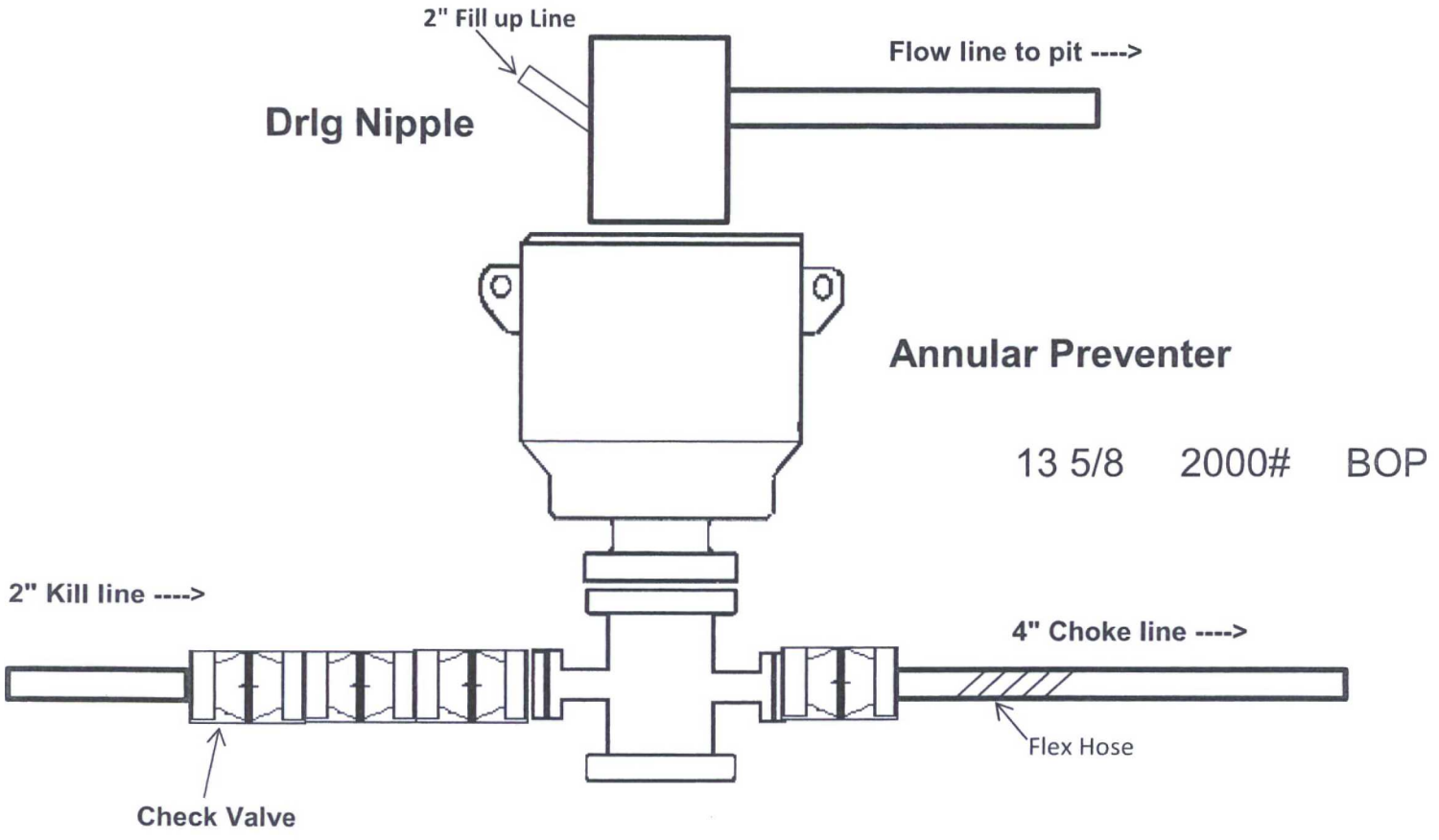
# 2M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



# 5,000 psi BOP Schematic



# 2,000 psi BOP Schematic



**Casing Program**

| Hole Size | Casing Interval | | Csg. Size | Weight (lbs) | Grade | Conn. | SF Collapse | SF Burst | SF Body |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | | | | | | |
| 17.5" | 0 | 860 | 13.375" | 68 | J55 | STC | 4.96 | 0.79 | 11.54 |
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