13-649

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs OCD

AUG 08 2013

RECEIVED

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☑ DRILL ☐ REENTER	5. Lease Serial No. NMNM120910
	6. If Indian, Allotee or Tribe Name
	7. If Unit or CA Agreement, Name and No. Bufflehead
1b. Type of Well: ☐ Oil Well ☐ Gas Well ☑ Other SWD ☑ Single Zone ☐ Multiple Zone	8. Lease Name and Well No. (40097) Buflehead 10 Federal SWD #1
2. Name of Operator COG Operating LLC. (229137)	9. API Well No. 30-025-41325
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940
	10. Field and Pool, or Exploratory (97003) SWD; ~~Delaware~~ Cherry Canyon
4. Location of Well (Report location clearly and in accordance with any State requirements.*) At surface 1980' FNL & 990' FEL Unit Letter I (NESE) Sec 10-T26S-R32E At proposed prod. Zone	11. Sec., T.R.M. or Blk and Survey or Area Sec. 10 - T26S - R32E
14. Distance in miles and direction from nearest town or post office* Approximately 24 miles from Malaga	12. County or Parish Lea County / 13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 990'	16. No. of acres in lease 1218.62	17. Spacing Unit dedicated to this well N/A
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. 3013'	19. Proposed Depth MD: 6,600' TVD: 6,600'	20. BLM/BIA Bond No. on file NMB000740 &NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3219'	22. Approximate date work will start* 7/1/2013	23. Estimated duration 30 days

24. Attachments

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

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

25. Signature Mayte Reyes	Name (Printed/Typed) Mayte Reyes	Date 4/5/2013
Title Regulatory Analyst		
Approved by (Signature) /s/George MacDonell	Name (Printed/Typed) /s/George MacDonell	Date AUG - 6 2013
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legan or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations theron.

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)

SWD-1395

KZ 08/14/13

*(Instructions on page 2)

Carlsbad Controlled Water Basin

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

AUG 16 2013

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Bufflehead 10 Fed SWD 1
SHL: 1980' FSL & 990' FEL
Section 10 T26S R32E
Lea County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

Fresh Water	320'	
Rustler	855'	
Top of Salt	1,226'	
Base of Salt	4,321'	
Delaware	4,536'	
Bell Canyon	**4,564'**	
Cherry Canyon	**5,538'**	
Brushy Canyon	**6,926'**	
Bone Spring	8,695'	Oil
TD TVD	6,600'	
TD MD	6,600'	

No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at 880' and circulating cement back to surface. All intervals will be isolated by setting 7" casing to total depth and tying back cement to a minimum of 500' into the 9-5/8" csg.

3. **Proposed Casing Program: All casing is new and API approved**

Hole Size	Depths	Section	OD Casing	New/ Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 ½"	0' – 880'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 ¼"	0' – 3,500'	Intrmd	9 5/8"	New	36#	BTC	J-55	1.125	1.125	1.6
12 ¼"	3500' – 4450'	Intrmd	9 5/8"	New	40#	BTC	J-55	1.125	1.125	1.6
8 ¾"	4450'-6600'	Disposal	7"	New	26#	LTC	J-55	1.125	1.125	1.6

- While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

4. Proposed Cement Program

a. 13-3/8" Surface
Lead: 375 sx Class C + 4% Gel + 2% $CaCl_2$
(13.5 ppg /1.75 cuft/sx)
Tail: 250 sx Class C + 2% $CaCl_2$
(14.8 ppg / 1.34 cuft/sx)
**Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate:
Lead: 875 sx Class C + 4% Gel + 2% $CaCl_2$
(13.5 ppg /1.75 cuft/sx)
Tail: 100 sx Class C + 2% $CaCl_2$
(14.8 ppg / 1.34 cuft/sx)
**Calculated w/35% excess on OH volumes

See COA

c. 7" Disposal:
Lead: 300 sx 50:50:10 H
(11.9 ppg /2.51 cuft/sx)
Tail: 275 sx Super H
(13 ppg / 1.69 cuft/sx)
**Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement.
- The 9-5/8" intermediate string is designed to circulate to surface.
- The 7" string will tie back a minimum of 500' into the 9-5/8" csg.

5. Pressure Control:

See COA

Nipple up on 13 3/8 with annular preventer tested to 50% of rated working pressure by independent tester and the rest of the 2M system tested to 2000 psi.
Nipple up on 9 5/8 with 3M system tested to 3000 psi by independent tester.
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. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating. A remotely operated choke will be installed before drilling out intermediate shoe.

6. Estimated BHP & BHT:

TD = 3020 psi
TD= 124°F

7. Mud Program: The applicable depths and properties of this system are as follows:

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 880'	Fresh Water	8.4	29	N.C.
880' – 4,450'	Brine	10	29	N.C.
4,450' – 6,600'	Cut Brine	8.8 – 9.2	29	N.C.

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. Auxiliary Well Control and Monitoring Equipment:

a. A Kelly cock will be in the drill string at all times.
b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the retrievable bridge plug is set into the 9-5/8" casing. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

9. Testing, Logging and Coring Program:

a. Drill stem tests will be based on geological sample shows.
b. If open hole electrical logging is performed, the program will be:
   i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
   ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
   iii. No coring program is planned
   iv. No additional testing is planned in the drilling phase.
   v. The Delaware Sand disposal interval will be swab tested after the completion to ensure that there are no commercial hydrocarbon shows within the injection interval. There are no plans to fracture treat the injection interval.

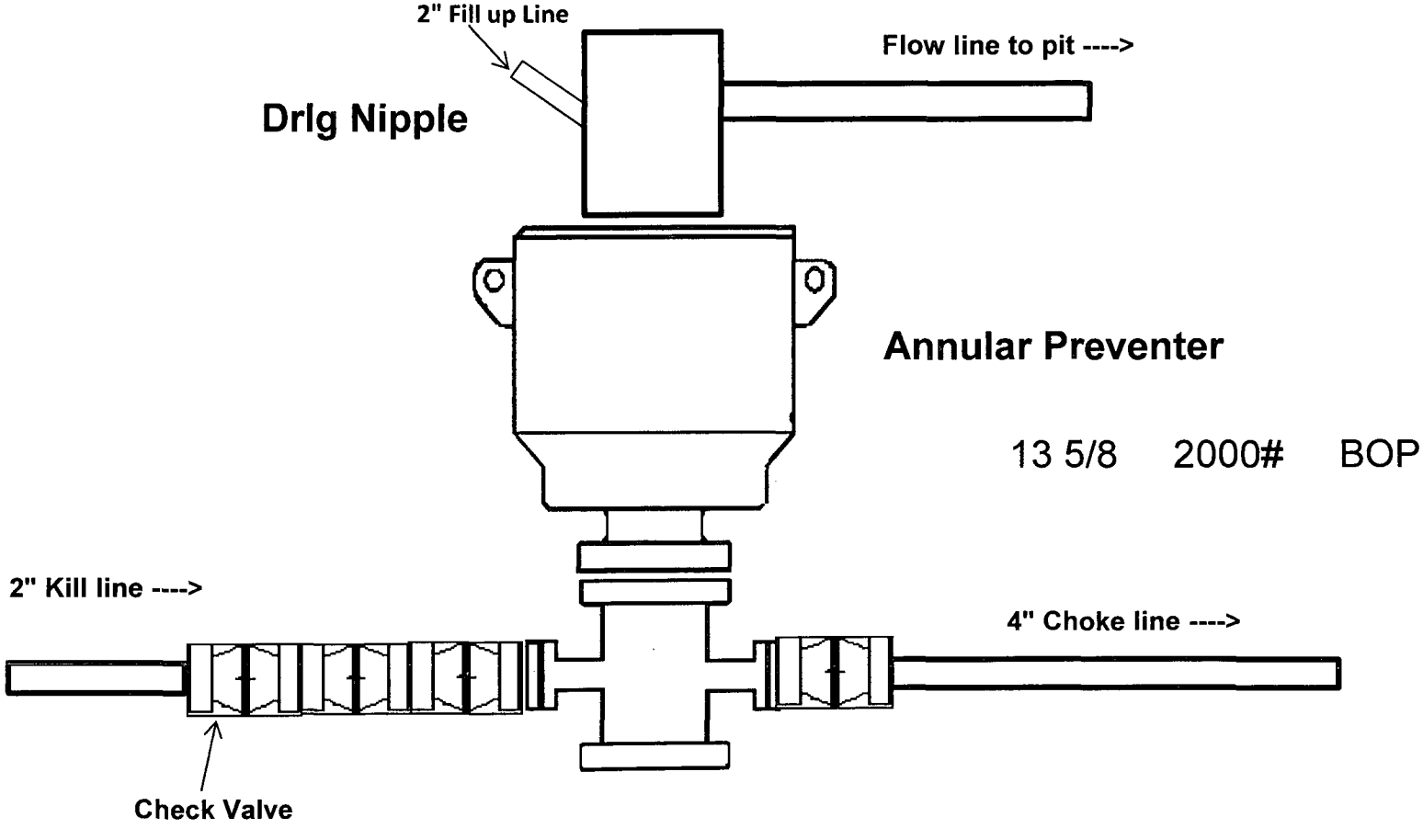
10. Potential Hazards:

a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

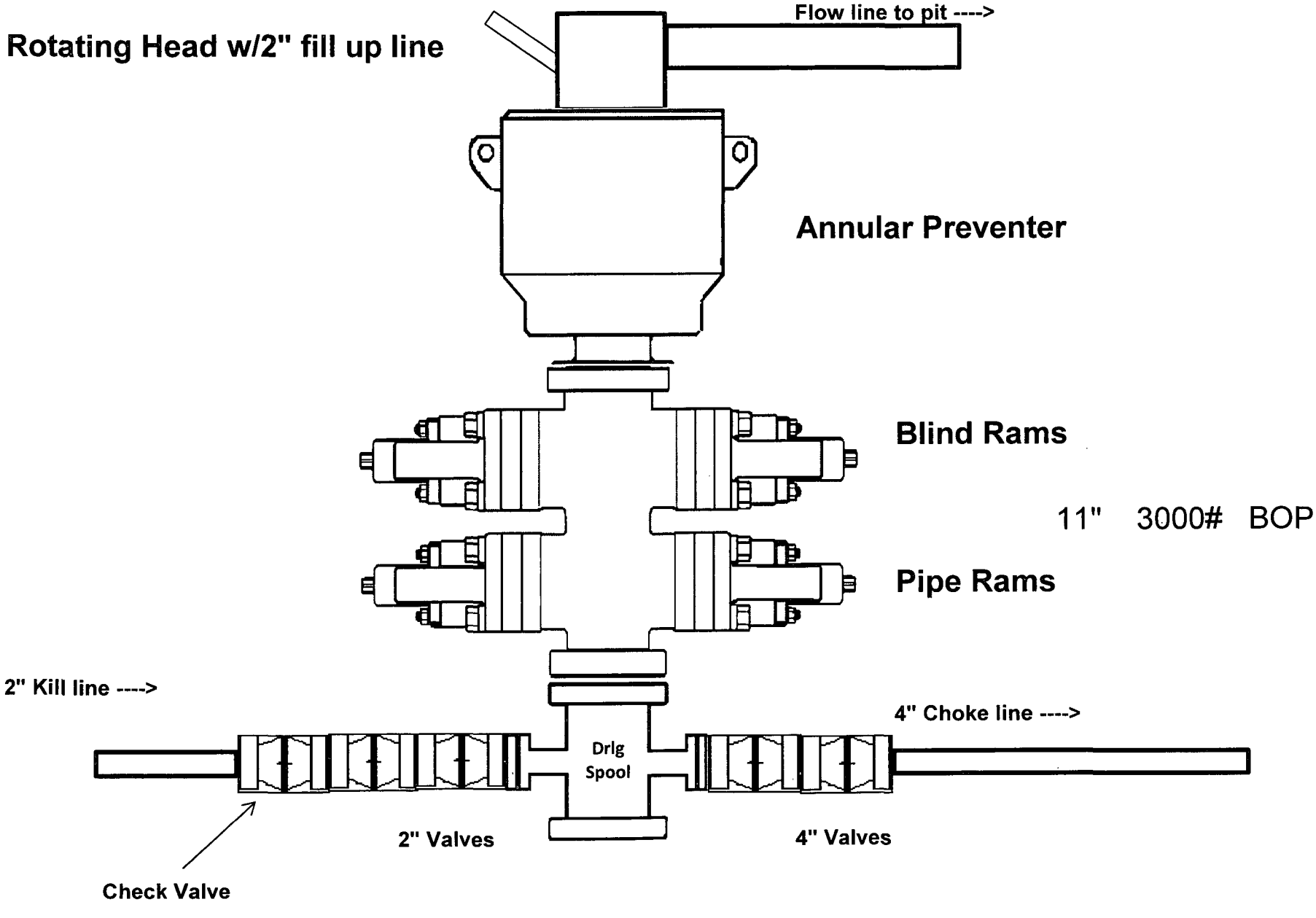
11. Anticipated starting date and Duration of Operations:

a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

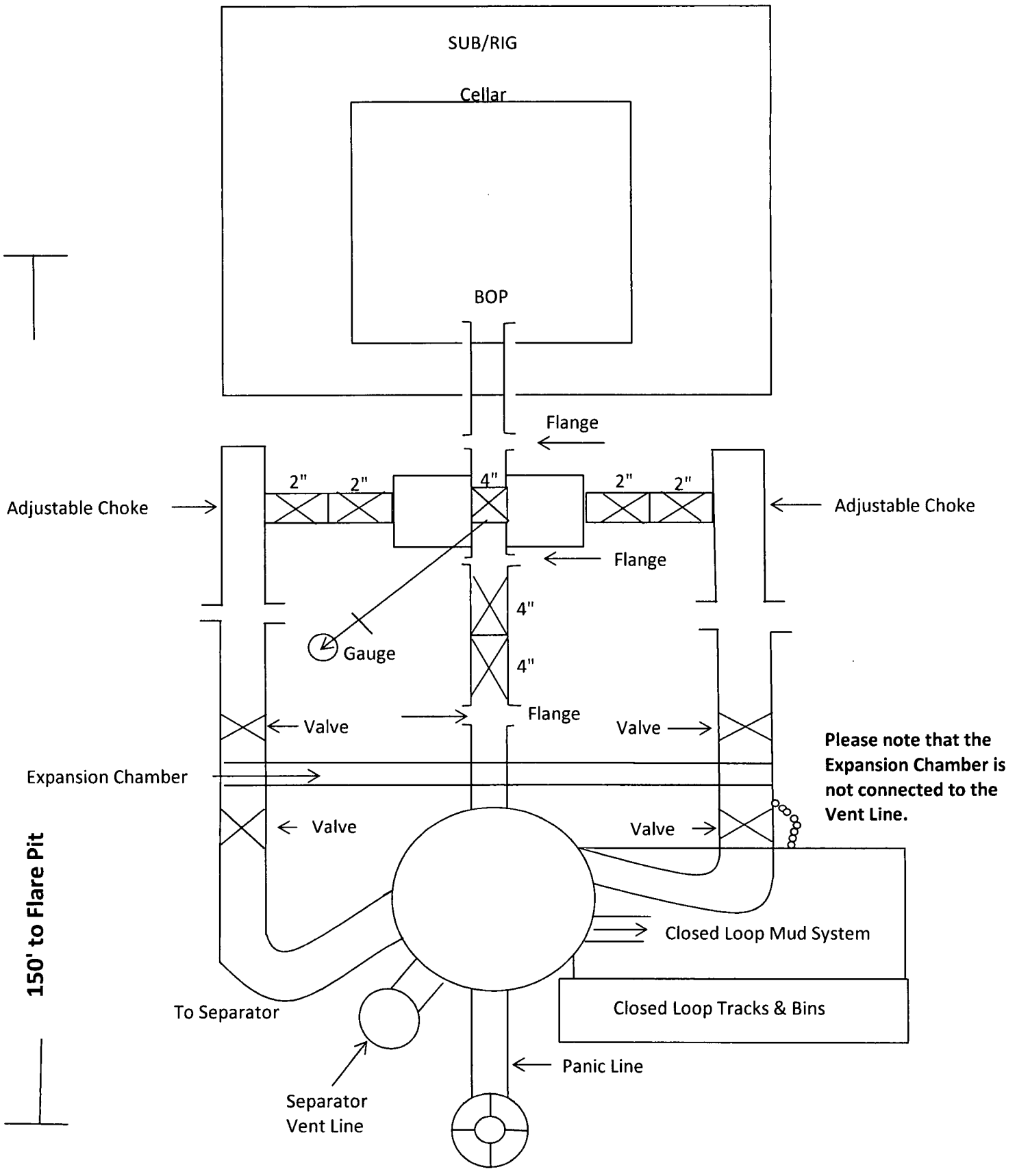
2,000 psi BOP Schematic



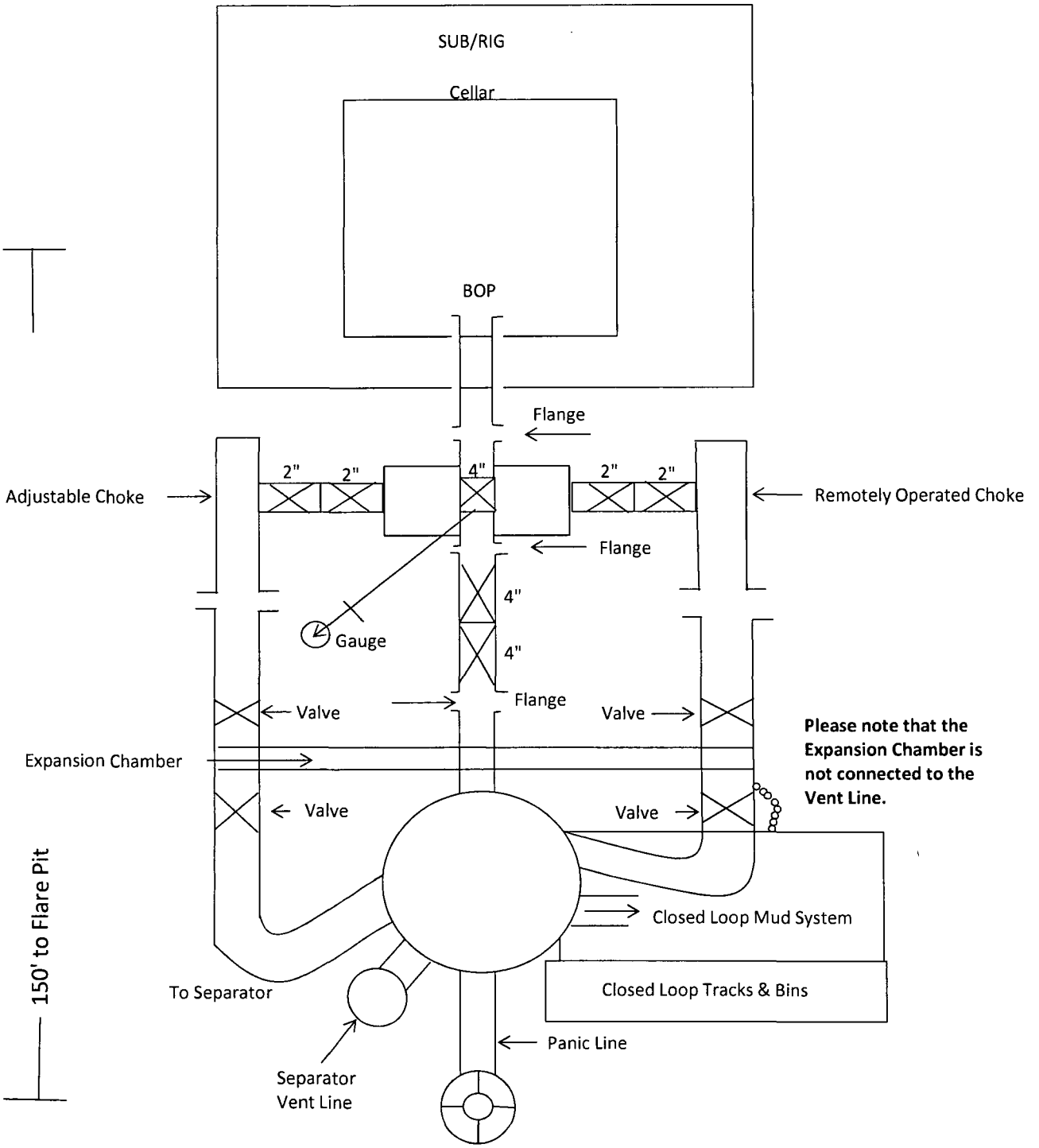
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



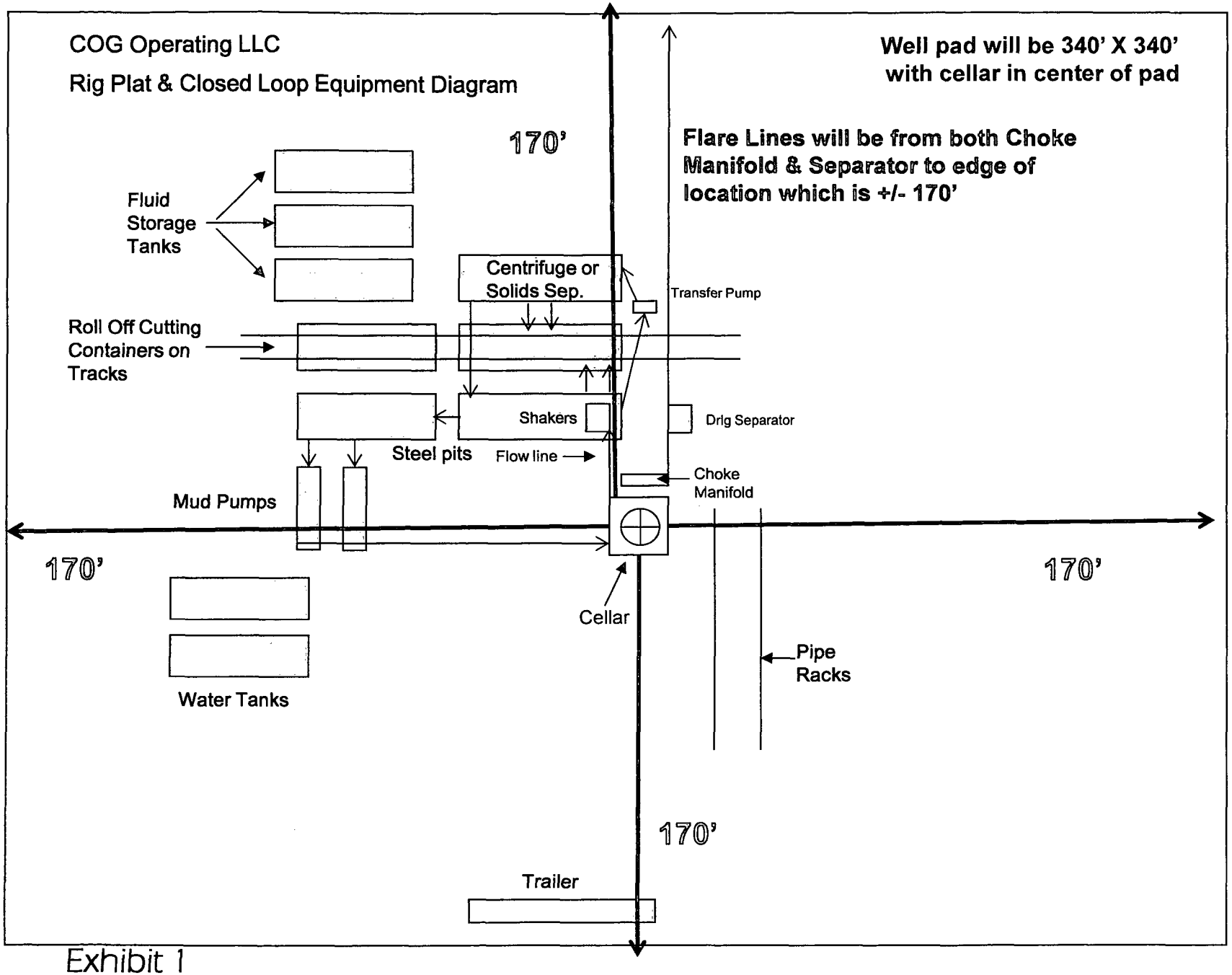
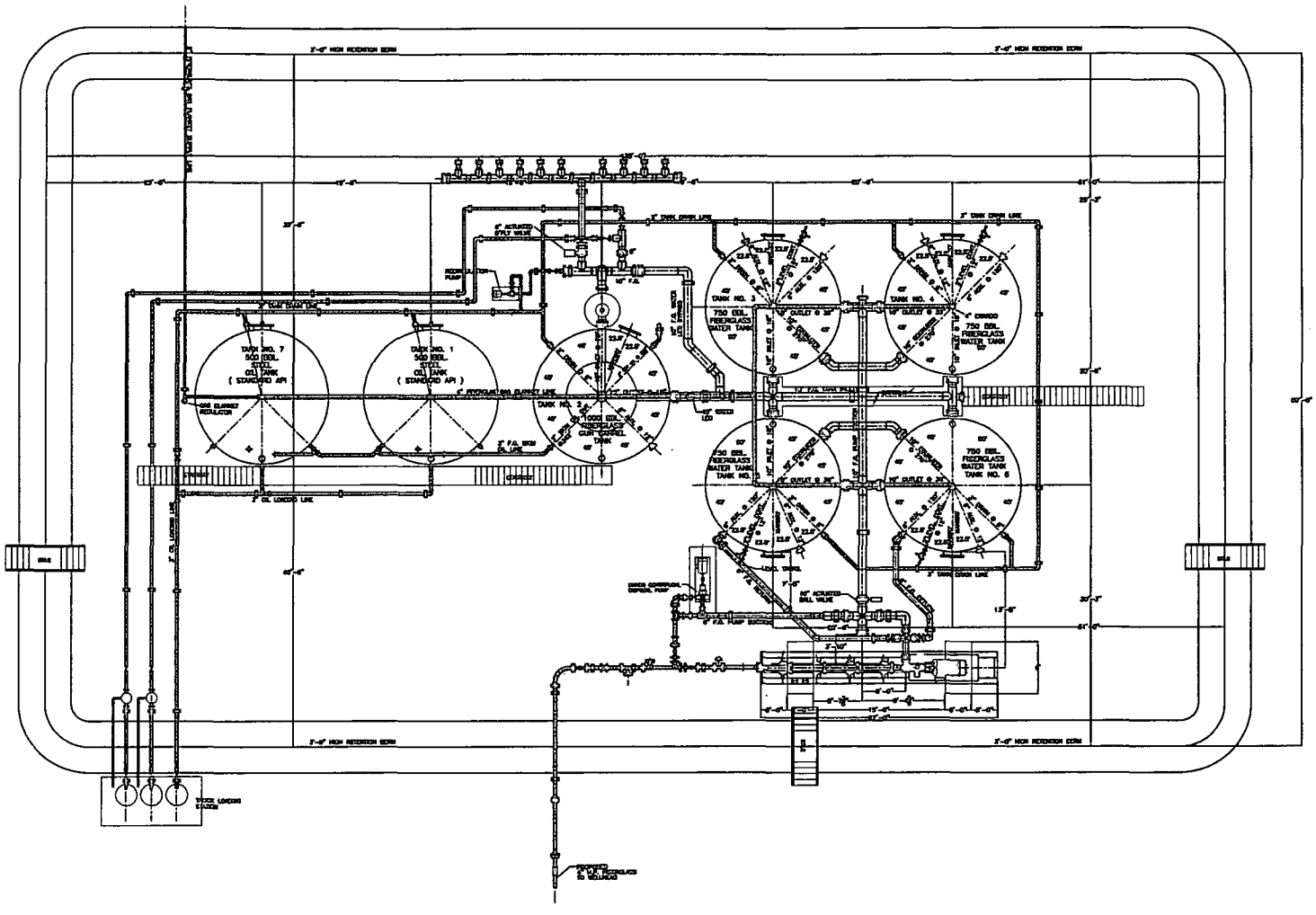

COG Operating LLC
Rig Plat & Closed Loop Equipment Diagram
Well pad will be 340' X 340' with cellar in center of pad
Flare Lines will be from both Choke Manifold & Separator to edge of location which is +/- 170'
170'
Fluid Storage Tanks
Centrifuge or Solids Sep.
Transfer Pump
Roll Off Cutting Containers on Tracks
Shakers
Drlg Separator
Steel pits
Flow line
Choke Manifold
Mud Pumps
170'
170'
Cellar
Pipe Racks
Water Tanks
170'
Trailer

Exhibit 1



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REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	REVISION	DESCRIPTION

CONCHO

CONCHO RESOURCES
SENM SWD STANDARD BATTERY
SALT WATER DISPOSAL STATION
EDDY COUNTY, NEW MEXICO

PIPING PLAN AND DETAILS

DRAWN BY: C.G.H.
CHECKED BY:
DATE: 12/12/12
DRAWING NO. 12-151-02