

Carlsbad Field Office OCD Hobbs

HOBBS OCD

JAN 03 2017

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

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. NMNM121490, NM84898, NM02965A
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 EOG Resources, Inc (7377)		7. If Unit or CA Agreement, Name and No.
3a. Address P.O. Box 2267 Midland, TX 79702		8. Lease Name and Well No. (715317) Rattlesnake 28 Fed Com 709H
3b. Phone No. (include area code) 432-686-3689		9. API Well No. 30-025- 43527
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 536' FNL & 1115' FWL, NWNW (D), Sec 28, 26S, 33E At proposed prod. zone 230' FSL & 330' FWL, SWNW (E), Sec 33		10. Field and Pool, or Exploratory (98097) WC-025 G-09 S263327G; Upper WC
14. Distance in miles and direction from nearest town or post office* Approximately +/- 35 miles Southwest from Jal, New Mexico		11. Sec., T. R. M. or Blk. and Survey or Area Section 28, T26S, R33E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 230' SL, 330' PP	16. No. of acres in lease 3759.32	12. County or Parish Lea
17. Spacing Unit dedicated to this well 237 ac.	13. State NM	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 658' frm 708H	19. Proposed Depth 19769' MD, 12375' TVD	20. BLM/BIA Bond No. on file NM 2308
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3227' GL	22. Approximate date work will start* 11/15/2016	23. Estimated duration 25 days

24. Attachments

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

- | | |
|---|---|
| <ol style="list-style-type: none"> 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 must be filed with the appropriate Forest Service Office). | <ol style="list-style-type: none"> 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 BLM. |
|---|---|

25. Signature	Name (Printed/Typed) Stan Wagner	Date 08/29/2016
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Title
Regulatory Specialist

Approved by (Signature)	Name (Printed/Typed) Cedy R. Layman	Date 12/22/16
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Title FOR CARLSBAD FIELD OFFICE Office FIELD MANAGER

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.

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)

APPROVAL FOR TWO YEARS

*(Instructions on page 2)

KZ
01/03/17

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

EOG RESOURCES, INC.
RATTLESNAKE 28 FED COM NO. 709H

1. GEOLOGIC NAME OF SURFACE FORMATION:

Permian

2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	750'
Top of Salt	1,090'
Base of Salt / Top Anhydrite	4,640'
Base Anhydrite	4,900'
Lamar	4,900'
Bell Canyon	4,925'
Cherry Canyon	6,000'
Brushy Canyon	7,530'
Bone Spring Lime	9,130'
1 st Bone Spring Sand	10,070'
2 nd Bone Spring Shale	10,320'
2 nd Bone Spring Sand	10,630'
3 rd Bone Spring Carb	11,080'
3 rd Bone Spring Sand	11,750'
Wolfcamp	12,190'
TD	12,375'

3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	6,000'	Oil
Brushy Canyon	7,530'	Oil
1 st Bone Spring Sand	10,070'	Oil
2 nd Bone Spring Shale	10,320'	Oil
2 nd Bone Spring Sand	10,630'	Oil
3 rd Bone Spring Carb	11,080'	Oil
3 rd Bone Spring Sand	11,750'	Oil
Wolfcamp	12,190'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 10.75" casing at 775' and circulating cement back to surface.

EOG RESOURCES, INC.
RATTLESNAKE 28 FED COM NO. 709H

4. CASING PROGRAM - NEW

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF _{min} Collapse	DF _{min} Burst	DF _{min} Tension
14.75"	0 – 775'	10.75"	40.5#	J55	STC	1.125	1.25	1.60
8.75"	0' – 11,100'	7.625"	29.7#	HCP-110	FlushMax III	1.125	1.25	1.60
6.75"	0' – 10,600'	5.5"	23#	HCP-110	VAM Top HT	1.125	1.25	1.60
6.75"	10,600'-19,769'	5.5"	23#	HCP-110	VAM SG	1.125	1.25	1.60

Variance is requested to wave the centralizer requirements for the 7-5/8" FJ casing in the 8-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 8-3/4" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

Cementing Program:

Depth	No. Sacks	Wt. ppg	Yld Ft ³ /ft	Mix Water Gal/sk	Slurry Description
10-3/4" 775'	325	13.5	1.73	9.13	Class C + 4.0% Bentonite + 0.6% CD-32 + 0.5% CaCl ₂ + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	200	14.8	1.34	6.34	Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate
7-5/8" 11,100'	250	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl ₂
	2000	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl ₂
	550	14.4	1.20	4.81	50:50 Class H:Poz + 0.25% CPT20A + 0.40% CPT49 + 0.20% CPT35 + 0.80% CPT16A + 0.25% CPT503P
5-1/2" 19,769'	725	14.1	1.26	5.80	Class H + 0.1% C-20 + 0.05% CSA-1000 + 0.20% C-49 + 0.40% C-17 (TOC @ 10,600')

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

EOG RESOURCES, INC.
RATTLESNAKE 28 FED COM NO. 709H

5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:

Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line).

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The surface casing will be tested to 1500 psi for 30 minutes.

Before drilling out of the intermediate casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The intermediate casing will be tested to 2000 psi for 30 minutes.

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 hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal.

The applicable depths and properties of the drilling fluid systems are as follows.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 775'	Fresh - Gel	8.6-8.8	28-34	N/c
775' – 11,100'	Brine	8.8-10.0	28-34	N/c
11,100' – 19,769' Lateral	Oil Base	10.0-11.5	58-68	3 - 6

An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate.

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

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7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H₂S monitoring and detection equipment will be utilized from surface casing point to TD.

8. LOGGING, TESTING AND CORING PROGRAM:

Open-hole logs are not planned for this well.

GR-CCL Will be run in cased hole during completions phase of operations.

9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:

The estimated bottom-hole temperature (BHT) at TD is 182 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 7400 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. Severe loss circulation is expected from 7,300' to Intermediate casing point.

10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:

The drilling operation should be finished in approximately one month. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

11. WELLHEAD:

A multi-bowl wellhead system will be utilized.

After running the 10-3/4" surface casing, a 13-5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Onshore Order No. 2

The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 5000 psi.

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The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Stream Flo FBD100 Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. Prior to running the intermediate casing, the rams will be changed out to accommodate the 7-5/8" casing. The bonnet seals will be tested to 1500 psi. After installing the intermediate casing the casing rams will be removed and replaced with variable bore rams. The remaining BOPE will not be retested after installing the intermediate casing.

Both the surface and intermediate casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

Exhibit 1 EOG Resources 5M BOPE

Rig Floor

- | |
|--|
| 1. 13 5/8" Rotating Head |
| 2. NOV 13 5/8" 5,000 PSI WP GK Annular Preventor |
| 3. 13 5/8" Cameron Type "U" 10,000 PSI WP Ram Preventors |
| 4. 2 1/16" - 10,000 PSI WP Check Valve |
| 5. 10,000 PSI WP - 1502 Union to kill line |
| 6. 2 1/16" - 10,000 PSI WP Manual Valves |
| 7. 13 5/8" 3,000 PSI WP x 13 5/8" 5,000 PSI WP Spacer Spool |
| 8. 4 1/16" 10,000 PSI WP HCR Valve |
| 9. 4 1/16" 10,000 PSI WP Manual Valve |
| 10. 6" OD x 3" ID 10,000 PSI WP Steel Armoured Flex Choke Line |
| 11. DSA - 13 5/8" 10,000 PSI WP x 13 5/8" 5,000 PSI WP |
| 12. Mud Cross - 13 5/8" 10,000 PSI WP |
| 13. Blind Rams |
| 14. Pipe Rams |
| 15. 13 5/8" Cameron Type "U" 10,000 PSI WP Pipe Rams |
| 16. Flow Line |
| 17. 2" Fill Line |

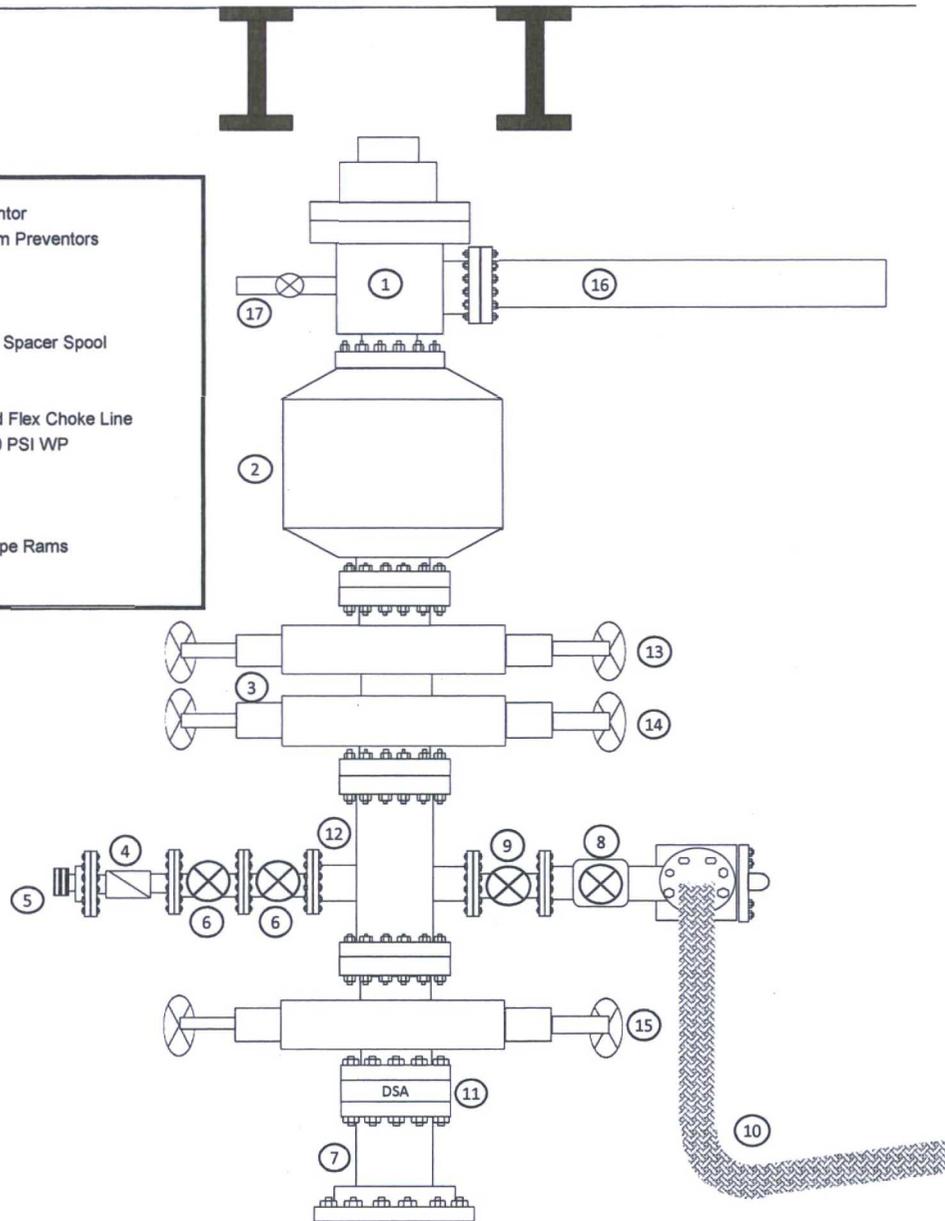
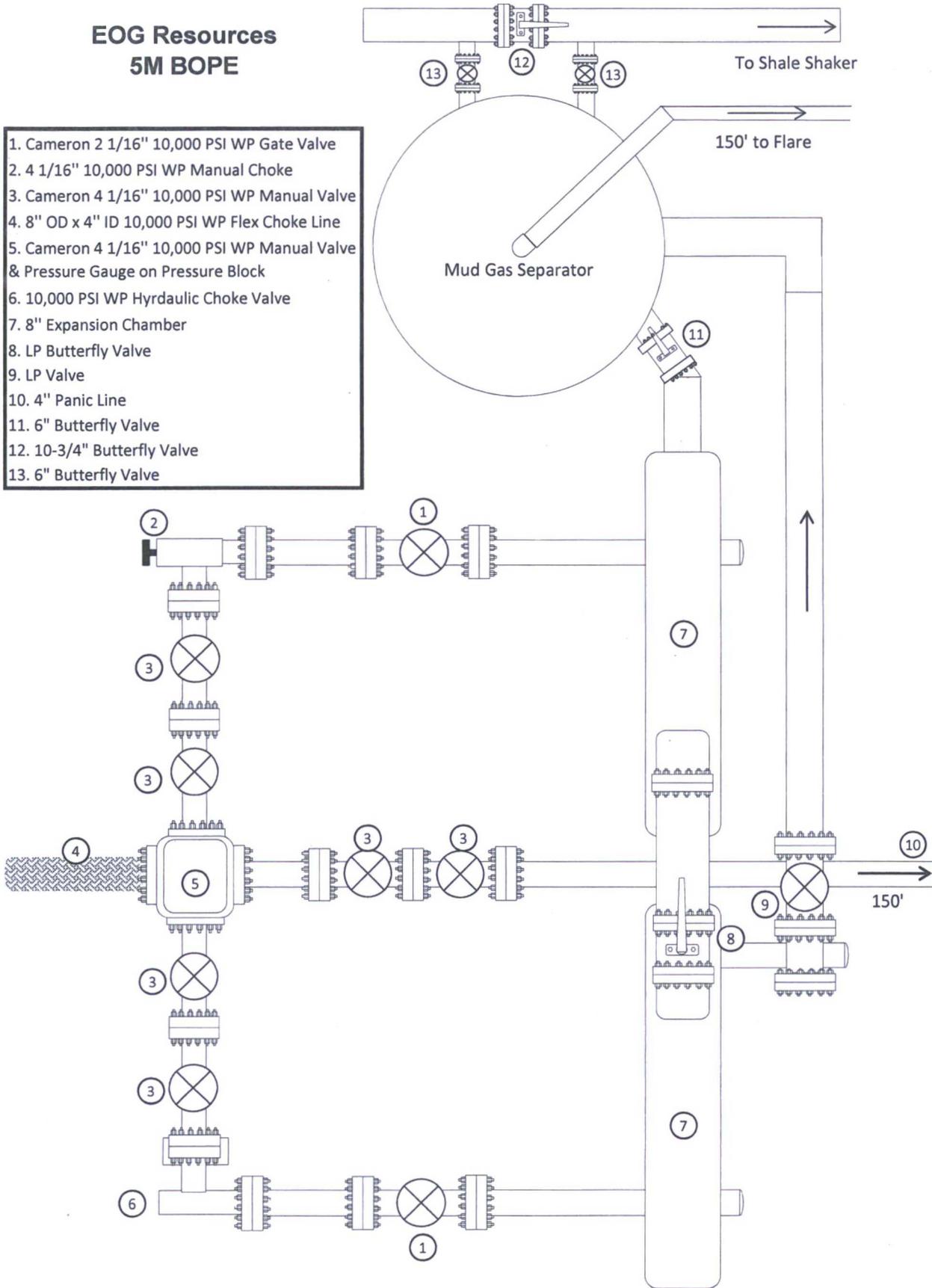


Exhibit 1a

EOG Resources 5M BOPE

1. Cameron 2 1/16" 10,000 PSI WP Gate Valve
2. 4 1/16" 10,000 PSI WP Manual Choke
3. Cameron 4 1/16" 10,000 PSI WP Manual Valve
4. 8" OD x 4" ID 10,000 PSI WP Flex Choke Line
5. Cameron 4 1/16" 10,000 PSI WP Manual Valve & Pressure Gauge on Pressure Block
6. 10,000 PSI WP Hyrdraulic Choke Valve
7. 8" Expansion Chamber
8. LP Butterfly Valve
9. LP Valve
10. 4" Panic Line
11. 6" Butterfly Valve
12. 10-3/4" Butterfly Valve
13. 6" Butterfly Valve



EOG 5M Choke Manifold Diagram (rev. 3/21/14)

Manufacturer: Midwest Hose & Specialty

Serial Number: SN#90067

Length: 35'

Size: OD = 8" ID = 4"

Ends: Flanges Size: 4-1/16"

WP Rating: 10,000 psi Anchors required by manufacturer: No

M I D W E S T
HOSE AND SPECIALTY INC.

INTERNAL HYDROSTATIC TEST REPORT		
Customer: CACTUS		P.O. Number: RIG #123 Asset # M10761
HOSE SPECIFICATIONS		
Type: CHOKER LINE		Length: 35'
I.D. 4" INCHES		O.D. 8" INCHES
WORKING PRESSURE 10,000 PSI	TEST PRESSURE 15,000 PSI	BURST PRESSURE PSI
COUPLINGS		
Type of End Fitting 4 1/16 10K FLANGE		
Type of Coupling: SWEDGED		MANUFACTURED BY MIDWEST HOSE & SPECIALTY
PROCEDURE		
<i>Hose assembly pressure tested with water at ambient temperature.</i>		
TIME HELD AT TEST PRESSURE 1 MIN.		ACTUAL BURST PRESSURE: 0 PSI
COMMENTS: SN#90067 M10761 Hose is covered with stainless steel armour cover and wrapped with fire resistant vermiculite coated fiberglass insulation rated for 1500 degrees complete with lifting eyes		
Date: 6/6/2011	Tested By: BOBBY FINK	Approved: MENDI JACKSON



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

Report Number: 11000070

Customer: CACTUS

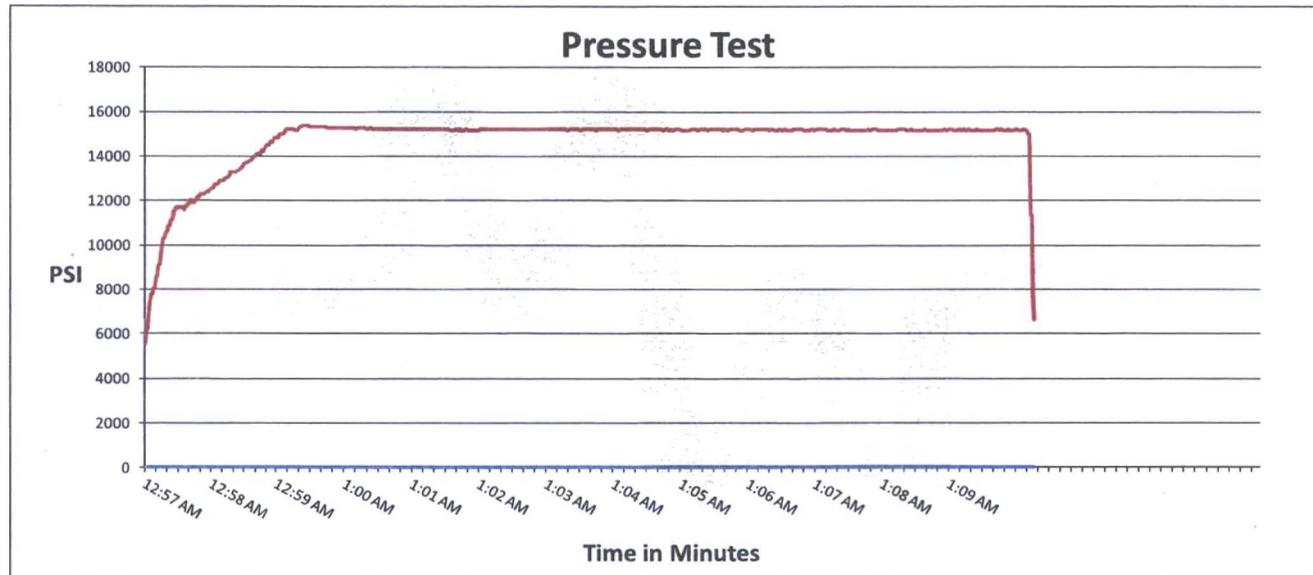
SALES ORDER# 90067

Hose Specifications

<u>Hose Type</u>	<u>Length</u>
C & K	35'
<u>I.D.</u>	<u>O.D.</u>
4"	8"
<u>Working Pressure</u>	<u>Burst Pressure</u>
10000 PSI	Standard Safety Multiplier Applies

Verification

<u>Type of Fitting</u>	<u>Coupling Method</u>
4 1/16 10K	Swage
<u>Die Size</u>	<u>Final O.D.</u>
6.62"	6.68"
<u>Hose Serial #</u>	<u>Hose Assembly Serial #</u>
	90067



Test Pressure
15000 PSI

Time Held at Test Pressure
11 1/4 Minutes

Actual Burst Pressure

Peak Pressure
15439 PSI

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

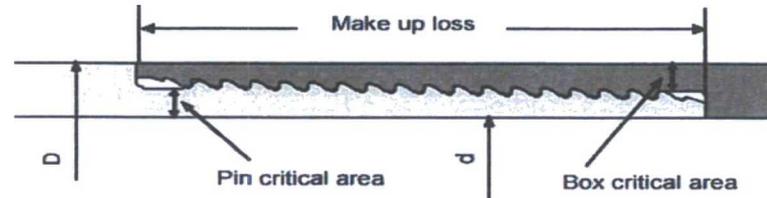
Tested By: Bobby Fink

Approved By: Mendi Jackson





**FLUSHMAX-III
Connection Data Sheet**



Pipe Body	Imperial		S.I.	
Grade	P110		P110	
Pipe OD (D)	7 5/8	in	193.68	mm
Weight	29.7	lb/ft	44.25	kg/m
Actual weight	29.0	lb/ft	43.26	kg/m
Wall thickness (t)	0.375	in	9.53	mm
Pipe ID (d)	6.875	in	174.63	mm
Pipe body cross section	8.537	in ²	5,508	mm ²
Drift Dia.	6.750	in	171.45	mm

Connection				
Box OD (W)	7.625	in	193.68	mm
PIN ID	6.875	in	174.63	mm
Pin critical area	4.420	in ²	2,852	mm ²
Box critical area	4.424	in ²	2,854	mm ²
Joint load efficiency	60	%	60	%
Make up loss	3.040	in	77.22	mm
Thread taper	1/16 (3/4 in per ft)			
Number of threads	5 thread per in.			

Connection Performance Properties				
Tensile Yield load	563.4	kips	2,506	kN
M.I.Y.P.	7,574	psi	52.2	MPa
Collapse strength	5,350	psi	36.9	MPa

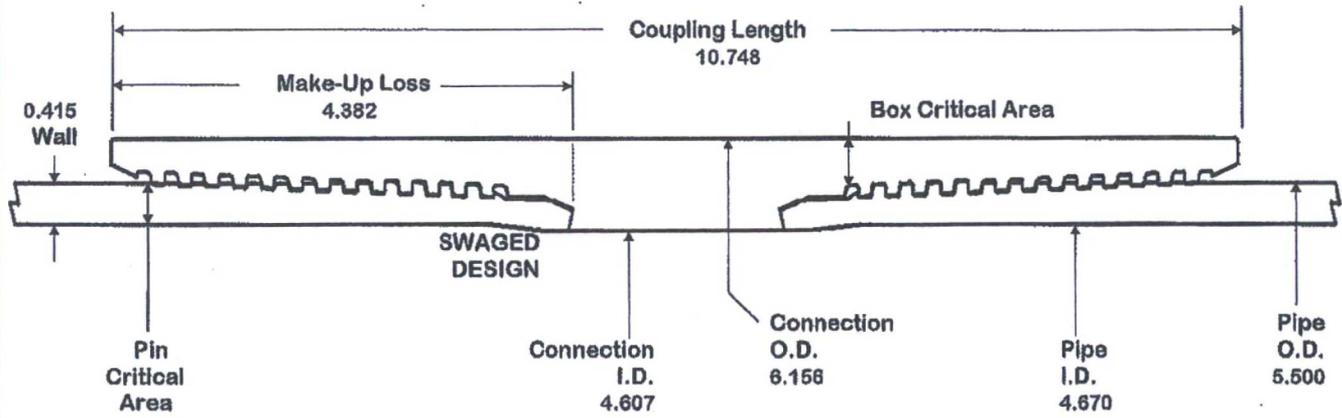
Note

M.I.Y.P. = Minimum Internal Yield Pressure of the connection

Torque Recommended				
Min.	8,700	ft-lb	11,700	N-m
Opti.	9,700	ft-lb	13,100	N-m
Max.	10,700	ft-lb	14,500	N-m
Operational Max.	23,600	ft-lb	32,000	N-m

Note : Operational Max. torque can be applied for high torque application

VAM® TOP HT



O.D. 5.500 WEIGHT 23.00 WALL 0.415 GRADE NSSMC P110HC DRIFT 4.545

PIPE BODY PROPERTIES

Material Grade NSSMC P110HC
 Min. Yield Strength 125 ksi
 Min. Tensile Strength 125 ksi

Outside Diameter 5.500 in
 Inside Diameter 4.670 in
 Nominal Area 6.630 sq.in.

Yield Strength 829 kips
 Ultimate Strength 829 kips
 Min Internal Yield 16,510 psi
 *High Collapse 16,220 psi

CONNECTION PROPERTIES

Connection OD 6.156 in
 Connection ID 4.607 in
 Make up Loss 4.382 in
 Coupling Length 10.748 in

Box Critical Area 6.757 sq.in.
 %PB Section Area 101.9%

Pin Critical Area 6.630 sq.in.
 %PB Section Area 100.0%

Yield Strength 829 kips
 Parting Load 829 kips
 Min Internal Yield 16,510 psi
 *High Collapse 16,220 psi
 Wk Compression 663 kips
 Max Pure Bending 30 °/100 ft

Contact: tech.support@vam-usa.com
 Ref. Drawing: SI-PD 100526 Rev.B
 Date: 30-Apr-15
 Time: 10:24 AM

TORQUE DATA ft-lb

min	opt	max
13,700	15,200	16,700

Max. Liner Torque : 20,000 ft-lb



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O.D (in)	WEIGHT (lb/ft)	WALL (in)	GRADE	DRIFT	CONNECTION
5.500	23.00	0.415	VST P110EC	4.545	VAM® SG

PIPE PROPERTIES	
Material Grade	VST P110EC
Min. Yield Strength	125 ksi
Min. Tensile Strength	135 ksi
Nominal OD	5.500 in
Nominal ID	4.670 in
Nominal Area	6.630 sq. in
Yield Strength	829 kips
Ultimate Strength	895 kips
Min Internal Yield	16,510 psi
*High Collapse	16,220 psi

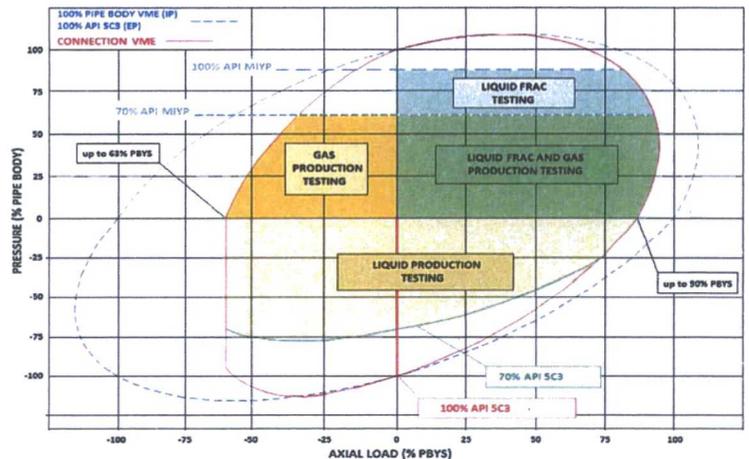
CONNECTION PROPERTIES	
Connection OD	5.720 in
Connection ID	4.603 in
Make up Loss	6.503 in
Connection Critical Area	5.967 sq. in
%PB Section Area	90.0%
Yield Strength	746 kips
Parting Load	805 kips
Min Internal Yield	16,510 psi
*High Collapse	11,350 psi
Working Compression	522 kips
Max. Bending w/ Sealability	40 °/100 ft

DOCUMENTATION	
Ref. Drawing	SI-PD 100835 Rev.A
Date	11-Aug-14
Time	1:21 PM
Email	tech.support@vam-usa.com

TORQUE VALUES	
Min Make Up Torque	9,100 ft-lb
Opt Make Up Torque	11,200 ft-lb
Max Make Up Torque	13,300 ft-lb
Max Torque w/ Sealability	14,500 ft-lb

The single solution for Shale Play needs

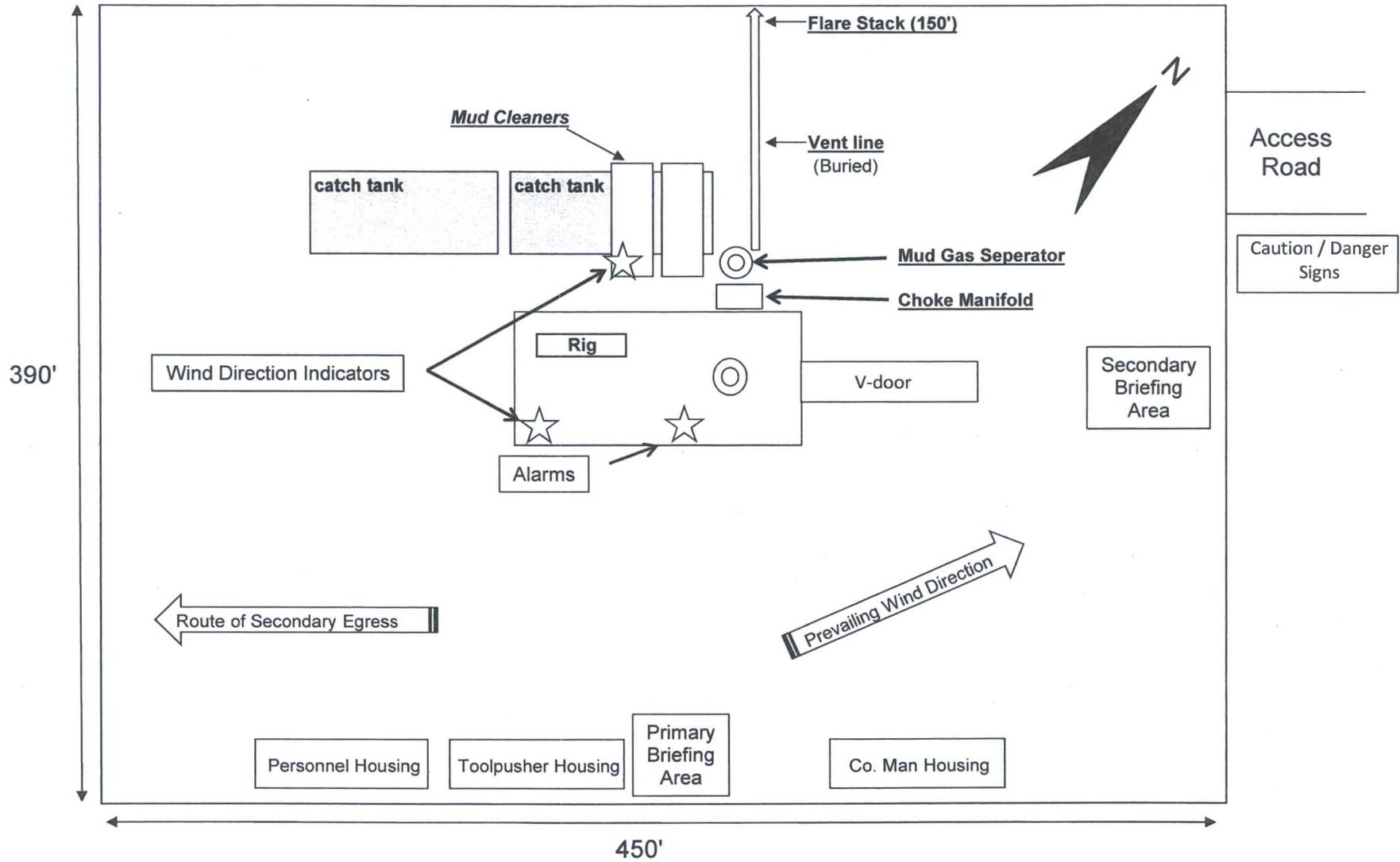
VAM® SG brings VAM® premium sealing performance to a semi-flush connection with extremely high Tension performance and increased Torque capacity, validated to the specific Shale drilling requirements, while remaining highly competitive in North American Shale play economics.



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Exhibit 4
EOG Resources
Rattlesnake 28 Fed Com #709H

Well Site Diagram



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OPERATOR CERTIFICATION

I certify that I, or someone under my direct supervision, have inspected the drill site and access route 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 the company I represent, 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 29th day of August, 2016.

Name: Stan Wagner

Position: Regulatory Specialist

Address: P.O. Box 2267, Midland, TX 79702

Telephone: (432) 686-3689

Email: stan_wagner@eogresources.com

Field Representative (if not above signatory): James Barwis

Address: P.O. Box 2267, Midland, TX 79702

Telephone: (432) 686-3791 office; (432) 425-1204 cell

Signed Stan Wagner