

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTFORM APPROVED  
OMB NO. 1004-0137  
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**  
**Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.**5. Lease Serial No.  
NMNM136870

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.  
CORRAL CANYON 4 FEDERAL 164H9. API Well No.  
30-015-47166-00-X110. Field and Pool or Exploratory Area  
PURPLE SAGE WOLFCAMP11. County or Parish, State  
EDDY COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**1. Type of Well  
☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator  
XTO ENERGY INCORPORATED  
Contact: KELLY KARDOS  
E-Mail: kelly\_kardos@xtoenergy.com3a. Address  
6401 HOLIDAY HILL ROAD BLDG 5  
MIDLAND, TX 79707  
3b. Phone No. (include area code)  
Ph: 432-620-43744. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 9 T25S R29E NENW 235FNL 2130FWL  
32.151264 N Lat, 103.991158 W Lon

## 12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

XTO Energy Inc, requests permission to make the following changes to the original APD:

Casing/Cement design per the attached drilling program.

XTO also requests the following variances:

Approval to utilize a spudder rig to pre-set surface casing per the attached Description of Operations.

Batch drill this well if necessary. In doing so, XTO will set each casing string and ensure that the well is cemented properly and the well is static. With floats holding, no pressure on the csg annulus, and the installation of a 10K TA cap as per GE recommendations, XTO will contact the BLM

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #518067 verified by the BLM Well Information System**  
**For XTO ENERGY INCORPORATED, sent to the Carlsbad**  
**Committed to AFMSS for processing by PRISCILLA PEREZ on 06/08/2020 (20PP3104SE)**

Name (Printed/Typed) KELLY KARDOS

Title REGULATORY COORDINATOR

Signature (Electronic Submission)

Date 06/08/2020

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By JENNIFER SANCHEZ

Title PETROLEUM ENGINEER

Date 06/11/2020

Conditions of approval, if any, are attached. Approval of this notice 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.

Office Carlsbad

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.

(Instructions on page 2)

**\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\***  
Entered - KMS NMOC

## **Additional data for EC transaction #518067 that would not fit on the form**

### **32. Additional remarks, continued**

to skid the rig to drill the remaining wells on the pad. Once surface and intermediate strings are all completed, XTO will begin drilling the production hole on each of the wells.

ONLY test broken pressure seals on the BOP equipment per the attached procedure.

Attachments:

Drilling Program

Multibowl Diagram

Spudder Rig Description of Operations

BOP Break Test Procedure

## Revisions to Operator-Submitted EC Data for Sundry Notice #518067

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM136870	NMNM136870
Agreement:		
Operator:	XTO ENERGY INC. 6401 HOLIDAY HILL RD BLDG 5 MIDLAND, TX 79707 Ph: 432-620-4374	XTO ENERGY INCORPORATED 6401 HOLIDAY HILL ROAD BLDG 5 MIDLAND, TX 79707 Ph: 432.683 2277
Admin Contact:	KELLY KARDOS REGULATORY COORDINATOR E-Mail: kelly_kardos@xtoenergy.com  Ph: 432-620-4374	KELLY KARDOS REGULATORY COORDINATOR E-Mail: kelly_kardos@xtoenergy.com  Ph: 432-620-4374
Tech Contact:	KELLY KARDOS REGULATORY COORDINATOR E-Mail: kelly_kardos@xtoenergy.com  Ph: 432-620-4374	KELLY KARDOS REGULATORY COORDINATOR E-Mail: kelly_kardos@xtoenergy.com  Ph: 432-620-4374
Location:		
State:	NM	NM
County:	EDDY	EDDY
Field/Pool:	PURPLE SAGE WOLFCAMP	PURPLE SAGE WOLFCAMP
Well/Facility:	CORRAL CANYON 4 FEDERAL 164H Sec 9 T25S R29E Mer NMP NENW 235FNL 2130FWL	CORRAL CANYON 4 FEDERAL 164H Sec 9 T25S R29E NENW 235FNL 2130FWL 32.151264 N Lat, 103.991158 W Lon

# PECOS DISTRICT

## DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>XTO Energy, Inc.</b>
<b>LEASE NO.:</b>	<b>NMMN-136870</b>
<b>WELL NAME &amp; NO.:</b>	<b>Corral Canyon 4 Federal 164H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>0235' FNL &amp; 2130' FWL</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>0200' FNL &amp; 2310' FWL Sec. 04, T. 25 S., R. 29 E.</b>
<b>LOCATION:</b>	<b>Section 09, T. 25 S., R. 29 E., NMPM</b>
<b>COUNTY:</b>	<b>Eddy County, New Mexico</b>

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input checked="" type="radio"/> Medium	<input type="radio"/> High
Cave/Karst Potential	<input type="radio"/> Critical		
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input type="checkbox"/> Fluid Filled	<input type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

### A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

**Possibility of water flows in the Salado and Castile.**

**Possibility of lost circulation in the Rustler, Red Beds, and Delaware.**

**Abnormal pressure may be encountered within the Bone Spring and all subsequent formations.**

## B. CASING

1. The **11-3/4** inch surface casing shall be set at approximately **610** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**8-5/8" Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.**

2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is:
  - Cement as proposed. Report Echo meter results on subsequent sundry. .  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**
  - ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

### C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi. Variance approved to use a 5M annular. The annular must be tested to 70% working pressure (3500 psi.)**
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

### BOP Break Testing Variance

- Shell testing is not approved for any portion of the hole with a MASP of 5000 psi or greater.
- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer prior to the commencement of any BOP Break Testing operations.
- A full BOP test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOP test will be required.

### D. SPECIAL REQUIREMENT (S)

**Anticollision report must be run due to the PICKETT DRAW 1 (30-015-25767)**

## GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ Eddy County

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

## A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
4. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
5. 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. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
6. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

## B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.



2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
  - d. The results of the test shall be reported to the appropriate BLM office.

- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

#### D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**JAM 06112020**

**Corral Canyon 4 Federal 164H**  
 Projected TD: 15995' MD / 10837' TVD  
 SHL: 235' FNL & 2130' FWL , Section 9, T25S, R29E  
 BHL: 200' FNL & 2310' FWL , Section 4, T25S, R29E  
 Eddy County, NM

**Casing Design**

Hole Size	Depth	OD Csg	Weight	Collar	Grade	New/Used	SF Burst	SF Collapse	SF Tension
14-3/4"	0' – 610'	11-3/4"	47	BTC	J-55	New	1.23	4.76	16.64
10-5/8"	0' – 3020'	8-5/8"	32	BTC	CYP-110	New	1.46	1.35	3.12
10-5/8"	3020' – 10067'	8-5/8"	32	BTC	HCL-80	New	1.06	1.50	2.27
7-7/8"	0' – 15995'	5-1/2"	20	BTC	P-110	New	1.18	1.46	2.59

XTO requests to not utilize centralizers in the curve and lateral

8-5/8" Collapse analyzed using 50% evacuation based on regional experience.

8-5/8 casing will be a split string with CYP-110 run from surface to 3020' & HCL-80 from 3020' to TD because the 8-5/8" HCL-80 casing fails at SF burst at surface. The split string design passes our internal requirements

5-1/2" tension calculated using vertical hanging weight plus the lateral weight multiplied by a friction factor of 0.35

Test on Casing will be limited to 70% burst of the casing or 1500 psi, whichever is less

**WELLHEAD:**

*Permanent Wellhead – Cactus Multibowl System*

A. Starting Head (RSH System): 11-3/4" SOW bottom x 13-5/8" 5M top flange

B. Tubing Head: 13-5/8" 5M bottom flange x 7-1/16" 10M top flange

Wellhead will be installed by manufacturer's representatives.

Manufacturer will monitor welding process to ensure appropriate temperature of seal.

Operator will test the 8-5/8" casing per BLM Onshore Order 2

Wellhead manufacturer representative may not be present for BOP test plug installation

**Cement Program**

**Surface Casing:**

Lead: 140 sxs Halcem-C + 2% CaCl (mixed at 12.8 ppg, 1.88 ft3/sx, 9.61 gal/sx water)

Tail: 190 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

**Intermediate Casing:**

1st Stage

Lead: 500 sxs Halcem-C + 2% CaCl (mixed at 12.8 ppg, 1.87 ft3/sx, 9.61 gal/sx water)

Tail: 310 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

2nd Stage

Tail: 1050 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

XTO requests to pump a two stage cement job on the 7-5/8" intermediate casing string with the first stage being pumped conventionally with the calculated top of cement at the Brush Canyon and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface. If necessary, a top out consisting of 1,500 sack of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (2.30 yld, 12.91 ppg) will be executed as a contingency. The final cement top will be verified by Echo-meter.

XTO will include the Echo-meter verified fluid top and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program.

XTO will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing

**Production Casing:**

Lead: 970 sxs Halcem-C + 2% CaCl (mixed at 11.5 ppg, 1.88 ft3/sx, 9.61 gal/sx water)

Tail: 970 sxs VersaCem (mixed at 13.2 ppg, 1.33 ft3/sx, 8.38 gal/sx water)

Compressives: 12-hr = 1375 psi 24 hr = 2285 psi

**Mud Circulation Program**

INTERVAL	Hole Size	Mud Type	MW (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
0' to 610'	14-3/4"	FW / Native	8.4-8.8	30-40	NC
610' to 10067'	10-5/8"	BW/FWM Direct Emulsion	8.5-9.8	29-32	NC - 20
10067' to 15995'	7-7/8"	FW / Cut Brine / Polymer/ OBM	13.2-13.8	32-50	NC - 20

DRILLING PLAN: BLM COMPLIANCE  
(Supplement to BLM 3160-3)

XTO Energy Inc.  
Corral Canyon 4 Fed 163H  
Projected TD: 15987' MD / 10858' TVD  
SHL: 365' FSL & 523' FEL , Section 23, T25S, R29E  
BHL: 200' FNL & 990' FEL , Section 32, T25S, R29E  
Eddy County, NM

**1. Geologic Name of Surface Formation**

A. Permian

**2. Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas:**

Formation	Well Depth (TVD)	Water/Oil/Gas
Rustler	247'	Water
Top of Salt	662'	Water
Base of Salt	2727'	Water
Delaware	2916'	Water
Bone Spring	6687'	Water/Oil/Gas
1st Bone Spring Ss	7617'	Water/Oil/Gas
2nd Bone Spring Ss	8387'	Water/Oil/Gas
3rd Bone Spring Ss	9506'	Water/Oil/Gas
Wolfcamp	9877'	Water/Oil/Gas
Wolfcamp A	10019'	Water/Oil/Gas
Wolfcamp B	10311'	Water/Oil/Gas
Wolfcamp D	10726'	Water/Oil/Gas
Target/Land Curve	10858'	Water/Oil/Gas

\*\*\* Hydrocarbons @ Brushy Canyon

\*\*\* Groundwater depth 40' (per NM State Engineers Office).

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 11-3/4 inch casing @ ' (52' above the salt) and circulating cement back to surface. A 10-5/8 inch vertical hole will be drilled to 10108' and 8-5/8 inch casing ran and cemented to surface. An 7-7/8 inch curve and lateral hole will be drilled to MD/TD and 5-1/2 casing will be set at TD and cemented back 300' into the 8-5/8 inch casing shoe.

**3. Casing Design**

Hole Size	Depth	OD Csg	Weight	Collar	Grade	New/Used	SF Burst	SF Collapse	SF Tension
14-3/4"	0' – 610'	11-3/4"	47	BTC	J-55	New	1.22	4.76	16.64
10-5/8"	0' – 3020'	8-5/8"	32	BTC	CYP-110	New	1.46	1.34	3.11
10-5/8"	3020' – 10108'	8-5/8"	32	BTC	HCL-80	New	1.06	1.50	2.26
7-7/8"	0' – 15987'	5-1/2"	20	BTC	P-110	New	1.18	1.46	2.59

- XTO requests to not utilize centralizers in the curve and lateral
- 8-5/8" Collapse analyzed using 50% evacuation based on regional experience.
- 8-5/8 casing will be a split string with CYP-110 run from surface to 3020' & HCL-80 from 3020' to TD because the 8-5/8" HCL-80 casing fails at SF burst at surface. The split string design passes our internal requirements
- 5-1/2" tension calculated using vertical hanging weight plus the lateral weight multiplied by a friction factor of 0.35
- Test on Casing will be limited to 70% burst of the casing or 1500 psi, whichever is less

**WELLHEAD:**

Permanent Wellhead – GE RSH Multibowl System

A. Starting Head (RSH System): 11-3/4" SOW bottom x 13-5/8" 5M top flange

B. Tubing Head: 13-5/8" 5M bottom flange x 7-1/16" 10M top flange

- Wellhead will be installed by manufacturer's representatives.
- Manufacturer will monitor welding process to ensure appropriate temperature of seal.
- Operator will test the 8-5/8" casing per Onshore Order 2.
- Wellhead manufacturer representative may not be present for BOP test plug installation

#### 4. Cement Program

##### **Surface Casing: 11-3/4", 47 New J-55, BTC casing to be set at +/- 610'**

Lead: 140 sxs Halcem-C + 2% CaCl (mixed at 12.8 ppg, 1.88 ft3/sx, 9.61 gal/sx water)

Tail: 190 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)

Compressives:        12-hr =            900 psi            24 hr = 1500 psi

Top of Cement: Surface

##### **Intermediate Casing: 8-5/8", 32 New CYP-110, BTC casing to be set at +/- 10108'**

###### 1st Stage

Lead: 510 sxs Halcem-C + 2% CaCl (mixed at 12.8 ppg, 1.87 ft3/sx, 9.61 gal/sx water)

Tail: 310 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)

Compressives:        12-hr =            900 psi            24 hr = 1500 psi

Top of Cement: Brushy Canyon

###### 2nd Stage

Tail: 1050 sxs Halcem-C (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)

Compressives:        12-hr =            900 psi            24 hr = 1500 psi

TOC: Surface

XTO requests to pump a two stage cement job on the 7-5/8" intermediate casing string with the first stage being pumped conventionally with the calculated top of cement at the Brush Canyon (6,465') and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface. If necessary, a top out consisting of 1,500 sack of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (2.30 yld, 12.91 ppg) will be executed as a contingency. The final cement top will be verified by Echo-meter.

XTO will include the Echo-meter verified fluid top and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program.

XTO will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing procedures.

##### **Production Casing: 5-1/2", 20 New P-110, BTC casing to be set at +/- 15987'**

Lead: 960 sxs Halcem-C + 2% CaCl (mixed at 11.5 ppg, 1.88 ft3/sx, 9.61 gal/sx water)

Tail: 960 sxs VersaCem (mixed at 13.2 ppg, 9808 ft3/sx, 8.38 gal/sx water)

Compressives:        12-hr =            1375 psi            24 hr = 2285 psi

Top of Cement: 300' inside previous casing shoe

#### 5. Pressure Control Equipment

Once the permanent WH is installed on the 13-3/8 casing, the blow out preventer equipment (BOP) will consist of a 13-5/8" minimum 5M Hydril and a 13-5/8" minimum 10M 3-Ram BOP. MASP should not exceed 5234 psi. In any instance where 10M BOP is required by BLM, XTO requests a variance to utilize 5M annular with 10M ram preventers (a common BOP configuration, which allows use of 10M rams in unlikely event that pressures exceed 5M). Also a variance is requested to test the 5M annular to 70% of working pressure at 3500 psi.

All BOP testing will be done by an independent service company. Annular pressure tests will be limited to 50% of the working pressure. When nipling up on the 13-5/8" 10M bradenhead and flange, the BOP test will be limited to 10000 psi. When the 11-3/4" and 8-5/8" casing is set, the packoff seals will be tested to a minimum of 10000 psi. All BOP tests will include a low pressure test as per BLM regulations. The 10M BOP diagrams are attached. Blind rams will be functioned tested each trip, pipe rams will be functioned tested each day.

A variance is requested to allow use of a flex hose as the choke line from the BOP to the Choke Manifold. If this hose is used, a copy of the manufacturer's certification and pressure test chart will be kept on the rig. Attached is an example of a certification and pressure test chart. The manufacturer does not require anchors.

A variance is requested to ONLY test broken pressure seals on the BOP equipment when moving from wellhead to wellhead which is in compliance with API Standard 53. API standard 53 states, that for pad drilling operation, moving from one wellhead to another within 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken. Based on discussions with the BLM on February 27th 2020, we will request permission to ONLY retest broken pressure seals if the following conditions are met: 1. After a full BOP test is conducted on the first well on the pad (First well will be the deepest Intermediate) 2. When skidding to drill an intermediate section does not penetrate into the Wolfcamp 3. Full BOP test will be required prior to drilling the production hole.

A variance is requested to cement offline for the surface and intermediate casing strings.

XTO requests a variance to be able to batch drill this well if necessary. In doing so, XTO will set each casing string and ensure that the well is cemented properly and the well is static. With floats holding, no pressure on the csg annulus, and the installation of a 10K TA cap as per GE recommendations, XTO will contact the BLM on each rig skid on the pad. Once surface and intermediate strings are all completed, XTO will begin drilling the production hole on each of the wells.

## 6. Proposed Mud Circulation System

INTERVAL	Hole Size	Mud Type	MW (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
0' to 610'	14-3/4"	FW / Native	8.4-8.8	30-40	NC
610' to 10108'	10-5/8"	Brine / Cut Brine / WBM	8.5-9.8	29-32	NC - 20
10108' to 15987'	7-7/8"	FW / Cut Brine / Polymer/ OBM	13.2-13.8	32-50	NC - 20

The necessary mud products for weight addition and fluid loss control will be on location at all times.

Spud with fresh water/native mud and set 11 3/4" surface casing, isolating the fresh water aquifer. Drill out from under 11-3/4" surface casing with a brine/oil direct emulsion water-based mud. Use fibrous materials as needed to control seepage and lost circulation. Pump viscous sweeps as needed for hole cleaning. Pump speed will be recorded on a daily drilling report after mudding up. A Pason or Totco will be used to detect changes in loss or gain of mud volume. A mud test will be performed every 24 hours to determine: density, viscosity, strength, filtration and pH as necessary. Use available solids controls equipment to help keep mud weight down after mud up. Rig up solids control equipment to operate as a closed loop system.

## 7. 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 appropriate connections will be on the rig floor at all times.
- C. H2S monitors will be on location when drilling below the 11-3/4" casing.

## 8. Logging, Coring and Testing Program

Mud Logger: Mud Logging Unit (2 man) below 1st intermediate casing.

Open hole logging will include Yes

## 9. Abnormal Pressures and Temperatures / Potential Hazards

None Anticipated. BHT of 145 to 165 F is anticipated. No H2S is expected but monitors will be in place to detect any H2S occurrences. Should these circumstances be encountered the operator and drilling contractor are prepared to take all necessary steps to ensure safety of all personnel and environment. Lost circulation could occur but is not expected to be a serious problem in this area and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid. The maximum anticipated bottom hole pressure for this well is 7622 psi.

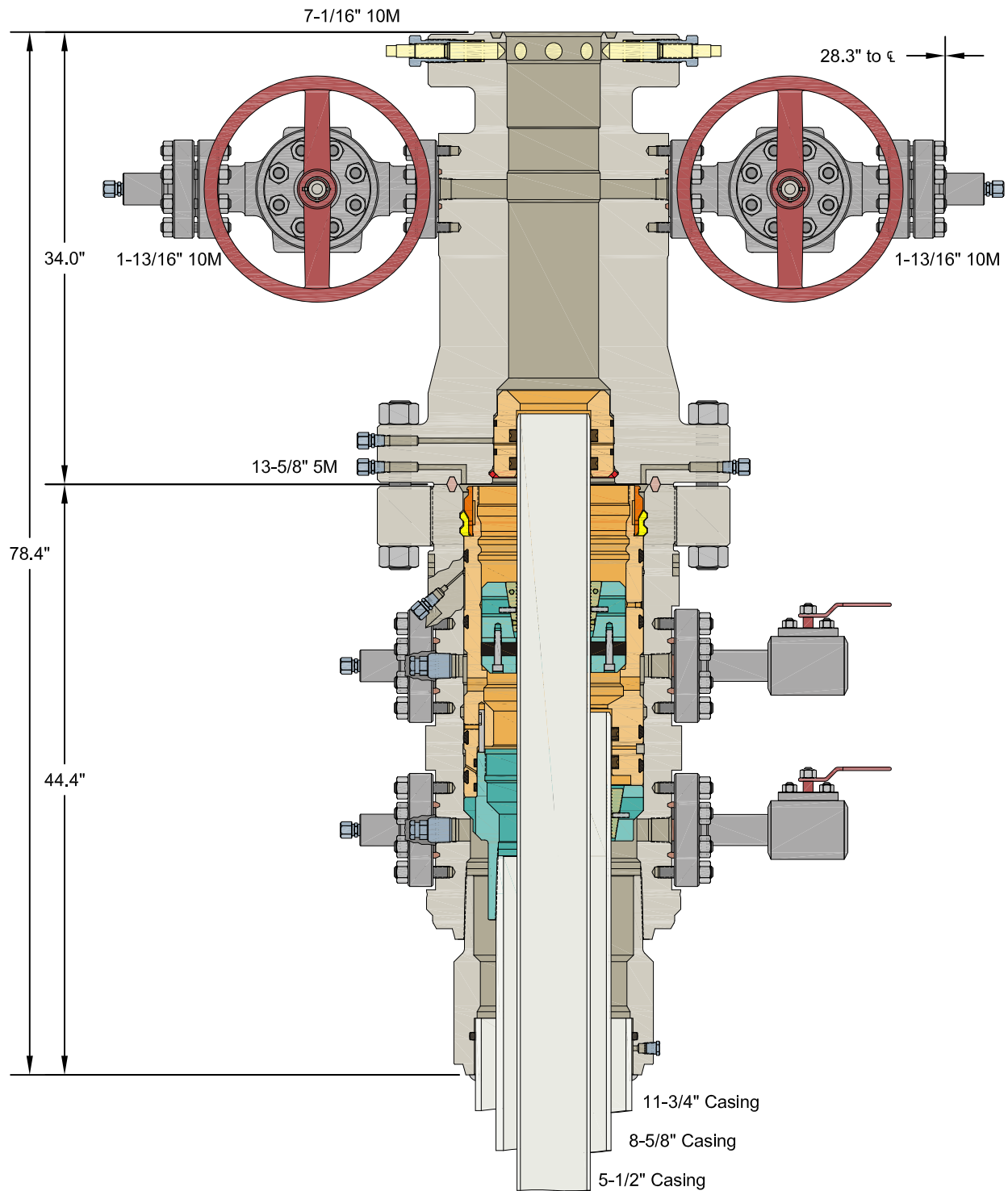
## 10. Anticipated Starting Date and Duration of Operations

Road and location construction will begin after Santa Fe and BLM have approved the APD. Anticipated spud date will be as soon after Santa Fe and BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 40 days. If production casing is run, an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.





GE Oil & Gas



ALL DIMENSIONS ARE APPROXIMATE

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XTO ENERGY, INC.

11-3/4" x 8-5/8" x 5-1/2" 10M RSH-2 Wellhead  
Assembly, With T-EBS-F Tubing Head

DRAWN	VJK	31OCT16
APPRV	KN	31OCT16
FOR REFERENCE ONLY		
DRAWING NO.		10012358



## **XTO Energy**

**Eddy County, NM (NAD-27)**

**Corral Canyon 4 Fed**

**#164H**

**OH**

**Plan: PERMITv2**

## **Standard Planning Report**

**18 May, 2020**



Project: Eddy County, NM (NAD-27)  
Site: Corral Canyon 4 Fed  
Well: #164H  
Wellbore: OH  
Design: PERMITv2

PROJECT DETAILS: Eddy County, NM (NAD-27)  
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level

WELL DETAILS: #164H

Rig Name:		Nabors X32	
RKB = 25' @ 2972.00usft (Nabors X32)			
Ground Level:		2947.00	
+N/-S	+E/-W	Northing	Easting
0.00	0.00	418875.70	606050.00
		Latitude	Longitude
		32.1511422	-103.9906683

DESIGN TARGET DETAILS

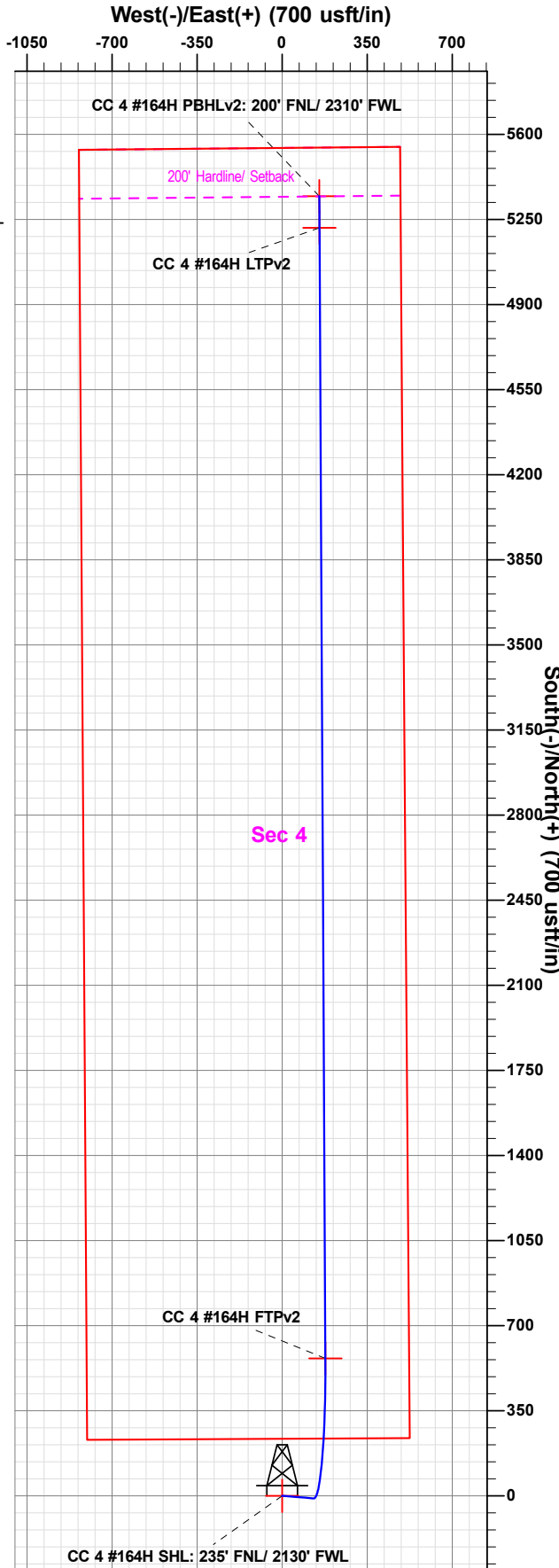
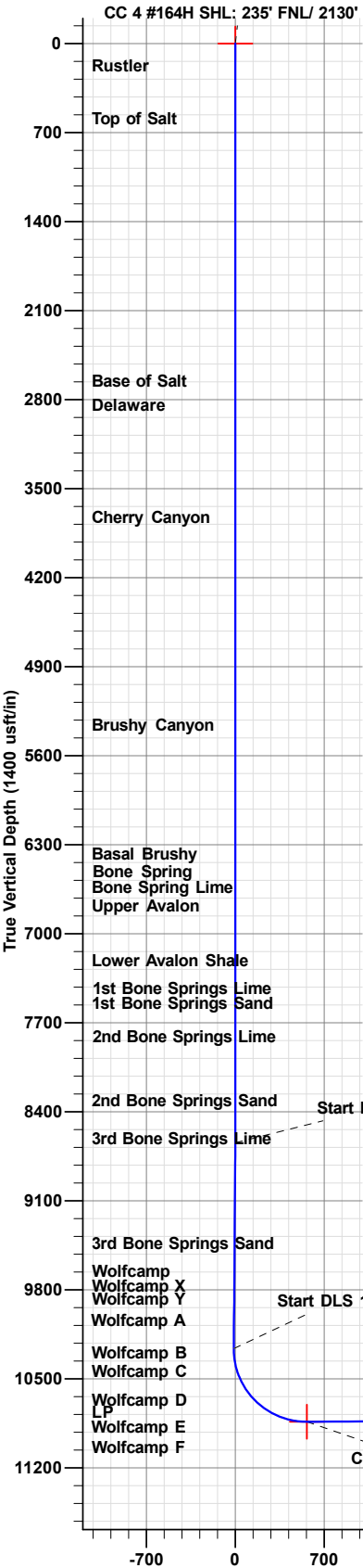
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
CC 4 #164H SHL: 235' FNL/ 2130' FWL	0.00	0.00	0.00	418875.70	606050.00	32.1511422	-103.9906683
CC 4 #164H PBHLv2: 200' FNL/ 2310' FWL	10811.97	5345.60	152.90	424221.30	606202.90	32.1658357	-103.9901192
CC 4 #164H LTPv2	10812.65	5215.60	153.60	424091.30	606203.60	32.1654784	-103.9901183
CC 4 #164H FTPv2	10837.00	565.50	177.70	419441.20	606227.70	32.1526952	-103.9900883

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8643.00	0.00	0.00	8643.00	0.00	0.00	0.00	0.00	0.00
3	8893.06	5.00	94.69	8892.75	-0.89	10.87	2.00	94.69	-0.95
4	10267.46	5.00	94.69	10261.91	-10.68	130.29	0.00	0.00	-11.37
5	11174.79	90.30	359.70	10837.00	565.50	177.70	10.00	-94.94	564.56
6	15825.02	90.30	359.70	10812.65	5215.60	153.57	0.00	0.00	5214.72
7	15955.02	90.30	359.70	10811.97	5345.60	152.90	0.00	0.00	5344.73

FORMATION TOP DETAILS

TVDPATH	Formation
246.00	Rustler
661.00	Top of Salt
2726.00	Base of Salt
2915.00	Delaware
3796.00	Cherry Canyon
5428.00	Brushy Canyon
6446.00	Basal Brushy
6686.00	Bone Spring
6708.00	Bone Spring Lime
6854.00	Upper Avalon
7284.00	Lower Avalon Shale
7537.00	1st Bone Springs Lime
7616.00	1st Bone Springs Sand
7883.00	2nd Bone Springs Lime
8386.00	2nd Bone Springs Sand
8682.00	3rd Bone Springs Lime
9505.00	3rd Bone Springs Sand
9890.00	Wolfcamp
9910.00	Wolfcamp X
9984.00	Wolfcamp Y
10024.00	Wolfcamp A
10310.00	Wolfcamp B
10510.00	Wolfcamp C
10736.00	Wolfcamp D
10832.00	Wolfcamp E
10837.00	LP



Vertical Section at 359.70° (1400 usft/in)

The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by Prototype are at the sole risk and responsibility of the user.

Plan: PERMITv2 (#164H/OH)

Created By: Matthew May Date: 10:08, May 18 2020



## Planning Report

<b>Database:</b>	EDM 5000.1.13 Single User Db	<b>Local Co-ordinate Reference:</b>	Well #164H
<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

<b>Project</b>	Eddy County, NM (NAD-27)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

Site		Corral Canyon 4 Fed			
Site Position:		Northing:	418,905.60 usft	Latitude:	32.1512244
From:	Map	Easting:	606,049.80 usft	Longitude:	-103.9906686
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.18 °

Well	#164H					
Well Position	+N/-S	-29.90 usft	Northing:	418,875.70 usft	Latitude:	32.1511422
	+E/-W	0.20 usft	Easting:	606,050.00 usft	Longitude:	-103.9906683
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	2,947.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	05/22/20	6.83	59.89	47,554

<b>Design</b>	PERMITv2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	359.70

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,643.00	0.00	0.00	8,643.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,893.06	5.00	94.69	8,892.75	-0.89	10.87	2.00	2.00	0.00	94.69	
10,267.46	5.00	94.69	10,261.91	-10.68	130.29	0.00	0.00	0.00	0.00	
11,174.79	90.30	359.70	10,837.00	565.50	177.70	10.00	9.40	-10.47	-94.94	CC 4 #164H FTPv2
15,825.02	90.30	359.70	10,812.65	5,215.60	153.57	0.00	0.00	0.00	0.00	CC 4 #164H LTPv2
15,955.02	90.30	359.70	10,811.97	5,345.60	152.90	0.00	0.00	0.00	0.00	CC 4 #164H PBHLv2



## Planning Report

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<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CC 4 #164H SHL: 235' FNL/ 2130' FWL</b>									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
246.00	0.00	0.00	246.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Rustler</b>									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
661.00	0.00	0.00	661.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Top of Salt</b>									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,726.00	0.00	0.00	2,726.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Base of Salt</b>									
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,915.00	0.00	0.00	2,915.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Delaware</b>									
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,796.00	0.00	0.00	3,796.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Cherry Canyon</b>									
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00



## Planning Report

<b>Database:</b>	EDM 5000.1.13 Single User Db	<b>Local Co-ordinate Reference:</b>	Well #164H
<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,428.00	0.00	0.00	5,428.00	0.00	0.00	0.00	0.00	0.00	0.00
Brushy Canyon									
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,446.00	0.00	0.00	6,446.00	0.00	0.00	0.00	0.00	0.00	0.00
Basal Brushy									
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,686.00	0.00	0.00	6,686.00	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring									
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,708.00	0.00	0.00	6,708.00	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring Lime									
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,854.00	0.00	0.00	6,854.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Avalon									
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,284.00	0.00	0.00	7,284.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Avalon Shale									
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,537.00	0.00	0.00	7,537.00	0.00	0.00	0.00	0.00	0.00	0.00
1st Bone Springs Lime									
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,616.00	0.00	0.00	7,616.00	0.00	0.00	0.00	0.00	0.00	0.00
1st Bone Springs Sand									
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00



## Planning Report

<b>Database:</b>	EDM 5000.1.13 Single User Db	<b>Local Co-ordinate Reference:</b>	Well #164H
<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,883.00	0.00	0.00	7,883.00	0.00	0.00	0.00	0.00	0.00	0.00
2nd Bone Springs Lime									
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,386.00	0.00	0.00	8,386.00	0.00	0.00	0.00	0.00	0.00	0.00
2nd Bone Springs Sand									
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,643.00	0.00	0.00	8,643.00	0.00	0.00	0.00	0.00	0.00	0.00
8,682.00	0.78	94.69	8,682.00	-0.02	0.26	-0.02	2.00	2.00	0.00
3rd Bone Springs Lime									
8,700.00	1.14	94.69	8,700.00	-0.05	0.57	-0.05	2.00	2.00	0.00
8,800.00	3.14	94.69	8,799.92	-0.35	4.29	-0.37	2.00	2.00	0.00
8,893.06	5.00	94.69	8,892.75	-0.89	10.87	-0.95	2.00	2.00	0.00
8,900.00	5.00	94.69	8,899.66	-0.94	11.47	-1.00	0.00	0.00	0.00
9,000.00	5.00	94.69	8,999.28	-1.65	20.16	-1.76	0.00	0.00	0.00
9,100.00	5.00	94.69	9,098.89	-2.37	28.85	-2.52	0.00	0.00	0.00
9,200.00	5.00	94.69	9,198.51	-3.08	37.54	-3.27	0.00	0.00	0.00
9,300.00	5.00	94.69	9,298.13	-3.79	46.23	-4.03	0.00	0.00	0.00
9,400.00	5.00	94.69	9,397.75	-4.50	54.92	-4.79	0.00	0.00	0.00
9,500.00	5.00	94.69	9,497.37	-5.22	63.61	-5.55	0.00	0.00	0.00
9,507.66	5.00	94.69	9,505.00	-5.27	64.27	-5.61	0.00	0.00	0.00
3rd Bone Springs Sand									
9,600.00	5.00	94.69	9,596.99	-5.93	72.29	-6.31	0.00	0.00	0.00
9,700.00	5.00	94.69	9,696.61	-6.64	80.98	-7.06	0.00	0.00	0.00
9,800.00	5.00	94.69	9,796.23	-7.35	89.67	-7.82	0.00	0.00	0.00
9,894.13	5.00	94.69	9,890.00	-8.02	97.85	-8.54	0.00	0.00	0.00
Wolfcamp									
9,900.00	5.00	94.69	9,895.85	-8.07	98.36	-8.58	0.00	0.00	0.00
9,914.21	5.00	94.69	9,910.00	-8.17	99.59	-8.69	0.00	0.00	0.00
Wolfcamp X									
9,988.49	5.00	94.69	9,984.00	-8.70	106.05	-9.25	0.00	0.00	0.00
Wolfcamp Y									
10,000.00	5.00	94.69	9,995.47	-8.78	107.05	-9.34	0.00	0.00	0.00
10,028.64	5.00	94.69	10,024.00	-8.98	109.54	-9.56	0.00	0.00	0.00
Wolfcamp A									
10,100.00	5.00	94.69	10,095.09	-9.49	115.74	-10.10	0.00	0.00	0.00
10,200.00	5.00	94.69	10,194.71	-10.20	124.43	-10.85	0.00	0.00	0.00
10,267.46	5.00	94.69	10,261.91	-10.68	130.29	-11.37	0.00	0.00	0.00
10,300.00	5.72	60.15	10,294.32	-9.99	133.11	-10.69	10.00	2.22	-106.14
10,315.78	6.64	48.19	10,310.00	-8.99	134.47	-9.70	10.00	5.82	-75.81
Wolfcamp B									
10,350.00	9.27	32.03	10,343.90	-5.34	137.41	-6.05	10.00	7.66	-47.22
10,400.00	13.74	20.62	10,392.89	3.64	141.64	2.90	10.00	8.95	-22.83
10,450.00	18.48	14.85	10,440.91	16.87	145.76	16.10	10.00	9.49	-11.54
10,500.00	23.33	11.39	10,487.61	34.25	149.75	33.46	10.00	9.70	-6.91
10,524.62	25.74	10.15	10,510.00	44.29	151.66	43.49	10.00	9.78	-5.05
Wolfcamp C									
10,550.00	28.23	9.07	10,532.62	55.64	153.57	54.84	10.00	9.81	-4.23



## Planning Report

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<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,600.00	33.16	7.40	10,575.60	80.90	157.20	80.07	10.00	9.85	-3.35
10,650.00	38.10	6.11	10,616.23	109.81	160.61	108.97	10.00	9.89	-2.57
10,700.00	43.05	5.08	10,654.20	142.17	163.77	141.31	10.00	9.91	-2.06
10,750.00	48.02	4.23	10,689.21	177.73	166.65	176.85	10.00	9.93	-1.71
10,800.00	52.99	3.50	10,721.00	216.21	169.24	215.32	10.00	9.94	-1.46
10,825.68	55.54	3.16	10,736.00	237.02	170.45	236.12	10.00	9.94	-1.32
<b>Wolfcamp D</b>									
10,850.00	57.96	2.86	10,749.33	257.32	171.51	256.42	10.00	9.95	-1.24
10,900.00	62.93	2.28	10,773.99	300.76	173.46	299.85	10.00	9.95	-1.15
10,950.00	67.91	1.76	10,794.78	346.19	175.06	345.27	10.00	9.95	-1.05
11,000.00	72.89	1.27	10,811.55	393.26	176.30	392.33	10.00	9.96	-0.98
11,050.00	77.87	0.80	10,824.16	441.62	177.17	440.68	10.00	9.96	-0.93
11,095.83	82.43	0.39	10,832.00	486.76	177.64	485.82	10.00	9.96	-0.90
<b>Wolfcamp E</b>									
11,100.00	82.85	0.36	10,832.53	490.89	177.66	489.96	10.00	9.96	-0.88
11,150.00	87.83	359.92	10,836.60	540.71	177.78	539.77	10.00	9.96	-0.87
11,174.79	90.30	359.70	10,837.00	565.50	177.70	564.56	10.00	9.96	-0.87
<b>LP - CC 4 #164H FTPv2</b>									
11,200.00	90.30	359.70	10,836.87	590.71	177.57	589.77	0.00	0.00	0.00
11,300.00	90.30	359.70	10,836.34	690.70	177.05	689.77	0.00	0.00	0.00
11,400.00	90.30	359.70	10,835.82	790.70	176.53	789.77	0.00	0.00	0.00
11,500.00	90.30	359.70	10,835.30	890.70	176.01	889.76	0.00	0.00	0.00
11,600.00	90.30	359.70	10,834.77	990.70	175.49	989.76	0.00	0.00	0.00
11,700.00	90.30	359.70	10,834.25	1,090.69	174.98	1,089.76	0.00	0.00	0.00
11,800.00	90.30	359.70	10,833.73	1,190.69	174.46	1,189.76	0.00	0.00	0.00
11,900.00	90.30	359.70	10,833.20	1,290.69	173.94	1,289.76	0.00	0.00	0.00
12,000.00	90.30	359.70	10,832.68	1,390.68	173.42	1,389.76	0.00	0.00	0.00
12,100.00	90.30	359.70	10,832.16	1,490.68	172.90	1,489.76	0.00	0.00	0.00
12,200.00	90.30	359.70	10,831.63	1,590.68	172.38	1,589.75	0.00	0.00	0.00
12,300.00	90.30	359.70	10,831.11	1,690.68	171.86	1,689.75	0.00	0.00	0.00
12,400.00	90.30	359.70	10,830.59	1,790.67	171.34	1,789.75	0.00	0.00	0.00
12,500.00	90.30	359.70	10,830.06	1,890.67	170.82	1,889.75	0.00	0.00	0.00
12,600.00	90.30	359.70	10,829.54	1,990.67	170.31	1,989.75	0.00	0.00	0.00
12,700.00	90.30	359.70	10,829.01	2,090.67	169.79	2,089.75	0.00	0.00	0.00
12,800.00	90.30	359.70	10,828.49	2,190.66	169.27	2,189.75	0.00	0.00	0.00
12,900.00	90.30	359.70	10,827.97	2,290.66	168.75	2,289.74	0.00	0.00	0.00
13,000.00	90.30	359.70	10,827.44	2,390.66	168.23	2,389.74	0.00	0.00	0.00
13,100.00	90.30	359.70	10,826.92	2,490.65	167.71	2,489.74	0.00	0.00	0.00
13,200.00	90.30	359.70	10,826.40	2,590.65	167.19	2,589.74	0.00	0.00	0.00
13,300.00	90.30	359.70	10,825.87	2,690.65	166.67	2,689.74	0.00	0.00	0.00
13,400.00	90.30	359.70	10,825.35	2,790.65	166.16	2,789.74	0.00	0.00	0.00
13,500.00	90.30	359.70	10,824.83	2,890.64	165.64	2,889.74	0.00	0.00	0.00
13,600.00	90.30	359.70	10,824.30	2,990.64	165.12	2,989.74	0.00	0.00	0.00
13,700.00	90.30	359.70	10,823.78	3,090.64	164.60	3,089.73	0.00	0.00	0.00
13,800.00	90.30	359.70	10,823.25	3,190.64	164.08	3,189.73	0.00	0.00	0.00
13,900.00	90.30	359.70	10,822.73	3,290.63	163.56	3,289.73	0.00	0.00	0.00
14,000.00	90.30	359.70	10,822.21	3,390.63	163.04	3,389.73	0.00	0.00	0.00
14,100.00	90.30	359.70	10,821.68	3,490.63	162.52	3,489.73	0.00	0.00	0.00
14,200.00	90.30	359.70	10,821.16	3,590.62	162.01	3,589.73	0.00	0.00	0.00
14,300.00	90.30	359.70	10,820.64	3,690.62	161.49	3,689.73	0.00	0.00	0.00
14,400.00	90.30	359.70	10,820.11	3,790.62	160.97	3,789.72	0.00	0.00	0.00
14,500.00	90.30	359.70	10,819.59	3,890.62	160.45	3,889.72	0.00	0.00	0.00
14,600.00	90.30	359.70	10,819.07	3,990.61	159.93	3,989.72	0.00	0.00	0.00





## Planning Report

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<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
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<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,700.00	90.30	359.70	10,818.54	4,090.61	159.41	4,089.72	0.00	0.00	0.00
14,800.00	90.30	359.70	10,818.02	4,190.61	158.89	4,189.72	0.00	0.00	0.00
14,900.00	90.30	359.70	10,817.50	4,290.61	158.37	4,289.72	0.00	0.00	0.00
15,000.00	90.30	359.70	10,816.97	4,390.60	157.85	4,389.72	0.00	0.00	0.00
15,100.00	90.30	359.70	10,816.45	4,490.60	157.34	4,489.71	0.00	0.00	0.00
15,200.00	90.30	359.70	10,815.92	4,590.60	156.82	4,589.71	0.00	0.00	0.00
15,300.00	90.30	359.70	10,815.40	4,690.59	156.30	4,689.71	0.00	0.00	0.00
15,400.00	90.30	359.70	10,814.88	4,790.59	155.78	4,789.71	0.00	0.00	0.00
15,500.00	90.30	359.70	10,814.35	4,890.59	155.26	4,889.71	0.00	0.00	0.00
15,600.00	90.30	359.70	10,813.83	4,990.59	154.74	4,989.71	0.00	0.00	0.00
15,700.00	90.30	359.70	10,813.31	5,090.58	154.22	5,089.71	0.00	0.00	0.00
15,800.00	90.30	359.70	10,812.78	5,190.58	153.70	5,189.71	0.00	0.00	0.00
15,825.02	90.30	359.70	10,812.65	5,215.60	153.57	5,214.72	0.00	0.00	0.00
<b>CC 4 #164H LTPv2</b>									
15,900.00	90.30	359.70	10,812.26	5,290.58	153.19	5,289.70	0.00	0.00	0.00
15,955.02	90.30	359.70	10,811.97	5,345.60	152.90	5,344.73	0.00	0.00	0.00
<b>CC 4 #164H PBHLv2: 200' FNL/ 2310' FWL</b>									

### Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
CC 4 #164H SHL: 2310' FWL	0.00	0.00	0.00	0.00	0.00	418,875.70	606,050.00	32.1511422	-103.9906683
- plan hits target center									
- Point									
CC 4 #164H PBHLv2:	0.00	0.00	10,811.97	5,345.60	152.90	424,221.30	606,202.90	32.1658358	-103.9901192
- plan hits target center									
- Point									
CC 4 #164H LTPv2	0.00	0.00	10,812.65	5,215.60	153.60	424,091.30	606,203.60	32.1654784	-103.9901183
- plan misses target center by 0.03usft at 15825.02usft MD (10812.65 TVD, 5215.60 N, 153.57 E)									
- Point									
CC 4 #164H FTPv2	0.00	0.00	10,837.00	565.50	177.70	419,441.20	606,227.70	32.1526952	-103.9900883
- plan hits target center									
- Point									



## Planning Report

<b>Database:</b>	EDM 5000.1.13 Single User Db	<b>Local Co-ordinate Reference:</b>	Well #164H
<b>Company:</b>	XTO Energy	<b>TVD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Project:</b>	Eddy County, NM (NAD-27)	<b>MD Reference:</b>	RKB = 25' @ 2972.00usft (Nabors X32)
<b>Site:</b>	Corral Canyon 4 Fed	<b>North Reference:</b>	Grid
<b>Well:</b>	#164H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PERMITv2		

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
246.00	246.00	Rustler			
661.00	661.00	Top of Salt			
2,726.00	2,726.00	Base of Salt			
2,915.00	2,915.00	Delaware			
3,796.00	3,796.00	Cherry Canyon			
5,428.00	5,428.00	Brushy Canyon			
6,446.00	6,446.00	Basal Brushy			
6,686.00	6,686.00	Bone Spring			
6,708.00	6,708.00	Bone Spring Lime			
6,854.00	6,854.00	Upper Avalon			
7,284.00	7,284.00	Lower Avalon Shale			
7,537.00	7,537.00	1st Bone Springs Lime			
7,616.00	7,616.00	1st Bone Springs Sand			
7,883.00	7,883.00	2nd Bone Springs Lime			
8,386.00	8,386.00	2nd Bone Springs Sand			
8,682.00	8,682.00	3rd Bone Springs Lime			
9,507.66	9,505.00	3rd Bone Springs Sand			
9,894.13	9,890.00	Wolfcamp			
9,914.21	9,910.00	Wolfcamp X			
9,988.49	9,984.00	Wolfcamp Y			
10,028.64	10,024.00	Wolfcamp A			
10,315.78	10,310.00	Wolfcamp B			
10,524.62	10,510.00	Wolfcamp C			
10,825.68	10,736.00	Wolfcamp D			
11,095.83	10,832.00	Wolfcamp E			
11,174.79	10,837.00	LP			

XTO respectfully requests approval to utilize a spudder rig to pre-set surface casing.

Description of Operations:

1. Spudder rig will move in to drill the surface hole and pre-set surface casing on the well.
  - a. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
  - b. The spudder rig will utilize fresh water-based mud to drill the surface hole to TD. Solids control will be handled entirely on a closed loop basis. No earth pits will be used.
2. The wellhead will be installed and tested as soon as the surface casing is cut off and WOC time has been reached.
3. A blind flange at the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wing valves.
  - a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations are expected to take 2-3 days per well on the pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling Operations will begin with a larger rig and a BOP stack equal to or greater than the pressure rating that was permitted will be nipped up and tested on the wellhead before drilling operations resume on each well.
  - a. The larger rig will move back onto the location within 180 days from the point at which the wells are secured and the spudder rig is moved off location.
  - b. The BLM will be notified 24 hours before the larger rig moves back on the pre-set locations
7. XTO will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
8. Once the rig is removed, XTO will secure the wellhead area by placing a guard rail around the cellar area.

**Subject:** Request for a Variance Allowing break Testing of the Blowout Preventer Equipment (BOPE)

XTO Energy requests a variance to ONLY test broken pressure seals on the BOPE and function test BOP when skidding a drilling rig between multiple wells on a pad.

**Background**

Onshore Oil and Gas Order (OOGO) No. 2, Drilling Operations, Sections III.A.2.i.iv.B states that the BOP test must be performed whenever any seal subject to test pressure is broken. The current interpretation of the Bureau of Land Management (BLM) requires a complete BOP test and not just a test of the affected component. OOGO No. 2, Section I.D.2 states, “Some situation may exist either on a well-by-well basis or field-wide basis whereby it is commonly accepted practice to vary a particular minimum standard(s) established in this order. This situation can be resolved by requesting a variance...”. XTO Energy feels the break testing the BOPE is such a situation. Therefore, as per OOGO No. 2, Section IV., XTO Energy submits this request for the variance.

**Supporting Documentation**

OOGO No. 2 became effective on December 19, 1988 and has remained the standard for regulating BLM onshore drilling operations for over 30 years. During this time there have been significant changes in drilling technology. BLM continues to use the variance request process to allow for the use of modern technology and acceptable engineering practices that have arisen since OOGO No. 2 was originally released. The XTO Energy drilling rig fleet has many modern upgrades that allow the intact BOP stack to be moved between well slots on a multi-well pad, as well as, wellhead designs that incorporate quick connects facilitating release of the BOP from the wellhead without breaking any BOP stack components apart. These technologies have been used extensively offshore, and other regulators, API, and many operators around the world have endorsed break testing as safe and reliable.



Figure 1: Winch System attached to BOP Stack



Figure 2: BOP Winch System

American Petroleum Institute (API) standards, specification and recommended practices are considered the industry standard and are consistently utilized and referenced by the industry. OOGO No. 2 recognizes API recommended Practices (RP) 53 in its original development. API Standard 53, *Well Control Equipment Systems for Drilling Wells* (Fifth Edition, December 2018, Annex C, Table C.4) recognizes break testing as an acceptable practice. Specifically, API Standard 53, Section 5.3.7.1 states “A pressure test of the pressure containing component shall be performed following the disconnection or repair, limited to the affected component.” See Table C.4 below for reference.

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API STANDARD 53

Table C.4—Initial Pressure Testing, Surface BOP Stacks

Component to be Pressure Tested	Pressure Test—Low Pressure <sup>ac</sup> psig (MPa)	Pressure Test—High Pressure <sup>ac</sup>	
		Change Out of Component, Elastomer, or Ring Gasket	No Change Out of Component, Elastomer, or Ring Gasket
Annular preventer <sup>b</sup>	250 to 350 (1.72 to 2.41)	RWP of annular preventer	MASP or 70% annular RWP, whichever is lower.
Fixed pipe, variable bore, blind, and BSR preventers <sup>bd</sup>	250 to 350 (1.72 to 2.41)	RWP of ram preventer or wellhead system, whichever is lower	ITP
Choke and kill line and BOP side outlet valves below ram preventers (both sides)	250 to 350 (1.72 to 2.41)	RWP of side outlet valve or wellhead system, whichever is lower	ITP
Choke manifold—upstream of chokes <sup>e</sup>	250 to 350 (1.72 to 2.41)	RWP of ram preventers or wellhead system, whichever is lower	ITP
Choke manifold—downstream of chokes <sup>e</sup>	250 to 350 (1.72 to 2.41)	RWP of valve(s), line(s), or MASP for the well program, whichever is lower	
Kelly, kelly valves, drill pipe safety valves, IBOPs	250 to 350 (1.72 to 2.41)	MASP for the well program	

<sup>a</sup> Pressure test evaluation periods shall be a minimum of five minutes.

No visible leaks.

The pressure shall remain stable during the evaluation period. The pressure shall not decrease below the intended test pressure.

<sup>b</sup> Annular(s) and VBR(s) shall be pressure tested on the largest and smallest OD drill pipe to be used in well program.

<sup>c</sup> For pad drilling operations, moving from one wellhead to another within the 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

<sup>d</sup> For surface offshore operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented during the initial test. For land operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented at commissioning and annually.

<sup>e</sup> Adjustable chokes are not required to be full sealing devices. Pressure testing against a closed choke is not required.

The Bureau of Safety and Environmental Enforcement (BSEE), Department of Interior, has also utilized the API standards, specification and best practices in the development of its offshore oil and gas regulations and incorporates them by reference within its regulations.

Break testing has been approved by the BLM in the past with other operators based on the detailed information provided in this document.

XTO Energy feels break testing and our current procedures meet the intent of OOGO No. 2 and often exceed it. There has been no evidence that break testing results in more components failing than seen on full BOP tests. XTO Energy's internal standards requires complete BOPE tests more often than that of OOGO No. 2 (Every 21 days). In addition to function testing the annular, pipe rams and blind rams after each BOP nipple up, XTO Energy performs a choke drill with the rig crew prior to drilling out every casing shoe. This is additional training for the rig crew that exceeds the requirements of the OOGO No.2.

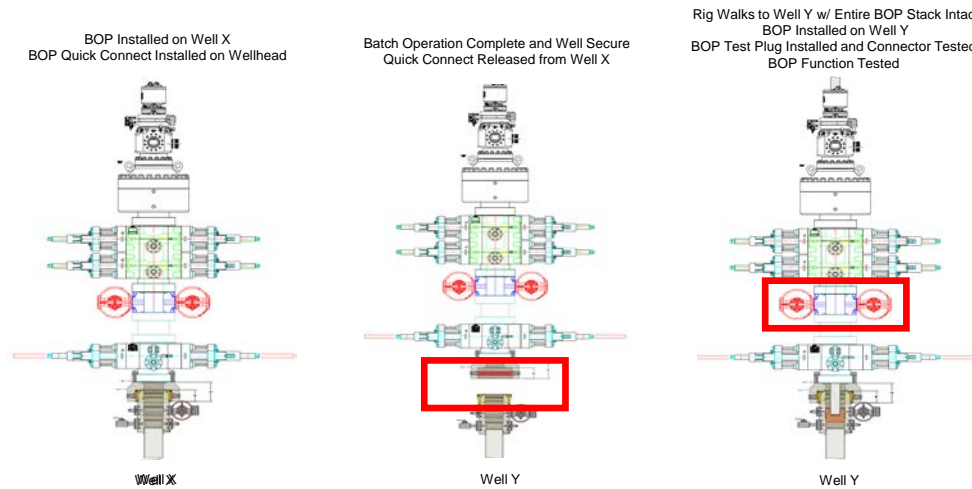
### **Procedures**

1. XTO Energy will use this document for our break testing plan for New Mexico Delaware basin. The summary below will be referenced in the APD or Sundry Notice and receive approval prior to implementing this variance.
2. XTO Energy will perform BOP break testing on multi-wells pads where multiple intermediate sections can be drilled and cased within the 21-day BOP test window.
  - a. A full BOP test will be conducted on the first well on the pad.
  - b. The first intermediate hole section drilled on the pad will be the deepest. All of the remaining hole sections will be the same depth or shallower.
    - i. Our Lower WC targets set the intermediate casing shoe no deeper than the Wolfcamp B.
    - ii. Our Upper WC targets set the intermediate casing shoe shallower than the Wolfcamp B.
  - c. A Full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.
  - d. A full BOP test will be required prior to drilling any production hole.
3. After performing a complete BOP test on the first well, the intermediate hole section will be drilled and cased, two breaks would be made on the BOP equipment.
  - a. Between the HCV valve and choke line connection
  - b. Between the BOP quick connect and the wellhead
4. The BOP is then lifted and removed from the wellhead by a hydraulic system.
5. After skidding to the next well, the BOP is moved to the wellhead by the same hydraulic system and installed.
6. The connections mentioned in 3a and 3b will then be reconnected.
7. Install test plug into the wellhead using test joint or drill pipe.
8. A shell test is performed against the upper pipe rams testing the two breaks.
9. The shell test will consist of a 250 psi low test and a high test to the value submitted in the APD or Sundry (e.g. 5,000 psi or 10,000psi).
10. Function test will be performed on the following components: lower pipe rams, blind rams, and annular.



11. For a multi-well pad the same two breaks on the BOP would be made and on the next wells and steps 4 through 10 would be repeated.
12. A second break test would only be done if the intermediate hole section being drilled could not be completed within the 21 day BOP test window.

*Note: Picture below highlights BOP components that will be tested during batch operations*



## Summary

A variance is requested to **ONLY** test broken pressure seals on the BOP equipment when moving from wellhead to wellhead which is in compliance with API Standard 53. API Standard 53 states, that for pad drilling operation, moving from one wellhead to another within 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

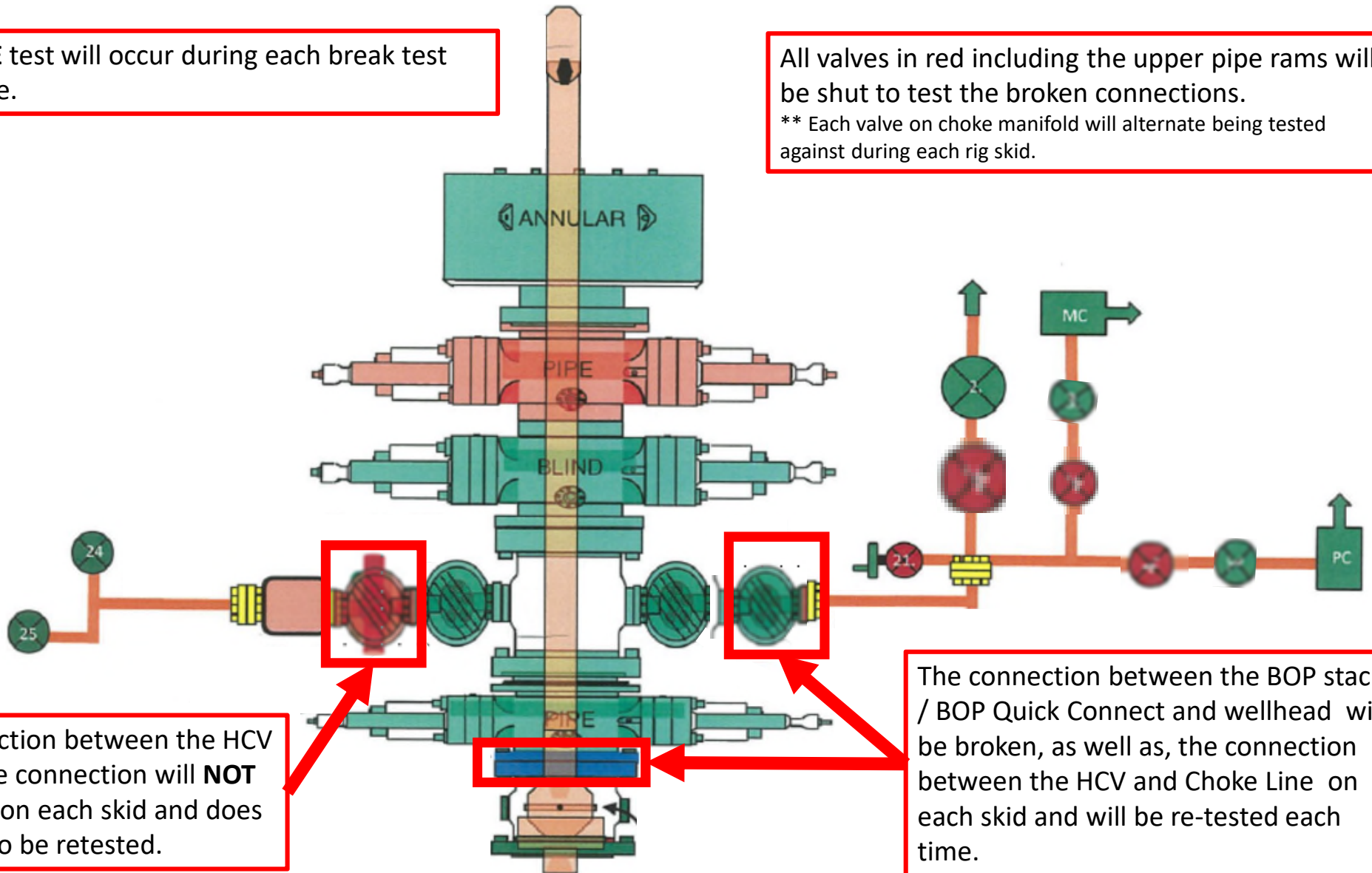
The BOP will be secured by a hydraulic carrier or cradle. The BLM will be contacted if a Well Control event occurs prior to the commencement of a BOPE Break Testing operation.

Based on discussions with the BLM on February 27th 2020 and the supporting documentation submitted to the BLM, we will request permission to **ONLY** retest broken pressure seals if the following conditions are met:

1. After a full BOP test is conducted on the first well on the pad.
2. The first intermediate hole section drilled on the pad will be the deepest. All of the remaining hole sections will be the same depth or shallower.
3. Full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.
4. Full BOP test will be required prior to drilling the production hole.

Only **ONE** test will occur during each break test procedure.

All valves in red including the upper pipe rams will be shut to test the broken connections.  
\*\* Each valve on choke manifold will alternate being tested against during each rig skid.



The connection between the HCV and kill line connection will **NOT** be broken on each skid and does not need to be retested.

The connection between the BOP stack / BOP Quick Connect and wellhead will be broken, as well as, the connection between the HCV and Choke Line on each skid and will be re-tested each time.