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

Sundry Print Report

11/28/2023

Well Name: RED HILLS UNIT

Well Location: T25S / R33E / SEC 33 / NENW / 32.092969 / -103.579656

County or Parish/State: LEA / NM

Well Number: 48H

Type of Well: CONVENTIONAL GAS WELL

Allottee or Tribe Name:

Lease Number: NMNM0024368A, NMNM024368A

Unit or CA Name:

Unit or CA Number:

US Well Number: 3002548455

Well Status: Approved Application for Permit to Drill

Operator: CIMAREX ENERGY COMPANY OF COLORADO

Notice of Intent

Sundry ID: 2739378

Type of Submission: Notice of Intent

Type of Action: APD Change

Date Sundry Submitted: 07/05/2023

Time Sundry Submitted: 01:24

Date proposed operation will begin: 01/01/2024

Procedure Description: Please see the attached sundry language and supporting documents regarding requested APD changes on the Red Hills 48H approved APD.

NOI Attachments

Procedure Description

RED_HILLS_48H_SUNDRY_LANGUAGE_AND_ATTACHMENTS___REV3_11_21_23_20231121104931.pdf

Conditions of Approval

Specialist Review

Red_Hills_Unit_48H_COA_20231128112045.pdf

Additional

Red_Hills_Unit_48H_COA_20231128120552.pdf

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Operator: CIMAREX ENERGY COMPANY OF COLORADO

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: AMY DOEBELE

Signed on: NOV 21, 2023 10:49 AM

Name: CIMAREX ENERGY COMPANY OF COLORADO

Title: Authorized Agent

Street Address: 85 S 200 E

City: VERNAL **State:** UT

Phone: (435) 789-1017

Email address: ADOEBELE@UINTAHGROUP.COM

Field

Representative Name: Shelley Bowen

Street Address: 6001 Deauville Blvd, 300N

City: Midland **State:** TN **Zip:** 79706

Phone: (432)620-1960

Email address: brittany.gordon@coterra.com

BLM Point of Contact

BLM POC Name: CHRISTOPHER WALLS

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5752342234

BLM POC Email Address: cwalls@blm.gov

Disposition: Approved

Disposition Date: 11/28/2023

Signature: Chris Walls

Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No.

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☐ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.

2. Name of Operator

9. API Well No.

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool or Exploratory Area

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*

11. Country or Parish, State

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

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

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

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*

Title

Signature

Date

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law 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, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. 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 the regulation in 43 CFR 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., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.
PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c)and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.
ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.
EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.
Response to this request is mandatory.
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 ofthis form to U.S. Department ofthe Interior, Bureau ofLand Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Location of Well

0. SHL: NWNE / 527 FNL / 2042 FWL / TWSP: 25S / RANGE: 33E / SECTION: 33 / LAT: 32.092969 / LONG: -103.579656 (TVD: 0 feet, MD: 0 feet)

PPP: NESW / 2640 FSL / 2430 FWL / TWSP: 25S / RANGE: 33E / SECTION: 33 / LAT: 32.087019 / LONG: -103.579711 (TVD: 9940 feet, MD: 11900 feet)

BHL: SESW / 100 FSL / 2010 FWL / TWSP: 26S / RANGE: 33E / SECTION: 4 / LAT: 32.065552 / LONG: -103.579288 (TVD: 9940 feet, MD: 19664 feet)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex
LEASE NO.:	**NMNM024368A**
LOCATION:	Section 33, T.25 S, R.33 E., NMPM
COUNTY:	Lea County, New Mexico
WELL NAME & NO.:	Red Hills Unit 48H
SURFACE HOLE FOOTAGE:	347'/N & 1962'/W
BOTTOM HOLE FOOTAGE:	100'/S & 1100'/W

*Changes approved through engineering via **Sundry 2739378_** on 11-28-2023_. Any previous COAs not addressed within the updated COAs still apply.*

COA

H_2S	○ Yes	◉ No		
Potash / WIPP	◉ None	○ Secretary	○ R-111-P	☐ WIPP
Cave / Karst	◉ Low	○ Medium	○ High	○ Critical
Wellhead	○ Conventional	◉ Multibowl	○ Both	○ Diverter
Cementing	☐ Primary Squeeze	☐ Cont. Squeeze	☐ EchoMeter	☐ DV Tool
Special Req	☐ Break Testing	☐ Water Disposal	☐ COM	☑ Unit
Variance	☑ Flex Hose	☐ Casing Clearance	☐ Pilot Hole	☐ Capitan Reef
Variance	☐ Four-String	☐ Offline Cementing	☐ Fluid-Filled	☐ Open Annulus
☐ **Batch APD / Sundry**				

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 must meet all requirements from **43 CFR 3176**, 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 **976** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) 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.

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.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.

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 calculates to 11%. Additional cement maybe 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. 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 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 43 CFR 3172 must be followed.

D. SPECIAL REQUIREMENT (S)

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months. (This is not necessary for secondary recovery unit wells)

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
Email **or** call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, **BLM_NM_CFO_DrillingNotifications@BLM.GOV**
(575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 689-5981

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 **43 CFR part 3170 Subpart 3172** 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 integrity 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 **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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 **43 CFR part 3170 Subpart 3172** 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 cement), 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** 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 **43 CFR part 3170 Subpart 3172**.

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.

ZS 11/28/2023

Cimarex Energy Company of Colorado respectfully requests the following drilling and directional changes be made to the existing, approved APD for the following well:

RED HILLS UNIT 48H

The AFMSS Location Table does not match the points in the C-102 & Directional Plan attached to the approved APD
527' FNL 2,010' FWL, NENW (C-102) 10,213 MD & 9,940' TVD (DIR PLAN)
Exit point #1 was called out at 0' FNL of Section 4, which would not account for the bottom lateral portion of the producing wellbore.

APPROVED APD

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Sec	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	TVD	MD
SHL #1 Leg	527	FNL	2042	FWL	25S	33E	33	NWNE	32.092969	-103.579656	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0024368A	3361	0	0
KOP #1 Leg	527	FNL	2042	FWL	25S	33E	33	NWNE	32.092963	-103.578342	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0024368A	6101	9462	9462
PPP #1-1 Leg	2640	FSL	2430	FWL	25S	33E	33	NESW	32.087019	-103.579711	LEA	NEWMEXICO	FIRSTPRIN	F	NMNM0005792	6579	11900	9940
EXIT #1 Leg	0	FNL	2430	FWL	26S	33E	4	SESW	32.0797472	-103.5792583	LEA	NEWMEXICO	FIRSTPRIN	F	NMNM089425	6579	14500	9940
BHL #1 Leg	100	FSL	2010	FWL	26S	33E	4	SESW	32.065552	-103.579288	LEA	NEWMEXICO	FIRSTPRIN	F	NMNM089425	6579	19664	9940

PROPOSED CHANGES

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Sec	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	TVD	MD
SHL #1 Leg	347	FNL	1962	FWL	25S	33E	33	NENW	32.09334	-103.579443	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0024368A	3361	0	0
KOP #1 Leg	103	FNL	1364	FWL	25S	33E	33	NENW	32.09402315	-103.58136842	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0024368A	-6458	9778	9819
PPP #1-1 Leg	100	FNL	1100	FWL	25S	33E	33	NWNW	32.094025	-103.582227	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0024368A	-7508	10370	10869
PPP #1-2 Leg	2640	FSL	1101	FWL	25S	33E	33	NWSW	32.087045	-103.582226	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0005792A	-7508	10370	13410
PPP #1-3 Leg	1320	FSL	1102	FWL	25S	33E	33	SWSW	32.083417	-103.582226	LEA	NEWMEXICO	NEWMEXICO	F	NMNM0005792	-7508	10370	14730
PPP #1-4 Leg	0	FNL	1102	FWL	25S	33E	4	NWNW	32.079789	-103.582226	LEA	NEWMEXICO	NEWMEXICO	F	NMNM089425	-7508	10370	16050
EXIT #1 Leg	100	FSL	1100	FWL	25S	33E	4	SWSW	32.065557	-103.582225	LEA	NEWMEXICO	NEWMEXICO	F	NMNM089425	-7508	10370	20530
BHL #1 Leg	100	FSL	1100	FWL	25S	33E	4	SWSW	32.065557	-103.582225	LEA	NEWMEXICO	NEWMEXICO	F	NMNM089425	-7508	10370	20530

Drilling Plan amendments:

Sec 1 - Geologic Formations

Geologic formation depths have all changed. Please see attached drilling plans.

Section 2 - Blowout Prevention

12.25" hole size – Min required WP 2M
8.75" hole size – Min required WP 3M
6" hole size – Min required WP 5M

Section 3 - Casing

Surface casing changed from 989' MD to 976' MD.
Intermediate casing string changed from 4,912' MD to 4,980' MD.
Tapered production string changed from 5.5" & 9,462' MD to 7" & 10,569' MD (L-80 & LT&C) with 7" P-110 & BT&C) ran from 9,819' to 10,569' MD.
A new 4 ½" (P-110, BT&C) completion liner was added from 9819' to 20,530' MD.

Section 4 - Cement

Surface cement sacks changed from 417 lead/195 tail to 410 lead/195 tail.
Intermediate cement sacks changed from 933 lead/287 tail to 948 lead/287 tail. Tail yield changed from 1.3 to 1.36.
Tapered production string changed from multiple production string cement segments to one production string segment consisting of:
Lead: 309 sx Tuned Light + LCM cement / 10.30 density & 3.64 yield.
Tail: 125 sx Class C + retarder cement / 14.80 density & 1.36 yield.
A completion liner string was added consisting of 739 sx, 14.20 density & 1.30 yield (Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS) TOC @ 10,369'.

Section 5 - Circulating Medium

Changed from:
0' to 989 - Spud Mud - 8.3 Min/8.8 Max
989' to 4,912' - Salt Saturated - 9.7 Min/10.2 Max
4,912' to 19,664' - Cut Brine - 8.5 Min/9 Max
To:
0' to 976' Fresh Water 7.83 Min/8.33 Max
976' to 4,980' Brine Water 9.80 Min/10.30 Max
4,980' to 10,569' Cut Brine or OBM 8.50 min/ 9.00 Max
10,569' to 20,530' OBM 9.20 min/ 9.70 Max

Section 7 – Pressure
Anticipated BHP changed from 4651' to 5,230'.

Other Variances:
Cimarex requests to perform offline cementing. OLC procedure as follows: 1. Land casing on solid body mandrel hanger. Engage pack off and lock ring 2. Install BPV. 3. Skid rig. 4. Check for pressure and remove BPV. 5. Circulate down casing, taking returns through casing valves. 6. Pump lead and tail cement. 7. Displace cement and bump the plug. 8. Ensure floats are holding pressure. 9. RD cement crew. 10. Install BPV and TA cap.

Cimarex requests permission to skid the rig to the next well on the pad to begin operations instead of waiting 8 hours for surface cement to harden on this well. Surface cement will be pumped, and we will ensure floats hold, do a green cement test and then skid to the next well on pad.
We will not perform any operations on this well until at least 8 hours and when both tail and lead slurry reach 500 psi. The mandrel hanger is made up on the last joint of 13 5/8" casing and then lowered down with and landing joint. It is then lowered down until the mandrel contacts the landing ring which is pre-welded to the conductor pipe. At this point the 13 5/8" casing is entirely supported by the conductor pipe via the landing ring/mandrel and is independent from the rig. This allows us to walk the rig away from the well and begin work on the next well while the cement is hardening. There is no way for the casing to be moved or knocked off center since it is hanging from the landing ring.

1. Geological Formations

TVD of target 10,370
MD at TD 20,530

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
RUSTLER	926	Useable Water	
TOP SALT	1295	N/A	
BASE SALT	4900	N/A	
TOP DELAWARE SANDS	4930	N/A	
CHERRY CANYON	5960	N/A	
BRUSHY CANYON	7480	Hydrocarbons	
BASAL BRUSHY CANYON	8855	Hydrocarbons	
BONE SPRING LIME	9040	Hydrocarbons	
LEONARD	9065	Hydrocarbons	
AVALON	9330	Hydrocarbons	
1ST BONE SPRING SAND	10020	Hydrocarbons	
2ND BONE SPRING	10370	Hydrocarbons	

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	976	976	13-3/8"	48.00	H-40	ST&C	1.75	4.09	6.87
12 1/4	0	4980	4980	9-5/8"	40.00	HCK-55	LT&C	1.43	1.48	2.82
8 3/4	0	9819	9819	7"	29.00	L-80	LT&C	1.53	1.78	1.96
8 3/4	9819	10569	10331	7"	29.00	P-110	BT&C	1.76	2.32	62.57
6	9819	20530	10370	4-1/2"	11.60	P-110	BT&C	1.45	2.05	57.42
					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?	Y
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?	Y

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	410	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	948	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	287	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Production	309	10.30	3.64	22.18		Lead: Tuned Light + LCM
	125	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Completion System	739	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	42
Intermediate	0	49
Production	4780	25
Completion System	10369	10

Cimarex request the ability to perform casing integrity tests after plug bump of cement job.

4. Pressure Control Equipment

	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	2M
			Blind Ram		
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	3M
			Blind Ram		
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	5M
			Blind Ram		
			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.

	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 976'	Fresh Water	7.83 - 8.33	28	N/C
976' to 4980'	Brine Water	9.80 - 10.30	30-32	N/C
4980' to 10569'	Cut Brine or OBM	8.50 - 9.00	27-70	N/C
10569' to 20530'	OBM	9.20 - 9.70	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.
X	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	5230 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 working pressure, or a maximum test pressure of 5000 psi.
The pressure test will be repeated at least every 30 days, asper 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.

All casing strings will be tested as per Onshore Order No.2 to at least 0.22 psi/ft or 1,500 whichever is greater and not to exceed 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.

10. Other Variances
Cimarex requests to perform offline cementing. OLC procedure as follows: 1. Land casing on solid body mandrel hanger. Engage pack off and lock ring 2. Install BPV. 3. Skid rig. 4. Check for pressure and remove BPV. 5. Circulate down casing, taking returns through casing valves. 6. Pump lead and tail cement. 7. Displace cement and bump the plug. 8. Ensure floats are holding pressure. 9. RD cement crew. 10. Install BPV and TA cap.

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District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

[X] AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-48455	97741	WC-025 G-09 S253335K; LWR BONE SPRIN

[4] Property Code	[5] Property Name	[6] Well Number
300545	RED HILLS UNIT	48H

[7] OGRID No.	[8] Operator Name	[9] Elevation
162683	CIMAREX ENERGY CO. OF COLORADO	3362.9'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	33	25S	33E		347	NORTH	1962	WEST	LEA

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	4	26S	33E		100	SOUTH	1100	WEST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
320			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

[16]

NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°05'36.03" (32.093340°)
LONGITUDE = 103°34'46.00" (103.579443°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°05'35.58" (32.093216°)
LONGITUDE = 103°34'44.30" (103.578973°)
STATE PLANE NAD 83 (N.M. EAST)
N: 398510.13' E: 774800.38'
STATE PLANE NAD 27 (N.M. EAST)
N: 398452.51' E: 733613.89'

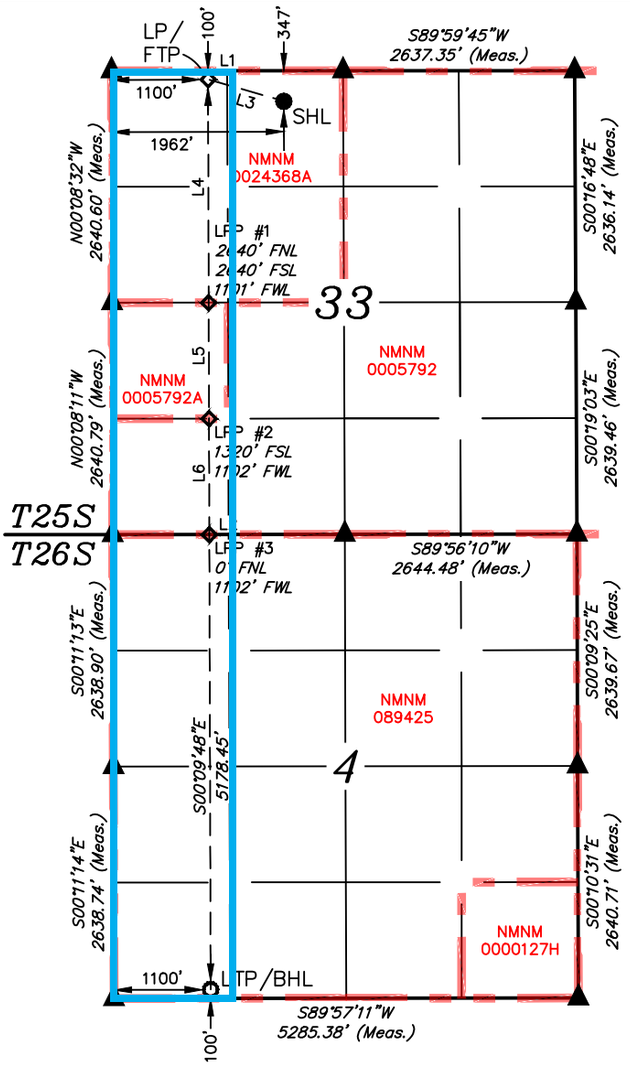
NAD 83 (LP/FTP)
LATITUDE = 32°05'38.49" (32.094025°)
LONGITUDE = 103°34'56.02" (103.582227°)
NAD 27 (LP/FTP)
LATITUDE = 32°05'38.04" (32.093901°)
LONGITUDE = 103°34'54.32" (103.581756°)
STATE PLANE NAD 83 (N.M. EAST)
N: 398753.25' E: 773936.55'
STATE PLANE NAD 27 (N.M. EAST)
N: 398695.62' E: 732750.07'

NAD 83 (LPP #1)
LATITUDE = 32°05'13.36" (32.087045°)
LONGITUDE = 103°34'56.02" (103.582226°)
NAD 27 (LPP #1)
LATITUDE = 32°05'12.91" (32.086920°)
LONGITUDE = 103°34'54.32" (103.581756°)
STATE PLANE NAD 83 (N.M. EAST)
N: 396213.90' E: 773954.38'
STATE PLANE NAD 27 (N.M. EAST)
N: 396156.34' E: 732767.78'

NAD 83 (LPP #2)
LATITUDE = 32°05'00.30" (32.083417°)
LONGITUDE = 103°34'56.01" (103.582226°)
NAD 27 (LPP #2)
LATITUDE = 32°04'59.85" (32.083292°)
LONGITUDE = 103°34'54.32" (103.581756°)
STATE PLANE NAD 83 (N.M. EAST)
N: 394894.03' E: 773963.64'
STATE PLANE NAD 27 (N.M. EAST)
N: 394836.50' E: 732776.99'

NAD 83 (LPP #3)
LATITUDE = 32°04'47.24" (32.079789°)
LONGITUDE = 103°34'56.01" (103.582226°)
NAD 27 (LPP #3)
LATITUDE = 32°04'46.79" (32.079664°)
LONGITUDE = 103°34'54.32" (103.581756°)
STATE PLANE NAD 83 (N.M. EAST)
N: 393574.15' E: 773972.91'
STATE PLANE NAD 27 (N.M. EAST)
N: 393516.66' E: 732786.19'

NAD 83 (LTP/BHL)
LATITUDE = 32°03'56.00" (32.065557°)
LONGITUDE = 103°34'56.01" (103.582225°)
NAD 27 (LTP/BHL)
LATITUDE = 32°03'55.55" (32.065432°)
LONGITUDE = 103°34'54.32" (103.581756°)
STATE PLANE NAD 83 (N.M. EAST)
N: 388396.72' E: 774009.25'
STATE PLANE NAD 27 (N.M. EAST)
N: 388339.35' E: 732822.29'



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S89°58'38"W	2635.30'
L2	S89°54'37"W	2642.84'
L3	N74°02'31"W	897.55'
L4	S00°09'48"E	2539.85'
L5	S00°09'48"E	1320.13'
L6	S00°09'48"E	1320.13'

● = SURFACE HOLE LOCATION
◇ = LPP/LANDING POINT/ FIRST TAKE POINT
○ = BOTTOM HOLE LOCATION/ LAST TAKE POINT
▲ = SECTION CORNER LOCATED

NOTE:
- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearing is a Transverse Mercator Projection with a Central Meridian of W103°53'00"

2000' 1000' 0' 2000'
SCALE
DRAWN BY: R.J. 03-19-18
REV: 4 N.D.T. 04-25-23
(SHL MOVE & WELL BORE CHANGES)

[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Brittany Gordon 6/6/2023
Signature Date

Brittany Gordon
Printed Name

brittany.gordon@coterra.com
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

May 05, 2017
Date of Survey
Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
04-25-23
PROFESSIONAL SURVEYOR

Certificate Number:

Geologic Prognosis

COTERRA

Well Information					Contact Information
Well Name: Red Hills Unit 48H		**County:** Lea			**Jenny Blake**
API #:		**State:** New Mexico			Office: (432) 571-7800
Dev/Exp: Development		**Field:**			Cell: (281) 639-4419
Surface Hole Information					Email: Jenny.Blake@coterra.com
Footages:	**Section:**	**Township:**	**Range:**	**Direction**	
347' FNL / 1962' FWL	33	25S	33E	N-S	**Staci Mueller**
Bottom Hole Information					Office: (432) 571-7898
Footages:	**Section:**	**Township:**	**Range:**		Cell: (406) 794-2287
100' FSL / 1100' FWL	4	26S	33E		Email: Staci.Mueller@coterra.com

Target Information		
2nd Shale	Landing TVD: ***10,370'***	TD TVD: 10,370'

Generated By: Jenny Blake
Est. GL Elevation: 3367
Est. KB above GL 23
Est. KB Elevation: 3390
Date Generated: 5/17/2023
Rig:

Horizon	TVD top	TVD base	SSTVD top	Thickness	Lithology	Mineral Resource	Comments
Rustler	926	1295	2629	369	Anhydrite	Useable Water	
Top Salt/Salado	1295	4900	1360	3605	Halite	N/A	
Base Salt/Lamar	4900	4930	-1021	30	Shale	N/A	
Top Delaware Sands/Bell Canyon	4930	5960	-1067	1030	Sandstone	Natural gas, oil	
Cherry Canyon	5960	7480	-2053	1520	Sandstone	Natural gas, oil	
Brushy Canyon	7480	8855	-4090	1375	Sandstone	Natural gas, oil	Hardline 100' FSL/100' FNL & 330' FWL/FEL
Basal Brushy Canyon	8855	9040	-5465	185			
Bone Spring Lime	9040	9065	-5015	25	Limestone	N/A	
Leonard/Avalon Sand	9065	9330	-5115	265	Shale	Natural gas, oil	
Avalon Shale	9330	10020	-5491	690	Shale	Natural gas, oil	
1st Bone Spring Sand	10020	10220	-6111	200	Sandstone	Natural gas, oil	
2nd Bone Spring Shale	10220		-6435				
2nd Bone Spring Shale Target	**10,370**	**---**	**-6980**	**---**			

Potential Geologic / Drilling Hazards: N/A

Type Log: 30025351120000

Offset Injection Wells:

Open Hole Logs: n/a
Service Provider:
Ops Contact:
Sales Contact:
Log Type:

Mudlogging Vendor: n/a

Schlumberger

Coterra Red Hills Unit 48H Rev1 kFc 24May23 Proposal Geodetic Report

Def Plan

Report Date:	May 24, 2023 - 03:57 PM (UTC 0)	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	COTERRA	**Vertical Section Azimuth:**	179.600 °(GRID North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Coterra Red Hills Unit Pad 47-50 / Red Hills Unit 48H	**TVD Reference Datum:**	RKB
Well:	Red Hills Unit 48H	**TVD Reference Elevation:**	3385.900 ft above MSL
Borehole:	Red Hills Unit 48H	**Seabed / Ground Elevation:**	3362.900 ft above MSL
UBHI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.243°
Survey Name:	Coterra Red Hills Unit 48H Rev1 kFc 24May23	**Total Gravity Field Strength:**	998.4351mgn (9.80665 Based)
Survey Date:	May 24, 2023	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	116.999 ° / 11027.967 ft / 6.407 / 1.063	**Total Magnetic Field Strength:**	47341.165 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.617°
Location Lat / Long:	32°5'36.02563"N , 103°34'45.99507"W	**Declination Date:**	May 24, 2023
Location Grid N/E Y/X:	N 398510.130 ftUS , E 774800.380 ftUS	**Magnetic Declination Model:**	HDGM 2023
CRS Grid Convergence Angle:	0.4006°	**North Reference:**	Grid North
Grid Scale Factor:	0.99997152	**Grid Convergence Used:**	0.4006°
Version / Patch:	2022.5.0.11	**Total Corr Mag North->Grid North:**	5.8421°
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)
SHL [347' FNL, 1962' FWL]	0.00	0.00	292.21	0.00	-3,385.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307			
	100.00	0.00	292.21	100.00	-3,285.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	200.00	0.00	292.21	200.00	-3,185.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	300.00	0.00	292.21	300.00	-3,085.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	400.00	0.00	292.21	400.00	-2,985.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	500.00	0.00	292.21	500.00	-2,885.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	600.00	0.00	292.21	600.00	-2,785.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	700.00	0.00	292.21	700.00	-2,685.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	800.00	0.00	292.21	800.00	-2,585.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	900.00	0.00	292.21	900.00	-2,485.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
Rustler	926.00	0.00	292.21	926.00	-2,459.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,000.00	0.00	292.21	1,000.00	-2,385.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,100.00	0.00	292.21	1,100.00	-2,285.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,200.00	0.00	292.21	1,200.00	-2,185.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
Salado	1,295.00	0.00	292.21	1,295.00	-2,090.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,300.00	0.00	292.21	1,300.00	-2,085.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,400.00	0.00	292.21	1,400.00	-1,985.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,500.00	0.00	292.21	1,500.00	-1,885.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,600.00	0.00	292.21	1,600.00	-1,785.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,700.00	0.00	292.21	1,700.00	-1,685.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
Nudge, Build 2°/100ft	1,800.00	0.00	292.21	1,800.00	-1,585.90	0.00	0.00	0.00	398,510.13	774,800.38	32.09334045	-103.57944307	0.00	0.00	0.00
	1,900.00	2.00	292.21	1,899.98	-1,485.92	-0.67	0.66	-1.62	398,510.79	774,798.76	32.09334230	-103.57944828	2.00	2.00	0.00
	2,000.00	4.00	292.21	1,999.84	-1,386.06	-2.68	2.64	-6.46	398,512.77	774,793.92	32.09334783	-103.57946388	2.00	2.00	0.00
	2,100.00	6.00	292.21	2,099.45	-1,286.45	-6.03	5.93	-14.53	398,516.06	774,785.85	32.09335704	-103.57948985	2.00	2.00	0.00
Hold	2,174.95	7.50	292.21	2,173.88	-1,212.02	-9.42	9.26	-22.68	398,519.39	774,777.70	32.09336635	-103.57951611	2.00	2.00	0.00
	2,200.00	7.50	292.21	2,198.72	-1,187.18	-10.68	10.50	-25.71	398,520.63	774,774.67	32.09336980	-103.57952585	0.00	0.00	0.00
	2,300.00	7.50	292.21	2,297.86	-1,088.04	-15.70	15.43	-37.79	398,525.56	774,762.59	32.09338360	-103.57956475	0.00	0.00	0.00
	2,400.00	7.50	292.21	2,397.01	-988.89	-20.71	20.37	-49.88	398,530.50	774,750.51	32.09339739	-103.57960365	0.00	0.00	0.00
	2,500.00	7.50	292.21	2,496.15	-889.75	-25.73	25.30	-61.96	398,535.43	774,738.42	32.09341119	-103.57964255	0.00	0.00	0.00
	2,600.00	7.50	292.21	2,595.29	-790.61	-30.75	30.23	-74.04	398,540.36	774,726.34	32.09342498	-103.57968145	0.00	0.00	0.00
	2,700.00	7.50	292.21	2,694.44	-691.46	-35.77	35.17	-86.12	398,545.30	774,714.26	32.09343877	-103.57972035	0.00	0.00	0.00
	2,800.00	7.50	292.21	2,793.58	-592.32	-40.79	40.10	-98.20	398,550.23	774,702.18	32.09345257	-103.57975925	0.00	0.00	0.00
	2,900.00	7.50	292.21	2,892.73	-493.17	-45.81	45.04	-110.29	398,555.17	774,690.10	32.09346636	-103.57979816	0.00	0.00	0.00
	3,000.00	7.50	292.21	2,991.87	-394.03	-50.82	49.97	-122.37	398,560.10	774,678.01	32.09348016	-103.57983706	0.00	0.00	0.00
	3,100.00	7.50	292.21	3,091.02	-294.88	-55.84	54.90	-134.45	398,565.03	774,665.93	32.09349395	-103.57987596	0.00	0.00	0.00
	3,200.00	7.50	292.21	3,190.16	-195.74	-60.86	59.84	-146.53	398,569.97	774,653.85	32.09350774	-103.57991486	0.00	0.00	0.00
	3,300.00	7.50	292.21	3,289.31	-96.59	-65.88	64.77	-158.62	398,574.90	774,641.77	32.09352154	-103.57995376	0.00	0.00	0.00
	3,400.00	7.50	292.21	3,388.45	2.55	-70.90	69.71	-170.70	398,579.83	774,629.69	32.09353533	-103.57999266	0.00	0.00	0.00
	3,500.00	7.50	292.21	3,487.60	101.70	-75.91	74.64	-182.78	398,584.77	774,617.60	32.09354912	-103.58003156	0.00	0.00	0.00
	3,600.00	7.50	292.21	3,586.74	200.84	-80.93	79.57	-194.86	398,589.70	774,605.52	32.09356292	-103.58007046	0.00	0.00	0.00
	3,700.00	7.50	292.21	3,685.89	299.99	-85.95	84.51	-206.95	398,594.64	774,593.44	32.09357671	-103.58010936	0.00	0.00	0.00
	3,800.00	7.50	292.21	3,785.03	399.13	-90.97	89.44	-219.03	398,599.57	774,581.36	32.09359050	-103.58014826	0.00	0.00	0.00
	3,900.00	7.50	292.21	3,884.18	498.28	-95.99	94.38	-231.11	398,604.50	774,569.28	32.09360430	-103.58018716	0.00	0.00	0.00
	4,000.00	7.50	292.21	3,983.32	597.42	-101.01	99.31	-243.19	398,609.44	774,557.19	32.09361809	-103.58022606	0.00	0.00	0.00
	4,100.00	7.50	292.21	4,082.47	696.57	-106.02	104.24	-255.28	398,614.37	774,545.11	32.09363189	-103.58026496	0.00	0.00	0.00
	4,200.00	7.50	292.21	4,181.61	795.71	-111.04	109.18	-267.36	398,619.31	774,533.03	32.09364568	-103.58030386	0.00	0.00	0.00
	4,300.00	7.50	292.21	4,280.75	894.85	-116.06	114.11	-279.44	398,624.24	774,520.95	32.09365947	-103.58034277	0.00	0.00	0.00
	4,400.00	7.50	292.21	4,379.90	994.00	-121.08	119.05	-291.52	398,629.17	774,508.87	32.09367327	-103.58038167	0.00	0.00	0.00
	4,500.00	7.50	292.21	4,479.04	1,093.14	-126.10	123.98	-303.60	398,634.11	774,496.78	32.09368706	-103.58042057	0.00	0.00	0.00
	4,600.00	7.50	292.21	4,578.19	1,192.29	-131.12	128.91	-315.69	398,639.04	774,484.70	32.09370085	-103.58045947	0.00	0.00	0.00
	4,700.00	7.50	292.21	4,677.33	1,291.43	-136.13	133.85	-327.77	398,643.97	774,472.62	32.09371465	-103.58049837	0.00	0.00	0.00
	4,800.00	7.50	292.21	4,776.48	1,390.58	-141.15	138.78	-339.85	398,648.91	774,460.54	32.09372844	-103.58053727	0.00	0.00	0.00
	4,900.00	7.50	292.21	4,875.62	1,489.72	-146.17	143.72	-351.93	398,653.84	774,448.46	32.09374223	-103.58057617	0.00	0.00	0.00
Lamar	4,924.59	7.50	292.21	4,900.00	1,514.10	-147.40	144.93	-354.90	398,655.05	774,445.49	32.09374563	-103.58058573	0.00	0.00	0.00
Bell Canyon	4,954.85	7.50	292.21	4,930.00	1,544.10	-148.92	146.42	-358.56	398,656.55	774,441.83	32.09374980	-103.58059751	0.00	0.00	0.00
	5,000.00	7.50	292.21	4,974.77	1,588.87	-151.19	148.65	-364.02	398,658.78	774,436.37	32.09375603	-103.58061507	0.00	0.00	0.00
	5,100.00	7.50	292.21	5,073.91	1,688.01	-156.21	153.58	-376.10	398,663.71	774,424.29	32.09376982	-103.58065397	0.00	0.00	0.00
	5,200.00	7.50	292.21	5,173.06	1,787.16	-161.22	158.52	-388.18	398,668.64	774,412.21	32.09378362	-103.58069287	0.00	0.00	0.00
	5,300.00	7.50	292.21	5,272.20	1,886.30	-166.24	163.45	-400.26	398,673.58	774,400.13	32.09379741	-103.58073177	0.00	0.00	0.00
	5,400.00	7.50	292.21	5,371.35	1,985.45	-171.26	168.39	-412.35	398,678.51	774,388.05	32.09381120	-103.58077067	0.00	0.00	0.00
	5,500.00	7.50	292.21	5,470.49	2,084.59	-176.28	173.32	-424.43	398,683.44	774,375.96	32.09382500	-103.58080958	0.00	0.00	0.00
	5,600.00	7.50	292.21	5,569.64	2,183.74	-181.30	178.25	-436.51	398,688.38	774,363.88	32.09383879	-103.58084848	0.00	0.00	0.00
	5,700.00	7.50	292.21	5,668.78	2,282.88	-186.32	183.19	-448.59	398,693.31	774,351.80	32.09385258	-103.58088738	0.00	0.00	0.00
	5,800.00	7.50	292.21	5,767.93	2,382.03	-191.33	188.12	-460.68	398,698.25	774,339.72	32.09386638	-103.58092628	0.00	0.00	0.00
	5,900.00	7.50	292.21	5,867.07	2,481.17	-196.35	193.06	-472.76	398,703.18	774,327.64	32.09388017	-103.58096518	0.00	0.00	0.00
Cherry Canyon	5,993.73	7.50	292.21	5,960.00	2,574.10	-201.06	197.68	-484.08	398,707.80	774,316.31	32.09389310	-103.58100164	0.00	0.00	0.00
	6,000.00	7.50	292.21	5,966.21	2,580.31	-201.37	197.99	-484.84	398,708.11	774,315.55	32.09389396	-103.58100408	0.00	0.00	0.00
	6,100.00	7.50	292.21	6,065.36	2,679.46	-206.39	202.92	-496.92	398,713.05	774,303.47	32.09390776	-103.58104298	0.00	0.00	0.00
	6,200.00	7.50	292.21	6,164.50	2,778.60	-211.41	207.86	-509.00	398,717.98	774,291.39	32.09392155	-103.58108188	0.00	0.00	0.00
	6,300.00	7.50	292.21	6,263.65	2,877.75	-216.42	212.79	-521.09	398,722.92	774,279.31	32.09393534	-103.58112078	0.00	0.00	0.00
	6,400.00	7.50	292.21	6,362.79	2,976.89	-221.44	217.73	-533.17	398,727.85	774,267.23	32.09394914	-103.58115968	0.00	0.00	0.00
	6,500.00	7.50	292.21	6,461.94	3,076.04	-226.46	222.66	-545.25	398,732.78	774,255.14	32.09396293	-103.58119858	0.00	0.00	0.00
	6,600.00	7.50	292.21	6,561.08	3,175.18	-231.48	227.59	-557.33	398,737.72	774,243.06	32.09397672	-103.58123749	0.00	0.00	0.00
	6,700.00	7.50	292.21	6,660.23	3,274.33	-236.50	232.53	-569.42	398,742.65	774,230.98	32.09399052	-103.58127639	0.00	0.00	0.00
Drop 2°/100ft	6,748.83	7.50	292.21	6,708.64	3,322.74	-238.95	234.94	-575.32	398,745.06	774,225.08	32.09399725	-103.58129538	0.00	0.00	0.00
	6,800.00	6.48	292.21	6,759.43	3,373.53	-241.34	237.29	-581.08	398,747.41	774,219.32	32.09400383	-103.58131394	2.00	-2.00	0.00
	6,900.00	4.48	292.21	6,858.97	3,473.07	-245.01	240.90	-589.91	398,751.02	774,210.49	32.09401391	-103.58134238	2.00	-2.00	0.00
	7,000.00	2.48	292.21	6,958.78	3,572.88	-247.34	243.19	-595.52	398,753.31	774,204.87	32.09402032	-103.58136045	2.00	-2.00	0.00
	7,100.00	0.48	292.21	7,058.74	3,672.84	-248.33	244.16	-597.91	398,754.29	774,202.49	32.09402304	-103.58136812	2.00	-2.00	0.00
Hold	7,123.78	0.00	292.21	7,082.52	3,696.62	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	2.00	-2.00	0.00
	7,200.00	0.00	292.21	7,158.74	3,772.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,300.00	0.00	292.21	7,258.74	3,872.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,400.00	0.00	292.21	7,358.74	3,972.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,500.00	0.00	292.21	7,458.74	4,072.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
Brushy Canyon	7,521.26	0.00	292.21	7,480.00	4,094.10	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,600.00	0.00	292.21	7,558.74	4,172.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,700.00	0.00	292.21	7,658.74	4,272.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,800.00	0.00	292.21	7,758.74	4,372.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	7,900.00	0.00	292.21	7,858.74	4,472.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,000.00	0.00	292.21	7,958.74	4,572.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,100.00	0.00	292.21	8,058.74	4,672.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,200.00	0.00	292.21	8,158.74	4,772.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,300.00	0.00	292.21	8,258.74	4,872.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,400.00	0.00	292.21	8,358.74	4,972.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,500.00	0.00	292.21	8,458.74	5,072.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,600.00	0.00	292.21	8,558.74	5,172.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,700.00	0.00	292.21	8,658.74	5,272.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,800.00	0.00	292.21	8,758.74	5,372.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
Basal Brushy Canyon	8,896.26	0.00	292.21	8,855.00	5,469.10	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	8,900.00	0.00	292.21	8,858.74	5,472.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,000.00	0.00	292.21	8,958.74	5,572.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
Bone Springs Lime	9,081.26	0.00	292.21	9,040.00	5,654.10	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,100.00	0.00	292.21	9,058.74	5,672.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
Leonard	9,106.26	0.00	292.21	9,065.00	5,679.10	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,200.00	0.00	292.21	9,158.74	5,772.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,300.00	0.00	292.21	9,258.74	5,872.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
Avalon	9,371.26	0.00	292.21	9,330.00	5,944.10	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,400.00	0.00	292.21	9,358.74	5,972.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,500.00	0.00	292.21	9,458.74	6,072.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,600.00	0.00	292.21	9,558.74	6,172.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,700.00	0.00	292.21	9,658.74	6,272.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,800.00	0.00	292.21	9,758.74	6,372.84	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
KOP, Build 10°/100ft	9,818.78	0.00	292.21	9,777.52	6,391.62	-248.37	244.20	-598.00	398,754.32	774,202.40	32.09402315	-103.58136842	0.00	0.00	0.00
	9,900.00	8.12	191.60	9,858.47	6,472.57	-242.75	238.57	-599.16	398,748.69	774,201.24	32.09400770	-103.58137227	10.00	10.00	0.00
	10,000.00	18.12	191.60	9,955.73	6,569.83	-220.57	216.36	-603.71	398,726.48	774,196.68	32.09394673	-103.58138749	10.00	10.00	0.00
1st BS SS	10,069.15	25.04	191.60	10,020.00	6,634.10	-195.71	191.46	-608.83	398,701.58	774,191.57	32.09387839	-103.58140456	10.00	10.00	0.00
	10,100.00	28.12	191.60	10,047.58	6,661.68	-182.21	177.94	-611.60	398,688.07	774,188.80	32.09384129	-103.58141382	10.00	10.00	0.00
	10,200.00	38.12	191.60	10,131.23	6,745.33	-128.83	124.48	-622.57	398,634.61	774,177.82	32.09369456	-103.58145046	10.00	10.00	0.00
	10,300.00	48.12	191.60	10,204.13	6,818.23	-62.05	57.61	-636.30	398,567.74	774,164.10	32.09351101	-103.58149629	10.00	10.00	0.00
2nd BS Carb	10,324.36	50.56	191.60	10,220.00	6,834.10	-43.97	39.50	-640.02	398,549.63	774,160.38	32.09346132	-103.58150869	10.00	10.00	0.00
	10,400.00	58.12	191.60	10,264.06	6,878.16	16.10	-20.65	-652.37	398,489.48	774,148.03	32.09329621	-103.58154992	10.00	10.00	0.00
	10,500.00	68.12	191.60	10,309.21	6,923.31	103.23	-107.91	-670.28	398,402.22	774,130.12	32.09305670	-103.58160972	10.00	10.00	0.00
Build 5°/100ft	10,568.78	75.00	191.60	10,330.95	6,945.05	167.02	-171.79	-683.39	398,338.34	774,117.01	32.09288137	-103.58165349	10.00	10.00	0.00

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)
	10,600.00	76.56	191.60	10,338.62	6,952.72	196.62	-201.44	-689.48	398,308.70	774,110.92	32.09280000	-103.58167381	5.00	5.00	0.00
	10,700.00	81.56	191.60	10,357.59	6,971.69	292.63	-297.58	-709.21	398,212.56	774,091.19	32.09253611	-103.58173970	5.00	5.00	0.00
	10,800.00	86.56	191.60	10,367.94	6,982.04	389.88	-394.98	-729.21	398,115.16	774,071.20	32.09226877	-103.58180644	5.00	5.00	0.00
Landing Point	10,868.78	90.00	191.60	10,370.00	6,984.10	457.12	-462.32	-743.03	398,047.83	774,057.38	32.09208396	-103.58185259	5.00	5.00	0.00
	10,900.00	90.00	191.60	10,370.00	6,984.10	487.66	-492.90	-749.31	398,017.24	774,051.10	32.09200002	-103.58187354	0.00	0.00	0.00
	11,000.00	90.00	191.60	10,370.00	6,984.10	585.47	-590.86	-769.41	397,919.29	774,030.99	32.09173115	-103.58194067	0.00	0.00	0.00
	11,100.00	90.00	191.60	10,370.00	6,984.10	683.29	-688.82	-789.52	397,821.33	774,010.88	32.09146229	-103.58200780	0.00	0.00	0.00
Turn 2°/100ft	11,123.78	90.00	191.60	10,370.00	6,984.10	706.55	-712.11	-794.30	397,798.04	774,006.10	32.09139835	-103.58202376	0.00	0.00	0.00
	11,200.00	90.00	190.08	10,370.00	6,984.10	781.31	-786.97	-808.63	397,723.18	773,991.77	32.09119287	-103.58207172	2.00	0.00	-2.00
	11,300.00	90.00	188.08	10,370.00	6,984.10	879.94	-885.71	-824.41	397,624.44	773,976.00	32.09092176	-103.58212486	2.00	0.00	-2.00
	11,400.00	90.00	186.08	10,370.00	6,984.10	979.08	-984.95	-836.72	397,525.21	773,963.68	32.09064924	-103.58216686	2.00	0.00	-2.00
	11,500.00	90.00	184.08	10,370.00	6,984.10	1,078.62	-1,084.55	-845.57	397,425.61	773,954.84	32.09037563	-103.58219767	2.00	0.00	-2.00
	11,600.00	90.00	182.08	10,370.00	6,984.10	1,178.43	-1,184.40	-850.94	397,325.77	773,949.47	32.09010128	-103.58221724	2.00	0.00	-2.00
	11,700.00	90.00	180.08	10,370.00	6,984.10	1,278.39	-1,284.38	-852.81	397,225.79	773,947.59	32.08982652	-103.58222554	2.00	0.00	-2.00
Hold	11,723.82	90.00	179.60	10,370.00	6,984.10	1,302.21	-1,308.19	-852.74	397,201.98	773,947.66	32.08976105	-103.58222586	2.00	0.00	-2.00
	11,800.00	90.00	179.60	10,370.00	6,984.10	1,378.39	-1,384.37	-852.21	397,125.80	773,948.19	32.08955165	-103.58222585	0.00	0.00	0.00
	11,900.00	90.00	179.60	10,370.00	6,984.10	1,478.39	-1,484.37	-851.51	397,025.80	773,948.89	32.08927677	-103.58222584	0.00	0.00	0.00
	12,000.00	90.00	179.60	10,370.00	6,984.10	1,578.39	-1,584.37	-850.81	396,925.81	773,949.59	32.08900190	-103.58222583	0.00	0.00	0.00
	12,100.00	90.00	179.60	10,370.00	6,984.10	1,678.39	-1,684.37	-850.11	396,825.81	773,950.29	32.08872703	-103.58222583	0.00	0.00	0.00
	12,200.00	90.00	179.60	10,370.00	6,984.10	1,778.39	-1,784.37	-849.41	396,725.82	773,950.99	32.08845216	-103.58222582	0.00	0.00	0.00
	12,300.00	90.00	179.60	10,370.00	6,984.10	1,878.39	-1,884.36	-848.71	396,625.82	773,951.69	32.08817729	-103.58222581	0.00	0.00	0.00
	12,400.00	90.00	179.60	10,370.00	6,984.10	1,978.39	-1,984.36	-848.02	396,525.83	773,952.39	32.08790242	-103.58222580	0.00	0.00	0.00
	12,500.00	90.00	179.60	10,370.00	6,984.10	2,078.39	-2,084.36	-847.32	396,425.84	773,953.09	32.08762755	-103.58222579	0.00	0.00	0.00
	12,600.00	90.00	179.60	10,370.00	6,984.10	2,178.39	-2,184.36	-846.62	396,325.84	773,953.79	32.08735268	-103.58222578	0.00	0.00	0.00
	12,700.00	90.00	179.60	10,370.00	6,984.10	2,278.39	-2,284.35	-845.92	396,225.85	773,954.49	32.08707780	-103.58222577	0.00	0.00	0.00
Pool NMNM0024368A exit to NMI	12,712.00	90.00	179.60	10,370.00	6,984.10	2,290.39	-2,296.35	-845.83	396,213.85	773,954.57	32.08704482	-103.58222577	0.00	0.00	0.00
	12,800.00	90.00	179.60	10,370.00	6,984.10	2,378.39	-2,384.35	-845.22	396,125.85	773,955.19	32.08680293	-103.58222576	0.00	0.00	0.00
	12,900.00	90.00	179.60	10,370.00	6,984.10	2,478.39	-2,484.35	-844.52	396,025.86	773,955.89	32.08652806	-103.58222575	0.00	0.00	0.00
	13,000.00	90.00	179.60	10,370.00	6,984.10	2,578.39	-2,584.35	-843.82	395,925.86	773,956.59	32.08625319	-103.58222574	0.00	0.00	0.00
	13,100.00	90.00	179.60	10,370.00	6,984.10	2,678.39	-2,684.34	-843.12	395,825.87	773,957.29	32.08597832	-103.58222573	0.00	0.00	0.00
	13,200.00	90.00	179.60	10,370.00	6,984.10	2,778.39	-2,784.34	-842.42	395,725.87	773,957.99	32.08570345	-103.58222572	0.00	0.00	0.00
	13,300.00	90.00	179.60	10,370.00	6,984.10	2,878.39	-2,884.34	-841.72	395,625.88	773,958.69	32.08542858	-103.58222571	0.00	0.00	0.00
	13,400.00	90.00	179.60	10,370.00	6,984.10	2,978.39	-2,984.34	-841.02	395,525.89	773,959.38	32.08515371	-103.58222570	0.00	0.00	0.00
	13,500.00	90.00	179.60	10,370.00	6,984.10	3,078.39	-3,084.33	-840.32	395,425.89	773,960.08	32.08487883	-103.58222569	0.00	0.00	0.00
	13,600.00	90.00	179.60	10,370.00	6,984.10	3,178.39	-3,184.33	-839.62	395,325.90	773,960.78	32.08460396	-103.58222568	0.00	0.00	0.00
	13,700.00	90.00	179.60	10,370.00	6,984.10	3,278.39	-3,284.33	-838.92	395,225.90	773,961.48	32.08432909	-103.58222567	0.00	0.00	0.00
	13,800.00	90.00	179.60	10,370.00	6,984.10	3,378.39	-3,384.33	-838.22	395,125.91	773,962.18	32.08405422	-103.58222566	0.00	0.00	0.00
	13,900.00	90.00	179.60	10,370.00	6,984.10	3,478.39	-3,484.32	-837.52	395,025.91	773,962.88	32.08377935	-103.58222565	0.00	0.00	0.00
	14,000.00	90.00	179.60	10,370.00	6,984.10	3,578.39	-3,584.32	-836.82	394,925.92	773,963.58	32.08350448	-103.58222564	0.00	0.00	0.00
Pool NMNM0005792A exit to NMI	14,032.00	90.00	179.60	10,370.00	6,984.10	3,610.39	-3,616.32	-836.60	394,893.92	773,963.80	32.08341652	-103.58222563	0.00	0.00	0.00
	14,100.00	90.00	179.60	10,370.00	6,984.10	3,678.39	-3,684.32	-836.12	394,825.92	773,964.28	32.08322961	-103.58222563	0.00	0.00	0.00
	14,200.00	90.00	179.60	10,370.00	6,984.10	3,778.39	-3,784.32	-835.43	394,725.93	773,964.98	32.08295473	-103.58222562	0.00	0.00	0.00
	14,300.00	90.00	179.60	10,370.00	6,984.10	3,878.39	-3,884.31	-834.73	394,625.93	773,965.68	32.08267986	-103.58222561	0.00	0.00	0.00
	14,400.00	90.00	179.60	10,370.00	6,984.10	3,978.39	-3,984.31	-834.03	394,525.94	773,966.38	32.08240499	-103.58222560	0.00	0.00	0.00
	14,500.00	90.00	179.60	10,370.00	6,984.10	4,078.39	-4,084.31	-833.33	394,425.95	773,967.08	32.08213012	-103.58222559	0.00	0.00	0.00
	14,600.00	90.00	179.60	10,370.00	6,984.10	4,178.39	-4,184.31	-832.63	394,325.95	773,967.78	32.08185525	-103.58222558	0.00	0.00	0.00
	14,700.00	90.00	179.60	10,370.00	6,984.10	4,278.39	-4,284.30	-831.93	394,225.96	773,968.48	32.08158038	-103.58222557	0.00	0.00	0.00
	14,800.00	90.00	179.60	10,370.00	6,984.10	4,378.39	-4,384.30	-831.23	394,125.96	773,969.18	32.08130551	-103.58222556	0.00	0.00	0.00
	14,900.00	90.00	179.60	10,370.00	6,984.10	4,478.39	-4,484.30	-830.53	394,025.97	773,969.88	32.08103063	-103.58222555	0.00	0.00	0.00
	15,000.00	90.00	179.60	10,370.00	6,984.10	4,578.39	-4,584.30	-829.83	393,925.97	773,970.58	32.08075576	-103.58222554	0.00	0.00	0.00
	15,100.00	90.00	179.60	10,370.00	6,984.10	4,678.39	-4,684.29	-829.13	393,825.98	773,971.27	32.08048089	-103.58222553	0.00	0.00	0.00
	15,200.00	90.00	179.60	10,370.00	6,984.10	4,778.39	-4,784.29	-828.43	393,725.98	773,971.97	32.08020602	-103.58222552	0.00	0.00	0.00
	15,300.00	90.00	179.60	10,370.00	6,984.10	4,878.39	-4,884.29	-827.73	393,625.99	773,972.67	32.07993115	-103.58222551	0.00	0.00	0.00
Section 33-4 Line, Pool NMNM00	15,352.00	90.00	179.60	10,370.00	6,984.10	4,930.39	-4,936.29	-827.37	393,573.99	773,973.04	32.07978821	-103.58222550	0.00	0.00	0.00
	15,400.00	90.00	179.60	10,370.00	6,984.10	4,978.39	-4,984.29	-827.03	393,526.00	773,973.37	32.07965628	-103.58222550	0.00	0.00	0.00
	15,500.00	90.00	179.60	10,370.00	6,984.10	5,078.39	-5,084.28	-826.33	393,426.00	773,974.07	32.07938141	-103.58222549	0.00	0.00	0.00
	15,600.00	90.00	179.60	10,370.00	6,984.10	5,178.39	-5,184.28	-825.63	393,326.01	773,974.77	32.07910653	-103.58222547	0.00	0.00	0.00
	15,700.00	90.00	179.60	10,370.00	6,984.10	5,278.39	-5,284.28	-824.93	393,226.01	773,975.47	32.07883166	-103.58222546	0.00	0.00	0.00
	15,800.00	90.00	179.60	10,370.00	6,984.10	5,378.39	-5,384.28	-824.23	393,126.02	773,976.17	32.07855679	-103.58222545	0.00	0.00	0.00
	15,900.00	90.00	179.60	10,370.00	6,984.10	5,478.39	-5,484.27	-823.54	393,026.02	773,976.87	32.07828192	-103.58222544	0.00	0.00	0.00
	16,000.00	90.00	179.60	10,370.00	6,984.10	5,578.39	-5,584.27	-822.84	392,926.03	773,977.57	32.07800705	-103.58222543	0.00	0.00	0.00
	16,100.00	90.00	179.60	10,370.00	6,984.10	5,678.39	-5,684.27	-822.14	392,826.03	773,978.27	32.07773218	-103.58222542	0.00	0.00	0.00
	16,200.00	90.00	179.60	10,370.00	6,984.10	5,778.39	-5,784.27	-821.44	392,726.04	773,978.97	32.07745730	-103.58222541	0.00	0.00	0.00
	16,300.00	90.00	179.60	10,370.00	6,984.10	5,878.39	-5,884.26	-820.74	392,626.04	773,979.67	32.07718243	-103.58222540	0.00	0.00	0.00
	16,400.00	90.00	179.60	10,370.00	6,984.10	5,978.39	-5,984.26	-820.04	392,526.05	773,980.37	32.07690756	-103.58222539	0.00	0.00	0.00
	16,500.00	90.00	179.60	10,370.00	6,984.10	6,078.39	-6,084.26	-819.34	392,426.06	773,981.07	32.07663269	-103.58222538	0.00	0.00	0.00
	16,600.00	90.00	179.60	10,370.00	6,984.10	6,178.39	-6,184.26	-818.64	392,326.06	773,981.77	32.07635782	-103.58222537	0.00	0.00	0.00
	16,700.00	90.00	179.60	10,370.00	6,984.10	6,278.39	-6,284.26	-817.94	392,226.07	773,982.47	32.07608295	-103.58222536	0.00	0.00	0.00
	16,800.00	90.00	179.60	10,370.00	6,984.10	6,378.39	-6,384.25	-817.24	392,126.07	773,983.16	32.07580807	-103.58222535	0.00	0.00	0.00
	16,900.00	90.00	179.60	10,370.00	6,984.10	6,478.39	-6,484.25	-816.54	392,026.08	773,983.86	32.07553320	-103.58222534	0.00	0.00	0.00
	17,000.00	90.00	179.60	10,370.00	6,984.10	6,578.39	-6,584.25	-815.84	391,926.08	773,984.56	32.07525833	-103.58222533	0.00	0.00	0.00
	17,100.00	90.00	179.60	10,370.00	6,984.10	6,678.39	-6,684.25	-815.14	391,826.09	773,985.26	32.07498346	-103.58222532	0.00	0.00	0.00
	17,200.00	90.00	179.60	10,370.00	6,984.10	6,778.39	-6,784.24	-814.44	391,726.09	773,985.96	32.07470859	-103.58222531	0.00	0.00	0.00
	17,300.00	90.00	179.60	10,370.00	6,984.10	6,878.39	-6,884.24	-813.74	391,626.10	773,986.66	32.07443371	-103.58222530	0.00	0.00	0.00
	17,400.00	90.00	179.60	10,370.00	6,984.10	6,978.39	-6,984.24	-813.04	391,526.10	773,987.36	32.07415884	-103.58222529	0.00	0.00	0.00
	17,500.00	90.00	179.60	10,370.00	6,984.10	7,078.39	-7,084.24	-812.34	391,426.11	773,988.06	32.07388397	-103.58222528	0.00	0.00	0.00
	17,600.00	90.00	179.60	10,370.00	6,984.10	7,178.39	-7,184.23	-811.64	391,326.12	773,988.76	32.07360910	-103.58222527	0.00	0.00	0.00
	17,700.00	90.00	179.60	10,370.00	6,984.10	7,278.39	-7,284.23	-810.95	391,226.12	773,989.46	32.07333423	-103.58222525	0.00	0.00	0.00
	17,800.00	90.00	179.60	10,370.00	6,984.10	7,378.39	-7,384.23	-810.25	391,126.13	773,990.16	32.07305936	-103.58222524	0.00	0.00	0.00
	17,900.00	90.00	179.60	10,370.00	6,984.10	7,478.39	-7,484.23	-809.55	391,026.13	773,990.86	32.07278448	-103.58222523	0.00	0.00	0.00
	18,000.00	90.00	179.60	10,370.00	6,984.10	7,578.39	-7,584.22	-808.85	390,926.14	773,991.56	32.07250961	-103.58222522	0.00	0.00	0.00
	18,100.00	90.00	179.60	10,370.00	6,984.10	7,678.39	-7,684.22	-808.15	390,826.14	773,992.26	32.07223474	-103.58222521	0.00	0.00	0.00
	18,200.00	90.00	179.60	10,370.00	6,984.10	7,778.39	-7,784.22	-807.45	390,726.15	773,992.96	32.07195987	-103.58222520	0.00	0.00	0.00
	18,300.00	90.00	179.60	10,370.00	6,984.10	7,878.39	-7,884.22	-806.75	390,626.15	773,993.66	32.07168500	-103.58222519	0.00	0.00	0.00
	18,400.00	90.00	179.60	10,370.00	6,984.10	7,978.39	-7,984.21	-806.05	390,526.16	773,994.36	32.07141012	-103.58222518	0.00	0.00	0.00
	18,500.00	90.00	179.60	10,370.00	6,984.10	8,078.39	-8,084.21	-805.35	390,426.17	773,995.05	32.07113525	-103.58222517	0.00	0.00	0.00
	18,600.00	90.00	179.60	10,370.00	6,984.10	8,178.39	-8,184.21	-804.65	390,326.17	773,995.75	32.07086038	-103.58222516	0.00	0.00	0.00
	18,700.00	90.00	179.60	10,370.00	6,984.10	8,278.39	-8,284.21	-803.95	390,226.18	773,996.45	32.07058551	-103.58222515	0.00	0.00	0.00
	18,800.00	90.00	179.60	10,370.00	6,984.10	8,378.39	-8,384.20	-803.25	390,126.18	773,997.15	32.07031064	-103.58222514	0.00	0.00	0.00
	18,900.00	90.00	179.60	10,370.00	6,984.10	8,478.39	-8,484.20	-802.55	390,026.19	773,997.85	32.07003576	-103.58222513	0.00	0.00	0.00
	19,000.00	90.00	179.60	10,370.00	6,984.10	8,578.39	-8,584.20	-801.85	389,926.19	773,998.55	32.06976089	-103.58222511	0.00	0.00	0.00
	19,100.00	90.00	179.60	10,370.00	6,984.10	8,678.39	-8,684.20	-801.15	389,826.20	773,999.25	32.06948602	-103.58222510	0.00	0.00	0.00
	19,200.00	90.00	179.60	10,370.00	6,984.10	8,778.39	-8,784.19	-800.45	389,726.20	773,999.95	32.06921115	-103.58222509	0.00	0.00	0.00
	19,300.00	90.00	179.60	10,370.00	6,984.10	8,878.39	-8,884.19	-799.75	389,626.21	774,000.65	32.06893628	-103.58222508	0.00	0.00	0.00
	19,400.00	90.00	179.60	10,370.00	6,984.10	8,978.39	-8,984.19	-799.05	389,526.21	774,001.35	32.06866140	-103.58222507	0.00	0.00	0.00
	19,500.00	90.00	179.60	10,370.00	6,984.10	9,078.39	-9,084.19	-798.36	389,426.22	774,002.05	32.06838653	-103.58222506	0.00	0.00	0.00
	19,600.00	90.00	179.60	10,370.00	6,984.10	9,178.39	-9,184.18	-797.66	389,326.23	774,002.75	32.06811166	-103.58222505	0.00	0.00	0.00
	19,700.00	90.00	179.60	10,370.00	6,984.10	9,278.39	-9,284.18	-796.96	389,226.23	774,003.45	32.06783679	-103.58222504	0.00	0.00	0.00
	19,800.00	90.00	179.60	10,370.00	6,984.10	9,378.39	-9,384.18	-796.26	389,126.24	774,004.15	32.06756192	-103.58222503	0.00	0.00	0.00
	19,900.00	90.00	179.60	10,370.00	6,984.10	9,478.39	-9,484.18	-795.56	389,026.24	774,004.85	32.06728704	-103.58222502	0.00	0.00	0.00
	20,000.00	90.00	179.60	10,370.00	6,984.10	9,578.39	-9,584.17	-794.86	388,926.25	774,005.55	32.06701217	-103.58222500	0.00	0.00	0.00
	20,100.00	90.00	179.60	10,370.00	6,984.10	9,678.39	-9,684.17	-794.16	388,826.25	774,006.25	32.06673730	-103.58222499	0.00	0.00	0.00
	20,200.00	90.00	179.60	10,370.00	6,984.10	9,778.39	-9,784.17	-793.46	388,726.26	774,006.95	32.06646243	-103.58222498	0.00	0.00	0.00
	20,300.00	90.00	179.60	10,370.00	6,984.10	9,878.39	-9,884.17	-792.76	388,626.26	774,007.64	32.06618756	-103.58222497	0.00	0.00	0.00
	20,400.00	90.00	179.60	10,370.00	6,984.10	9,978.39	-9,984.16	-792.06	388,526.27	774,008.34	32.06591268	-103.58222496	0.00	0.00	0.00
	20,500.00	90.00	179.60	10,370.00	6,984.10	10,078.39	-10,084.16	-791.36	388,426.28	774,009.04	32.06563781	-103.58222495	0.00	0.00	0.00
Red Hills Unit 48H - BHL [100' FS	20,529.56	90.00	179.60	10,370.00	6,984.10	10,107.95	-10,113.72	-791.15	388,396.72	774,009.25	32.06555657	-103.58222495	0.00	0.00	0.00

Survey Type: Def Plan

Survey Error Model: ISCWSA0 3 - D 95 % 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 Code	Borehole / Survey
	1	0.000	9,800.000	1/100.000	–	–		A001Mb_MWD	Red Hills Unit 48H / Coterra Red Hills Unit 48H Rev1 kFc 24May23
	1	9,800.000	20,529.347	1/100.000	–	–		A008Mb_MWD+IFR1+MS	Red Hills Unit 48H / Coterra Red Hills Unit 48H Rev1 kFc 24May23

A default hole/casing size was used for A/C calculation because the wellbore size is not defined correctly.

EOU Geometry:

End MD (ft)	Hole Size (in)	Casing Size (in)	Name

Schlumberger

COTERRA

Rev1

COTERRA

Borehole:	Well:	Field:	Structure:
Red Hills Unit 48H	Red Hills Unit 48H	NM Lea County (NAD 83)	Coterra Red Hills Unit Pad 47-50

Gravity & Magnetic Parameters						Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet					Miscellaneous			
Model:	HDGM 2023	Dip:	59.617°	Date:	24-May-2023	Lat:	N 32 5 36.03	Northing:	398510.13ftUS	Grid Conv:	0.4006°	Slot:	Red Hills Unit 48H	TVD Ref:	RKB (3385.900 ft above MSL)
MagDec:	6.243°	FS:	47341.165nT	Gravity FS:	998.435mgn (9.80665 Based)	Lon:	W 103 34 46.00	Easting:	774800.38ftUS	Scale Fact:	0.99997152	Plan:	Coterra Red Hills Unit 48H Rev1 kFc 24May23		

Critical Points

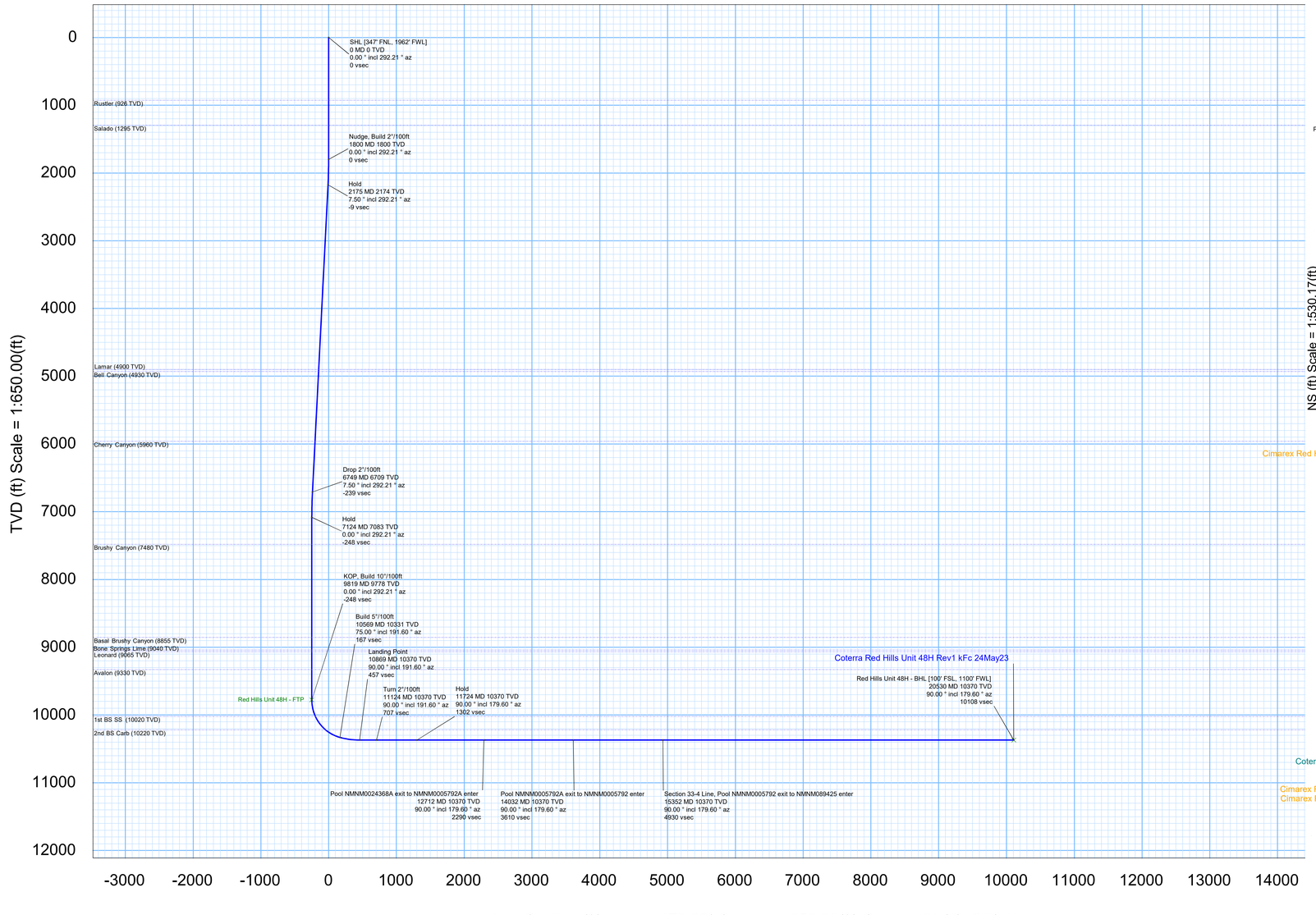
Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [347' FNL, 1962' FWL]	0.00	0.00	292.21	0.00	0.00	0.00	0.00	
Rustler	926.00	0.00	292.21	926.00	0.00	0.00	0.00	0.00
Salado	1295.00	0.00	292.21	1295.00	0.00	0.00	0.00	0.00
Nudge, Build 2°/100ft	1800.00	0.00	292.21	1800.00	0.00	0.00	0.00	0.00
Hold	2174.95	7.50	292.21	2173.88	-9.42	9.26	-22.68	2.00
Lamar	4924.59	7.50	292.21	4900.00	-147.40	144.93	-354.90	0.00
Bell Canyon	4954.85	7.50	292.21	4930.00	-148.92	146.42	-358.56	0.00
Cherry Canyon	5993.73	7.50	292.21	5960.00	-201.06	197.68	-484.08	0.00
Drop 2°/100ft	6748.83	7.50	292.21	6708.64	-238.95	234.94	-575.32	0.00
Hold	7123.78	0.00	292.21	7082.52	-248.37	244.20	-598.00	2.00
Brushy Canyon	7521.26	0.00	292.21	7480.00	-248.37	244.20	-598.00	0.00
Basal Brushy Canyon	8896.26	0.00	292.21	8855.00	-248.37	244.20	-598.00	0.00
Bone Springs Lime	9081.26	0.00	292.21	9040.00	-248.37	244.20	-598.00	0.00
Leonard	9106.26	0.00	292.21	9065.00	-248.37	244.20	-598.00	0.00
Avalon	9371.26	0.00	292.21	9330.00	-248.37	244.20	-598.00	0.00
KOP, Build 10°/100ft	9818.78	0.00	292.21	9777.52	-248.37	244.20	-598.00	0.00
1st BS SS	10069.15	25.04	191.60	10020.00	-195.71	191.46	-608.83	10.00
2nd BS Carb	10324.36	50.56	191.60	10220.00	-43.97	39.50	-640.02	10.00
Build 5°/100ft	10568.78	75.00	191.60	10330.95	167.02	-171.79	-683.39	10.00
Landing Point	10868.78	90.00	191.60	10370.00	457.12	-462.32	-743.03	5.00
Turn 2°/100ft	11123.78	90.00	191.60	10370.00	706.55	-712.11	-794.30	0.00
Hold	11723.82	90.00	179.60	10370.00	1302.21	-1308.19	-852.74	2.00
Pool NMNM0024368A exit to NMNM0005792A enter	12712.00	90.00	179.60	10370.00	2290.39	-2296.35	-845.83	0.00
Pool NMNM0005792A exit to NMNM0005792 enter	14032.00	90.00	179.60	10370.00	3610.39	-3616.32	-836.60	0.00
Section 33-4 Line, Pool NMNM0005792 exit to NMNM089425 enter	15352.00	90.00	179.60	10370.00	4930.39	-4936.29	-827.37	0.00
Red Hills Unit 48H - BHL [100' FSL, 1100' FWL]	20529.56	90.00	179.60	10370.00	10107.95	-10113.72	-791.15	0.00

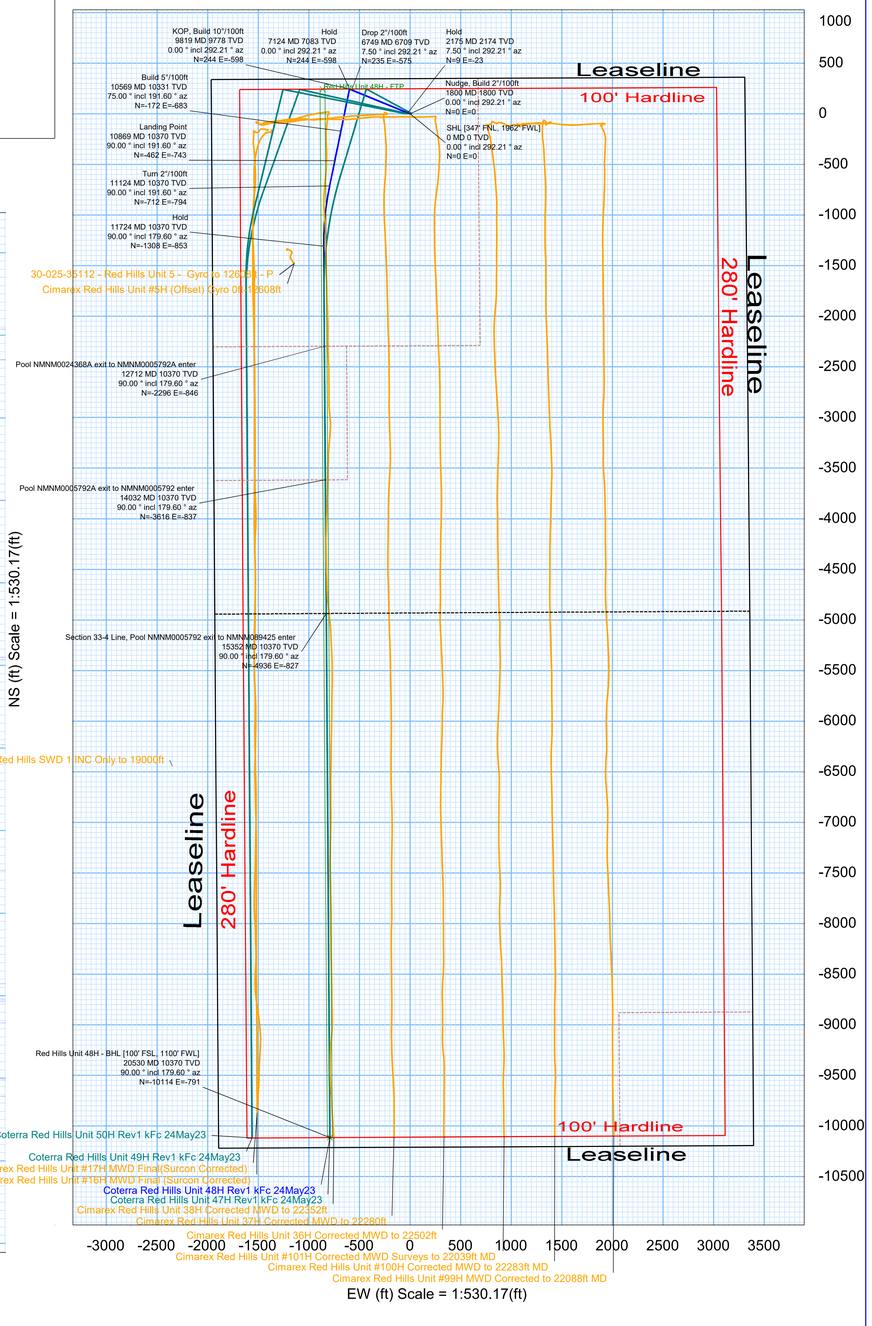
D E C **CONTROLLED**

Plan ref	Coterra Red Hills Unit 48H Rev1 kFc 24May23
Drawing ref	
Copy number	of 3
Date	24-May-2023

1	Client	
2	Client	
3	Office	
4	Office	

Copy number for





PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex
LEASE NO.:	**NMNM024368A**
LOCATION:	Section 33, T.25 S, R.33 E., NMPM
COUNTY:	Lea County, New Mexico
WELL NAME & NO.:	Red Hills Unit 48H
SURFACE HOLE FOOTAGE:	347'/N & 1962'/W
BOTTOM HOLE FOOTAGE:	100'/S & 1100'/W

*Changes approved through engineering via **Sundry 2739378_** on 11-28-2023_. Any previous COAs not addressed within the updated COAs still apply.*

COA

H_2S	○ Yes	◉ No		
Potash / WIPP	◉ None	○ Secretary	○ R-111-P	☐ WIPP
Cave / Karst	◉ Low	○ Medium	○ High	○ Critical
Wellhead	○ Conventional	◉ Multibowl	○ Both	○ Diverter
Cementing	☐ Primary Squeeze	☐ Cont. Squeeze	☐ EchoMeter	☐ DV Tool
Special Req	☐ Break Testing	☐ Water Disposal	☐ COM	☑ Unit
Variance	☑ Flex Hose	☐ Casing Clearance	☐ Pilot Hole	☐ Capitan Reef
Variance	☐ Four-String	☐ Offline Cementing	☐ Fluid-Filled	☐ Open Annulus
☐ **Batch APD / Sundry**				

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 must meet all requirements from **43 CFR 3176**, 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 **976** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) 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.

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.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.

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 calculates to 11%. Additional cement maybe 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. 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 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 43 CFR 3172 must be followed.

D. SPECIAL REQUIREMENT (S)

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months. (This is not necessary for secondary recovery unit wells)

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
Email **or** call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, **BLM_NM_CFO_DrillingNotifications@BLM.GOV**
(575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 689-5981

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 **43 CFR part 3170 Subpart 3172** 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 integrity 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 **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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 **43 CFR part 3170 Subpart 3172** 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 cement), 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** 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 **43 CFR part 3170 Subpart 3172**.

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.

ZS 11/28/2023

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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 291653

CONDITIONS

Operator: CIMAREX ENERGY CO. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 291653
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
pkautz	None	1/22/2024