

HOBBS OCD

APR 26 2017

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. SHL: NMNM108968 BHL: NMNM120908	
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 COG Production LLC. (217955)		7. If Unit or CA Agreement, Name and No.	
3a. Address 2208 West Main Street Artesia, NM 88210		8. Lease Name and Well No. (317670) Azores Federal Com #10H	
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-025-43761	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 210' FSL & 420' FEL Unit Letter P (SESE) Sec 29-T245-R32E At proposed prod. Zone 200' FNL & 990' FEL Unit Letter A (NENE) Sec 29-T245-R32E		10. Field and Pool, or Exploratory (97899) WC-025 G-06 5253206M; Bone Spring	
14. Distance in miles and direction from nearest town or post office* Approximately 21 miles East of Malaga		11. Sec., T.R.M. or Blk and Survey or Area Sec. 29 - T245 - R32E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 200'		12. County or Parish Lea	
16. No. of acres in lease NMNM108968: 80 NMNM120908: 1891.72		13. State NM	
17. Spacing Unit dedicated to this well 160		18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 50' (Prop. Azores #5H)	
19. Proposed Depth TVD: 9,290' MD: 14,111'		20. BLM/BIA Bond No. on file NMB000860 & NMB000845	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3508.6' GL		22. Approximate date work will start* 11/1/2016	
		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. | 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 shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 9/15/2016
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Regulatory Analyst Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed) Ty Allen for Cody Layton	Date 07 Apr 2017
Title FOR FIELD MANAGER	Office BLM-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.

APPROVAL FOR TWO YEARS

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)

KZ 04/26/17

*(Instructions on page 2)

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS AND
SPECIAL STIPULATIONS
ATTACHED

Carlsbad Controlled Water Basin

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

COG Production, LLC - Azores Federal Com #10H

1. Geologic Formations

TVD of target	9,290' EOL	Pilot hole depth	NA
MD at TD:	14,111'	Deepest expected fresh water:	541'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	879	Water	
Top of Salt	1096	Salt	
Base of Salt	4414	Salt	
Lamar	4642	Salt Water	
Bell Canyon	4664	Salt Water	
Cherry Canyon	5574	Oil/Gas	
Brushy Canyon	6964	Oil/Gas	
Bone Spring Lime	8588	Oil/Gas	
U. Avalon Shale	8828	Oil/Gas	
L. Avalon Shale	9068	Oil/Gas	
1st Bone Spring Sand	9647	Oil/Gas	
2nd Bone Spring Sand	X	Oil/Gas	
3rd Bone Spring Sand	X	Oil/Gas	
Wolfcamp	X	Oil/Gas	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	905	13.375"	54.5	J55	STC	2.73	1.36	10.42
12.25"	0	4670	9.625"	40	J55	LTC	1.04	1.09	2.78
8.75"	0	14,111	5.5"	17	P110	LTC	1.65	2.95	2.82
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.

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 3 rd 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 2 nd 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?	

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3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft ³ / sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	350	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl ₂
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl ₂
Inter.	890	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	640	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	1350	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%
1 st Intermediate	0'	50%
Production	4,170'	25% OH in Lateral (KOP to EOL) – 40% OH in Vertical

COG Production, LLC - Azores Federal Com #10H

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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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"	3M	Annular	x	50% testing pressure
			Blind Ram	x	3M
			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.

X	Formation integrity test will be performed per Onshore Order #2. 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.
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.

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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	Saturated Brine	10 - 10.2	28-34	N/C
9-5/8" Int shoe	Lateral TD	Cut Brine	8.6 - 9.4	28-34	N/C

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
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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	

COG Production, LLC - Azores Federal Com #10H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4545 psi at 9290' TVD
Abnormal Temperature	NO 150 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.
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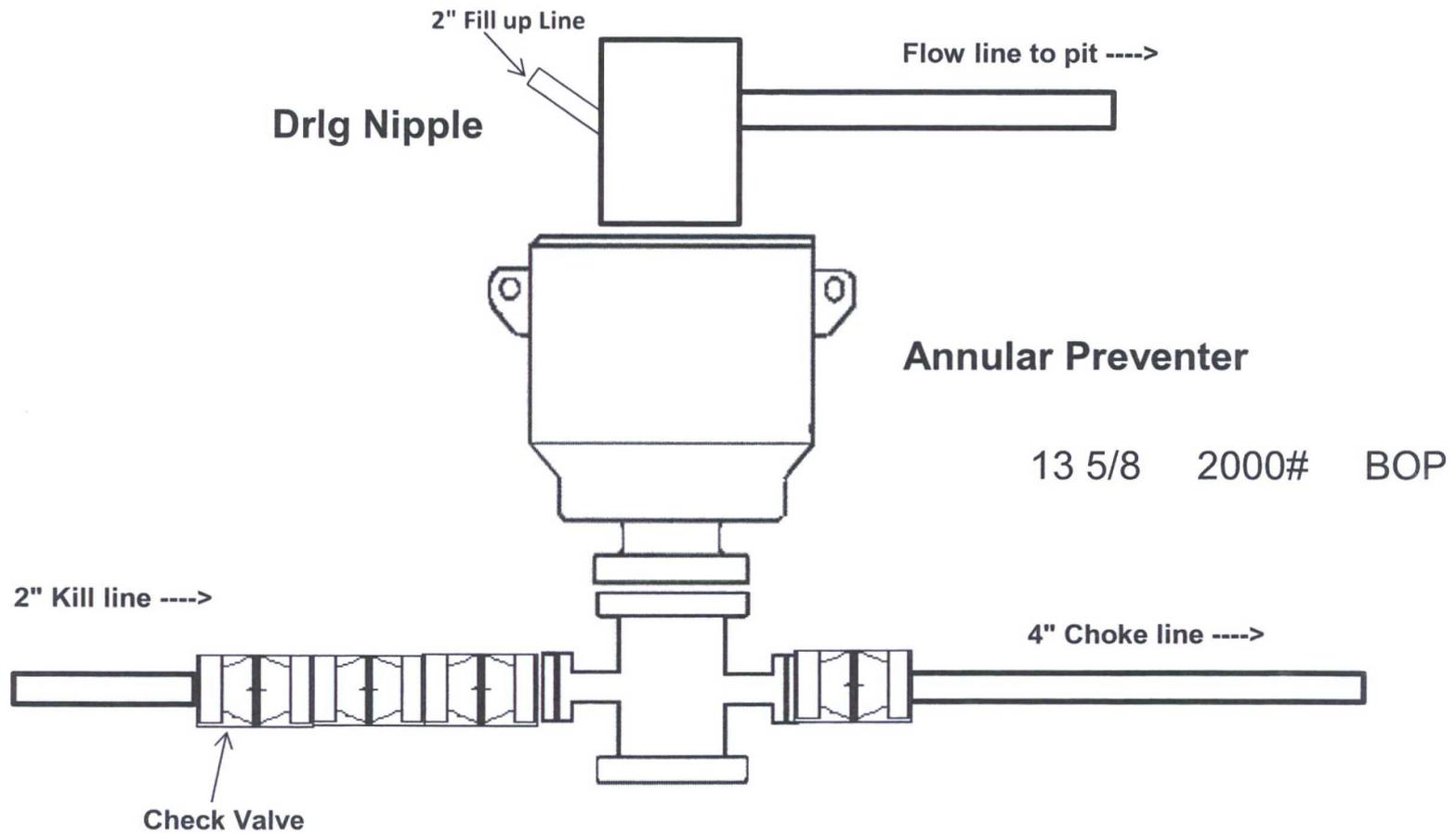
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

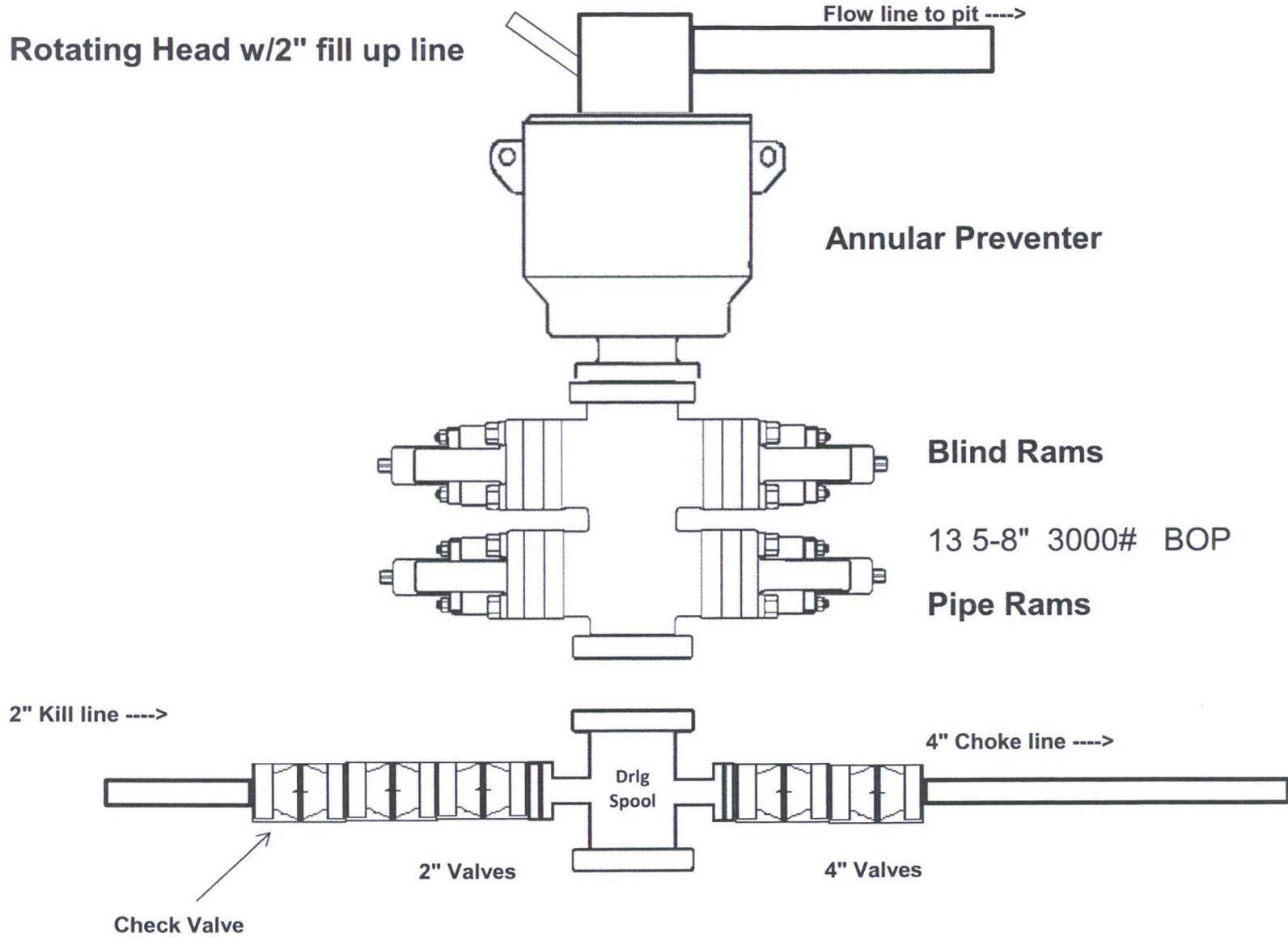
N	Is it a walking operation?
N	Is casing pre-set?

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

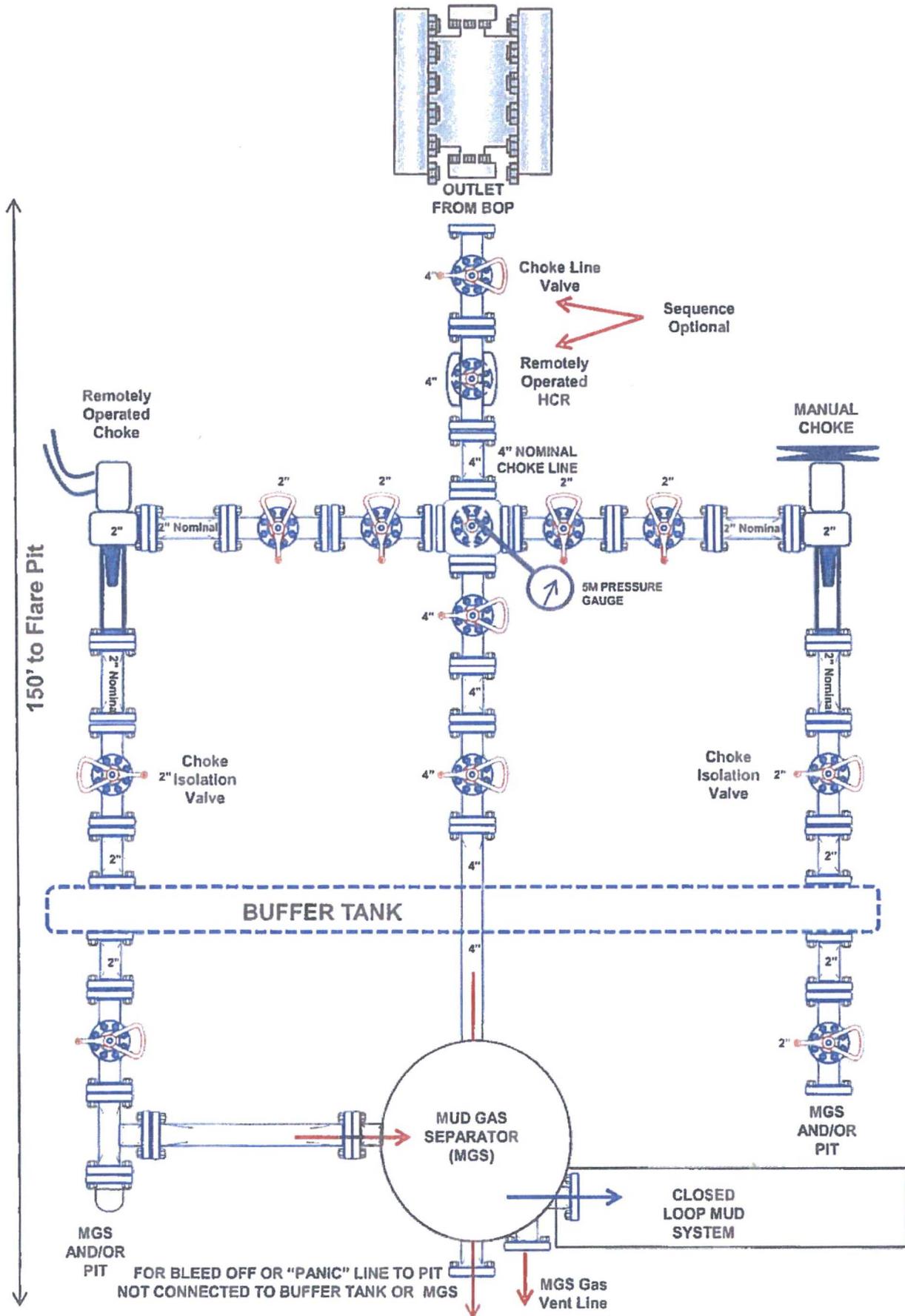
2,000 psi BOP Schematic



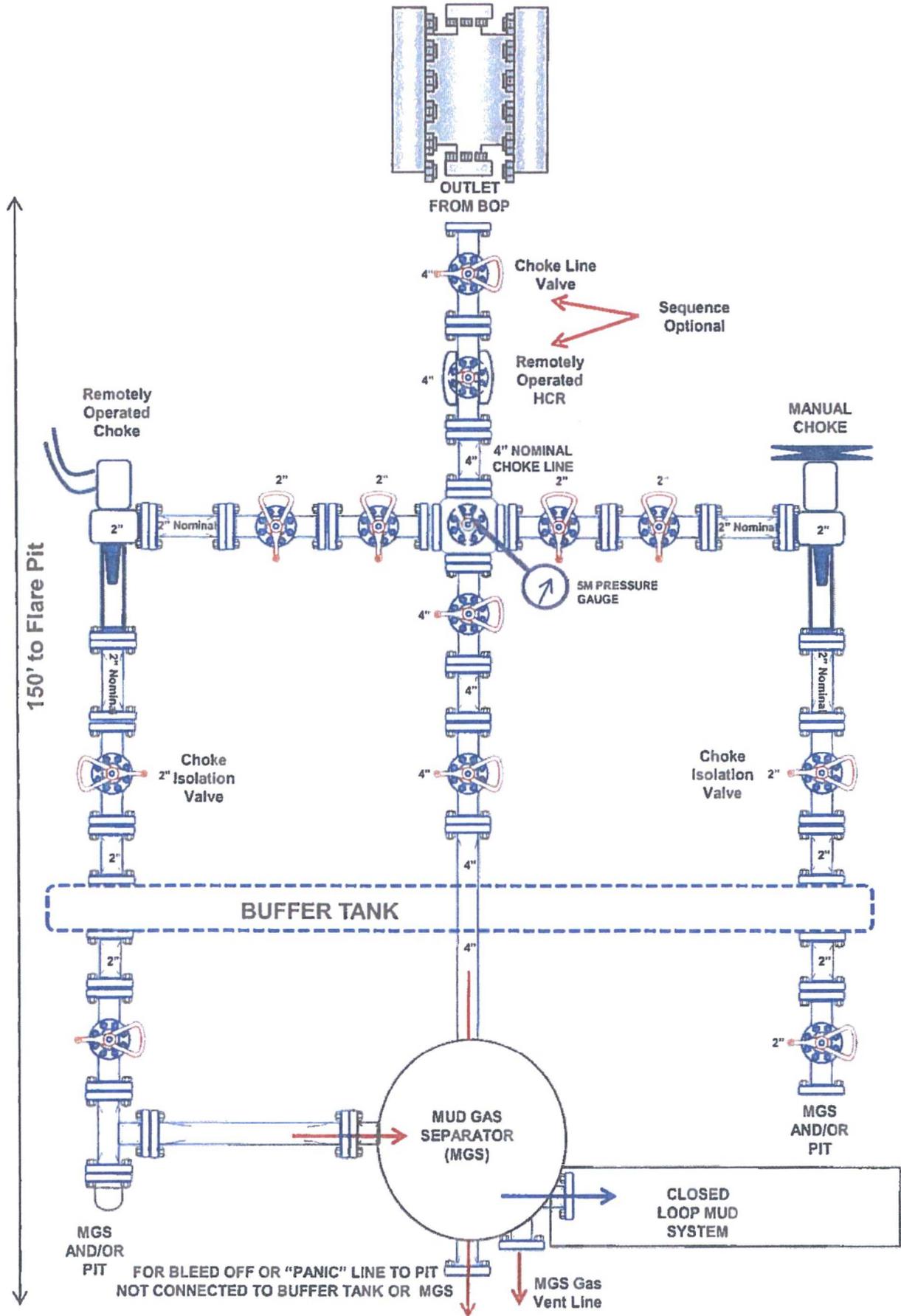
3,000 psi BOP Schematic



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

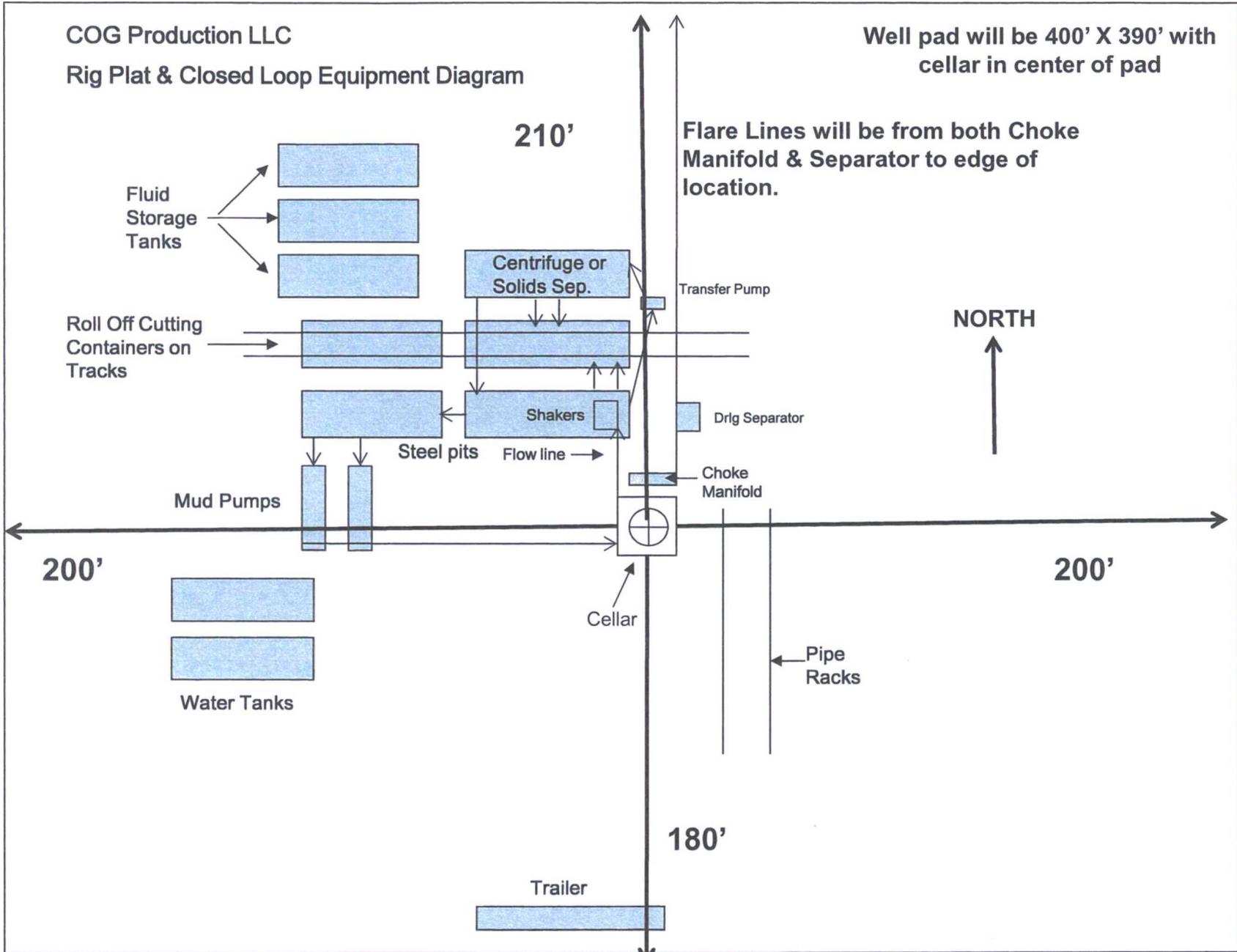


3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



COG Production LLC
Rig Plat & Closed Loop Equipment Diagram

Well pad will be 400' X 390' with
cellar in center of pad



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

COG Production LLC
 H₂S Equipment Schematic
 Terrain: Shinnery sand hills.

Well pad will be 400' X 390'
 with cellar in center of pad

