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DEC 19 2019

DISTRICT II-ARTESIA O.C.D.

Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM138848

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☑ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☑ Multiple Zone

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

8. Lease Name and Well No.
TAR HEEL 19-18 FEDERAL COM 2H
326771

2. Name of Operator
CIMAREX ENERGY COMPANY

9. API Well No.
30-015-46561

3a. Address
600 N. Marienfeld St., Suite 600 Midland TX 79701

3b. Phone No. *(include area code)*
(432)620-1936

10. Field and Pool, or Exploratory
UPPER WOLFCAMP / PURPLE SAGE W

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface SWSW / 540 FSL / 369 FWL / LAT 32.022027 / LONG -103.927959

At proposed prod. zone LOT 1 / 330 FNL / 756 FWL / LAT 32.04886 / LONG -103.926789

11. Sec. T. R. M. or Blk. and Survey or Area
SEC 19 / T26S / R30E / 1PM

14. Distance in miles and direction from nearest town or post office*
21 miles

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
369 feet

16. No of acres in lease
600.92

17. Spacing Unit dedicated to this well
640.92

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
20 feet

19. Proposed Depth
10698 feet / 20338 feet

20. BLM/BIA Bond No. in file
FED: NMB001188

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3016 feet

22. Approximate date work will start*
05/01/2019

23. Estimated duration
30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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).
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 requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Hope Knauls / Ph: (918)295-1799	03/04/2019

Title
Regulatory Technician

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	12/13/2019

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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.

APPROVED WITH CONDITIONS

Approval Date: 12/13/2019

(Continued on page 2)

*(Instructions on page 2)

RVP 12-27-19

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CER 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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Additional Operator Remarks

Location of Well

1. SHL: SWSW / 540 FSL / 369 FWL / TWSP: 26S / RANGE: 30E / SECTION: 19 / LAT: 32.022027 / LONG: -103.927959 (TVD: 0 feet, MD: 0 feet)
   PPP: SWSW / 378 FNL / 756 FWL / TWSP: 26S / RANGE: 30E / SECTION: 19 / LAT: 32.0220528 / LONG: -103.9280222 (TVD: 10202 feet, MD: 10222 feet)
   BHL: LOT 1 / 330 FNL / 756 FWL / TWSP: 26S / RANGE: 30E / SECTION: 18 / LAT: 32.04886 / LONG: -103.926789 (TVD: 10698 feet, MD: 20338 feet)

BLM Point of Contact

Name: Priscilla Perez
Title: Legal Instruments Examiner
Phone: 5752345934
Email: pperez@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**CIMAREX ENERGY COMPANY**
LEASE NO.:	**NMNM138848**
LOCATION:	**Section 19, T.26 S., R.30 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

WELL NAME & NO.:	Tar Heel 19-18 Fed 2H
SURFACE HOLE FOOTAGE:	540'/S & 369'/W
BOTTOM HOLE FOOTAGE	330'/N & 756'/W

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	○ Medium	◉ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ 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.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **500** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

    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.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

   - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

   ❖ In High 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 **7** inch production casing is:

   - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess cement calculates to 22%, additional cement might be required.**

4. The minimum required fill of cement behind the **4-1/2** inch production liner is:

   - Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification. **Excess cement calculates to 7%, additional cement might be required.**

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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **3000 (3M)** psi.

4. 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 production casing shoe shall be **5000 (5M)** 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.

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

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 2nd 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 Potash Areas: 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 for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. 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 intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. 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.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. 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.

7. 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.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

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.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

e. 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.

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. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

   c. 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).

   d. 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.

   e. The results of the test shall be reported to the appropriate BLM office.

   f. 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.

g. 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.

h. 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.

JJP12042019

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy Company of CO
LEASE NO.:	NMNM138848
LOCATION:	Section 19, T. 26 S., R. 30 E.
COUNTY:	Eddy

Wells:
Well Pad 1
Tar Heel 19-18 Federal #1H
Surface Hole Location: 540' FSL & 369' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 330' FNL & 380' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #2H
Surface Hole Location: 540' FSL & 389' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 330' FNL & 756' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #3H
Surface Hole Location: 540' FSL & 409' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 330' FNL & 1132' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #4H
Surface Hole Location: 540' FSL & 429' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 100' FNL & 660' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #5H
Surface Hole Location: 480' FSL & 469' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #6H
Surface Hole Location: 480' FSL & 489' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #7H
Surface Hole Location: 480' FSL & 509' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #8H
Surface Hole Location: 480' FSL & 529' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Approval Date: 12/13/2019

Tar Heel 19-18 Federal #9H
Surface Hole Location: 420' FSL & 369' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #10H
Surface Hole Location: 420' FSL & 389' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #11H
Surface Hole Location: 420' FSL & 409' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #12H
Surface Hole Location: 420' FSL & 429' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #13H
Surface Hole Location: 350' FSL & 469' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #14H
Surface Hole Location: 360' FSL & 489' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #15H
Surface Hole Location: 360' FSL & 509' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #16H
Surface Hole Location: 360' FSL & 529' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Well Pad 2
Tar Heel 19-18 Federal #17H
Surface Hole Location: 760' FSL & 1376' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 1650' FNL & 1508' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #18H
Surface Hole Location: 760' FSL & 1396' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 1650' FNL & 1884' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #19H
Surface Hole Location: 760' FSL & 1416' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 1650' FNL & 2260' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #20H
Surface Hole Location: 760' FSL & 1436' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: 1420' FNL & 1980' FWL, Section 18, T.26 S, R.30 E

Tar Heel 19-18 Federal #21H
Surface Hole Location: 700' FSL & 1476' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #22H
Surface Hole Location: 700' FSL & 1496' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #23H
Surface Hole Location: 700' FSL & 1516' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #24H
Surface Hole Location: 700' FSL & 1536' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #25H
Surface Hole Location: 640' FSL & 1376' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #26H
Surface Hole Location: 640' FSL & 1396' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #27H
Surface Hole Location: 640' FSL & 1416' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #28H
Surface Hole Location: 640' FSL & 1436' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #29H
Surface Hole Location: 580' FSL & 1476' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #30H
Surface Hole Location: 580' FSL & 1496' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #31H
Surface Hole Location: 580' FSL & 1516' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

Tar Heel 19-18 Federal #32H
Surface Hole Location: 580' FSL & 1536' FWL, Section 19, T.26 S, R.30 E
Bottom Hole Location: TBD

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See information below discussing NAGPRA.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Watershed:

The entire well pad(s) will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

When crossing ephemeral drainages the pipeline(s) will be buried to a minimum depth of 48 inches from the top of pipe to ground level. Erosion control methods such as gabions and/or rock aprons should be placed on both up and downstream sides of the pipeline crossing. In addition, curled (weed free) wood/straw fiber wattles/logs and/or silt fences should be placed on the downstream side for sediment control during construction and maintained until soils and vegetation have stabilized. Water bars should be placed within the ROW to divert and dissipate surface runoff. A pipeline access road is not permitted to cross these ephemeral drainages. Traffic should be diverted to a preexisting route. Additional seeding may be required in floodplains and drainages to restore energy dissipating vegetation.

Prior to pipeline installation/construction a leak detection plan will be developed. The method(s) could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Temporary Fresh Water Frac Line(s): once the temporary use exceeds the timeline of 180 days and/or with a 90 day extension status; further analysis will be required if the applicant pursues to turn the temporary ROW into a permanent ROW.

Cave/Karst:
Construction Mitigation

In order to mitigate the impacts from construction activities on cave and karst resources, the following Conditions of Approval will apply to this APD or project:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to alter the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of the feature(s) as well as the possibility of leaks/spills entering the karst drainage system.

Surface Flowlines Installation:

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Drilling Mitigation

Federal regulations and standard Conditions of Approval applied to all APDs require that adequate measures are taken to prevent contamination to the environment. Due to the extreme sensitivity of the cave and karst resources in this project area, the following additional Conditions of Approval will be added to this APD.

To prevent cave and karst resource contamination the following will be required:

- Closed loop system using steel tanks - all fluids and cuttings will be hauled off-site and disposed of properly at an authorized site
- Rotary drilling with fresh water where cave or karst features are expected to prevent contamination of freshwater aquifers.
- Directional drilling is only allowed at depths greater than 100 feet below the cave occurrence zone to prevent additional impacts resulting from directional drilling.
- Lost circulation zones will be logged and reported in the drilling report so BLM can assess the situation and work with the operator on corrective actions.
- Additional drilling, casing, and cementing procedures to protect cave zones and fresh water aquifers. See drilling COAs.

Production Mitigation

In order to mitigate the impacts from production activities and due to the nature of karst terrane, the following Conditions of Approval will apply to this APD:

- Tank battery locations and facilities will be bermed and lined with a 20 mil thick permanent liner that has a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.
- Development and implementation of a leak detection system to provide an early alert to operators when a leak has occurred.

- Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Residual and Cumulative Mitigation
The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be taken to correct the problem to the BLM's approval.

Plugging and Abandonment Mitigation
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Range:
Cattleguards
Where a permanent cattlegaurd is approved, an appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s). Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

Fence Requirement
Where entry granted across a fence line, the fence must be braced and tied off on both sides of the passageway PRIOR to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder PRIOR to crossing any fence(s).

VRM IV:
- Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2013).

Wildlife:

Texas Hornshell Mussel:
Oil and Gas and Associated Infrastructure Mitigation Measures for Zone D – CCA Boundary Requirements:
- Provide CEHMM with the permit, lease grant, or other authorization form BLM, if applicable.
- Provide CEHMM with plats or other electronic media describing the new surface disturbance for the project.

Desert Heronries proposed ACEC:

- No surface disturbance within up to 200 meters of a heronry.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which

creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

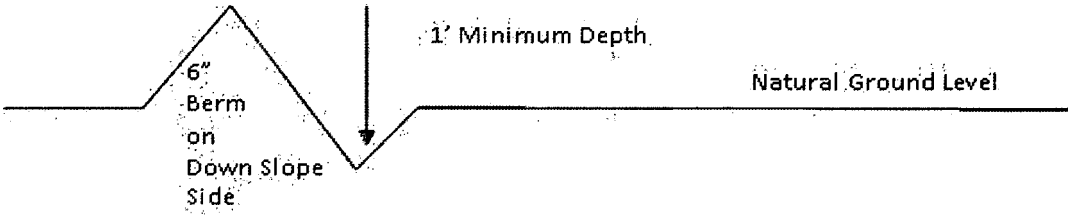
Ditching
Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Cattle guards
An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement
Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

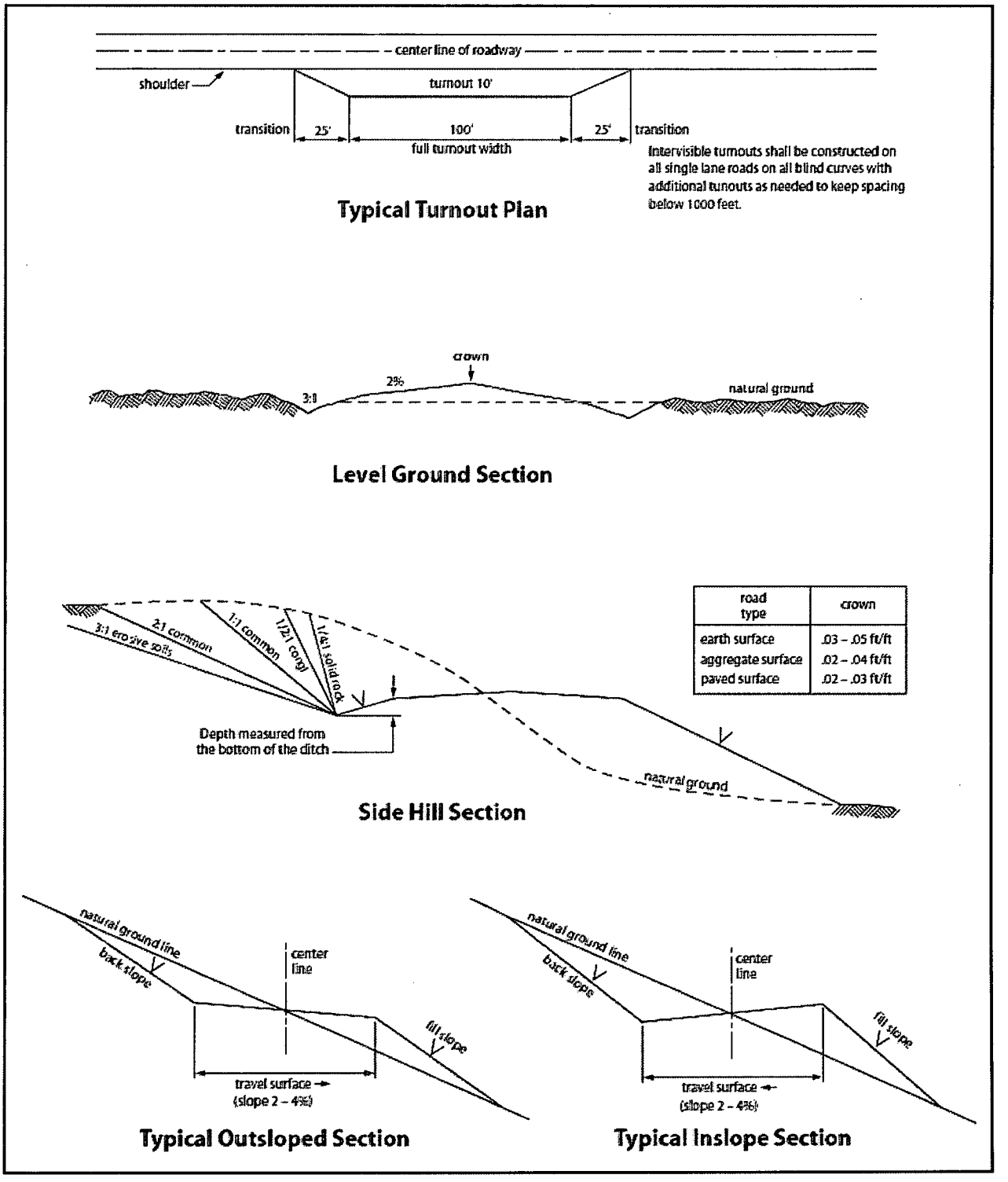


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

( ) seed mixture 1	(X) seed mixture 3
(X) seed mixture 2	( ) seed mixture 4
( ) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – Shale Green, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible

within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 17 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

17. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

18. Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

19. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

20. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.

b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant (*see* 40 CFR, Part 702-799 and in particular, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation,

maintenance, and termination of the facility;

b. Activities of other parties including, but not limited to:
   (1) Land clearing
   (2) Earth-disturbing and earth-moving work
   (3) Blasting
   (4) Vandalism and sabotage;

c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of **30** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 6 inches under all roads,

"two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 16 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

16. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

17. Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

18. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

19. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

Temporary Freshwater Pipelines (Drilling and Fracturing Operations)
CONDITIONS OF APPROVAL

Maintain a copy of your temporary permit and your approved route diagram on location. BLM personnel may request to see a copy of your permit during construction to ensure compliance with all conditions of approval.

Holder agrees to comply with the following conditions of approval to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this permit.

2. Standard Conditions of Approval:

- Pipelines must be removed within 30-45 days from this route unless granted in writing by the authorized officer.
- Pipelines will be placed not farther than 5 to 10 feet off the edge of existing oil and gas maintained roads or other maintained roads.
- Areas impacted (disturbed greater than vegetation compaction) by your project will require full reclamation.
- Pipelines will be empty before disassembly. Flow water back to the designated holding area.
- Do not restrict traffic on existing roads. Place ramps where needed on existing access roads.
- All pumps and other equipment must be placed on existing surfaced areas (pads, roads, etc.).

3. . Any cultural resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred

objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 4 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

4. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

5. Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

Temporary Produced Water CONDITIONS OF APPROVAL
(Pipelines from Pond to Wells)

Pipelines must follow within 10 feet of existing oil and gas roads. The applicant must get like approval from the state. The applicant is responsible for cleanup of any spills. The primary objective is to not allow produced water to reach the ground.

Maintain a copy of your temporary permit and your approved route diagram on location during installation and operations. BLM personnel may request to see a copy of your permit during installation or operations to ensure compliance with all conditions of approval. The project will cease until the permit is on location.

Holder agrees to comply with the following conditions of approval to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this permit.

2. Standard Conditions of Approval:

- Pipelines must be removed within 30-45 days from this route.
- Pipelines and all connection points must be leak proof. The company must prevent any amount of produced water from reaching the ground. Small drips are not allowed to touch the ground.
- Pipelines and all connection points must be pressure-tested with freshwater prior to use with produced water.
- Pipelines flowing from the frac water holding area to the target well(s) will be laid along existing oil and gas maintained roads (within 5 to 10 feet of roadway).
- Areas impacted (disturbed greater than vegetation compaction) by your project will require full reclamation.
- Pipelines will be empty before disassembly. Freshwater must be flowed through the pipeline to removal all the produced water prior to disassembly. Flow water back to the designated holding area.
- Do not restrict traffic on existing roads. Place ramps where needed on existing access roads.
- Pipe will be placed not farther than 5 to 10 feet off the edge of existing oil and gas maintained roads or other maintained roads.
- All pumps and other equipment must be placed on existing surfaced areas (pads, roads, etc.).
- All equipment associated with transporting produced water must be leak proof.
- The produced water lines and equipment would need to be checked and monitored continuously to ensure a leak is not occurring. If a leak is discovered (no matter how small), it must be corrected immediately, even if it would require ceasing the fracturing operation. Non-earthen secondary containments should be put in place if a small leak occurs.
- Any spills or leaks of produced water would need to be reported as soon as possibly known to the authorized officer. Any spills would need to be addressed as quickly as possible, and reclamation of the disturbance will need to be discussed with the authorized officer.

3. Any cultural resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 4 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

4. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

5. Any paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

(Insert Seed Mixture Here)

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

12/16/2019

Operator Certification

I hereby 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 which currently 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.

NAME: Amithy Crawford **Signed on:** 03/04/2019

Title: Regulatory Analyst

Street Address:

City: **State:** **Zip:**

Phone: (432)620-1909

Email address: acrawford@cimarex.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report

12/16/2019

APD ID: 10400038943 **Submission Date:** 03/04/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400038943 **Tie to previous NOS?** Y **Submission Date:** 03/04/2019

BLM Office: CARLSBAD **User:** Amithy Crawford **Title:** Regulatory Analyst

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM138848 **Lease Acres:** 600.92

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** CIMAREX ENERGY COMPANY

Operator letter of designation:

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY

Operator Address: 600 N. Marienfeld St., Suite 600 **Zip:** 79701

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)620-1936

Operator Internet Address: tstathem@cimarex.com

Section 2 - Well Information

Well in Master Development Plan? NO **Master Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** UPPER WOLFCAMP **Pool Name:** PURPLE SAGE WOLFCAMP GAS

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** YES **New surface disturbance?**

Type of Well Pad: SINGLE WELL **Multiple Well Pad Name:** **Number:**

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 21 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 369 FT

Reservoir well spacing assigned acres Measurement: 640.92 Acres

Well plat: Tar_Heel_19_18_Fed_2H_C102_20191011093329.pdf

Well work start Date: 05/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 23782 **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce
SHL Leg #1	540	FSL	369	FWL	26S	30E	19	Aliquot SWSW	32.022027	-103.927959	EDDY	NEW MEXICO	FIRST PRIN	F	NMNM 138848	3016	0	0	
KOP Leg #1	540	FSL	369	FWL	26S	30E	19	Aliquot SWSW	32.021567	-103.926775	EDDY	NEW MEXICO	FIRST PRIN	F	NMNM 138848	-7092	10128	10108	
PPP Leg #1-1	378	FNL	756	FWL	26S	30E	19	Aliquot SWSW	32.022028	-103.928022	EDDY	NEW MEXICO	FIRST PRIN	F	NMNM 138848	-7186	10222	10202	

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce
EXIT Leg #1	330	FNL	756	FWL	26S	30E	18	Lot 1	32.04886	-103.926789	EDDY	NEW MEXICO	FIRST PRIN	F	NMNM 138848	-7682	20338	10698	
BHL Leg #1	330	FNL	756	FWL	26S	30E	18	Lot 1	32.04886	-103.926789	EDDY	NEW MEXICO	FIRST PRIN	F	NMNM 138848	-7682	20338	10698	

APD ID: 10400038943 **Submission Date:** 03/04/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	RUSTLER	3022	1050	1050		USEABLE WATER	N
2	SALADO	-1918	1918	1918		NONE	Y
3	CASTILE	569	2453	2453		NONE	N
4	LAMAR	-179	3201	3201		NONE	N
5	BELL CANYON	-246	3268	3268		NONE	N
6	CHERRY CANYON	-1163	4185	4185		NONE	N
7	BRUSHY CANYON	-2452	5474	5474		NATURAL GAS,OIL	N
8	BONE SPRING	-4004	7026	7026		NATURAL GAS,OIL	N
9	BONE SPRING 1ST	-4910	7932	7932		NATURAL GAS,OIL	N
10	BONE SPRING 2ND	-5354	8376	8376		NATURAL GAS,OIL	N
11	BONE SPRING 3RD	-6094	9116	9116		NATURAL GAS,OIL	N
12	WOLFCAMP	-7596	10618	10618		NATURAL GAS,OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M **Rating Depth:** 1100

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" 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 test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor 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. A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Tar_Heel_19_18_Fed_2H_Choke_2M3M_20190219093938.pdf

BOP Diagram Attachment:

Tar_Heel_19_18_Fed_2H_BOP_2M_20190219093958.pdf

Pressure Rating (PSI): 3M **Rating Depth:** 3248

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" 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 test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor 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. A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Tar_Heel_19_18_Fed_2H_Choke_2M3M_20190219094039.pdf

BOP Diagram Attachment:

Tar_Heel_19_18_Fed_2H_BOP_3M_20190219094059.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Pressure Rating (PSI): 5M **Rating Depth:** 11095

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" 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 test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor 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. A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

Tar_Heel_19_18_Fed_2H_Choke_5M_20190219094126.pdf

BOP Diagram Attachment:

Tar_Heel_19_18_Fed_2H_BOP_5M_20190219094146.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	NON API	N	0	1100	0	1100	0	1100	1100	H-40	48	ST&C	1.47	3.44	BUOY	6.1	BUOY	6.1
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3248	0	3248	0	3248	3248	J-55	36	LT&C	1.17	2.04	BUOY	3.87	BUOY	3.87
3	PRODUCTION	8.75	7.0	NEW	API	N	0	10107	0	10107	0	10107	10107	L-80	29	LT&C	1.48	1.73	BUOY	1.89	BUOY	1.89
4	PRODUCTION	8.75	7.0	NEW	API	N	10107	11095	10107	11095	10107	11095	988	L-80	29	BUTT	1.4	1.63	BUOY	39.44	BUOY	39.44

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
5	COMPLETION SYSTEM	6	4.5	NEW	API	N	10107	20144	10107	20144	10107	20144	10037	HCP-110	11.6	BUTT	1.27	1.54	BUOY	53.53	BUOY	53.53

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tar_Heels_19_18_Fed_Com_2H_Spec_Sheet_20190219094247.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Tar_Heel_19_18_Fed_2H_Casing_Assumptions_20190219095143.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Tar_Heel_19_18_Fed_2H_Casing_Assumptions_20190219095217.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Casing Attachments

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Tar_Heel_19_18_Fed_2H_Casing_Assumptions_20190219095247.pdf

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Tar_Heel_19_18_Fed_2H_Casing_Assumptions_20190219095322.pdf

Casing ID: 5 **String Type:** COMPLETION SYSTEM

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Tar_Heel_19_18_Fed_2H_Casing_Assumptions_20190219095337.pdf

Section 4 - Cement

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1100	534	1.72	13.5	917	50	Class C	Bentonite
SURFACE	Tail		0	1100	143	1.34	14.8	191	25	Class C	LCM
INTERMEDIATE	Lead		0	3248	595	1.88	12.9	1118	50	35:65 (Poz C)	Salt, Bentonite
INTERMEDIATE	Tail		0	3248	190	1.3	14.8	254	25	50:50 (Poz H)	Salt, bentonite, fluid loss, dispersant, sms
PRODUCTION	Lead		0	11095	364	3.64	10.3	1322	25	Tuned Light	LCM
PRODUCTION	Tail		0	10107	127	1.3	14.2	164	25	50:50	Salt, bentonite, fluid loss, dispersant, sms
PRODUCTION	Lead		0	11095	364	3.64	10.3	1322	25	Tuned light	LCM
PRODUCTION	Tail		10107	11095	127	1.3	14.2	164	25	50:50 (Poz:H)	salt, bentonite, fliud loss, dispersant, sms
COMPLETION SYSTEM	Lead		10107	20338	672	1.3	14.2	873	10	50:50 (Poz:H)	Salt, bentonite, fluid loss, dispersant, sms

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.
Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Operator Name: CIMAREX ENERGY COMPANY

Well Name: TAR HEEL 19-18 FEDERAL COM **Well Number:** 2H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
3248	11095	OTHER : Cut Brine	8.5	9							
0	1100	SPUD MUD	8.3	8.8							
1100	3248	SALT SATURATED	9.7	10.2							
11095	20144	OIL-BASED MUD	12	12.5							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

No DST Planned

List of open and cased hole logs run in the well:

CNL,DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 6953 **Anticipated Surface Pressure:** 4599.44

Anticipated Bottom Hole Temperature(F): 176

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Lost circulation may be encountered in the Delaware mountain group. Abnormal pressure as well as hole stability issues may be encountered in the Wolfcamp.

Contingency Plans geoharzards description:

Lost circulation material will be available, as well as additional drilling fluid along with the fluid volume in the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed. Sufficient barite will be available to maintain appropriate mud weight for the Wolfcamp interval.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Tar_Heel_19_18_Fed_2H_H2S_Plan_20190219095911.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Tar_Heel_19_18_Fed_2H_Directional_Plan_20190219100113.pdf
Tar_Heel_19_18_Fed_2H_AC_Report_20190219100124.pdf

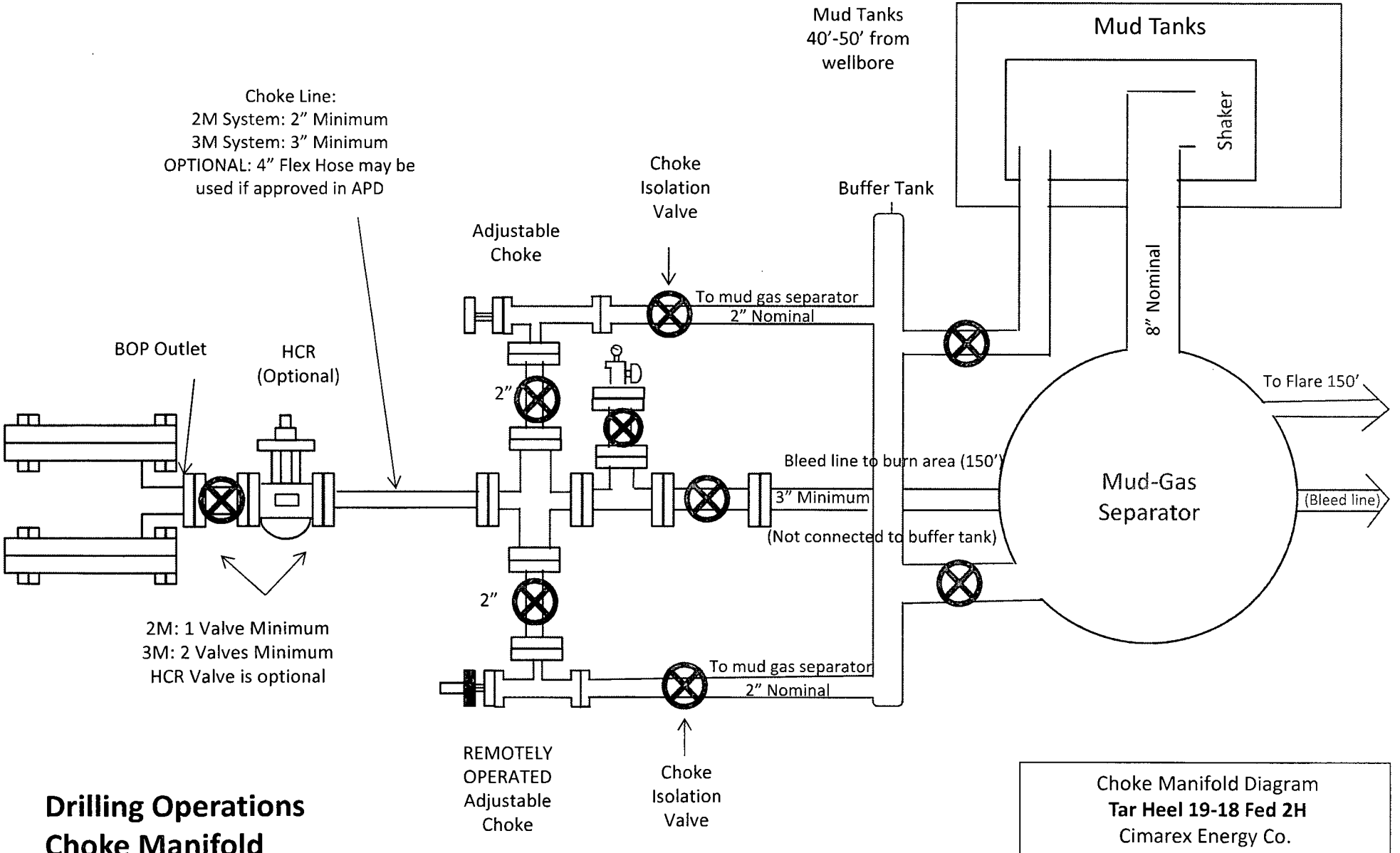
Other proposed operations facets description:

Other proposed operations facets attachment:

Tar_Heel_19_18_Fed_2H_Flex_Hose_20190219100235.pdf
Tar_Heel_19_18_Fed_2H_Gas_Capture_Plan_20190219100221.pdf
Tar_Heel_19_18_Fed_2H_Drilling_Plan_20190219100220.pdf

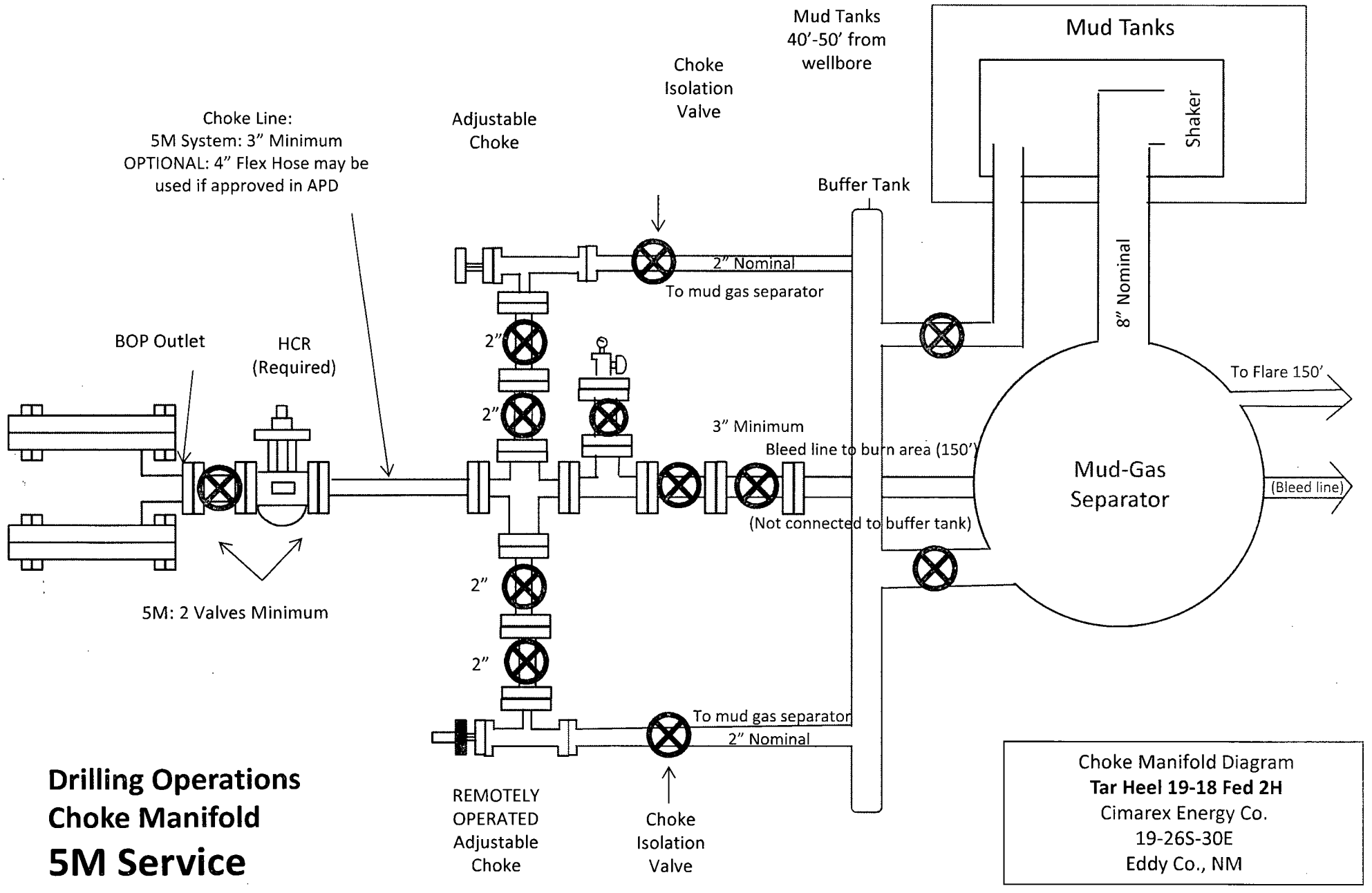
Other Variance attachment:

Tar_Heel_19_18_Fed_2H_Multibowl_Wellhead_20190219100330.pdf
Tar_Heel_19_18_Fed_2H_Multibowl_Procedure_20190219100334.pdf



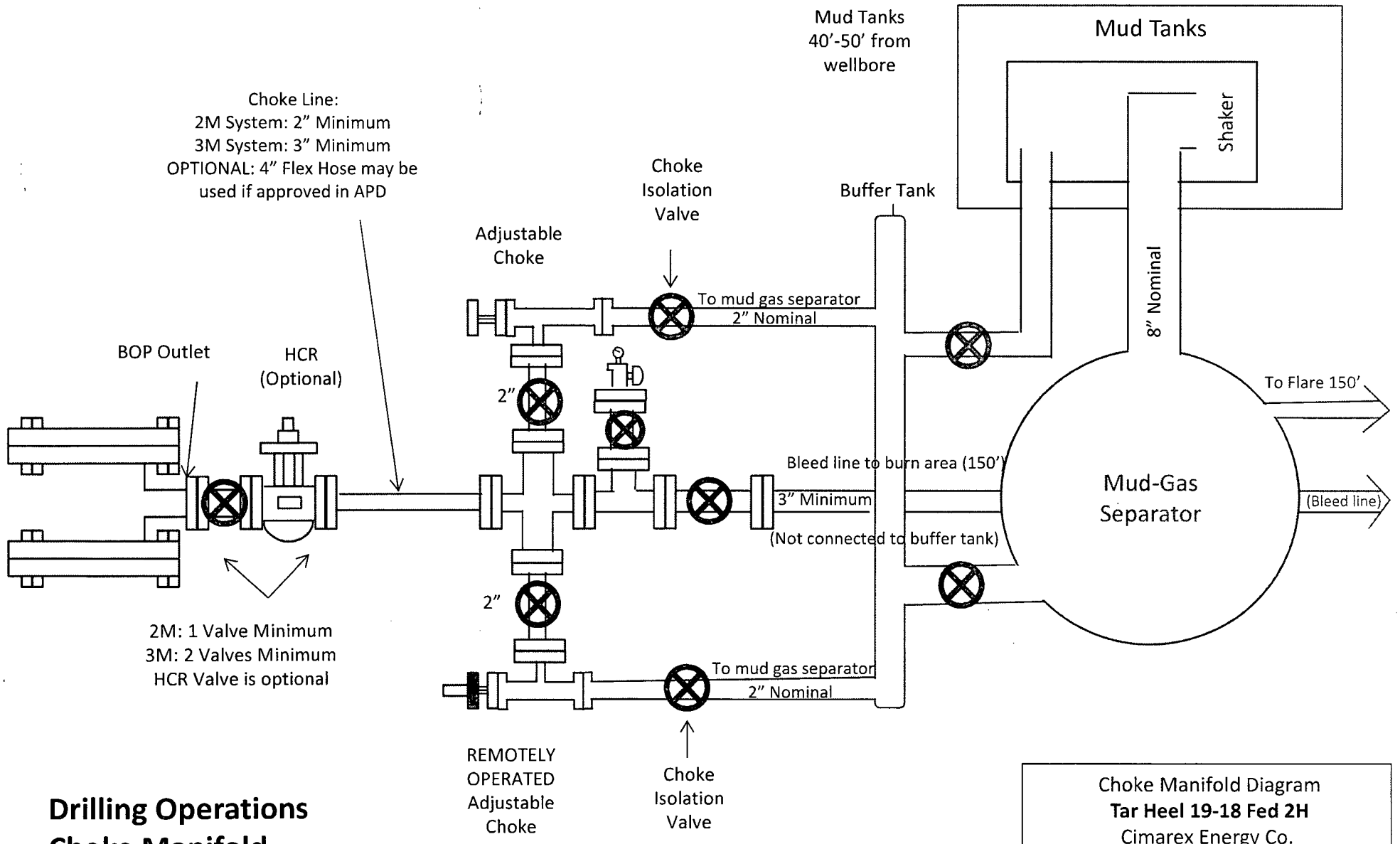
Drilling Operations
Choke Manifold
2M/3M Service

Choke Manifold Diagram
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM



Drilling Operations
Choke Manifold
5M Service

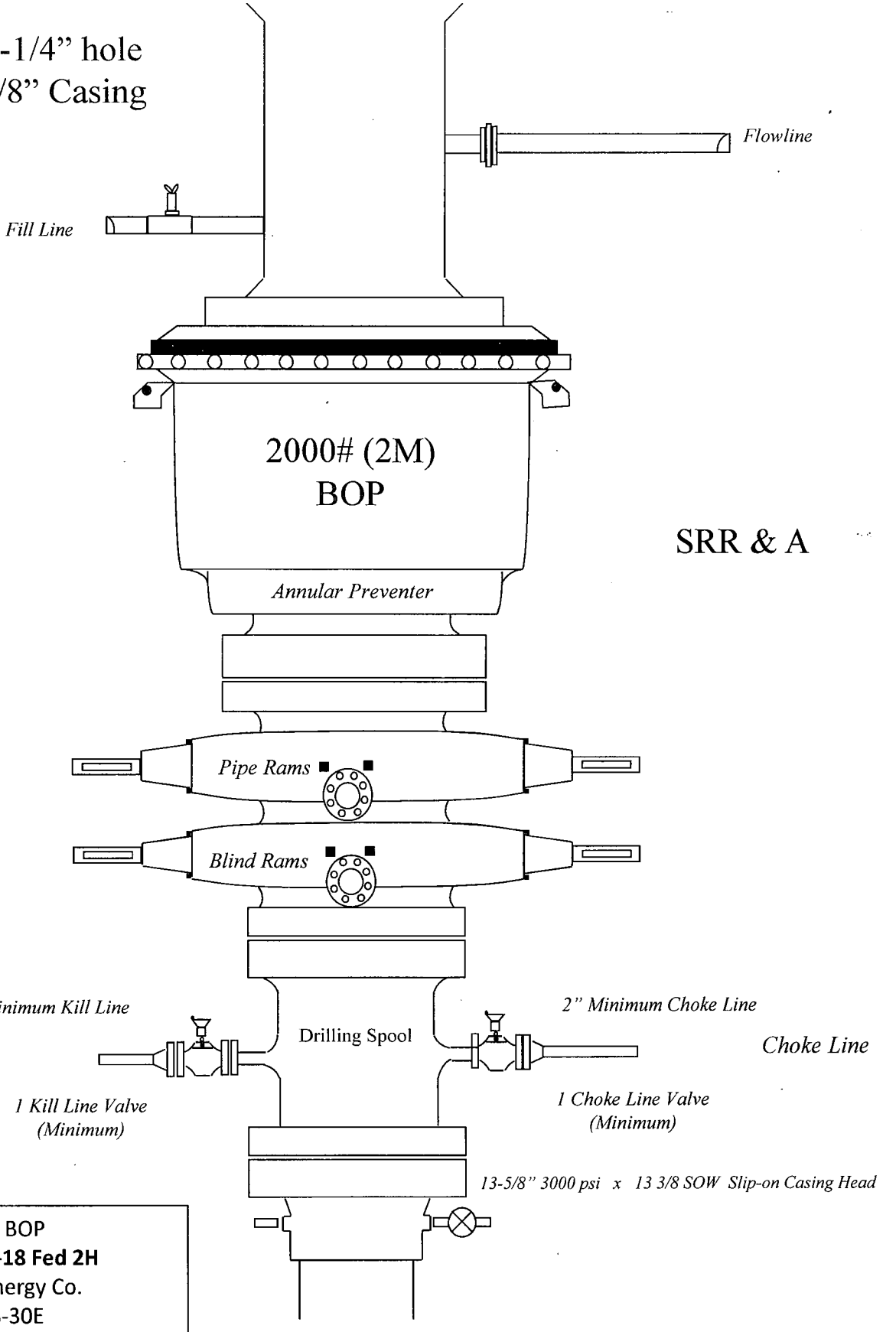
Choke Manifold Diagram
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM



Drilling Operations
Choke Manifold
2M/3M Service

Choke Manifold Diagram
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

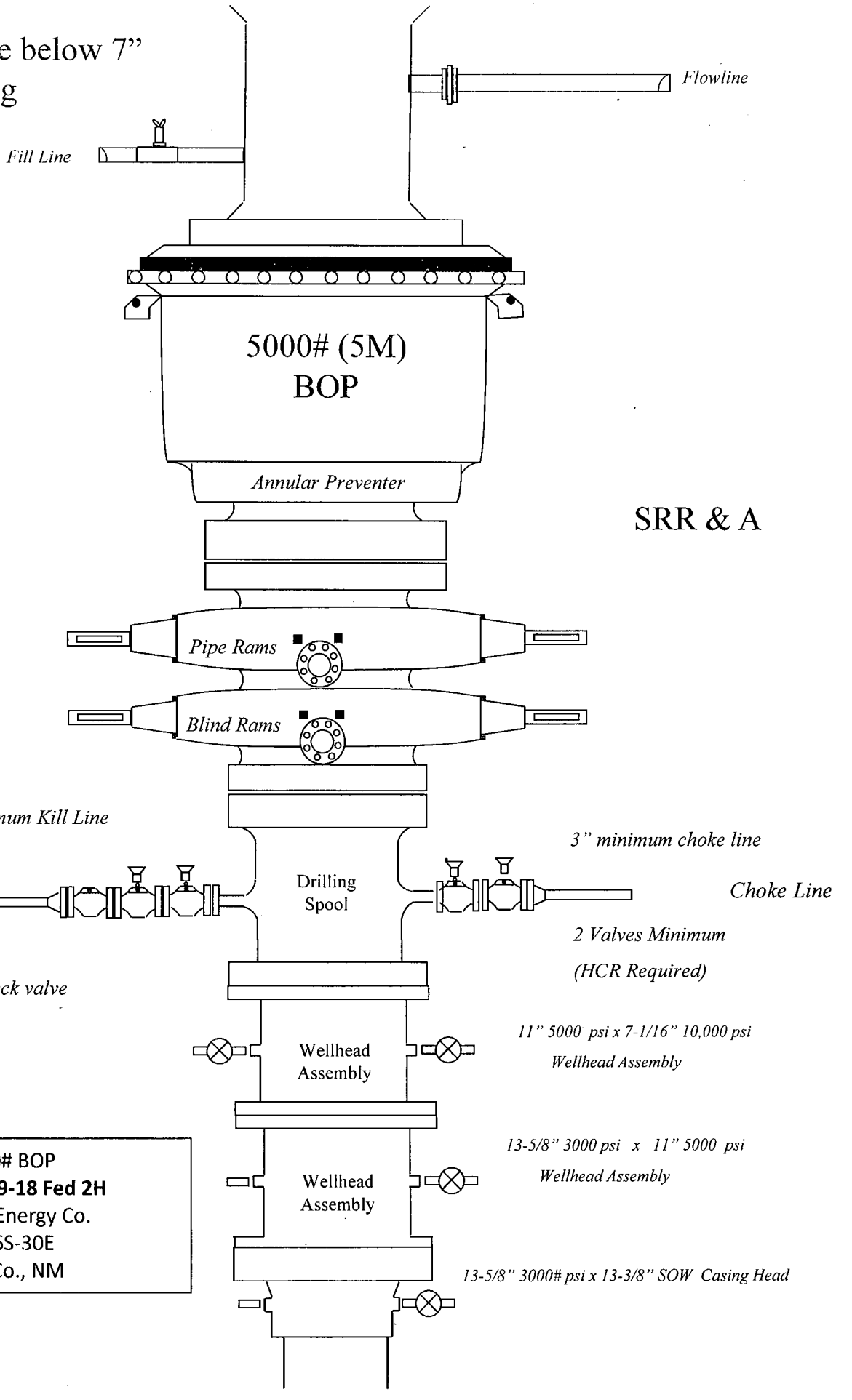
Drilling 12-1/4" hole
below 13 3/8" Casing



SRR & A

2000# BOP
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

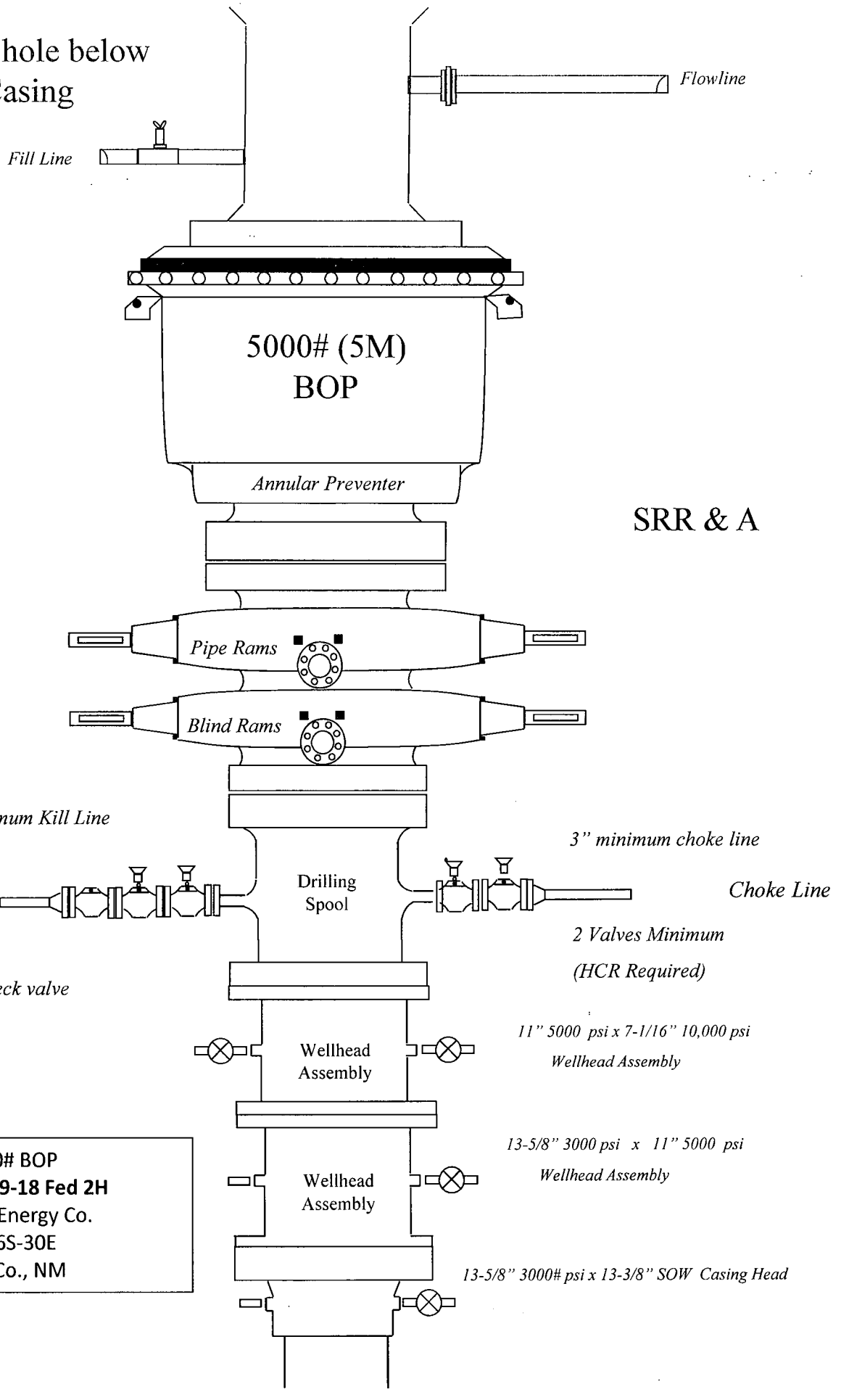
Drilling 6" hole below 7" Casing



SRR & A

5000# BOP
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

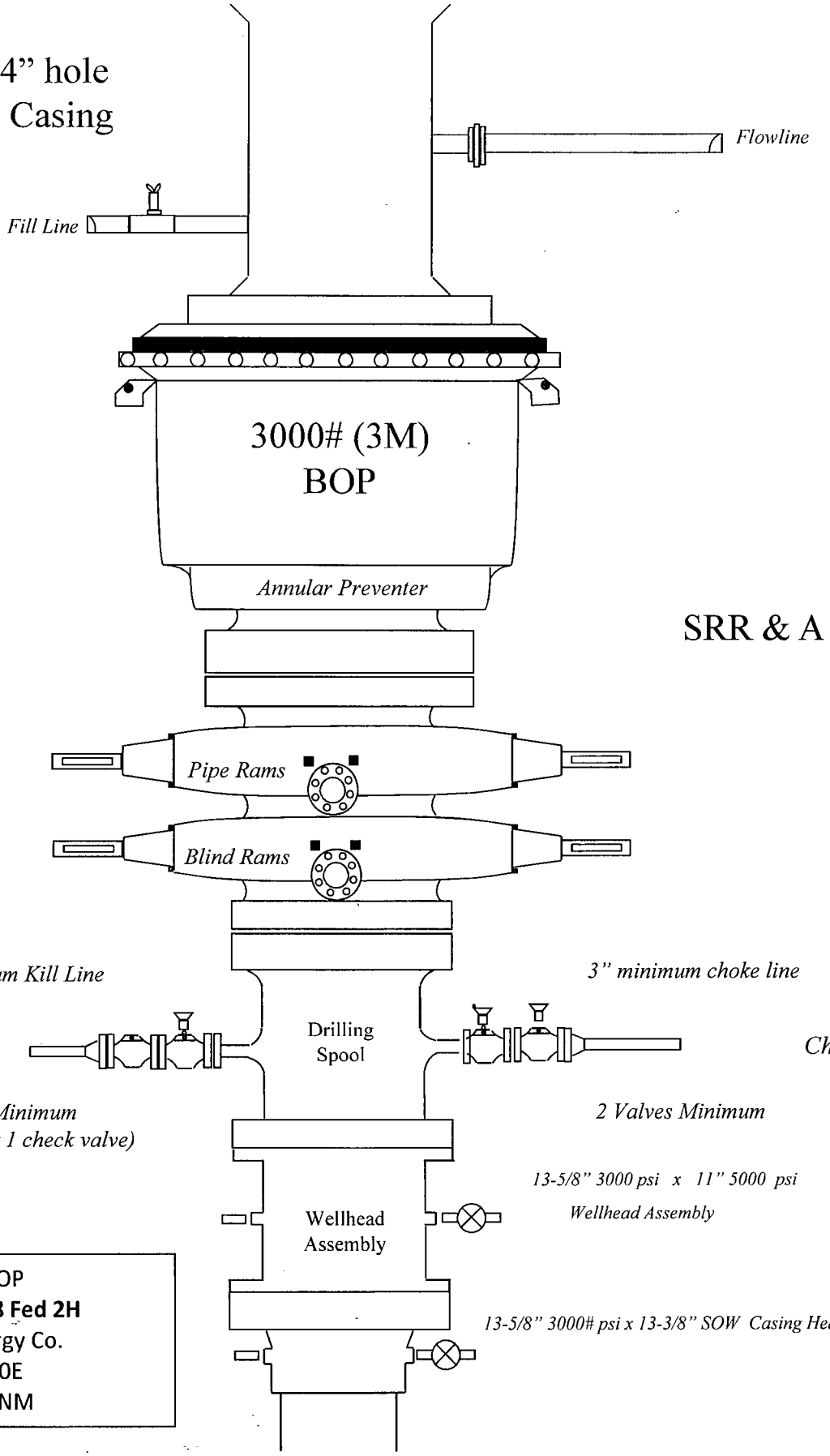
Drilling 9-7/8" hole below
10-3/4" Casing



SRR & A

5000# BOP
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Drilling 8-3/4" hole
below 9 5/8" Casing



SRR & A

3000# BOP
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Print

EVRAZ

Tar Heels 19-18 Fed #2H

Surface Casing Spec Sheet

OCTG Performance Data

Casing Performance

Availability: ERW

Pipe Body Geometry

Outside Diameter:	13.375 in	Inside Diameter:	12.715 in
Wall Thickness:	0.330 in	Cross Section Area:	13.524 sq in
Nominal Weight:	48.00 lb/ft	Drift Diameter:	12.559 in
Plain End Weight:	46.02 lb/ft	Alternate Drift Diameter:	-

Pipe Body Performance

Grade:	H40	Collapse Strength (ERW):	740 psi
Pipe Body Yield Strength:	541000 lbf	Collapse Strength (SMLS):	-

SC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	3220 lb·ft	2420 lb·ft	4030 lb·ft
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	1730 psi
Joint Strength:	322000 lbf		

LC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	-
Joint Strength:	-		

BC Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	-
Joint Strength:	-		

PE Connection

Connection Geometry

	Optimum	Minimum	Maximum
Make Up Torque:	-	-	-
Coupling Outside Diameter:	14.375 in		

Connection Performance

Grade:	H40	Minimum Internal Yield Pressure:	1730 psi
Joint Strength:	-		

Tar Heel 19-18 Federal #2H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1100	1100	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.47	3.44	6.10
12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
					BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Tar Heel 19-18 Federal #2H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1100	1100	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.47	3.44	6.10
12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
					BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Tar Heel 19-18 Federal #2H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
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12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
					BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Tar Heel 19-18 Federal #2H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1100	1100	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.47	3.44	6.10
12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
					BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Tar Heel 19-18 Federal #2H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1100	1100	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.47	3.44	6.10
12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
					BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Hydrogen Sulfide Drilling Operations Plan
Tar Heel 19-18 Federal 2H
Cimarex Energy Co.
UL: Lot 4, Sec. 19, 26S, 30E
Eddy Co., NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:
   A. Characteristics of H_2S
   B. Physical effects and hazards
   C. Principal and operation of H2S detectors, warning system and briefing areas.
   D. Evacuation procedure, routes and first aid.
   E. Proper use of safety equipment & life support systems
   F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

   H_2S Detection and Alarm Systems:
   A. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may play placed as deemed necessary.
   B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:
   A. Windsock at mudpit area should be high enough to be visible.
   B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

4 Condition Flags and Signs
   A. Warning sign on access road to location.
   B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H_2S present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

5 Well control equipment:
   A. See exhibit "E-1"

6 Communication:
   A. While working under masks chalkboards will be used for communication.
   B. Hand signals will be used where chalk board is inappropriate.
   C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drillstem Testing:
   No DSTs r cores are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

H_2S Contingency Plan
Tar Heel 19-18 Federal 2H Cimarex
Energy Co.
UL: 4, Sec. 19, 26S, 30E
Eddy Co., NM

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must:

« Isolate the area and prevent entry by other persons into the 100 ppm ROE.
« Evacuate any public places encompassed by the 100 ppm ROE.
« Be equipped with H_2S monitors and air packs in order to control the release.
« Use the "buddy system" to ensure no injuries occur during the 432-620-1975
« Take precautions to avoid personal injury during this operation.
« Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
« Have received training in the:
  - Detection of H_2S, and
  - Measures for protection against the gas,
  - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Please see attached International Chemical Safety Cards.

Contacting Authorities

Cimarex Energy Co. of Colorado's personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Cimarex Energy Co. of Colorado's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

H_2S Contingency Plan Emergency Contacts

Tar Heel 19-18 Federal 2H

Cimarex Energy Co.

UL: 4, Sec. 19, 26S, 30E

Eddy Co., NM

Company Office			
Cimarex Energy Co. of Colorado		800-969-4789	
Co. Office and After-Hours Menu			

Key Personnel

Name	**Title**	**Office**	**Mobile**
Larry Seigrist	Drilling Manager	432-620-1934	580-243-8485
Charlie Pritchard	Drilling Superintendent	432-620-1975	432-238-7084
Roy Shirley	Construction Superintendent		432-634-2136

Artesia		
Ambulance	911	
State Police	575-746-2703	
City Police	575-746-2703	
Sheriff's Office	575-746-9888	
Fire Department	**575-746-2701**	
Local Emergency Planning Committee	575-746-2122	
New Mexico Oil Conservation Division	575-748-1283	

Carlsbad		
Ambulance	911	
State Police	575-885-3137	
City Police	575-885-2111	
Sheriff's Office	575-887-7551	
Fire Department	**575-887-3798**	
Local Emergency Planning Committee	575-887-6544	
US Bureau of Land Management	575-887-6544	

Santa Fe		
New Mexico Emergency Response Commission (Santa Fe)	505-476-9600	
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs	505-827-9126	
New Mexico State Emergency Operations Center	505-476-9635	

National		
National Emergency Response Center (Washington, D.C.)	800-424-8802	

Medical		
Flight for Life - 4000 24th St.; Lubbock, TX	806-743-9911	
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923	
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433	
SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949	

Other		
Boots & Coots IWC	800-256-9688	or 281-931-8884
Cudd Pressure Control	432-699-0139	or 432-563-3356
Halliburton	575-746-2757	
B.J. Services	575-746-3569	

Schlumberger

Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18 Proposal
Geodetic Report
(Def Plan)

CIMAREX

Report Date:	January 25, 2019 - 10:05 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex Energy	**Vertical Section Azimuth:**	359.758 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Tar Heel 19-18 Federal Com #2H / New Slot	**TVD Reference Datum:**	RKB
Well:	Tar Heel 19-18 Federal Com #2H	**TVD Reference Elevation:**	3043.500 ft above MSL
Borehole:	Tar Heel 19-18 Federal Com #2H	**Seabed / Ground Elevation:**	3017.500 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.789 °
Survey Name:	Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18	**Total Gravity Field Strength:**	998.4407mgn (9.80665 Based)
Survey Date:	January 24, 2019	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	101.087 ° / 10340.267 ft / 6.298 / 0.967	**Total Magnetic Field Strength:**	47813.415 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.647 °
Location Lat / Long:	N 32° 1' 19.29746", W 103° 55' 40.65167"	**Declination Date:**	January 24, 2019
Location Grid N/E Y/X:	N 371987.950 ftUS, E 666969.180 ftUS	**Magnetic Declination Model:**	HDGM 2019
CRS Grid Convergence Angle:	0.2150 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99992717	**Grid Convergence Used:**	0.2150 °
Version / Patch:	2.10.753.0	**Total Corr Mag North->Grid North:**	6.5739 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [540' FSL, 389' FWL]	0.00	0.00	1.91	0.00	0.00	0.00	0.00	N/A	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	100.00	0.00	115.00	100.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	200.00	0.00	115.00	200.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	300.00	0.00	115.00	300.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	400.00	0.00	115.00	400.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	500.00	0.00	115.00	500.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	600.00	0.00	115.00	600.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	700.00	0.00	115.00	700.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	800.00	0.00	115.00	800.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	900.00	0.00	115.00	900.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1000.00	0.00	115.00	1000.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
Rustler	*1050.00*	*0.00*	*115.00*	*1050.00*	*0.00*	*0.00*	*0.00*	*0.00*	*371987.95*	*666969.18*	*N 32 1 19.30*	*W 103 55 40.65*
	1100.00	0.00	115.00	1100.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1200.00	0.00	115.00	1200.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1300.00	0.00	115.00	1300.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1400.00	0.00	115.00	1400.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1500.00	0.00	115.00	1500.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1600.00	0.00	115.00	1600.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1700.00	0.00	115.00	1700.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1800.00	0.00	115.00	1800.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	1900.00	0.00	115.00	1900.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
Salado (Top Salt)	*1918.00*	*0.00*	*115.00*	*1918.00*	*0.00*	*0.00*	*0.00*	*0.00*	*371987.95*	*666969.18*	*N 32 1 19.30*	*W 103 55 40.65*
	2000.00	0.00	115.00	2000.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	2100.00	0.00	115.00	2100.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
	2200.00	0.00	115.00	2200.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65
Nudge 2°/100' DLS	2300.00	0.00	115.00	2300.00	0.00	0.00	0.00	0.00	371987.95	666969.18	N 32 1 19.30	W 103 55 40.65

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2400.00	2.00	115.00	2399.98	-0.74	-0.74	1.58	2.00	371987.21	666970.76	N 32 1 19.29	W 103 55 40.63
Castille (Base Salt)	*2453.07*	*3.06*	*115.00*	*2453.00*	*-1.74*	*-1.73*	*3.71*	*2.00*	*371986.22*	*666972.89*	*N 32 1 19.28*	*W 103 55 40.61*
	2500.00	4.00	115.00	2499.84	-2.98	-2.95	6.32	2.00	371985.00	666975.50	N 32 1 19.27	W 103 55 40.58
Hold Nudge	2589.60	5.79	115.00	2589.11	-6.24	-6.18	13.26	2.00	371981.77	666982.43	N 32 1 19.24	W 103 55 40.50
	2600.00	5.79	115.00	2599.45	-6.68	-6.62	14.21	0.00	371981.33	666983.39	N 32 1 19.23	W 103 55 40.49
	2700.00	5.79	115.00	2698.94	-10.99	-10.89	23.35	0.00	371977.06	666992.53	N 32 1 19.19	W 103 55 40.38
	2800.00	5.79	115.00	2798.43	-15.29	-15.15	32.50	0.00	371972.80	667001.68	N 32 1 19.15	W 103 55 40.27
	2900.00	5.79	115.00	2897.92	-19.60	-19.42	41.64	0.00	371968.53	667010.82	N 32 1 19.10	W 103 55 40.17
	3000.00	5.79	115.00	2997.41	-23.90	-23.68	50.79	0.00	371964.27	667019.97	N 32 1 19.06	W 103 55 40.06
	3100.00	5.79	115.00	3096.90	-28.20	-27.95	59.94	0.00	371960.00	667029.11	N 32 1 19.02	W 103 55 39.96
	3200.00	5.79	115.00	3196.39	-32.51	-32.21	69.08	0.00	371955.74	667038.26	N 32 1 18.98	W 103 55 39.85
Bell Canyon (Top Delaware)	*3271.98*	*5.79*	*115.00*	*3268.00*	*-35.60*	*-35.28*	*75.67*	*0.00*	*371952.67*	*667044.84*	*N 32 1 18.95*	*W 103 55 39.77*
	3300.00	5.79	115.00	3295.88	-36.81	-36.48	78.23	0.00	371951.47	667047.40	N 32 1 18.93	W 103 55 39.74
	3400.00	5.79	115.00	3395.37	-41.11	-40.74	87.38	0.00	371947.21	667056.55	N 32 1 18.89	W 103 55 39.64
	3500.00	5.79	115.00	3494.86	-45.42	-45.01	96.52	0.00	371942.94	667065.69	N 32 1 18.85	W 103 55 39.53
	3600.00	5.79	115.00	3594.35	-49.72	-49.27	105.67	0.00	371938.68	667074.84	N 32 1 18.81	W 103 55 39.43
	3700.00	5.79	115.00	3693.84	-54.02	-53.54	114.81	0.00	371934.42	667083.99	N 32 1 18.76	W 103 55 39.32
	3800.00	5.79	115.00	3793.33	-58.33	-57.80	123.96	0.00	371930.15	667093.13	N 32 1 18.72	W 103 55 39.21
	3900.00	5.79	115.00	3892.82	-62.63	-62.07	133.11	0.00	371925.89	667102.28	N 32 1 18.68	W 103 55 39.11
	4000.00	5.79	115.00	3992.31	-66.93	-66.33	142.25	0.00	371921.62	667111.42	N 32 1 18.64	W 103 55 39.00
	4100.00	5.79	115.00	4091.80	-71.24	-70.60	151.40	0.00	371917.36	667120.57	N 32 1 18.59	W 103 55 38.90
Cherry Canyon	*4193.68*	*5.79*	*115.00*	*4185.00*	*-75.27*	*-74.59*	*159.97*	*0.00*	*371913.36*	*667129.14*	*N 32 1 18.55*	*W 103 55 38.80*
	4200.00	5.79	115.00	4191.29	-75.54	-74.86	160.55	0.00	371913.09	667129.71	N 32 1 18.55	W 103 55 38.79
	4300.00	5.79	115.00	4290.78	-79.84	-79.13	169.69	0.00	371908.83	667138.86	N 32 1 18.51	W 103 55 38.68
	4400.00	5.79	115.00	4390.26	-84.15	-83.39	178.84	0.00	371904.56	667148.00	N 32 1 18.47	W 103 55 38.58
	4500.00	5.79	115.00	4489.75	-88.45	-87.66	187.98	0.00	371900.30	667157.15	N 32 1 18.42	W 103 55 38.47
	4600.00	5.79	115.00	4589.24	-92.76	-91.92	197.13	0.00	371896.03	667166.30	N 32 1 18.38	W 103 55 38.37
	4700.00	5.79	115.00	4688.73	-97.06	-96.19	206.28	0.00	371891.77	667175.44	N 32 1 18.34	W 103 55 38.26
	4800.00	5.79	115.00	4788.22	-101.36	-100.45	215.42	0.00	371887.50	667184.59	N 32 1 18.30	W 103 55 38.15
	4900.00	5.79	115.00	4887.71	-105.67	-104.72	224.57	0.00	371883.24	667193.73	N 32 1 18.25	W 103 55 38.05
	5000.00	5.79	115.00	4987.20	-109.97	-108.98	233.72	0.00	371878.97	667202.88	N 32 1 18.21	W 103 55 37.94
	5100.00	5.79	115.00	5086.69	-114.27	-113.25	242.86	0.00	371874.71	667212.02	N 32 1 18.17	W 103 55 37.84
	5200.00	5.79	115.00	5186.18	-118.58	-117.51	252.01	0.00	371870.45	667221.17	N 32 1 18.13	W 103 55 37.73
	5300.00	5.79	115.00	5285.67	-122.88	-121.78	261.15	0.00	371866.18	667230.31	N 32 1 18.08	W 103 55 37.62
	5400.00	5.79	115.00	5385.16	-127.18	-126.04	270.30	0.00	371861.92	667239.46	N 32 1 18.04	W 103 55 37.52
Brushy Canyon	*5489.30*	*5.79*	*115.00*	*5474.00*	*-131.03*	*-129.85*	*278.47*	*0.00*	*371858.11*	*667247.63*	*N 32 1 18.00*	*W 103 55 37.42*
	5500.00	5.79	115.00	5484.65	-131.49	-130.31	279.45	0.00	371857.65	667248.61	N 32 1 18.00	W 103 55 37.41
	5600.00	5.79	115.00	5584.14	-135.79	-134.57	288.59	0.00	371853.39	667257.75	N 32 1 17.96	W 103 55 37.31
	5700.00	5.79	115.00	5683.63	-140.09	-138.84	297.74	0.00	371849.12	667266.90	N 32 1 17.91	W 103 55 37.20
	5800.00	5.79	115.00	5783.12	-144.40	-143.10	306.89	0.00	371844.86	667276.04	N 32 1 17.87	W 103 55 37.09
	5900.00	5.79	115.00	5882.61	-148.70	-147.37	316.03	0.00	371840.59	667285.19	N 32 1 17.83	W 103 55 36.99
	6000.00	5.79	115.00	5982.10	-153.00	-151.63	325.18	0.00	371836.33	667294.33	N 32 1 17.78	W 103 55 36.88
	6100.00	5.79	115.00	6081.59	-157.31	-155.90	334.32	0.00	371832.06	667303.48	N 32 1 17.74	W 103 55 36.78
	6200.00	5.79	115.00	6181.08	-161.61	-160.16	343.47	0.00	371827.80	667312.62	N 32 1 17.70	W 103 55 36.67
	6300.00	5.79	115.00	6280.56	-165.92	-164.43	352.62	0.00	371823.53	667321.77	N 32 1 17.66	W 103 55 36.56
Drop to Vertical 2°/100' DLS	6319.54	5.79	115.00	6300.00	-166.76	-165.26	354.40	0.00	371822.70	667323.56	N 32 1 17.65	W 103 55 36.54
	6400.00	4.18	115.00	6380.16	-169.74	-168.22	360.74	2.00	371819.75	667329.90	N 32 1 17.62	W 103 55 36.47
	6500.00	2.18	115.00	6480.00	-172.11	-170.56	365.77	2.00	371817.40	667334.93	N 32 1 17.60	W 103 55 36.41
	6600.00	0.18	115.00	6579.97	-172.99	-171.44	367.64	2.00	371816.53	667336.80	N 32 1 17.59	W 103 55 36.39
Hold Vertical	6609.14	0.00	115.00	6589.11	-172.99	-171.44	367.66	2.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	6700.00	0.00	115.00	6679.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	6800.00	0.00	115.00	6779.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	6900.00	0.00	115.00	6879.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7000.00	0.00	115.00	6979.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top Bone Spring	*7046.03*	*0.00*	*115.00*	*7026.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	7100.00	0.00	115.00	7079.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7200.00	0.00	115.00	7179.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7300.00	0.00	115.00	7279.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7400.00	0.00	115.00	7379.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7500.00	0.00	115.00	7479.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7600.00	0.00	115.00	7579.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7700.00	0.00	115.00	7679.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7800.00	0.00	115.00	7779.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	7900.00	0.00	115.00	7879.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top 1st BSPG SS	*7952.03*	*0.00*	*115.00*	*7932.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	8000.00	0.00	115.00	7979.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8100.00	0.00	115.00	8079.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8200.00	0.00	115.00	8179.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8300.00	0.00	115.00	8279.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top 2nd BSPG Carb	*8396.03*	*0.00*	*115.00*	*8376.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	8400.00	0.00	115.00	8379.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8500.00	0.00	115.00	8479.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8600.00	0.00	115.00	8579.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top 2nd BSPG SS	*8625.03*	*0.00*	*115.00*	*8605.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	8700.00	0.00	115.00	8679.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8800.00	0.00	115.00	8779.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	8900.00	0.00	115.00	8879.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9000.00	0.00	115.00	8979.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9100.00	0.00	115.00	9079.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top 3rd BSPG Carb	*9136.03*	*0.00*	*115.00*	*9116.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	9200.00	0.00	115.00	9179.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9300.00	0.00	115.00	9279.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9400.00	0.00	115.00	9379.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top Harkey SS	*9411.03*	*0.00*	*115.00*	*9391.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	9500.00	0.00	115.00	9479.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9600.00	0.00	115.00	9579.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9700.00	0.00	115.00	9679.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	9800.00	0.00	115.00	9779.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
Top 3rd BSPG SS	*9876.03*	*0.00*	*115.00*	*9856.00*	*-172.99*	*-171.44*	*367.66*	*0.00*	*371816.52*	*667336.81*	*N 32 1 17.59*	*W 103 55 36.39*
	9900.00	0.00	115.00	9879.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	10000.00	0.00	115.00	9979.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	10100.00	0.00	115.00	10079.97	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
KOP - Build 12°/100' DLS	10128.08	0.00	115.00	10108.05	-172.99	-171.44	367.66	0.00	371816.52	667336.81	N 32 1 17.59	W 103 55 36.39
	10200.00	8.63	359.76	10179.70	-167.59	-166.04	367.64	12.00	371821.93	667336.79	N 32 1 17.64	W 103 55 36.39
Top Wolfcamp	*10222.65*	*11.35*	*359.76*	*10202.00*	*-163.66*	*-162.11*	*367.62*	*12.00*	*371825.85*	*667336.77*	*N 32 1 17.68*	*W 103 55 36.39*
	10300.00	20.63	359.76	10276.28	-142.37	-140.82	367.53	12.00	371847.14	667336.68	N 32 1 17.89	W 103 55 36.39
Wolfcamp A1 Shale	*10372.57*	*29.34*	*359.76*	*10342.00*	*-111.75*	*-110.20*	*367.40*	*12.00*	*371877.76*	*667336.55*	*N 32 1 18.19*	*W 103 55 36.39*
	10400.00	32.63	359.76	10365.51	-97.63	-96.08	367.34	12.00	371891.88	667336.49	N 32 1 18.33	W 103 55 36.39
	10500.00	44.63	359.76	10443.49	-35.32	-33.77	367.08	12.00	371954.19	667336.23	N 32 1 18.95	W 103 55 36.39
	10600.00	56.63	359.76	10506.80	41.85	43.40	366.75	12.00	372031.35	667335.90	N 32 1 19.71	W 103 55 36.39
	10700.00	68.63	359.76	10552.69	130.49	132.04	366.38	12.00	372119.98	667335.53	N 32 1 20.59	W 103 55 36.39
Build 4°/100' DLS	10753.08	75.00	359.76	10569.25	180.89	182.44	366.16	12.00	372170.38	667335.32	N 32 1 21.09	W 103 55 36.39
	10800.00	76.88	359.76	10580.65	226.41	227.96	365.97	4.00	372215.89	667335.12	N 32 1 21.54	W 103 55 36.39
	10900.00	80.88	359.76	10599.93	324.51	326.06	365.56	4.00	372313.98	667334.71	N 32 1 22.51	W 103 55 36.39
	11000.00	84.88	359.76	10612.33	423.72	425.26	365.14	4.00	372413.18	667334.29	N 32 1 23.49	W 103 55 36.39
	11100.00	88.88	359.76	10617.78	523.55	525.09	364.72	4.00	372513.00	667333.87	N 32 1 24.48	W 103 55 36.39

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Wolfcamp 'A1' Target Landing Point	11115.65	89.50	359.76	10618.00	539.20	540.75	364.65	4.00	372528.66	667333.80	N 32 1 24.63	W 103 55 36.39
	11200.00	89.50	359.76	10618.73	623.54	625.09	364.29	0.00	372612.99	667333.45	N 32 1 25.47	W 103 55 36.39
	11300.00	89.50	359.76	10619.60	723.54	725.08	363.87	0.00	372712.98	667333.02	N 32 1 26.46	W 103 55 36.39
	11400.00	89.50	359.76	10620.47	823.54	825.08	363.45	0.00	372812.97	667332.60	N 32 1 27.45	W 103 55 36.39
	11500.00	89.50	359.76	10621.33	923.53	925.07	363.03	0.00	372912.96	667332.18	N 32 1 28.44	W 103 55 36.39
	11600.00	89.50	359.76	10622.20	1023.53	1025.07	362.60	0.00	373012.94	667331.76	N 32 1 29.43	W 103 55 36.40
	11700.00	89.50	359.76	10623.07	1123.53	1125.07	362.18	0.00	373112.93	667331.34	N 32 1 30.42	W 103 55 36.40
	11800.00	89.50	359.76	10623.94	1223.52	1225.06	361.76	0.00	373212.92	667330.91	N 32 1 31.41	W 103 55 36.40
	11900.00	89.50	359.76	10624.80	1323.52	1325.06	361.34	0.00	373312.91	667330.49	N 32 1 32.40	W 103 55 36.40
	12000.00	89.50	359.76	10625.67	1423.51	1425.05	360.92	0.00	373412.89	667330.07	N 32 1 33.39	W 103 55 36.40
	12100.00	89.50	359.76	10626.54	1523.51	1525.05	360.49	0.00	373512.88	667329.65	N 32 1 34.37	W 103 55 36.40
	12200.00	89.50	359.76	10627.41	1623.51	1625.04	360.07	0.00	373612.87	667329.22	N 32 1 35.36	W 103 55 36.40
	12300.00	89.50	359.76	10628.27	1723.50	1725.04	359.65	0.00	373712.86	667328.80	N 32 1 36.35	W 103 55 36.40
	12400.00	89.50	359.76	10629.14	1823.50	1825.03	359.23	0.00	373812.85	667328.38	N 32 1 37.34	W 103 55 36.40
	12500.00	89.50	359.76	10630.01	1923.50	1925.03	358.80	0.00	373912.83	667327.96	N 32 1 38.33	W 103 55 36.40
	12600.00	89.50	359.76	10630.88	2023.49	2025.02	358.38	0.00	374012.82	667327.54	N 32 1 39.32	W 103 55 36.40
	12700.00	89.50	359.76	10631.74	2123.49	2125.02	357.96	0.00	374112.81	667327.11	N 32 1 40.31	W 103 55 36.40
	12800.00	89.50	359.76	10632.61	2223.48	2225.01	357.54	0.00	374212.80	667326.69	N 32 1 41.30	W 103 55 36.40
	12900.00	89.50	359.76	10633.48	2323.48	2325.01	357.12	0.00	374312.79	667326.27	N 32 1 42.29	W 103 55 36.40
	13000.00	89.50	359.76	10634.35	2423.48	2425.00	356.69	0.00	374412.77	667325.85	N 32 1 43.28	W 103 55 36.40
	13100.00	89.50	359.76	10635.21	2523.47	2525.00	356.27	0.00	374512.76	667325.42	N 32 1 44.27	W 103 55 36.40
	13200.00	89.50	359.76	10636.08	2623.47	2625.00	355.85	0.00	374612.75	667325.00	N 32 1 45.26	W 103 55 36.40
	13300.00	89.50	359.76	10636.95	2723.47	2724.99	355.43	0.00	374712.74	667324.58	N 32 1 46.25	W 103 55 36.40
	13400.00	89.50	359.76	10637.81	2823.46	2824.99	355.00	0.00	374812.72	667324.16	N 32 1 47.24	W 103 55 36.40
	13500.00	89.50	359.76	10638.68	2923.46	2924.98	354.58	0.00	374912.71	667323.74	N 32 1 48.23	W 103 55 36.41
	13600.00	89.50	359.76	10639.55	3023.45	3024.98	354.16	0.00	375012.70	667323.31	N 32 1 49.22	W 103 55 36.41
	13700.00	89.50	359.76	10640.42	3123.45	3124.97	353.74	0.00	375112.69	667322.89	N 32 1 50.21	W 103 55 36.41
	13800.00	89.50	359.76	10641.28	3223.45	3224.97	353.31	0.00	375212.68	667322.47	N 32 1 51.20	W 103 55 36.41
	13900.00	89.50	359.76	10642.15	3323.44	3324.96	352.89	0.00	375312.66	667322.05	N 32 1 52.19	W 103 55 36.41
	14000.00	89.50	359.76	10643.02	3423.44	3424.96	352.47	0.00	375412.65	667321.62	N 32 1 53.18	W 103 55 36.41
	14100.00	89.50	359.76	10643.89	3523.43	3524.95	352.05	0.00	375512.64	667321.20	N 32 1 54.17	W 103 55 36.41
	14200.00	89.50	359.76	10644.75	3623.43	3624.95	351.63	0.00	375612.63	667320.78	N 32 1 55.15	W 103 55 36.41
	14300.00	89.50	359.76	10645.62	3723.43	3724.94	351.20	0.00	375712.62	667320.36	N 32 1 56.14	W 103 55 36.41
	14400.00	89.50	359.76	10646.49	3823.42	3824.94	350.78	0.00	375812.60	667319.93	N 32 1 57.13	W 103 55 36.41
	14500.00	89.50	359.76	10647.36	3923.42	3924.93	350.36	0.00	375912.59	667319.51	N 32 1 58.12	W 103 55 36.41
	14600.00	89.50	359.76	10648.22	4023.42	4024.93	349.94	0.00	376012.58	667319.09	N 32 1 59.11	W 103 55 36.41
	14700.00	89.50	359.76	10649.09	4123.41	4124.93	349.51	0.00	376112.57	667318.67	N 32 2 0.10	W 103 55 36.41
	14800.00	89.50	359.76	10649.96	4223.41	4224.92	349.09	0.00	376212.55	667318.25	N 32 2 1.09	W 103 55 36.41
	14900.00	89.50	359.76	10650.83	4323.40	4324.92	348.67	0.00	376312.54	667317.82	N 32 2 2.08	W 103 55 36.41
	15000.00	89.50	359.76	10651.69	4423.40	4424.91	348.25	0.00	376412.53	667317.40	N 32 2 3.07	W 103 55 36.41
	15100.00	89.50	359.76	10652.56	4523.40	4524.91	347.83	0.00	376512.52	667316.98	N 32 2 4.06	W 103 55 36.41
	15200.00	89.50	359.76	10653.43	4623.39	4624.90	347.40	0.00	376612.51	667316.56	N 32 2 5.05	W 103 55 36.41
	15300.00	89.50	359.76	10654.30	4723.39	4724.90	346.98	0.00	376712.49	667316.13	N 32 2 6.04	W 103 55 36.41
	15400.00	89.50	359.76	10655.16	4823.39	4824.89	346.56	0.00	376812.48	667315.71	N 32 2 7.03	W 103 55 36.42
	15500.00	89.50	359.76	10656.03	4923.38	4924.89	346.14	0.00	376912.47	667315.29	N 32 2 8.02	W 103 55 36.42
	15600.00	89.50	359.76	10656.90	5023.38	5024.88	345.71	0.00	377012.46	667314.87	N 32 2 9.01	W 103 55 36.42
	15700.00	89.50	359.76	10657.77	5123.37	5124.88	345.29	0.00	377112.45	667314.45	N 32 2 10.00	W 103 55 36.42
	15800.00	89.50	359.76	10658.63	5223.37	5224.87	344.87	0.00	377212.43	667314.02	N 32 2 10.99	W 103 55 36.42
	15900.00	89.50	359.76	10659.50	5323.37	5324.87	344.45	0.00	377312.42	667313.60	N 32 2 11.98	W 103 55 36.42
	16000.00	89.50	359.76	10660.37	5423.36	5424.86	344.02	0.00	377412.41	667313.18	N 32 2 12.97	W 103 55 36.42
	16100.00	89.50	359.76	10661.24	5523.36	5524.86	343.60	0.00	377512.40	667312.76	N 32 2 13.96	W 103 55 36.42
	16200.00	89.50	359.76	10662.10	5623.36	5624.86	343.18	0.00	377612.38	667312.33	N 32 2 14.94	W 103 55 36.42
	16300.00	89.50	359.76	10662.97	5723.35	5724.85	342.76	0.00	377712.37	667311.91	N 32 2 15.93	W 103 55 36.42
	16400.00	89.50	359.76	10663.84	5823.35	5824.85	342.34	0.00	377812.36	667311.49	N 32 2 16.92	W 103 55 36.42
	16500.00	89.50	359.76	10664.70	5923.34	5924.84	341.91	0.00	377912.35	667311.07	N 32 2 17.91	W 103 55 36.42
	16600.00	89.50	359.76	10665.57	6023.34	6024.84	341.49	0.00	378012.34	667310.65	N 32 2 18.90	W 103 55 36.42
	16700.00	89.50	359.76	10666.44	6123.34	6124.83	341.07	0.00	378112.32	667310.22	N 32 2 19.89	W 103 55 36.42

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	16800.00	89.50	359.76	10667.31	6223.33	6224.83	340.65	0.00	378212.31	667309.80	N 32 2 20.88	W 103 55 36.42
	16900.00	89.50	359.76	10668.17	6323.33	6324.82	340.22	0.00	378312.30	667309.38	N 32 2 21.87	W 103 55 36.42
	17000.00	89.50	359.76	10669.04	6423.33	6424.82	339.80	0.00	378412.29	667308.96	N 32 2 22.86	W 103 55 36.42
	17100.00	89.50	359.76	10669.91	6523.32	6524.81	339.38	0.00	378512.28	667308.53	N 32 2 23.85	W 103 55 36.42
	17200.00	89.50	359.76	10670.78	6623.32	6624.81	338.96	0.00	378612.26	667308.11	N 32 2 24.84	W 103 55 36.43
	17300.00	89.50	359.76	10671.64	6723.31	6724.80	338.53	0.00	378712.25	667307.69	N 32 2 25.83	W 103 55 36.43
	17400.00	89.50	359.76	10672.51	6823.31	6824.80	338.11	0.00	378812.24	667307.27	N 32 2 26.82	W 103 55 36.43
	17500.00	89.50	359.76	10673.38	6923.31	6924.80	337.69	0.00	378912.23	667306.85	N 32 2 27.81	W 103 55 36.43
	17600.00	89.50	359.76	10674.25	7023.30	7024.79	337.27	0.00	379012.21	667306.42	N 32 2 28.80	W 103 55 36.43
	17700.00	89.50	359.76	10675.11	7123.30	7124.79	336.85	0.00	379112.20	667306.00	N 32 2 29.79	W 103 55 36.43
	17800.00	89.50	359.76	10675.98	7223.30	7224.78	336.42	0.00	379212.19	667305.58	N 32 2 30.78	W 103 55 36.43
	17900.00	89.50	359.76	10676.85	7323.29	7324.78	336.00	0.00	379312.18	667305.16	N 32 2 31.77	W 103 55 36.43
	18000.00	89.50	359.76	10677.72	7423.29	7424.77	335.58	0.00	379412.17	667304.73	N 32 2 32.76	W 103 55 36.43
	18100.00	89.50	359.76	10678.58	7523.28	7524.77	335.16	0.00	379512.15	667304.31	N 32 2 33.75	W 103 55 36.43
	18200.00	89.50	359.76	10679.45	7623.28	7624.76	334.73	0.00	379612.14	667303.89	N 32 2 34.73	W 103 55 36.43
	18300.00	89.50	359.76	10680.32	7723.28	7724.76	334.31	0.00	379712.13	667303.47	N 32 2 35.72	W 103 55 36.43
	18400.00	89.50	359.76	10681.19	7823.27	7824.75	333.89	0.00	379812.12	667303.04	N 32 2 36.71	W 103 55 36.43
	18500.00	89.50	359.76	10682.05	7923.27	7924.75	333.47	0.00	379912.11	667302.62	N 32 2 37.70	W 103 55 36.43
	18600.00	89.50	359.76	10682.92	8023.27	8024.74	333.05	0.00	380012.09	667302.20	N 32 2 38.69	W 103 55 36.43
	18700.00	89.50	359.76	10683.79	8123.26	8124.74	332.62	0.00	380112.08	667301.78	N 32 2 39.68	W 103 55 36.43
	18800.00	89.50	359.76	10684.66	8223.26	8224.73	332.20	0.00	380212.07	667301.36	N 32 2 40.67	W 103 55 36.43
	18900.00	89.50	359.76	10685.52	8323.25	8324.73	331.78	0.00	380312.06	667300.93	N 32 2 41.66	W 103 55 36.43
	19000.00	89.50	359.76	10686.39	8423.25	8424.73	331.36	0.00	380412.04	667300.51	N 32 2 42.65	W 103 55 36.43
	19100.00	89.50	359.76	10687.26	8523.25	8524.72	330.93	0.00	380512.03	667300.09	N 32 2 43.64	W 103 55 36.44
	19200.00	89.50	359.76	10688.13	8623.24	8624.72	330.51	0.00	380612.02	667299.67	N 32 2 44.63	W 103 55 36.44
	19300.00	89.50	359.76	10688.99	8723.24	8724.71	330.09	0.00	380712.01	667299.24	N 32 2 45.62	W 103 55 36.44
	19400.00	89.50	359.76	10689.86	8823.24	8824.71	329.67	0.00	380812.00	667298.82	N 32 2 46.61	W 103 55 36.44
	19500.00	89.50	359.76	10690.73	8923.23	8924.70	329.24	0.00	380911.98	667298.40	N 32 2 47.60	W 103 55 36.44
	19600.00	89.50	359.76	10691.59	9023.23	9024.70	328.82	0.00	381011.97	667297.98	N 32 2 48.59	W 103 55 36.44
	19700.00	89.50	359.76	10692.46	9123.22	9124.69	328.40	0.00	381111.96	667297.56	N 32 2 49.58	W 103 55 36.44
	19800.00	89.50	359.76	10693.33	9223.22	9224.69	327.98	0.00	381211.95	667297.13	N 32 2 50.57	W 103 55 36.44
	19900.00	89.50	359.76	10694.20	9323.22	9324.68	327.56	0.00	381311.94	667296.71	N 32 2 51.56	W 103 55 36.44
	20000.00	89.50	359.76	10695.06	9423.21	9424.68	327.13	0.00	381411.92	667296.29	N 32 2 52.55	W 103 55 36.44
	20100.00	89.50	359.76	10695.93	9523.21	9524.67	326.71	0.00	381511.91	667295.87	N 32 2 53.54	W 103 55 36.44
	20200.00	89.50	359.76	10696.80	9623.21	9624.67	326.29	0.00	381611.90	667295.44	N 32 2 54.52	W 103 55 36.44
	20300.00	89.50	359.76	10697.67	9723.20	9724.66	325.87	0.00	381711.89	667295.02	N 32 2 55.51	W 103 55 36.44
Cimarex Tar Heel 19-18 Federal Com #2H - PBHL [330' FNL, 756' FWL]	20338.41	89.50	359.76	10698.00	9761.61	9763.07	325.70	0.00	381750.29	667294.86	N 32 2 55.89	W 103 55 36.44

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

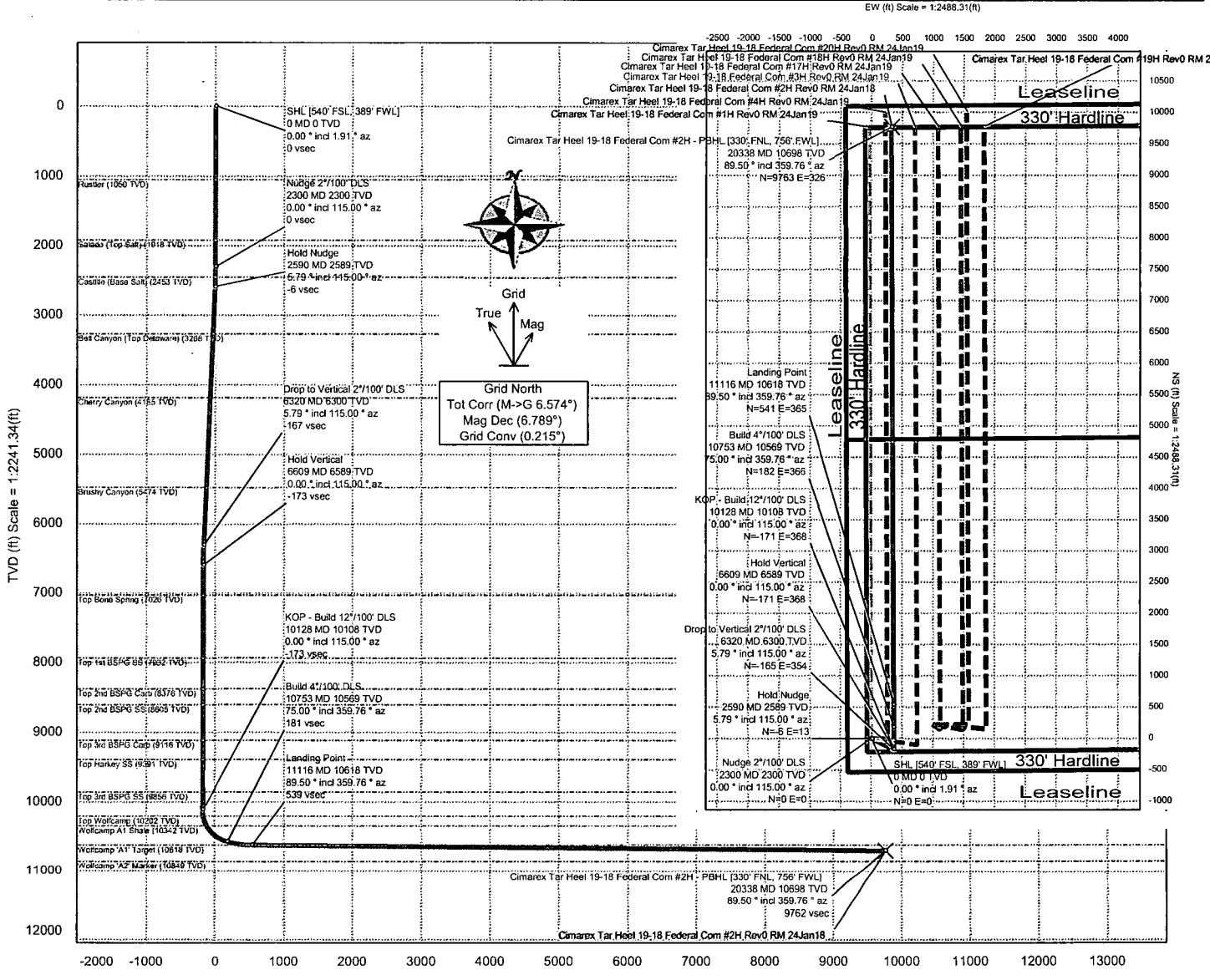
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Tar Heel 19-18 Federal Com #2H / Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18
	1	26.000	20338.408	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Tar Heel 19-18 Federal Com #2H / Cimarex Tar Heel 19-18 Federal

Cimarex Energy Rev 0

Borehole:	Well:	Field:	Structure:
Tar Heel 19-18 Federal Com #2H	Tar Heel 19-18 Federal Com #2H	NM Eddy County (NAD 83)	Cimarex Tar Heel 19-18 Federal Com # 2H

Gravity & Magnetic Parameters					Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet				Miscellaneous			
Model:	HDGM 2019	Dip: 59.647°	Date:	24-Jan-2019	Lat:	N 32 1 19.30	Northing:	371987.95ftUS	Grid Conv: 0.215°	Slot:	New Slot	TVD Ref:	RKB(3043.5ft above MSL)
MagDec:	6.789°	FS: 47813.415nT	Gravity FS:	998.441mgn (9.80665 Based)	Lon:	W 103 55 40.65	Easting:	666969.18ftUS	Scale Fact: 0.99992717	Plan:	Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18		



Vertical Section (ft) Azim = 359.76° Scale = 1:2241.34(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [540' FSL, 389' FWL]	0.00	0.00	1.91	0.00	0.00	0.00	0.00	
Rustler	1050.00	0.00	115.00	1050.00	0.00	0.00	0.00	0.00
Salado (Top Salt)	1918.00	0.00	115.00	1918.00	0.00	0.00	0.00	0.00
Nudge 2°/100' DLS	2300.00	0.00	115.00	2300.00	0.00	0.00	0.00	0.00
Castille (Base Salt)	2453.07	3.06	115.00	2453.00	-1.74	-1.73	3.71	2.00
Hold Nudge	2589.60	5.79	115.00	2589.11	-6.24	-6.18	13.26	2.00
Bell Canyon (Top Delaware)	3271.98	5.79	115.00	3268.00	-35.60	-35.28	75.67	0.00
Cherry Canyon	4193.68	5.79	115.00	4185.00	-75.27	-74.59	159.97	0.00
Brushy Canyon	5489.30	5.79	115.00	5474.00	-131.03	-129.85	278.47	0.00
Drop to Vertical 2°/100' DLS	6319.54	5.79	115.00	6300.00	-166.76	-165.26	354.40	0.00
Hold Vertical	6609.14	0.00	115.00	6589.11	-172.99	-171.44	367.66	2.00
Top Bone Spring	7046.03	0.00	115.00	7026.00	-172.99	-171.44	367.66	0.00
Top 1st BSPG SS	7952.03	0.00	115.00	7932.00	-172.99	-171.44	367.66	0.00
Top 2nd BSPG Carb	8396.03	0.00	115.00	8376.00	-172.99	-171.44	367.66	0.00
Top 2nd BSPG SS	8625.03	0.00	115.00	8605.00	-172.99	-171.44	367.66	0.00
Top 3rd BSPG Carb	9136.03	0.00	115.00	9116.00	-172.99	-171.44	367.66	0.00
Top Harkey SS	9411.03	0.00	115.00	9391.00	-172.99	-171.44	367.66	0.00
Top 3rd BSPG SS	9876.03	0.00	115.00	9856.00	-172.99	-171.44	367.66	0.00
KOP - Build 12°/100' DLS	10128.08	0.00	115.00	10108.05	-172.99	-171.44	367.66	0.00
Top Wolfcamp	10222.65	11.35	359.76	10202.00	-163.66	-162.11	367.62	12.00
Wolfcamp A1 Shale	10372.57	29.34	359.76	10342.00	-111.75	-110.20	367.40	12.00
Build 4°/100' DLS	10753.08	75.00	359.76	10569.25	180.89	182.44	366.16	12.00
Landing Point	11115.65	89.50	359.76	10618.00	539.20	540.75	364.65	4.00
Wolfcamp 'A1' Target	11115.66	89.50	359.76	10618.00	539.20	540.75	364.65	0.00
Cimarex Tar Heel 19-18 Federal Com #2H - PBHL [330' FNL, 756' FWL]	20338.41	89.50	359.76	10698.00	9761.61	9763.07	325.70	0.00
Wolfcamp 'A2' Marker	NaN			10849.00				

Schlumberger

CIMAREX

Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18 Anti-Collision Summary Report

Analysis Date-24hr Time:	January 25, 2019 - 10:06	**Analysis Method:**	3D Least Distance
Client:	Cimarex Energy	**Reference Trajectory:**	Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan18 (Def Plan)
Field:	NM Eddy County (NAD 83)	**Depth Interval:**	Every 10.00 Measured Depth (ft)
Structure:	Cimarex Tar Heel 19-18 Federal Com #2H	**Rule Set:**	NAL Procedure: D&M AntiCollision Standard S002
Slot:	New Slot	**Min Pts:**	All local minima indicated.
Well:	Tar Heel 19-18 Federal Com #2H	**Version / Patch:**	2.10.753.0
Borehole:	Tar Heel 19-18 Federal Com #2H	**Database \ Project:**	US1153APP452.dir.slb.com\drilling-NM Eddy County 2.10
Scan MD Range:	0.00ft ~ 20338.41ft		

Trajectory Error Model: ISCWSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

Offset Trajectories Summary

Offset Selection Criteria

Wellhead distance scan: Not performed!

Selection filters: Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans
- All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

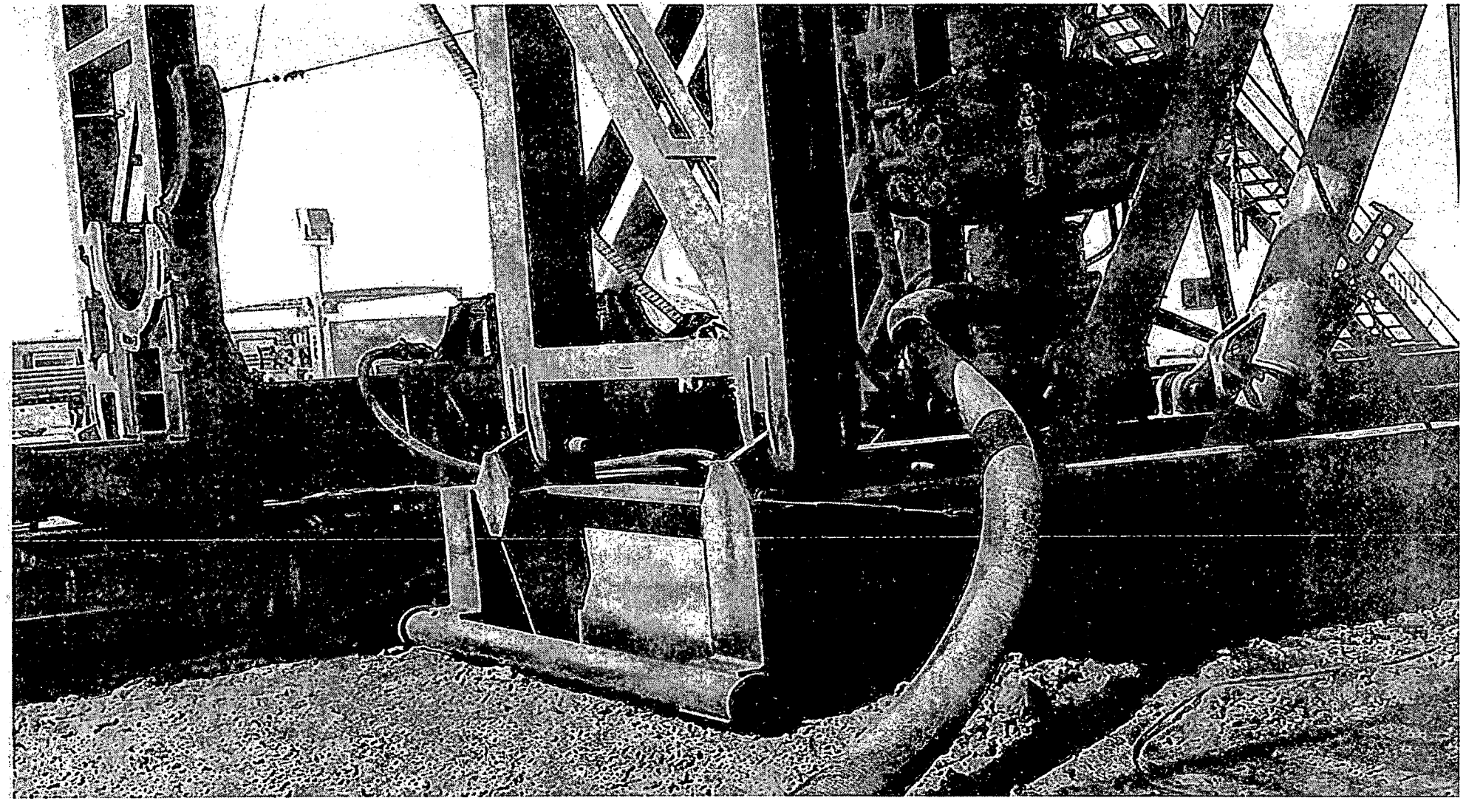
Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Cimarex Tar Heel 19-18 Federal Com #3H Rev0 RM 24Jan19 (Def Plan)												Fail Minor	
	20.00	16.49	17.50	3.51	N/A	MAS = 5.03 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert	
	19.99	16.49	17.49	3.50	N/A	MAS = 5.03 (m)	26.00	26.00				WRP	
	19.99	20.00	5.82	-0.01	1.50	OSF1.50	1920.00	1920.00		OSF<1.50		Enter Minor	
	19.99	20.76	5.32	-0.76	1.44	OSF1.50	2000.00	2000.00				MinPt-CtCt	
	20.01	20.83	5.29	-0.82	1.43	OSF1.50	2010.00	2010.00				MINPT-O-EOU	
	20.06	20.89	5.29	-0.84	1.43	OSF1.50	2020.00	2020.00				MinPts	
	21.36	21.36	6.29	0.00	1.50	OSF1.50	2090.00	2090.00		OSF>1.50		Exit Minor	
	67.48	22.02	51.96	45.45	4.99	OSF1.50	2650.00	2649.20	OSF>5.00			Exit Alert	
	382.18	58.59	342.29	323.59	10.15	OSF1.50	10040.00	10019.97				MinPts	
	388.97	60.06	348.10	328.91	10.07	OSF1.50	10250.00	10228.65				MinPt-O-SF	
	385.13	117.33	306.07	267.80	5.00	OSF1.50	13230.00	10636.34	OSF<5.00			Enter Alert	
	375.95	331.35	154.21	44.60	1.70	OSF1.50	20280.00	10697.49				MinPt-CtCt	
	375.95	333.17	153.00	42.76	1.69	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #1H Rev0 RM 24Jan19 (Def Plan)												Fail Minor	
	20.03	16.50	17.53	3.53	N/A	MAS = 5.03 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert	
	20.00	16.50	17.50	3.50	N/A	MAS = 5.03 (m)	26.00	26.00				WRP	
	20.00	20.09	5.77	-0.09	1.49	OSF1.50	1930.00	1930.00		OSF<1.50		Enter Minor	
	20.00	23.58	3.45	-3.58	1.25	OSF1.50	2300.00	2300.00				MinPt-CtCt	
	20.02	23.64	3.42	-3.63	1.24	OSF1.50	2310.00	2310.00				MINPT-O-EOU	
	20.07	23.70	3.43	-3.64	1.24	OSF1.50	2320.00	2320.00				MinPts	
	24.11	24.38	7.02	-0.27	1.48	OSF1.50	2460.00	2459.92		OSF>1.50		Exit Minor	

Results highlighted: Sep-Factor separation <= 1.50 ft

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	83.62	27.03	64.77	56.60	4.96	OSF1.50	3090.00	3086.95	OSF>5.00			Exit Alert	
	375.95	88.70	315.98	287.25	6.50	OSF1.50	11290.00	10619.51				MinPt-CtCt	
	375.95	114.60	298.71	261.34	5.00	OSF1.50	12640.00	10631.22	OSF<5.00			Enter Alert	
	375.96	341.66	147.35	34.30	1.65	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #4H Rev0 RM 24Jan19 (Def Plan)													Warning Alert
	40.00	32.50	37.50	7.50	N/A	MAS = 9.90 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert	
	39.99	32.50	37.49	7.50	N/A	MAS = 9.90 (m)	26.00	26.00				WRP	
	39.99	32.50	28.47	7.50	4.15	MAS = 9.90 (m)	1500.00	1500.00				MinPts	
	40.01	32.50	28.43	7.51	4.13	MAS = 9.90 (m)	1510.00	1510.00				MINPT-O-EOU	
	40.60	32.50	28.79	8.10	4.09	MAS = 9.90 (m)	1560.00	1560.00				MinPt-O-SF	
	52.45	32.50	39.87	19.95	4.96	MAS = 9.90 (m)	1770.00	1770.00	OSF>5.00			Exit Alert	
	133.59	32.50	114.41	101.09	7.86	MAS = 9.90 (m)	4020.00	4012.20				MinPt-O-SF	
	134.33	32.50	115.04	101.83	7.85	MAS = 9.90 (m)	4110.00	4101.75				MinPt-O-SF	
	114.79	32.50	93.46	82.30	5.96	MAS = 9.90 (m)	4880.00	4867.81				MinPts	
	114.88	32.50	93.38	82.38	5.92	MAS = 9.90 (m)	4920.00	4907.61				MINPT-O-EOU	
	118.55	32.59	95.99	85.96	5.79	OSF1.50	5170.00	5156.33				MinPt-O-SF	
	197.13	57.93	157.68	139.20	5.27	OSF1.50	9140.00	9119.97				MinPts	
	197.25	58.00	157.75	139.25	5.26	OSF1.50	9150.00	9129.97				MinPt-O-SF	
	1030.67	303.85	827.28	726.83	5.12	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #17H Rev0 RM 24Jan19 (Def Plan)													Warning Alert
	1012.04	32.81	1009.54	979.23	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1012.04	32.81	1009.53	979.23	141991.04	MAS = 10.00 (m)	26.00	26.00				WRP	
	960.60	32.81	941.95	927.79	59.46	MAS = 10.00 (m)	3120.00	3116.80				MinPt-O-SF	
	810.99	61.75	768.91	749.24	20.54	OSF1.50	10120.00	10099.97				MinPt-CtCt	
	751.91	227.80	599.11	524.11	4.99	OSF1.50	17020.00	10669.22	OSF<5.00			Enter Alert	
	751.90	332.61	529.23	419.29	3.41	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #18H Rev0 RM 24Jan19 (Def Plan)													Pass
	1031.56	32.81	1029.06	998.75	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1031.56	32.81	1029.05	998.75	132331.01	MAS = 10.00 (m)	26.00	26.00				WRP	
	1031.56	32.81	1015.06	998.75	73.47	MAS = 10.00 (m)	2290.00	2290.00				MinPts	
	1031.48	32.81	1014.73	998.67	72.22	MAS = 10.00 (m)	2400.00	2399.98				MinPt-O-SF	
	1030.22	32.81	1013.77	997.41	73.67	MAS = 10.00 (m)	2620.00	2619.35				MINPT-O-EOU	
	1030.22	32.81	1013.78	997.41	73.74	MAS = 10.00 (m)	2630.00	2629.30				MinPts	
	1180.08	40.84	1152.02	1139.24	46.07	OSF1.50	6200.00	6181.08				MinPt-O-SF	
	1169.43	59.29	1129.07	1110.14	30.82	OSF1.50	10120.00	10099.97				MinPt-CtCt	
	1127.86	330.60	906.62	797.25	5.14	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #19H Rev0 RM 24Jan19 (Def Plan)													Pass
	1051.11	32.81	1048.61	1018.30	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1051.11	32.81	1048.60	1018.30	121014.89	MAS = 10.00 (m)	26.00	26.00				WRP	
	1051.11	32.81	1036.49	1018.30	86.50	MAS = 10.00 (m)	1990.00	1990.00				MinPts	
	1051.14	32.81	1036.42	1018.33	85.82	MAS = 10.00 (m)	2010.00	2010.00				MINPT-O-EOU	
	1062.49	32.81	1046.74	1029.68	80.02	MAS = 10.00 (m)	2300.00	2300.00				MinPt-O-SF	
	1388.05	44.77	1357.37	1343.27	49.16	OSF1.50	6400.00	6380.16				MinPt-O-SF	
	1518.68	49.58	1484.79	1469.10	48.30	OSF1.50	7260.00	7239.97				MinPt-O-SF	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	1503.80	329.69	1283.18	1174.11	6.88	OSF1.50	20338.41	10698.00				MinPts	
Cimarex Tar Heel 19-18 Federal Com #2H Rev0 RM 24Jan19 (Def Plan)													Pass
	1070.67	32.81	1068.17	1037.86	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1070.67	32.81	1068.16	1037.86	92453.80	MAS = 10.00 (m)	26.00	26.00				WRP	
	1070.67	32.81	1059.18	1037.86	118.90	MAS = 10.00 (m)	1490.00	1490.00				MinPts	
	1070.70	32.81	1059.12	1037.89	117.65	MAS = 10.00 (m)	1510.00	1510.00				MINPT-O-EOU	
	1159.96	32.81	1145.08	1127.15	93.50	MAS = 10.00 (m)	2400.00	2399.98				MinPt-O-SF	
	1365.04	36.72	1339.73	1328.32	59.72	OSF1.50	5240.00	5225.98				MinPt-O-SF	
	1286.32	41.19	1258.03	1245.13	49.77	OSF1.50	6560.00	6539.97				MinPt-O-SF	
	1286.02	51.36	1250.94	1234.66	39.40	OSF1.50	8570.00	8549.97				MinPt-CtCt	
	1286.03	51.42	1250.92	1234.61	39.36	OSF1.50	8580.00	8559.97				MINPT-O-EOU	
	1286.08	51.48	1250.93	1234.61	39.31	OSF1.50	8590.00	8569.97				MinPt-O-ADP	
	1302.25	52.90	1266.15	1249.35	38.69	OSF1.50	8870.00	8849.97				MinPt-O-SF	
	2007.64	52.23	1971.99	1955.41	60.48	OSF1.50	11260.00	10619.25				MinPt-CtCt	
	2008.17	322.95	1792.03	1685.22	9.39	OSF1.50	20338.41	10698.00				MinPts	

Co-Flex Hose
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM



Co-Flex Hose Hydrostatic Test
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Midwest Hose & Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT

Customer:	P.O. Number:
Oderco Inc	odyd-271

HOSE SPECIFICATIONS

Type:	Hose Length:
Stainless Steel Armor Choke & Kill Hose	45'ft.

I.D.	O.D.
4 INCHES	9 INCHES

WORKING PRESSURE	TEST PRESSURE	BURST PRESSURE
10,000 PSI	15,000 PSI	0 PSI

COUPLINGS

Stem Part No.	Ferrule No.
OKC OKC	OKC OKC
Type of Coupling:	
Swage-It	

PROCEDURE

Hose assembly pressure tested with water at ambient temperature.

TIME HELD AT TEST PRESSURE	ACTUAL BURST PRESSURE:
15 MIN.	0 PSI

Hose Assembly Serial Number:	Hose Serial Number:
79793	OKC

Comments:

Date:	Tested:	Approved:
3/8/2011		

Midwest Hose & Specialty, Inc.

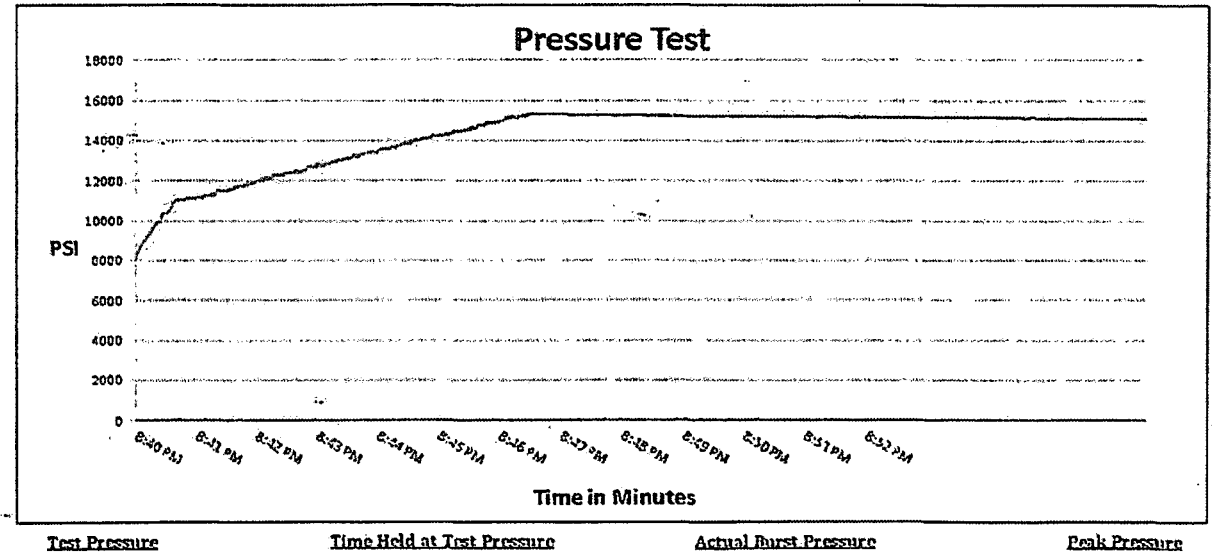
Internal Hydrostatic Test Graph

March 3, 2011

Customer: Houston

Pick Ticket #: 94260

Hose Specifications		Verification	
Hose Type	**Length**	**Type of Fitting**	**Coupling Method**
C & K	45'	4 1/16 10K	Swage
I.D.	**O.D.**	**Die Size**	**Final O.D.**
4"	6.09"	6.38"	6.25"
Working Pressure	**Burst Pressure**	**Hose Serial #**	**Hose Assembly Serial #**
10000 PSI	Standard Safety Multiplier Applies	5544	79793



Test Pressure	Time Held at Test Pressure	Actual Burst Pressure	Peak Pressure
15000 PSI	11 Minutes		15483 PSI

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

Tested By: *Zac Mcconnell*

Approved By: *Kim Thomas*

Co-Flex Hose Hydrostatic Test
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Co-Flex Hose
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer: DEM	**PO** ODYD-271

SPECIFICATIONS

Sales Order 79793	**Dated:** 3/8/2011

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

Supplier:
Midwest Hose & Specialty, Inc.
10640 Tanner Road
Houston, Texas 77041

Comments:

Approved: Jamal Garcia	**Date:** 3/8/2011

Midwest Hose & Specialty, Inc.

Co-Flex Hose
Tar Heel 19-18 Fed 2H
Cimarex Energy Co.
19-26S-30E
Eddy Co., NM

Specification Sheet
Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium componets.The reinforcement cables, inner liner and cover are made of the highest quality material to handle the tough drilling applications of today's industry. The end connections are available with API flanges, API male threads, hubs, hammer unions or other special fittings upon request. Hose assembly is manufactured to API 7K. This assembly is wrapped with fire resistant vermculite coated fiberglass insulation, rated at 2000 degrees with stainless steel armor cover.

Working Pressure:	5,000 or 10,000 psi working pressure
Test Pressure:	10,000 or 15,000 psi test pressure
Reinforcement:	Multiple steel cables
Cover:	Stainless Steel Armor
Inner Tube:	Petroleum resistant, Abrasion resistant
End Fitting:	API flanges, API male threads, threaded or butt weld hammer unions, unibolt and other special connections
Maximum Length:	110 Feet
ID:	2-1/2", 3", 3-1/2", 4"
Operating Temperature:	-22 deg F to +180 deg F (-30 deg C to +82 deg C)

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District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original to Appropriate District Office

GAS CAPTURE PLAN

Date: 1-24-2019

☒ Original Operator & OGRID No.: Cimarex Energy Co. of-162683

☐ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Tar Heel 19-18 Federal Com #2H	Pending	19-26S-30E	540'FSL & 389' FWL	4000		

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to Gas Transporter and will be connected to Gas Transporter low/high pressure gathering system located in Eddy County, New Mexico. It will require 2 miles of pipeline to connect the facility to low/high pressure gathering system. Operator provides (periodically) to Gas Transporter a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Operator and Gas Transporter have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Lucid Red Hills Processing Plant located in Sec 13-24S-33E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Gas Transporter system at that time. Based on current information, it is Operator's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

1. Geological Formations

TVD of target 10,698
MD at TD 20,338

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	1050	N/A	
Salado	1918	N/A	
Castille	2453	N/A	
Bell Canyon	3268	N/A	
Cherry Canyon	4185	N/A	
Brushy Canyon	5474	N/A	
Bone Spring	7026	N/A	
Wolfcamp	10202	N/A	
Wolfcamp A1 Marker	10342	N/A	
Wolfcamp A1 Target	10618	N/A	
Wolfcamp A2 Marker	10849	N/A	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1100	1100	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.47	3.44	6.10
12 1/4	0	3248	3248	9-5/8"	36.00	J-55	LT&C	1.17	2.04	3.87
8 3/4	0	10107	10107	7"	29.00	L-80	LT&C	1.48	1.73	1.89
8 3/4	10107	11095	10698	7"	29.00	L-80	BT&C	1.40	1.63	39.44
6	10107	20338	10698	4-1/2"	11.60	HCP-110	BT&C	1.27	1.54	53.53
						BLM Minimum Safety Factor		1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	534	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	143	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	595	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	190	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	364	10.30	3.64	22.18		Lead: Tuned Light + LCM
	127	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	672	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	45
Intermediate	0	53
Production	3048	23
Completion System	11095	10

4. Pressure Control Equipment

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

BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram	X	
			Double Ram	X	
			Other		

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

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

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	N	Are anchors required by manufacturer?

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1100'	FW Spud Mud	8.30 - 8.80	30-32	N/C
1100' to 3248'	Brine Water	9.70 - 10.20	30-32	N/C
3248' to 11095'	FW/Cut Brine	8.50 - 9.00	30-32	N/C
11095' to 20338'	Oil Based Mud	12.00 - 12.50	50-70	N/C

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

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

6. Logging and Testing Procedures

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

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	6953 psi
Abnormal Temperature	No

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

8. Other Facets of Operation

9. Wellhead

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" 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 test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor 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.

A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

The casing string utilizing steel body pack-off will be tested to 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.