Form 3160-3
(June 2015)

OCD – HOBBS
11/03/2020
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FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM026394

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.
VACA DRAW 20-17 FEDERAL
61H [319775]

2. Name of Operator
CIMAREX ENERGY COMPANY [215099]

9. API Well No. 30-025-47961

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

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

10. Field and Pool, or Exploratory [97903]
BONE SPRING / UPPER BONE SPRING

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SESE / 330 FSL / 820 FEL / LAT 32.109732 / LONG -103.588417
At proposed prod. zone NENE / 100 FNL / 1870 FEL / LAT 32.137508 / LONG -103.640403

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 20 / T25S / R33E / NMP

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
2560

17. Spacing Unit dedicated to this well
320

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

19. Proposed Depth
10800 feet / 20745 feet

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3398 feet

22. Approximate date work will start*
12/01/2019

23. Estimated duration
30 days

24. Attachments

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

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature
(Electronic Submission)

Name *(Printed/Typed)*

Date
01/18/2019

Title

Approved by *(Signature)*
(Electronic Submission)

Name *(Printed/Typed)*
Cody Layton / Ph: (575)234-5959

Date
10/21/2020

Title
Assistant Field Manager Lands & Minerals

Office
CARLSBAD

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

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

GCP Rec 11/03/2020

SL

APPROVED WITH CONDITIONS

KZ
11/04/2020

Approval Date: 10/21/2020

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Cimarex Energy Company**
LEASE NO.:	**NMNM026394**
WELL NAME & NO.:	Vaca Draw 20-17 Federal 61H
SURFACE HOLE FOOTAGE:	330'/S & 820'/E
BOTTOM HOLE FOOTAGE	100'/N & 1870'/E
LOCATION:	Section 20, T.25 S., R.33 E., NMPM
COUNTY:	Lea County, New Mexico

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8 inch** surface casing shall be set at approximately **1,085 feet** (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8 inch** intermediate casing and shall be set at approximately **4,814 feet** is:

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

3. The minimum required fill of cement behind the **5-1/2 inch** production casing is:

    - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi**.

3. 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 intermediate casing shoe shall be **3000 (3M)** psi.

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.

d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

GENERAL REQUIREMENTS

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

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

B. PRESSURE CONTROL

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

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of **4** hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

YJ (09/11/2020)

APD ID: 10400038013 **Submission Date:** 01/18/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400038013 **Tie to previous NOS?** Y **Submission Date:** 01/18/2019

BLM Office: CARLSBAD **User:** Hope Knauls **Title:** Regulatory Technician

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

Lease number: NMNM026394 **Lease Acres:** 2560

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

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

Agreement number:

Agreement name:

Keep application confidential? YES

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

Operator letter of designation:

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY

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

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)620-1936

Operator Internet Address: tstathem@cimarex.com

Section 2 - Well Information

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

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

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

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** BONE SPRING **Pool Name:** UPPER BONE SPRING SHALE

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

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

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

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** VACA DRAW 20-17 FEDERAL **Number:** E2E2 PAD

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 27 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 330 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Vaca_Draw_20_17_Fed_61H_C102_BLM_Lease_20200213163116.pdf

Vaca_Draw_20_17_Fed_61H_C102_20200213163117.pdf

Well work start Date: 12/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	330	FSL	820	FEL	25S	33E	20	Aliquot SESE	32.109732	-103.588417	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 026394	3398	0	0	
KOP Leg #1	331	FSL	440	FEL	25S	33E	20	Aliquot SESE	32.109731	-103.587192	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 026394	3398	0	0	

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1-1	332	FSL	1870	FEL	25S	33E	20	Aliquot SESE	32.109803	-103.587192	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 026394	-7079	10500	10477	
EXIT Leg #1	100	FNL	1041	FEL	25S	33E	17	Aliquot NENE	32.137579	-103.591792	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 026394	-7402	20745	10800	
BHL Leg #1	100	FNL	1870	FEL	25S	35E	17	Aliquot NENE	32.137508	-103.640403	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 026394	-7402	20745	10800	

APD ID: 10400038013 **Submission Date:** 01/18/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

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Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
374299	RUSTLER	3398	935	935		USEABLE WATER	N
374300	TOP SALT	2100	1298	1298		NONE	N
374301	BASE OF SALT	-1316	4714	4714		NONE	N
374311	BELL CANYON	-1359	4804	4804		NONE	N
374310	LAMAR	-1511	4909	4909		NONE	N
374312	BELL CANYON	-1539	4937	4937		NONE	N
374306	BRUSHY CANYON	-4138	7536	7536		NATURAL GAS, OIL	N
374304	BONE SPRING	-5634	9032	9032		NATURAL GAS, OIL	Y
374305	AVALON SAND	-5914	9312	9312		NATURAL GAS, OIL	N
374307	BONE SPRING 1ST	-6613	10011	10011		NATURAL GAS, OIL	N
374308	BONE SPRING 2ND	-7185	10583	10583		NATURAL GAS, OIL	N
374309	BONE SPRING 3RD	-8324	11722	11722		NATURAL GAS, OIL	N
667611	WOLFCAMP	-8791	12189	12189		NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Pressure Rating (PSI): 2M **Rating Depth:** 4814

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

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.
Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.
Choke Diagram Attachment:

Vaca_Draw_20_17_Fed_61H_Choke_2M3M_20200219101217.pdf

BOP Diagram Attachment:

Vaca_Draw_20_17_Fed_61H_BOP_2M_20200219101228.pdf

Pressure Rating (PSI): 3M **Rating Depth:** 20745

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

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.
Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.
Choke Diagram Attachment:

Vaca_Draw_20_17_Fed_61H_Choke_2M3M_20200219101312.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Vaca_Draw_20_17_Fed_61H_Choke_2M3M_20200219101312.pdf

BOP Diagram Attachment:

Vaca_Draw_20_17_Fed_61H_BOP_3M_20200219101321.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	NON API	N	0	985	0	985			985	H-40	48	ST&C	1.64	3.84	BUOY	6.81	BUOY	6.81
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4814	0	4814			4814	J-55	40	LT&C	1.35	1.55	BUOY	2.7	BUOY	2.7
3	PRODUCTION	8.75	5.5	NEW	API	N	0	10250	0	10250	0		10250	L-80	17	LT&C	1.31	1.61	BUOY	1.84	BUOY	1.84
4	PRODUCTION	8.75	5.5	NEW	API	N	9173	20750	9173	10800			11577	L-80	17	BUTT	1.24	1.53	BUOY	42.46	BUOY	42.46

Casing Attachments

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

Inspection Document:

Spec Document:

Vaca_Draw_20_17_Fed_61H_Surf_Casing_Spec_Sheet_20200219133326.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_61H_Casing_Assumptions_20200219132817.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_61H_Casing_Assumptions_20200219133704.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_61H_Casing_Assumptions_20200219134031.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_61H_Casing_Assumptions_20200219134147.pdf

Section 4 - Cement

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	985	415	1.72	13.5	713	50	Class C	Bentonite
SURFACE	Tail		0	985	195	1.34	14.8	260	25	Class C	LCM
INTERMEDIATE	Lead		0	4814	916	1.88	12.9	1718	50	35:65 (Poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		0	4814	282	1.34	14.8	377	25	Class C	LCM
PRODUCTION	Lead		0	10250	496	3.64	10.3	1802	25	Tuned Light	LCM
PRODUCTION	Tail		0	10250	2527	1.3	14.2	3285	25	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
PRODUCTION	Lead		9173	20745	496	3.64	10.3	1802	25	Tuned Light	LCM
PRODUCTION	Tail		9173	20745	2527	1.3	14.2	3285	25	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	985	SPUD MUD	8.3	8.8							

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
985	4814	OTHER : Brine Water	9.7	10.2							
4814	20745	OTHER : FW/Cut Brine	8.5	9							

Section 6 - Test, Logging, Coring

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

No DST Planned

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

CNL,DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5054 **Anticipated Surface Pressure:** 2678

Anticipated Bottom Hole Temperature(F): 177

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

Describe:

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

Contingency Plans geoharzards description:

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

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Vaca_Draw_20_17_Fed_61H_H2S_Plan_20200219141838.pdf

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_61H_AC_Report_20200219142225.pdf

Vaca_Draw_20_17_Fed_61H_Directional_Plan_20200219142248.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

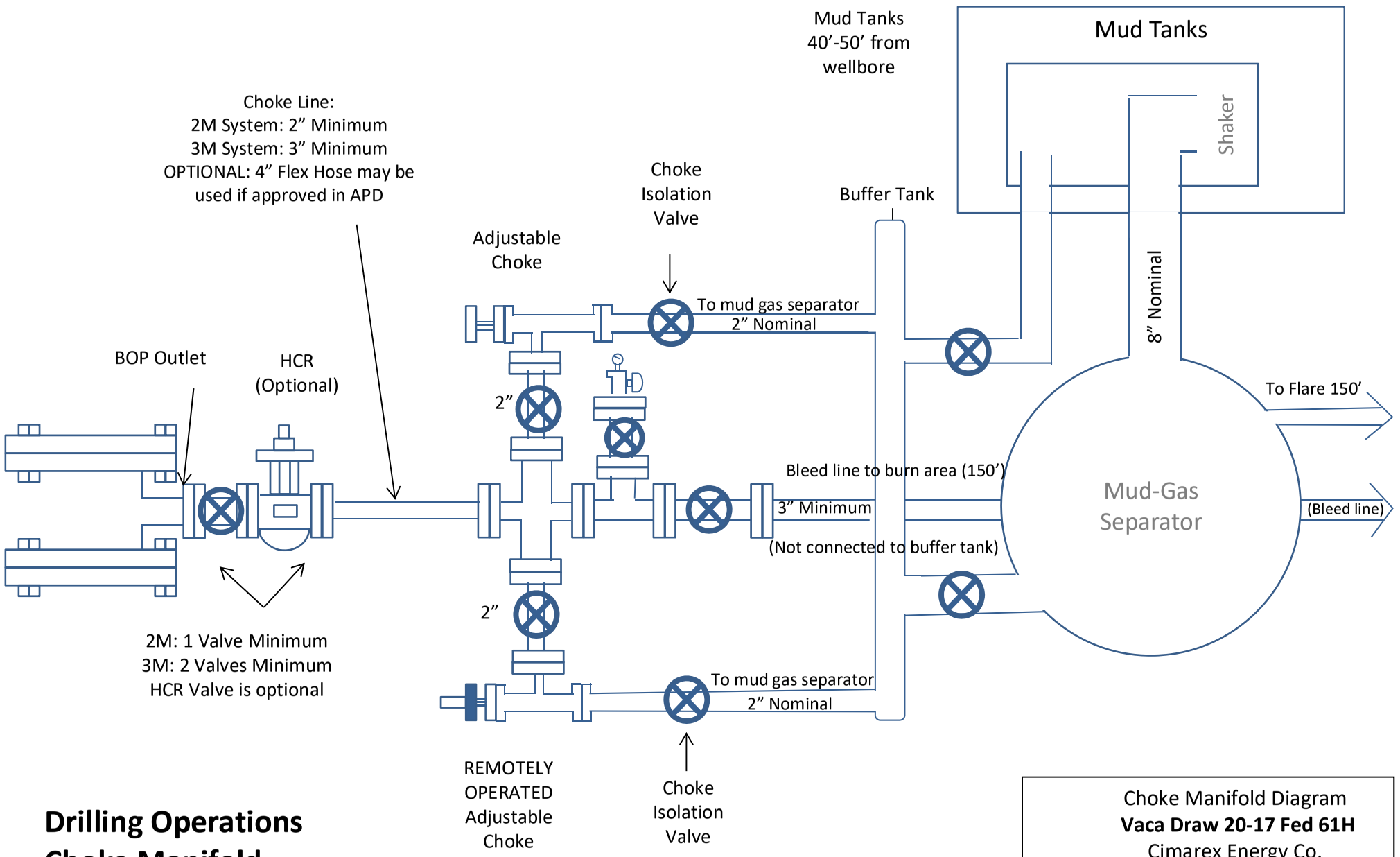
Vaca_Draw_20_17_Fed_61H_Flex_Hose_20200219142330.pdf

Vaca_Draw_20_17_Fed_61H_Gas_Capture_Plan_20200219142331.pdf

Vaca_Draw_20_17_Fed_61H_Drilling_Plan_20200219142332.pdf

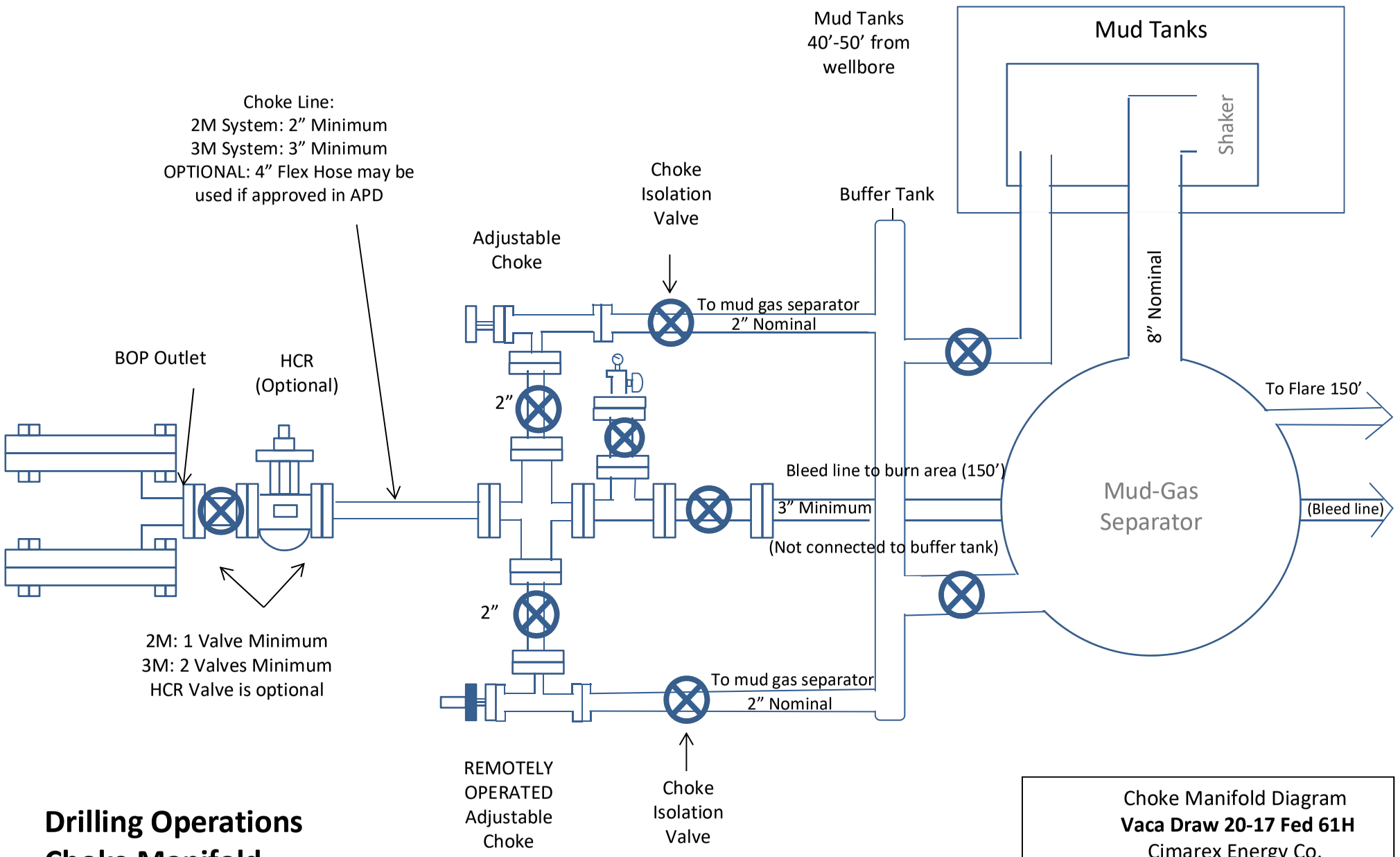
Other Variance attachment:

Vaca_Draw_20_17_Fed_61H_Multibowl_Wellhead_20200220130220.pdf



Drilling Operations
Choke Manifold
2M/3M Service

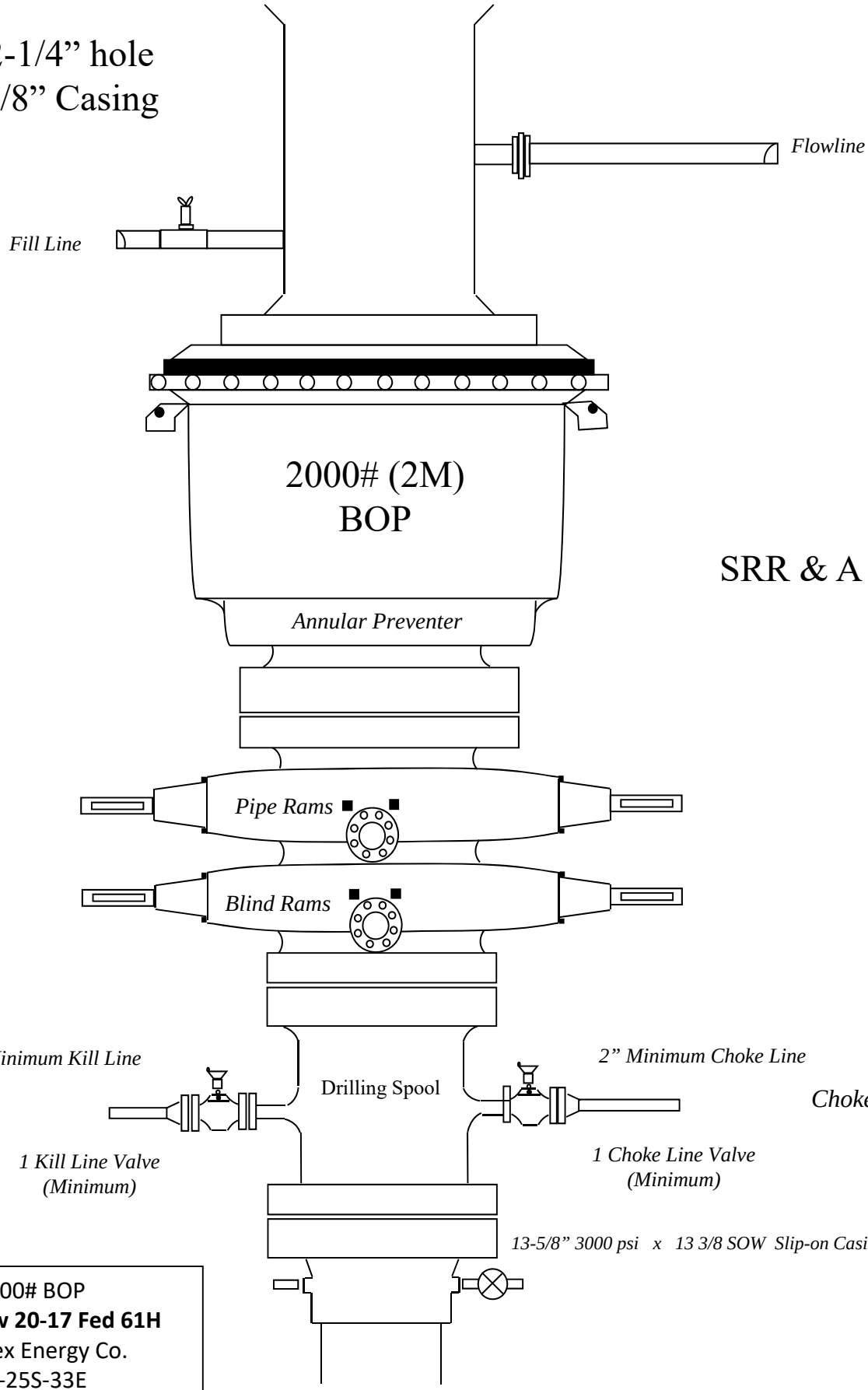
Choke Manifold Diagram
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM



Drilling Operations
Choke Manifold
2M/3M Service

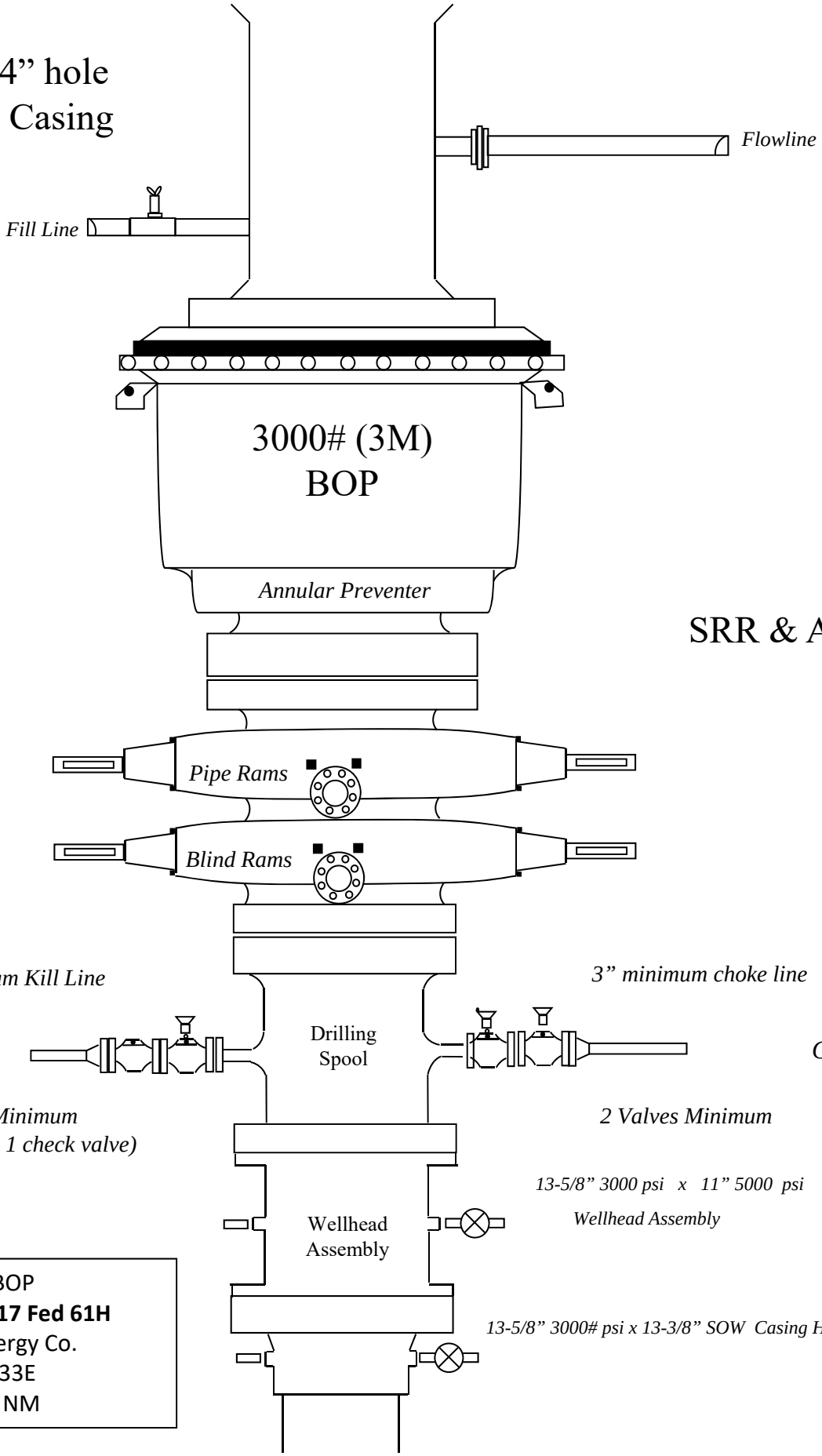
Choke Manifold Diagram
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

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



2000# BOP
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

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



SRR & A

3000# BOP
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Print

EVRAZ

Vaca Draw 20-17 Fed 61H
Surface Casing Spec Sheet

OCTG Performance Data

Casing Performance

Availability: ERW

Pipe Body Geometry

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

Pipe Body Performance

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

SC Connection

Connection Geometry

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

Connection Performance

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

LC Connection

Connection Geometry

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

Connection Performance

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

BC Connection

Connection Geometry

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

Connection Performance

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

PE Connection

Connection Geometry

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

Connection Performance

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

Vaca Draw 20-17 Fed 61H

Casing Assumptions

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	985	985	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.64	3.84	6.81
12 1/4	0	4814	4814	9-5/8"	40.00	J-55	LT&C	1.35	1.55	2.70
8 3/4	0	10250	10250	5-1/2"	17.00	L-80	LT&C	1.31	1.61	1.84
8 3/4	9173	20745	10800	5-1/2"	17.00	L-80	BT&C	1.24	1.53	42.46
						BLM Minimum Safety Factor		1.125	1	1.6 Dry 1.8 Wet

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

Hydrogen Sulfide Drilling Operations Plan
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
UL: P, Sec. 20, 25S, 33E
Lea Co., NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:

A. Characteristics of H_2S
B. Physical effects and hazards
C. Principal and operation of H2S detectors, warning system and briefing areas.
D. Evacuation procedure, routes and first aid.
E. Proper use of safety equipment & life support systems
F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

H_2S Detection and Alarm Systems:

A. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may play placed as deemed necessary.

B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:

A. Windsock at mudpit area should be high enough to be visible.

B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

4 Condition Flags and Signs

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

5 Well control equipment:

A. See exhibit "E-1"

6 Communication:

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

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

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

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

H_2S Contingency Plan
Vaca Draw 20-17 Fed 60H
Cimarex Energy Co.
UL: P, Sec. 20, 25S, 33E
Lea Co., NM

Emergency Procedures

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

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

Ignition of Gas Source

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

Characteristics of H_2S and SO_2

Please see attached International Chemical Safety Cards.

Contacting Authorities

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

H_2S Contingency Plan Emergency Contacts

Vaca Draw 20-17 Fed 60H

Cimarex Energy Co.

UL: P, Sec. 20, 25S, 33E

Lea Co., NM

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

Key Personnel

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

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

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

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

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

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

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

Schlumberger

CIMAREX

Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19 Anti-Collision Summary Report

Analysis Date-24hr Time:	October 07, 2019 - 09:26	**Analysis Method:**	3D Least Distance
Client:	Cimarex Energy	**Reference Trajectory:**	Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19 (Non-Def Plan)
Field:	NM Lea County (NAD 83)	**Depth Interval:**	Every 10.00 Measured Depth (ft)
Structure:	Cimarex Vaca Draw 20-17 Federal #61H	**Rule Set:**	NAL Procedure: D&M AntiCollision Standard S002
Slot:	New Slot	**Min Pts:**	All local minima indicated.
Well:	Vaca Draw 20-17 Federal #61H	**Version / Patch:**	2.10.782.0
Borehole:	Vaca Draw 20-17 Federal #61H	**Database \ Project:**	US1153APP452.dir.slb.com\drilling-NM Lea County 2.10
Scan MD Range:	0.00ft ~ 20745.83ft		

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

Offset Trajectories Summary

Offset Selection Criteria

Wellhead distance scan: Not performed!

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

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Cimarex Vaca Draw 20-17 Federal #60H Rev0 RM 12Sept19 (Non-Def Plan)													Fail Minor
	20.03	16.49	17.53	3.54	N/A	MAS = 5.03 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert	
	19.99	16.49	17.49	3.50	N/A	MAS = 5.03 (m)	26.00	26.00				WRP	
	19.99	20.00	5.83	-0.01	1.50	OSF1.50	1920.00	1920.00		OSF<1.50		Enter Minor	
	19.99	20.75	5.32	-0.76	1.44	OSF1.50	2000.00	2000.00				MinPt-CtCt	
	20.01	20.82	5.29	-0.82	1.43	OSF1.50	2010.00	2010.00				MINPT-O-EOU	
	20.06	20.90	5.30	-0.83	1.43	OSF1.50	2020.00	2020.00				MinPts	
	21.11	21.32	6.06	-0.22	1.48	OSF1.50	2080.00	2079.99		OSF>1.50		Exit Minor	
	76.69	24.84	59.30	51.85	4.98	OSF1.50	2680.00	2677.23	OSF>5.00			Exit Alert	
	278.92	41.53	250.41	237.40	10.62	OSF1.50	5519.36	5500.00				MinPt-O-SF	
	278.79	41.57	250.24	237.21	10.61	OSF1.50	5600.00	5580.28				MinPt-O-SF	
	149.96	46.92	117.85	103.04	4.98	OSF1.50	7240.00	7220.03	OSF<5.00			Enter Alert	
	119.07	52.33	83.36	66.75	3.51	OSF1.50	8110.00	8090.03				MinPt-CtCt	
	119.17	52.64	83.24	66.53	3.49	OSF1.50	8160.00	8140.03				MINPT-O-EOU	
	119.27	52.76	83.26	66.51	3.48	OSF1.50	8180.00	8160.03				MinPt-O-ADP	
	120.17	53.32	83.79	66.85	3.47	OSF1.50	8270.00	8250.03				MinPt-O-SF	
	124.76	66.95	79.30	57.81	2.85	OSF1.50	10342.50	10322.54				MINPT-O-EOU	
	124.82	67.00	79.32	57.81	2.84	OSF1.50	10350.00	10330.03				MinPts	
	220.40	69.35	173.34	151.06	4.89	OSF1.50	10650.00	10609.21	OSF>5.00			Exit Alert	
	286.30	87.78	226.95	198.52	4.99	OSF1.50	13250.00	10800.00	OSF<5.00			Enter Alert	
	286.30	286.41	94.53	-0.11	1.50	OSF1.50	19780.00	10800.00		OSF<1.50		Enter Minor	
	286.30	316.03	74.78	-29.73	1.36	OSF1.50	20745.83	10800.00				MinPts	

Results highlighted: Sep-Factor separation <= 1.50 ft

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Cimarex Vaca Draw 20-17 Federal #71H Rev4 RM 19Jul19 (Def Plan)													Warning Alert
	453.94	32.81	452.14	421.14	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	453.93	32.81	452.13	421.13	N/A	MAS = 10.00 (m)	26.00	26.00				WRP	
	141.96	44.30	111.73	97.66	4.97	OSF1.50	5130.00	5112.91	OSF<5.00			Enter Alert	
	59.78	45.53	28.82	14.25	1.99	OSF1.50	5790.00	5770.04				MinPts	
	59.78	45.49	28.84	14.28	1.99	OSF1.50	5800.00	5780.04				MinPt-CtCt	
	154.50	47.75	122.07	106.75	4.99	OSF1.50	6720.00	6700.03	OSF>5.00			Exit Alert	
	540.33	63.90	497.13	476.43	13.01	OSF1.50	9600.00	9580.03				MINPT-O-EOU	
	540.39	63.97	497.14	476.42	13.00	OSF1.50	9610.00	9590.03				MinPt-O-ADP	
	544.57	65.04	500.61	479.53	12.88	OSF1.50	9760.00	9740.03				MinPt-O-SF	
	903.85	117.78	824.72	786.06	11.67	OSF1.50	13900.00	10800.00				MinPt-CtCt	
	921.37	277.87	735.52	643.50	5.00	OSF1.50	19190.00	10800.00	OSF<5.00			Enter Alert	
	926.57	325.93	708.67	600.63	4.28	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #74H Rev0 RM 12Sept19 (Non-Def Plan)													Warning Alert
	529.95	32.81	527.45	497.14	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	529.94	32.81	527.44	497.14	N/A	MAS = 10.00 (m)	26.00	26.00				WRP	
	96.68	32.81	74.90	63.87	4.95	MAS = 10.00 (m)	4450.00	4436.89	OSF<5.00			Enter Alert	
	63.24	33.56	40.03	29.68	2.93	OSF1.50	4780.00	4764.96				MinPt-CtCt	
	63.28	33.63	40.02	29.65	2.93	OSF1.50	4790.00	4774.90				MinPts	
	63.39	33.70	40.09	29.70	2.93	OSF1.50	4800.00	4784.84				MinPt-O-SF	
	114.30	36.24	89.31	78.06	4.97	OSF1.50	5210.00	5192.45	OSF>5.00			Exit Alert	
	327.44	66.90	282.01	260.54	7.57	OSF1.50	10350.00	10330.03				MinPts	
	328.29	67.22	282.64	261.07	7.55	OSF1.50	10390.00	10369.96				MinPt-O-SF	
	1553.04	317.46	1340.56	1235.58	7.38	OSF1.50	20745.83	10800.00				MinPts	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H 0ft-19583ft (Surcon Corrected) (Def Survey)													Warning Alert
	493.63	32.81	491.82	460.82	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	493.61	32.81	491.80	460.80	341548.89	MAS = 10.00 (m)	26.00	26.00				WRP	
	493.26	32.81	490.38	460.45	456.91	MAS = 10.00 (m)	290.00	290.00				MinPts	
	492.65	32.81	487.48	459.84	146.05	MAS = 10.00 (m)	800.00	800.00				MinPts	
	492.79	32.81	487.31	459.98	133.70	MAS = 10.00 (m)	880.00	880.00				MINPT-O-EOU	
	189.30	32.81	168.90	156.49	10.12	MAS = 10.00 (m)	5780.00	5760.04				MinPt-O-SF	
	174.99	34.95	151.06	140.04	7.86	OSF1.50	7320.00	7300.03				MinPt-CtCt	
	175.19	35.37	150.97	139.81	7.77	OSF1.50	7410.00	7390.03				MINPT-O-EOU	
	175.85	36.24	151.05	139.61	7.60	OSF1.50	7590.00	7570.03				MinPt-O-ADP	
	153.37	46.02	122.04	107.35	5.15	OSF1.50	9440.00	9420.03				MinPt-CtCt	
	153.39	46.13	121.98	107.25	5.14	OSF1.50	9450.00	9430.03				MinPts	
	153.67	46.22	122.21	107.45	5.14	OSF1.50	9460.00	9440.03				MinPt-O-SF	
	958.66	107.87	886.23	850.79	13.50	OSF1.50	14080.00	10800.00				MinPt-CtCt	
	959.03	108.90	885.91	850.12	13.38	OSF1.50	14130.00	10800.00				MINPT-O-EOU	
	958.24	116.89	879.80	841.35	12.44	OSF1.50	14390.00	10800.00				MinPt-CtCt	
	949.70	149.19	849.73	800.51	9.63	OSF1.50	15480.00	10800.00				MinPt-CtCt	
	950.48	151.72	848.83	798.77	9.48	OSF1.50	15580.00	10800.00				MINPT-O-EOU	
	951.50	152.92	849.04	798.58	9.41	OSF1.50	15630.00	10800.00				MinPt-O-ADP	
	952.36	164.45	842.21	787.91	8.75	OSF1.50	15990.00	10800.00				MinPt-CtCt	
	939.59	186.56	814.70	753.02	7.60	OSF1.50	16730.00	10800.00				MinPt-CtCt	
	939.97	187.59	814.39	752.38	7.57	OSF1.50	16780.00	10800.00				MINPT-O-EOU	
	940.79	191.22	812.79	749.56	7.43	OSF1.50	16890.00	10800.00				MinPt-CtCt	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	941.51	193.38	812.08	748.14	7.35	OSF1.50	16980.00	10800.00				MINPT-O-EOU	
	942.09	194.05	812.20	748.03	7.33	OSF1.50	17010.00	10800.00				MinPt-O-ADP	
	939.05	232.36	783.63	706.69	6.09	OSF1.50	18260.00	10800.00				MinPt-CtCt	
	939.07	243.50	776.22	695.57	5.81	OSF1.50	18630.00	10800.00				MinPt-CtCt	
	939.50	254.93	769.03	684.57	5.55	OSF1.50	19010.00	10800.00				MinPt-CtCt	
	908.72	273.82	725.66	634.90	5.00	OSF1.50	19620.00	10800.00	OSF<5.00			Enter Alert	
	905.91	278.29	719.87	627.62	4.90	OSF1.50	19800.00	10800.00				MinPt-CtCt	
	906.68	281.01	718.82	625.67	4.86	OSF1.50	19910.00	10800.00				MINPT-O-EOU	
	907.64	282.19	719.00	625.45	4.84	OSF1.50	19960.00	10800.00				MinPt-O-ADP	
	923.58	288.66	730.62	634.92	4.82	OSF1.50	20260.00	10800.00				MinPt-O-SF	
	936.03	294.64	739.09	641.39	4.78	OSF1.50	20440.00	10800.00				MinPt-O-SF	
	948.29	298.39	748.85	649.90	4.78	OSF1.50	20600.00	10800.00				MinPt-O-SF	
	961.30	302.15	759.36	659.16	4.79	OSF1.50	20745.83	10800.00				MinPt-O-SF	
Cimarex Vaca Draw 20-17 Federal #75H Rev0 RM 12Sept19 (Non-Def Plan)													Warning Alert
	549.95	32.81	547.45	517.15	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	549.94	32.81	547.44	517.14	N/A	MAS = 10.00 (m)	26.00	26.00				WRP	
	155.49	40.73	127.37	114.76	6.05	OSF1.50	5750.00	5730.05				MinPt-O-SF	
	154.09	40.20	126.33	113.89	6.08	OSF1.50	5820.00	5800.03				MinPt-O-ADP	
	154.03	40.13	126.32	113.90	6.09	OSF1.50	5830.00	5810.03				MinPt-O-ADP	
	153.90	39.97	126.30	113.93	6.11	OSF1.50	5870.00	5850.03				MINPT-O-EOU	
	153.81	39.83	126.30	113.98	6.12	OSF1.50	5910.00	5890.03				MinPt-O-ADP	
	153.79	39.80	126.30	113.99	6.13	OSF1.50	5930.00	5910.03				MINPT-O-EOU	
	153.78	39.76	126.32	114.02	6.13	OSF1.50	5960.00	5940.03				MinPt-CtCt	
	167.99	52.32	132.22	115.67	4.99	OSF1.50	8570.00	8550.03	OSF<5.00			Enter Alert	
	167.99	67.50	122.10	100.49	3.83	OSF1.50	10342.50	10322.54				MINPT-O-EOU	
	168.04	67.56	122.10	100.47	3.82	OSF1.50	10350.00	10330.03				MinPt-O-ADP	
	168.23	67.65	122.25	100.59	3.82	OSF1.50	10360.00	10340.03				MinPt-O-SF	
	223.66	69.65	176.40	154.01	4.94	OSF1.50	10600.00	10567.73	OSF>5.00			Exit Alert	
	1527.17	314.90	1316.40	1212.26	7.32	OSF1.50	20745.83	10800.00				MinPts	
EOG Vaca Draw 20 Federal #1 (Offset) Plugged Inc Only 0ft-14200ft (Def Survey)													Warning Alert
	3403.71	32.81	3401.21	3370.90	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	3403.70	32.81	3400.77	3370.89	7985.64	MAS = 10.00 (m)	26.00	26.00				WRP	
	3401.46	32.81	3382.47	3368.66	206.08	MAS = 10.00 (m)	540.00	540.00				MinPts	
	3408.87	113.42	3332.42	3295.45	46.07	OSF1.50	2150.00	2149.93				MinPt-CtCt	
	3416.59	131.25	3328.26	3285.34	39.77	OSF1.50	2560.00	2557.93				MINPT-O-EOU	
	3466.58	218.93	3319.80	3247.65	24.01	OSF1.50	4230.00	4218.17				MINPT-O-EOU	
	3512.73	271.31	3331.02	3241.42	19.59	OSF1.50	5300.00	5281.92				MinPt-O-ADP	
	3515.68	368.31	3269.31	3147.37	14.41	OSF1.50	7140.00	7120.03				MinPt-CtCt	
	3514.33	430.76	3226.32	3083.57	12.30	OSF1.50	8340.00	8320.03				MinPt-CtCt	
	1860.21	561.70	1484.22	1298.51	5.00	OSF1.50	12500.00	10800.00	OSF<5.00			Enter Alert	
	1215.77	565.58	837.89	650.20	3.23	OSF1.50	13910.00	10800.00				MinPts	
	1215.83	565.61	837.92	650.22	3.23	OSF1.50	13920.00	10800.00				MinPt-O-SF	
	1878.18	565.64	1500.25	1312.53	5.00	OSF1.50	15340.00	10800.00	OSF>5.00			Exit Alert	
	6942.01	571.18	6560.40	6370.84	18.30	OSF1.50	20745.83	10800.00				TD	
Hankamer Curtis Bass-Federal #1 (Offset) Plugged Blind 0ft-5074ft (Def Survey)													Warning Alert

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	4445.85	32.81	4442.70	4413.04	6840.70	MAS = 10.00 (m)	0.00	0.00				Surface	
	4445.85	32.81	4439.97	4413.04	1317.15	MAS = 10.00 (m)	26.00	26.00				WRP	
	4445.85	617.71	4033.21	3828.14	10.83	OSF1.50	2000.00	2000.00				MinPt-CtCt	
	4513.93	1358.65	3607.33	3155.28	4.99	OSF1.50	4370.00	4357.36	OSF<5.00			Enter Alert	
	4538.55	1581.97	3483.07	2956.58	4.31	OSF1.50	5090.00	5073.15				MinPts	
	4899.01	1472.59	3916.45	3426.42	5.00	OSF1.50	6880.00	6860.03	OSF>5.00			Exit Alert	
	5933.51	420.83	5652.12	5512.68	21.27	OSF1.50	14910.00	10800.00				MinPt-CtCt	
	5933.65	421.12	5652.07	5512.53	21.25	OSF1.50	14950.00	10800.00				MINPT-O-EOU	
	5940.63	428.59	5654.07	5512.04	20.90	OSF1.50	15200.00	10800.00				MinPt-O-ADP	
	8077.48	1124.77	7326.80	6952.71	10.79	OSF1.50	20390.00	10800.00				MinPt-O-SF	
	8323.02	1156.94	7550.90	7166.08	10.81	OSF1.50	20745.83	10800.00				TD	
Cimarex Vaca Draw 20-17 Federal #72H Rev6 kFc 28Sep19 (Def Plan)													Pass
	473.78	32.81	471.97	440.97	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	473.77	32.81	471.96	440.96	N/A	MAS = 10.00 (m)	10.00	10.00				MinPts	
	473.77	32.81	471.96	440.96	774510.57	MAS = 10.00 (m)	26.00	26.00				WRP	
	107.67	32.81	86.11	74.86	5.41	MAS = 10.00 (m)	5640.00	5620.17				MinPt-O-SF	
	107.12	32.81	85.75	74.31	5.43	MAS = 10.00 (m)	5690.00	5670.09				MINPT-O-EOU	
	107.10	32.81	85.77	74.29	5.44	MAS = 10.00 (m)	5700.00	5680.08				MinPts	
	148.07	43.66	118.13	104.41	5.31	OSF1.50	8830.00	8810.03				MinPts	
	148.19	43.74	118.20	104.45	5.30	OSF1.50	8840.00	8820.03				MinPt-O-SF	
	1369.79	217.59	1223.89	1152.19	9.54	OSF1.50	17670.00	10800.00				MinPt-CtCt	
	1393.80	311.59	1185.24	1082.21	6.75	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #72H Surveys 0ft to update (Non-Def Survey)													Pass
	473.78	32.81	471.97	440.97	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	473.77	32.81	471.96	440.96	N/A	MAS = 10.00 (m)	10.00	10.00				MinPts	
	473.77	32.81	471.96	440.96	774510.57	MAS = 10.00 (m)	26.00	26.00				WRP	
	107.67	32.81	86.11	74.86	5.41	MAS = 10.00 (m)	5640.00	5620.17				MinPt-O-SF	
	107.12	32.81	85.75	74.31	5.43	MAS = 10.00 (m)	5690.00	5670.09				MINPT-O-EOU	
	107.10	32.81	85.77	74.29	5.44	MAS = 10.00 (m)	5700.00	5680.08				MinPts	
	149.63	42.55	120.66	107.08	5.44	OSF1.50	8760.00	8740.03				MinPts	
	149.69	42.62	120.67	107.07	5.44	OSF1.50	8770.00	8750.03				MinPt-O-ADP	
	150.01	42.75	120.91	107.27	5.43	OSF1.50	8790.00	8770.03				MinPt-O-SF	
	1503.21	32.81	1482.43	1470.40	79.15	MAS = 10.00 (m)	11320.00	10800.00				MinPts	
	1503.22	32.81	1482.43	1470.41	79.08	MAS = 10.00 (m)	11330.00	10800.00				MINPT-O-EOU	
	1809.24	41.55	1780.93	1767.68	68.22	OSF1.50	12330.00	10800.00				MinPt-O-SF	
	9541.81	58.13	9502.45	9483.68	254.06	OSF1.50	20745.83	10800.00				TD	
Cimarex Vaca Draw 20-17 Federal #71H MWD 0ft-Update (Non-Def Survey)													Pass
	453.94	32.81	452.14	421.14	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	453.94	32.81	452.13	421.13	809714.47	MAS = 10.00 (m)	10.00	10.00				MinPts	
	453.94	32.81	452.13	421.14	104272.89	MAS = 10.00 (m)	26.00	26.00				WRP	
	454.05	32.81	452.08	421.24	2744.44	MAS = 10.00 (m)	80.00	80.00				MINPT-O-EOU	
	454.25	32.81	452.07	421.44	1218.46	MAS = 10.00 (m)	130.00	130.00				MINPT-O-EOU	
	451.62	32.81	444.71	418.81	88.20	MAS = 10.00 (m)	1070.00	1070.00				MinPts	
	486.55	32.81	478.81	453.74	81.63	MAS = 10.00 (m)	1250.00	1250.00				MinPt-O-SF	
	13733.49	145.47	13635.91	13588.03	143.38	OSF1.50	20370.00	10800.00				MinPt-O-SF	
	14001.22	148.16	13901.84	13853.06	143.48	OSF1.50	20745.83	10800.00				TD	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Cimarex Vaca Draw 20-17 Federal #48H Rev0 RM 12Sept19 (Non-Def Plan)													Pass
	1199.83	32.81	1197.33	1167.03	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1199.83	32.81	1197.32	1167.03	89815.88	MAS = 10.00 (m)	26.00	26.00				WRP	
	1199.83	32.81	1185.14	1167.03	98.21	MAS = 10.00 (m)	2000.00	2000.00				MinPts	
	1199.85	32.81	1185.11	1167.04	97.83	MAS = 10.00 (m)	2010.00	2010.00				MINPT-O-EOU	
	1220.01	32.81	1204.01	1187.20	90.16	MAS = 10.00 (m)	2350.00	2349.16				MinPt-O-SF	
	737.45	70.18	689.57	667.27	16.47	OSF1.50	10342.50	10322.54				MinPt-CtCt	
	737.47	70.23	689.55	667.24	16.45	OSF1.50	10350.00	10330.03				MINPT-O-EOU	
	737.52	70.29	689.56	667.23	16.44	OSF1.50	10360.00	10340.03				MinPt-O-ADP	
	742.54	71.09	694.06	671.46	16.35	OSF1.50	10490.00	10467.70				MinPt-O-SF	
	1676.87	335.35	1452.47	1341.51	7.55	OSF1.50	20745.83	10800.00				MinPts	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #45H 0ft-19226ft (Surcon Corrected) (Def Survey)													Pass
	1281.21	32.81	1279.40	1248.40	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	1281.22	32.81	1279.40	1248.41	74414.72	MAS = 10.00 (m)	26.00	26.00				WRP	
	1281.35	32.81	1279.33	1248.54	6112.91	MAS = 10.00 (m)	90.00	90.00				MINPT-O-EOU	
	1281.58	32.81	1279.29	1248.77	2675.54	MAS = 10.00 (m)	150.00	150.00				MINPT-O-EOU	
	1276.70	32.81	1270.49	1243.89	289.76	MAS = 10.00 (m)	1050.00	1050.00				MINPT-O-EOU	
	1105.67	32.81	1084.11	1072.86	55.58	MAS = 10.00 (m)	5600.00	5580.28				MinPt-O-SF	
	791.03	44.91	760.33	746.12	27.76	OSF1.50	8770.00	8750.03				MinPt-CtCt	
	791.09	45.10	760.26	745.99	27.64	OSF1.50	8810.00	8790.03				MINPT-O-EOU	
	791.13	45.15	760.27	745.98	27.60	OSF1.50	8820.00	8800.03				MinPt-O-ADP	
	797.49	46.24	765.91	751.25	27.13	OSF1.50	9050.00	9030.03				MinPt-O-SF	
	1621.03	133.97	1531.20	1487.06	18.34	OSF1.50	15100.00	10800.00				MinPt-CtCt	
	1621.77	135.93	1530.63	1485.84	18.08	OSF1.50	15190.00	10800.00				MINPT-O-EOU	
	1622.51	136.81	1530.79	1485.70	17.97	OSF1.50	15230.00	10800.00				MinPt-O-ADP	
	1640.05	151.03	1538.85	1489.02	16.44	OSF1.50	15730.00	10800.00				MinPt-O-ADP	
	1653.10	172.87	1537.34	1480.23	14.46	OSF1.50	16420.00	10800.00				MinPt-CtCt	
	1653.87	191.48	1525.71	1462.40	13.05	OSF1.50	17050.00	10800.00				MinPt-CtCt	
	1654.85	196.24	1523.52	1458.62	12.74	OSF1.50	17210.00	10800.00				MinPt-CtCt	
	1655.21	203.37	1519.11	1451.84	12.29	OSF1.50	17450.00	10800.00				MinPt-CtCt	
	1654.18	209.07	1514.29	1445.11	11.95	OSF1.50	17640.00	10800.00				MinPt-CtCt	
	1656.95	215.03	1513.09	1441.92	11.63	OSF1.50	17870.00	10800.00				MINPT-O-EOU	
	1661.49	222.94	1512.34	1438.54	11.25	OSF1.50	18130.00	10800.00				MINPT-O-EOU	
	1662.45	224.13	1512.52	1438.32	11.19	OSF1.50	18180.00	10800.00				MinPt-O-ADP	
	1632.01	259.95	1458.20	1372.06	9.46	OSF1.50	19340.00	10800.00				MinPt-CtCt	
	1633.03	262.76	1457.35	1370.27	9.37	OSF1.50	19460.00	10800.00				MINPT-O-EOU	
	1637.56	267.86	1458.48	1369.70	9.21	OSF1.50	19650.00	10800.00				MinPt-O-ADP	
	1638.16	301.92	1436.37	1336.24	8.17	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #44H Rev6 kFc 28Sep19 (Def Plan)													Pass
	1301.18	32.81	1299.38	1268.38	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	1301.19	32.81	1299.36	1268.38	74216.48	MAS = 10.00 (m)	26.00	26.00				WRP	
	1300.35	32.81	1295.29	1267.54	398.67	MAS = 10.00 (m)	780.00	780.00				MinPts	
	1300.48	32.81	1294.44	1267.67	306.99	MAS = 10.00 (m)	1010.00	1010.00				MinPts	
	1300.50	32.81	1294.24	1267.69	291.75	MAS = 10.00 (m)	1060.00	1060.00				MINPT-O-EOU	
	1301.25	32.81	1294.02	1268.44	232.95	MAS = 10.00 (m)	1300.00	1300.00				MINPT-O-EOU	
	1306.03	32.81	1295.57	1273.22	148.06	MAS = 10.00 (m)	2000.00	2000.00				MINPT-O-EOU	
	1308.03	32.81	1297.39	1275.23	145.20	MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	1321.71	32.81	1311.03	1288.90	146.23	MAS = 10.00 (m)	2309.88	2309.27				MinPt-O-SF	
	1275.19	32.81	1257.32	1242.38	78.68	MAS = 10.00 (m)	4780.00	4764.96				MinPts	
	1275.19	32.81	1257.28	1242.39	78.48	MAS = 10.00 (m)	4790.00	4774.90				MINPT-O-EOU	
	1275.30	32.81	1257.33	1242.49	77.71	MAS = 10.00 (m)	4830.00	4814.67				MINPT-O-EOU	
	1257.23	32.81	1236.19	1224.42	64.59	MAS = 10.00 (m)	5600.00	5580.28				MinPt-O-SF	
	1126.54	45.62	1095.50	1080.91	38.55	OSF1.50	9270.00	9250.03				MinPt-CtCt	
	1126.66	47.90	1093.78	1078.75	37.39	OSF1.50	9500.00	9480.03				MinPts	
	1138.32	48.99	1104.74	1089.33	36.86	OSF1.50	9750.00	9730.03				MinPt-O-SF	
	1412.16	170.56	1297.62	1241.60	12.58	OSF1.50	15720.00	10800.00				MinPt-CtCt	
	1423.72	327.60	1204.48	1096.11	6.56	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #44H MWD 0ft-Update (Non-Def Survey)													Pass
	1301.18	32.81	1299.38	1268.38	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	1301.19	32.81	1299.36	1268.38	74216.48	MAS = 10.00 (m)	26.00	26.00				WRP	
	1300.35	32.81	1295.29	1267.54	398.67	MAS = 10.00 (m)	780.00	780.00				MinPts	
	1300.48	32.81	1294.44	1267.67	306.99	MAS = 10.00 (m)	1010.00	1010.00				MinPts	
	1300.50	32.81	1294.24	1267.69	291.75	MAS = 10.00 (m)	1060.00	1060.00				MINPT-O-EOU	
	1301.25	32.81	1294.02	1268.44	232.95	MAS = 10.00 (m)	1300.00	1300.00				MINPT-O-EOU	
	1306.03	32.81	1295.57	1273.22	148.06	MAS = 10.00 (m)	2000.00	2000.00				MINPT-O-EOU	
	1308.03	32.81	1297.39	1275.23	145.20	MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF	
	1321.71	32.81	1311.03	1288.90	146.23	MAS = 10.00 (m)	2309.88	2309.27				MinPt-O-SF	
	1275.19	32.81	1257.32	1242.38	78.68	MAS = 10.00 (m)	4780.00	4764.96				MinPts	
	1275.19	32.81	1257.28	1242.39	78.48	MAS = 10.00 (m)	4790.00	4774.90				MINPT-O-EOU	
	1275.30	32.81	1257.33	1242.49	77.71	MAS = 10.00 (m)	4830.00	4814.67				MINPT-O-EOU	
	1257.23	32.81	1236.19	1224.42	64.59	MAS = 10.00 (m)	5600.00	5580.28				MinPt-O-SF	
	1126.54	45.62	1095.50	1080.91	38.55	OSF1.50	9270.00	9250.03				MinPt-CtCt	
	1126.71	46.52	1095.08	1080.19	37.78	OSF1.50	9420.00	9400.03				MINPT-O-EOU	
	1126.80	46.64	1095.09	1080.16	37.68	OSF1.50	9440.00	9420.03				MinPt-O-ADP	
	1135.07	47.39	1102.87	1087.69	37.31	OSF1.50	9620.00	9600.03				MinPt-O-SF	
	1139.88	47.56	1107.57	1092.32	37.31	OSF1.50	9670.00	9650.03				MinPt-O-SF	
	1450.24	47.35	1418.15	1402.88	47.43	OSF1.50	10860.00	10744.50				MinPt-O-SF	
	1450.96	48.49	1418.12	1402.47	46.31	OSF1.50	11240.00	10800.00				MinPt-CtCt	
	1450.96	48.51	1418.11	1402.45	46.29	OSF1.50	11250.00	10800.00				MinPts	
	1454.76	48.71	1421.77	1406.05	46.22	OSF1.50	11350.00	10800.00				MinPt-O-SF	
	9611.08	57.29	9572.38	9553.79	258.58	OSF1.50	20745.83	10800.00				TD	
Cimarex Vaca Draw 20-17 Federal #47H Rev0 RM 12Sept19 (Non-Def Plan)													Pass
	1219.84	32.81	1217.34	1187.03	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1219.84	32.81	1217.32	1187.03	74040.16	MAS = 10.00 (m)	26.00	26.00				WRP	
	1219.84	32.81	1205.14	1187.03	99.81	MAS = 10.00 (m)	2000.00	2000.00				MinPts	
	1219.85	32.81	1205.11	1187.04	99.43	MAS = 10.00 (m)	2010.00	2010.00				MINPT-O-EOU	
	1261.59	32.81	1244.79	1228.78	88.06	MAS = 10.00 (m)	2550.00	2547.99				MinPt-O-SF	
	1141.00	67.53	1095.09	1073.47	26.33	OSF1.50	10342.50	10322.54				MinPt-CtCt	
	1141.08	67.74	1095.03	1073.34	26.24	OSF1.50	10370.00	10350.02				MINPT-O-EOU	
	1141.14	67.82	1095.04	1073.32	26.21	OSF1.50	10380.00	10360.00				MinPt-O-ADP	
	1157.49	70.02	1109.95	1087.47	25.69	OSF1.50	10680.00	10632.62				MinPt-O-SF	
	1891.58	338.86	1664.84	1552.72	8.42	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #46H Rev0 RM 12Sept19 (Non-Def Plan)													Pass
	1239.84	32.81	1237.34	1207.03	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	1239.84	32.81	1237.32	1207.03	76287.56	MAS = 10.00 (m)	26.00	26.00				WRP	
	1239.84	32.81	1225.14	1207.03	101.46	MAS = 10.00 (m)	2000.00	2000.00				MinPts	
	1239.85	32.81	1225.11	1207.05	101.07	MAS = 10.00 (m)	2010.00	2010.00				MINPT-O-EOU	
	1610.64	48.60	1577.41	1562.04	52.33	OSF1.50	5600.00	5580.28				MinPt-O-SF	
	1619.80	86.80	1561.10	1533.00	28.78	OSF1.50	10380.00	10360.00				MinPt-CtCt	
	1620.03	87.92	1560.59	1532.12	28.41	OSF1.50	10510.00	10486.62				MINPT-O-EOU	
	1620.17	88.08	1560.62	1532.09	28.35	OSF1.50	10530.00	10505.25				MinPt-O-ADP	
	1636.73	90.37	1575.65	1546.36	27.90	OSF1.50	10840.00	10734.78				MinPt-O-SF	
	2167.09	342.99	1937.60	1824.10	9.54	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #43H Rev3 IP 13Aug19 (Def Plan)													Pass
	1321.15	32.81	1318.65	1288.35	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	
	1321.15	32.81	1318.63	1288.35	65219.66	MAS = 10.00 (m)	26.00	26.00				WRP	
	1321.15	32.81	1306.45	1288.35	108.07	MAS = 10.00 (m)	2000.00	2000.00				MinPts	
	1321.17	32.81	1306.42	1288.36	107.66	MAS = 10.00 (m)	2010.00	2010.00				MINPT-O-EOU	
	1700.85	73.50	1651.01	1627.34	35.88	OSF1.50	8860.00	8840.03				MINPT-O-EOU	
	1700.90	73.57	1651.02	1627.33	35.85	OSF1.50	8870.00	8850.03				MinPt-O-ADP	
	1715.82	75.28	1664.79	1640.53	35.31	OSF1.50	9200.00	9180.03				MinPt-O-SF	
	2249.26	153.40	2146.16	2095.86	22.33	OSF1.50	14890.00	10800.00				MinPt-CtCt	
	2256.53	331.63	2034.60	1924.89	10.27	OSF1.50	20745.83	10800.00				MinPts	
Cimarex Vaca Draw 20-17 Federal #43H MWD 0ft-Update (Non-Def Survey)													Pass
	1321.16	32.81	1319.35	1288.35	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	1321.16	32.81	1319.33	1288.35	65727.37	MAS = 10.00 (m)	26.00	26.00				WRP	
	1321.62	32.81	1316.96	1288.81	462.23	MAS = 10.00 (m)	700.00	700.00				MinPts	
	1321.86	32.81	1315.59	1289.06	295.65	MAS = 10.00 (m)	1060.00	1060.00				MinPts	
	1572.73	32.81	1563.11	1539.93	200.85	MAS = 10.00 (m)	1910.00	1910.00				MinPt-O-SF	
	14038.33	145.93	13940.44	13892.40	146.09	OSF1.50	20630.00	10800.00				MinPt-O-SF	
	14120.78	146.77	14022.33	13974.01	146.10	OSF1.50	20745.83	10800.00				TD	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H ST01 MWD 0ft-22279ft (Surcon Corrected) (Def Survey)													Pass
	2519.26	32.81	2517.56	2486.45	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	2519.29	32.81	2517.56	2486.48	70295.66	MAS = 10.00 (m)	26.00	26.00				WRP	
	2519.37	32.81	2517.54	2486.56	19617.66	MAS = 10.00 (m)	60.00	60.00				MINPT-O-EOU	
	2394.85	32.81	2383.33	2362.04	241.72	MAS = 10.00 (m)	2430.00	2428.69				MinPts	
	2379.99	32.81	2365.29	2347.18	182.04	MAS = 10.00 (m)	3720.00	3711.15				MinPts	
	2380.04	32.81	2365.24	2347.23	180.55	MAS = 10.00 (m)	3760.00	3750.92				MINPT-O-EOU	
	2365.29	32.81	2347.30	2332.48	144.70	MAS = 10.00 (m)	4600.00	4586.01				MinPts	
	2365.36	32.81	2347.23	2332.55	143.44	MAS = 10.00 (m)	4640.00	4625.78				MINPT-O-EOU	
	2343.52	32.81	2321.21	2310.71	113.48	MAS = 10.00 (m)	5600.00	5580.28				MinPt-O-SF	
	1974.08	48.81	1940.73	1925.27	63.77	OSF1.50	9190.00	9170.03				MinPt-CtCt	
	1974.11	48.91	1940.70	1925.20	63.64	OSF1.50	9210.00	9190.03				MINPT-O-EOU	
	1974.15	48.95	1940.70	1925.19	63.57	OSF1.50	9220.00	9200.03				MinPt-O-ADP	
	1981.43	52.15	1945.86	1929.29	59.69	OSF1.50	9850.00	9830.03				MinPt-CtCt	
	1981.58	52.60	1945.71	1928.98	59.15	OSF1.50	9940.00	9920.03				MINPT-O-EOU	
	1982.17	53.45	1945.73	1928.72	58.18	OSF1.50	10100.00	10080.03				MINPT-O-EOU	
	1982.31	53.61	1945.76	1928.69	58.00	OSF1.50	10130.00	10110.03				MinPt-O-ADP	
	1984.29	55.36	1946.58	1928.93	56.14	OSF1.50	10450.00	10429.13				MINPT-O-EOU	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	1984.50	55.62	1946.62	1928.88	55.87	OSF1.50	10500.00	10477.19				MinPt-O-ADP	
	2028.84	58.61	1989.04	1970.23	53.87	OSF1.50	11070.00	10799.47				MinPt-O-SF	
	2037.48	58.81	1997.56	1978.67	53.87	OSF1.50	11110.00	10800.00				MinPt-O-SF	
	2501.52	70.64	2453.95	2430.88	54.19	OSF1.50	12180.00	10800.00				MinPts	
	2516.67	90.56	2455.82	2426.11	42.33	OSF1.50	12970.00	10800.00				MinPt-CtCt	
	2517.67	95.63	2453.43	2422.04	40.07	OSF1.50	13180.00	10800.00				MINPT-O-EOU	
	2518.18	96.24	2453.54	2421.94	39.82	OSF1.50	13210.00	10800.00				MinPt-O-ADP	
	2519.93	110.04	2446.09	2409.89	34.79	OSF1.50	13700.00	10800.00				MinPt-CtCt	
	2520.61	112.04	2445.44	2408.57	34.17	OSF1.50	13790.00	10800.00				MINPT-O-EOU	
	2521.37	112.92	2445.61	2408.45	33.90	OSF1.50	13830.00	10800.00				MinPt-O-ADP	
	2521.20	118.89	2441.45	2402.30	32.18	OSF1.50	14020.00	10800.00				MinPt-CtCt	
	2520.52	138.62	2427.62	2381.90	27.54	OSF1.50	14720.00	10800.00				MinPt-CtCt	
	2503.37	176.61	2385.15	2326.76	21.42	OSF1.50	16030.00	10800.00				MinPt-CtCt	
	2496.04	191.67	2367.78	2304.37	19.67	OSF1.50	16540.00	10800.00				MinPt-CtCt	
	2491.12	211.93	2349.36	2279.19	17.74	OSF1.50	17220.00	10800.00				MinPt-CtCt	
	2491.66	213.45	2348.88	2278.21	17.62	OSF1.50	17290.00	10800.00				MINPT-O-EOU	
	2492.20	214.09	2348.99	2278.11	17.57	OSF1.50	17320.00	10800.00				MinPt-O-ADP	
	2497.83	220.99	2350.02	2276.84	17.06	OSF1.50	17530.00	10800.00				MinPt-CtCt	
	2497.02	227.45	2344.91	2269.57	16.56	OSF1.50	17750.00	10800.00				MinPt-CtCt	
	2497.14	231.63	2342.25	2265.51	16.26	OSF1.50	17890.00	10800.00				MinPt-CtCt	
	2487.01	242.12	2325.12	2244.89	15.49	OSF1.50	18250.00	10800.00				MinPt-CtCt	
	2487.16	245.12	2323.27	2242.04	15.30	OSF1.50	18350.00	10800.00				MinPt-CtCt	
	2487.78	246.97	2322.65	2240.81	15.19	OSF1.50	18430.00	10800.00				MINPT-O-EOU	
	2488.51	247.87	2322.78	2240.64	15.14	OSF1.50	18470.00	10800.00				MinPt-O-ADP	
	2513.46	263.06	2337.61	2250.40	14.40	OSF1.50	18990.00	10800.00				MINPT-O-EOU	
	2513.49	278.67	2327.24	2234.83	13.59	OSF1.50	19470.00	10800.00				MinPt-CtCt	
	2508.52	289.73	2314.88	2218.78	13.04	OSF1.50	19840.00	10800.00				MinPt-CtCt	
	2510.47	295.31	2313.12	2215.16	12.81	OSF1.50	20050.00	10800.00				MINPT-O-EOU	
	2510.27	316.97	2298.48	2193.30	11.93	OSF1.50	20745.83	10800.00				MinPts	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #4H MWD 0ft-12228ft (Surcon Corrected) (Def Survey)													Pass
	2519.26	32.81	2516.76	2486.45	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	
	2519.29	32.81	2516.75	2486.48	70273.27	MAS = 10.00 (m)	26.00	26.00				WRP	
	2519.37	32.81	2516.74	2486.56	19611.41	MAS = 10.00 (m)	60.00	60.00				MINPT-O-EOU	
	2394.85	32.81	2382.43	2362.04	242.42	MAS = 10.00 (m)	2430.00	2428.69				MinPts	
	2379.99	32.81	2364.36	2347.18	181.98	MAS = 10.00 (m)	3720.00	3711.15				MinPts	
	2380.04	32.81	2364.31	2347.23	180.55	MAS = 10.00 (m)	3760.00	3750.92				MINPT-O-EOU	
	2365.29	32.81	2346.38	2332.48	144.74	MAS = 10.00 (m)	4600.00	4586.01				MinPts	
	2365.36	32.81	2346.31	2332.55	143.52	MAS = 10.00 (m)	4640.00	4625.78				MINPT-O-EOU	
	2343.52	33.57	2320.27	2309.95	113.38	OSF1.50	5600.00	5580.28				MinPt-O-SF	
	1974.08	49.75	1939.80	1924.33	63.73	OSF1.50	9190.00	9170.03				MinPt-CtCt	
	1974.11	49.84	1939.76	1924.27	63.60	OSF1.50	9210.00	9190.03				MINPT-O-EOU	
	1974.15	49.89	1939.77	1924.26	63.54	OSF1.50	9220.00	9200.03				MinPt-O-ADP	
	1981.43	53.07	1944.93	1928.36	59.67	OSF1.50	9850.00	9830.03				MinPt-CtCt	
	1981.58	53.54	1944.78	1928.05	59.12	OSF1.50	9940.00	9920.03				MINPT-O-EOU	
	1982.17	54.38	1944.81	1927.79	58.16	OSF1.50	10100.00	10080.03				MINPT-O-EOU	
	1982.31	54.54	1944.83	1927.77	57.99	OSF1.50	10130.00	10110.03				MinPt-O-ADP	
	1984.29	56.26	1945.67	1928.03	56.15	OSF1.50	10450.00	10429.13				MINPT-O-EOU	
	1984.50	56.52	1945.71	1927.98	55.88	OSF1.50	10500.00	10477.19				MinPt-O-ADP	
	2028.84	59.51	1988.13	1969.33	53.87	OSF1.50	11070.00	10799.47				MinPt-O-SF	
	2037.48	59.72	1996.65	1977.76	53.87	OSF1.50	11110.00	10800.00				MinPt-O-SF	

Offset Trajectory	Separation			Allow	Sep.	Controlling	Reference Trajectory		Risk Level			Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
	10287.98	69.70	10240.68	10218.28	229.60	OSF1.50	20745.83	10800.00				TD	

Schlumberger

Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19 Proposal Geodetic Report

(Non-Def Plan)

CIMAREX

Report Date:	October 04, 2019 - 05:14 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex Energy	**Vertical Section Azimuth:**	359.634 ° (Grid North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Vaca Draw 20-17 Federal #61H / New Slot	**TVD Reference Datum:**	RKB
Well:	Vaca Draw 20-17 Federal #61H	**TVD Reference Elevation:**	3424.800 ft above MSL
Borehole:	Vaca Draw 20-17 Federal #61H	**Seabed / Ground Elevation:**	3398.800 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.610 °
Survey Name:	Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19	**Total Gravity Field Strength:**	998.4327mgn (9.80665 Based)
Survey Date:	September 12, 2019	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	102.395 ° / 10510.764 ft / 6.315 / 0.973	**Total Magnetic Field Strength:**	47738.783 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.707 °
Location Lat / Long:	N 32° 6' 35.03566", W 103° 35' 18.30301"	**Declination Date:**	October 04, 2019
Location Grid N/E Y/X:	N 404453.900 ftUS, E 771979.930 ftUS	**Magnetic Declination Model:**	HDGM 2019
CRS Grid Convergence Angle:	0.3960 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99997002	**Grid Convergence Used:**	0.3960 °
Version / Patch:	2.10.782.0	**Total Corr Mag North->Grid North:**	6.2142 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [330' FSL, 820' FEL]	0.00	0.00	353.72	0.00	0.00	0.00	0.00	N/A	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	100.00	0.00	89.68	100.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	200.00	0.00	89.68	200.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	300.00	0.00	89.68	300.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	400.00	0.00	89.68	400.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	500.00	0.00	89.68	500.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	600.00	0.00	89.68	600.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	700.00	0.00	89.68	700.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	800.00	0.00	89.68	800.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	900.00	0.00	89.68	900.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1000.00	0.00	89.68	1000.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
Rustler	*1001.00*	*0.00*	*89.68*	*1001.00*	*0.00*	*0.00*	*0.00*	*0.00*	*404453.90*	*771979.93*	*N 32 6 35.04*	*W 103 35 18.30*
	1100.00	0.00	89.68	1100.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1200.00	0.00	89.68	1200.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1300.00	0.00	89.68	1300.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
Top of Salt	*1341.00*	*0.00*	*89.68*	*1341.00*	*0.00*	*0.00*	*0.00*	*0.00*	*404453.90*	*771979.93*	*N 32 6 35.04*	*W 103 35 18.30*
	1400.00	0.00	89.68	1400.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1500.00	0.00	89.68	1500.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1600.00	0.00	89.68	1600.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1700.00	0.00	89.68	1700.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1800.00	0.00	89.68	1800.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	1900.00	0.00	89.68	1900.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
Nudge 2°/100' DLS	2000.00	0.00	89.68	2000.00	0.00	0.00	0.00	0.00	404453.90	771979.93	N 32 6 35.04	W 103 35 18.30
	2100.00	2.00	89.68	2099.98	0.00	0.01	1.75	2.00	404453.91	771981.68	N 32 6 35.04	W 103 35 18.28
	2200.00	4.00	89.68	2199.84	-0.01	0.04	6.98	2.00	404453.94	771986.91	N 32 6 35.04	W 103 35 18.22
	2300.00	6.00	89.68	2299.45	-0.01	0.09	15.69	2.00	404453.99	771995.62	N 32 6 35.04	W 103 35 18.12
Hold Nudge	2309.88	6.20	89.68	2309.27	-0.01	0.09	16.74	2.00	404453.99	771996.67	N 32 6 35.04	W 103 35 18.11

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2400.00	6.20	89.68	2398.87	-0.02	0.15	26.47	0.00	404454.05	772006.40	N 32 6 35.04	W 103 35 18.00
	2500.00	6.20	89.68	2498.28	-0.03	0.21	37.27	0.00	404454.11	772017.20	N 32 6 35.04	W 103 35 17.87
	2600.00	6.20	89.68	2597.70	-0.04	0.27	48.06	0.00	404454.17	772027.99	N 32 6 35.04	W 103 35 17.74
	2700.00	6.20	89.68	2697.12	-0.05	0.33	58.86	0.00	404454.23	772038.79	N 32 6 35.03	W 103 35 17.62
	2800.00	6.20	89.68	2796.53	-0.05	0.39	69.65	0.00	404454.29	772049.58	N 32 6 35.03	W 103 35 17.49
	2900.00	6.20	89.68	2895.95	-0.06	0.45	80.45	0.00	404454.35	772060.38	N 32 6 35.03	W 103 35 17.37
	3000.00	6.20	89.68	2995.36	-0.07	0.51	91.24	0.00	404454.41	772071.17	N 32 6 35.03	W 103 35 17.24
	3100.00	6.20	89.68	3094.78	-0.08	0.57	102.04	0.00	404454.47	772081.97	N 32 6 35.03	W 103 35 17.12
	3200.00	6.20	89.68	3194.19	-0.09	0.63	112.84	0.00	404454.53	772092.76	N 32 6 35.03	W 103 35 16.99
	3300.00	6.20	89.68	3293.61	-0.09	0.69	123.63	0.00	404454.59	772103.56	N 32 6 35.03	W 103 35 16.87
	3400.00	6.20	89.68	3393.03	-0.10	0.76	134.43	0.00	404454.66	772114.35	N 32 6 35.03	W 103 35 16.74
	3500.00	6.20	89.68	3492.44	-0.11	0.82	145.22	0.00	404454.72	772125.15	N 32 6 35.03	W 103 35 16.61
	3600.00	6.20	89.68	3591.86	-0.12	0.88	156.02	0.00	404454.78	772135.94	N 32 6 35.03	W 103 35 16.49
	3700.00	6.20	89.68	3691.27	-0.13	0.94	166.81	0.00	404454.84	772146.74	N 32 6 35.03	W 103 35 16.36
	3800.00	6.20	89.68	3790.69	-0.14	1.00	177.61	0.00	404454.90	772157.53	N 32 6 35.03	W 103 35 16.24
	3900.00	6.20	89.68	3890.10	-0.14	1.06	188.40	0.00	404454.96	772168.33	N 32 6 35.03	W 103 35 16.11
	4000.00	6.20	89.68	3989.52	-0.15	1.12	199.20	0.00	404455.02	772179.12	N 32 6 35.03	W 103 35 15.99
	4100.00	6.20	89.68	4088.93	-0.16	1.18	209.99	0.00	404455.08	772189.92	N 32 6 35.03	W 103 35 15.86
	4200.00	6.20	89.68	4188.35	-0.17	1.24	220.79	0.00	404455.14	772200.71	N 32 6 35.03	W 103 35 15.74
	4300.00	6.20	89.68	4287.77	-0.18	1.30	231.58	0.00	404455.20	772211.51	N 32 6 35.03	W 103 35 15.61
	4400.00	6.20	89.68	4387.18	-0.19	1.36	242.38	0.00	404455.26	772222.30	N 32 6 35.03	W 103 35 15.49
	4500.00	6.20	89.68	4486.60	-0.19	1.42	253.18	0.00	404455.32	772233.10	N 32 6 35.03	W 103 35 15.36
	4600.00	6.20	89.68	4586.01	-0.20	1.48	263.97	0.00	404455.38	772243.89	N 32 6 35.03	W 103 35 15.23
	4700.00	6.20	89.68	4685.43	-0.21	1.54	274.77	0.00	404455.44	772254.69	N 32 6 35.03	W 103 35 15.11
	4800.00	6.20	89.68	4784.84	-0.22	1.60	285.56	0.00	404455.50	772265.48	N 32 6 35.03	W 103 35 14.98
	4900.00	6.20	89.68	4884.26	-0.23	1.67	296.36	0.00	404455.57	772276.28	N 32 6 35.03	W 103 35 14.86
Base of Salt	*4915.83*	*6.20*	*89.68*	*4900.00*	*-0.23*	*1.68*	*298.07*	*0.00*	*404455.58*	*772277.99*	*N 32 6 35.03*	*W 103 35 14.84*
Lamar	*4951.04*	*6.20*	*89.68*	*4935.00*	*-0.23*	*1.70*	*301.87*	*0.00*	*404455.60*	*772281.79*	*N 32 6 35.03*	*W 103 35 14.79*
Bell Canyon	*4986.25*	*6.20*	*89.68*	*4970.00*	*-0.23*	*1.72*	*305.67*	*0.00*	*404455.62*	*772285.59*	*N 32 6 35.03*	*W 103 35 14.75*
	5000.00	6.20	89.68	4983.67	-0.24	1.73	307.15	0.00	404455.63	772287.07	N 32 6 35.03	W 103 35 14.73
	5100.00	6.20	89.68	5083.09	-0.24	1.79	317.95	0.00	404455.69	772297.87	N 32 6 35.03	W 103 35 14.61
	5200.00	6.20	89.68	5182.51	-0.25	1.85	328.74	0.00	404455.75	772308.66	N 32 6 35.03	W 103 35 14.48
	5300.00	6.20	89.68	5281.92	-0.26	1.91	339.54	0.00	404455.81	772319.46	N 32 6 35.03	W 103 35 14.36
	5400.00	6.20	89.68	5381.34	-0.27	1.97	350.33	0.00	404455.87	772330.25	N 32 6 35.03	W 103 35 14.23
	5500.00	6.20	89.68	5480.75	-0.28	2.03	361.13	0.00	404455.93	772341.05	N 32 6 35.03	W 103 35 14.10
Drop to Vertical 2°/100' DLS	5519.36	6.20	89.68	5500.00	-0.28	2.04	363.22	0.00	404455.94	772343.14	N 32 6 35.03	W 103 35 14.08
	5600.00	4.58	89.68	5580.28	-0.28	2.08	370.80	2.00	404455.98	772350.71	N 32 6 35.03	W 103 35 13.99
	5700.00	2.58	89.68	5680.08	-0.29	2.12	377.05	2.00	404456.02	772356.97	N 32 6 35.03	W 103 35 13.92
	5800.00	0.58	89.68	5780.04	-0.29	2.13	379.81	2.00	404456.03	772359.73	N 32 6 35.03	W 103 35 13.89
Hold	5829.24	0.00	89.68	5809.27	-0.29	2.14	379.96	2.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	5900.00	0.00	89.68	5880.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6000.00	0.00	89.68	5980.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
Cherry Canyon	*6067.97*	*0.00*	*89.68*	*6048.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	6100.00	0.00	89.68	6080.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6200.00	0.00	89.68	6180.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6300.00	0.00	89.68	6280.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6400.00	0.00	89.68	6380.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6500.00	0.00	89.68	6480.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6600.00	0.00	89.68	6580.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6700.00	0.00	89.68	6680.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6800.00	0.00	89.68	6780.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	6900.00	0.00	89.68	6880.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7000.00	0.00	89.68	6980.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7100.00	0.00	89.68	7080.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7200.00	0.00	89.68	7180.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7300.00	0.00	89.68	7280.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7400.00	0.00	89.68	7380.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7500.00	0.00	89.68	7480.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Brushy Canyon	*7544.97*	*0.00*	*89.68*	*7525.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	7600.00	0.00	89.68	7580.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7700.00	0.00	89.68	7680.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7800.00	0.00	89.68	7780.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	7900.00	0.00	89.68	7880.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8000.00	0.00	89.68	7980.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8100.00	0.00	89.68	8080.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8200.00	0.00	89.68	8180.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8300.00	0.00	89.68	8280.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8400.00	0.00	89.68	8380.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8500.00	0.00	89.68	8480.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8600.00	0.00	89.68	8580.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8700.00	0.00	89.68	8680.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8800.00	0.00	89.68	8780.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	8900.00	0.00	89.68	8880.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9000.00	0.00	89.68	8980.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9100.00	0.00	89.68	9080.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
Bone Spring Lime	*9133.97*	*0.00*	*89.68*	*9114.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
Leonard Shale	*9169.97*	*0.00*	*89.68*	*9150.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	9200.00	0.00	89.68	9180.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9300.00	0.00	89.68	9280.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
Avalon Shale	*9378.97*	*0.00*	*89.68*	*9359.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	9400.00	0.00	89.68	9380.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9500.00	0.00	89.68	9480.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9600.00	0.00	89.68	9580.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9700.00	0.00	89.68	9680.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9800.00	0.00	89.68	9780.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	9900.00	0.00	89.68	9880.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	10000.00	0.00	89.68	9980.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	10100.00	0.00	89.68	10080.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
1st Bone Spring Sand	*10103.97*	*0.00*	*89.68*	*10084.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	10200.00	0.00	89.68	10180.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
2nd Bone Spring Carb	*10291.97*	*0.00*	*89.68*	*10272.00*	*-0.29*	*2.14*	*379.96*	*0.00*	*404456.04*	*772359.88*	*N 32 6 35.03*	*W 103 35 13.89*
	10300.00	0.00	89.68	10280.03	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
KOP - Build 12°/100' DLS	10342.50	0.00	89.68	10322.54	-0.29	2.14	379.96	0.00	404456.04	772359.88	N 32 6 35.03	W 103 35 13.89
	10400.00	6.90	359.63	10379.90	3.17	5.59	379.94	12.00	404459.49	772359.86	N 32 6 35.06	W 103 35 13.89
	10500.00	18.90	359.63	10477.19	25.45	27.88	379.80	12.00	404481.78	772359.72	N 32 6 35.29	W 103 35 13.89
	10600.00	30.90	359.63	10567.73	67.48	69.90	379.53	12.00	404523.80	772359.45	N 32 6 35.70	W 103 35 13.89
2nd Bone Spring Sand	*10687.12*	*41.35*	*359.63*	*10638.00*	*118.77*	*121.19*	*379.20*	*12.00*	*404575.09*	*772359.12*	*N 32 6 36.21*	*W 103 35 13.88*
	10700.00	42.90	359.63	10647.56	127.41	129.83	379.15	12.00	404583.73	772359.06	N 32 6 36.29	W 103 35 13.88
	10800.00	54.90	359.63	10713.17	202.63	205.05	378.67	12.00	404658.94	772358.58	N 32 6 37.04	W 103 35 13.88
	10900.00	66.90	359.63	10761.72	289.85	292.27	378.11	12.00	404746.16	772358.03	N 32 6 37.90	W 103 35 13.88
	11000.00	78.90	359.63	10791.07	385.25	387.67	377.50	12.00	404841.56	772357.42	N 32 6 38.85	W 103 35 13.88
Landing Point	11092.50	90.00	359.63	10800.00	477.17	479.59	376.91	12.00	404933.48	772356.83	N 32 6 39.76	W 103 35 13.88
	11100.00	90.00	359.63	10800.00	484.67	487.09	376.86	0.00	404940.97	772356.78	N 32 6 39.83	W 103 35 13.88
	11200.00	90.00	359.63	10800.00	584.67	587.09	376.23	0.00	405040.97	772356.14	N 32 6 40.82	W 103 35 13.88
	11300.00	90.00	359.63	10800.00	684.67	687.09	375.59	0.00	405140.96	772355.51	N 32 6 41.81	W 103 35 13.88
	11400.00	90.00	359.63	10800.00	784.67	787.08	374.95	0.00	405240.96	772354.87	N 32 6 42.80	W 103 35 13.88
	11500.00	90.00	359.63	10800.00	884.67	887.08	374.31	0.00	405340.95	772354.23	N 32 6 43.79	W 103 35 13.88
	11600.00	90.00	359.63	10800.00	984.67	987.08	373.67	0.00	405440.95	772353.59	N 32 6 44.78	W 103 35 13.88
	11700.00	90.00	359.63	10800.00	1084.67	1087.08	373.03	0.00	405540.94	772352.95	N 32 6 45.77	W 103 35 13.88
	11800.00	90.00	359.63	10800.00	1184.67	1187.08	372.39	0.00	405640.94	772352.31	N 32 6 46.76	W 103 35 13.88
	11900.00	90.00	359.63	10800.00	1284.67	1287.07	371.75	0.00	405740.93	772351.67	N 32 6 47.75	W 103 35 13.88
	12000.00	90.00	359.63	10800.00	1384.67	1387.07	371.12	0.00	405840.93	772351.03	N 32 6 48.74	W 103 35 13.88

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	12100.00	90.00	359.63	10800.00	1484.67	1487.07	370.48	0.00	405940.92	772350.40	N 32 6 49.72	W 103 35 13.88
	12200.00	90.00	359.63	10800.00	1584.67	1587.07	369.84	0.00	406040.92	772349.76	N 32 6 50.71	W 103 35 13.88
	12300.00	90.00	359.63	10800.00	1684.67	1687.07	369.20	0.00	406140.91	772349.12	N 32 6 51.70	W 103 35 13.87
	12400.00	90.00	359.63	10800.00	1784.67	1787.06	368.56	0.00	406240.91	772348.48	N 32 6 52.69	W 103 35 13.87
	12500.00	90.00	359.63	10800.00	1884.67	1887.06	367.92	0.00	406340.90	772347.84	N 32 6 53.68	W 103 35 13.87
	12600.00	90.00	359.63	10800.00	1984.67	1987.06	367.28	0.00	406440.90	772347.20	N 32 6 54.67	W 103 35 13.87
	12700.00	90.00	359.63	10800.00	2084.67	2087.06	366.64	0.00	406540.89	772346.56	N 32 6 55.66	W 103 35 13.87
	12800.00	90.00	359.63	10800.00	2184.67	2187.06	366.01	0.00	406640.89	772345.92	N 32 6 56.65	W 103 35 13.87
	12900.00	90.00	359.63	10800.00	2284.67	2287.05	365.37	0.00	406740.88	772345.29	N 32 6 57.64	W 103 35 13.87
	13000.00	90.00	359.63	10800.00	2384.67	2387.05	364.73	0.00	406840.87	772344.65	N 32 6 58.63	W 103 35 13.87
	13100.00	90.00	359.63	10800.00	2484.67	2487.05	364.09	0.00	406940.87	772344.01	N 32 6 59.62	W 103 35 13.87
	13200.00	90.00	359.63	10800.00	2584.67	2587.05	363.45	0.00	407040.86	772343.37	N 32 7 0.61	W 103 35 13.87
	13300.00	90.00	359.63	10800.00	2684.67	2687.05	362.81	0.00	407140.86	772342.73	N 32 7 1.60	W 103 35 13.87
	13400.00	90.00	359.63	10800.00	2784.67	2787.04	362.17	0.00	407240.85	772342.09	N 32 7 2.59	W 103 35 13.87
	13500.00	90.00	359.63	10800.00	2884.67	2887.04	361.53	0.00	407340.85	772341.45	N 32 7 3.58	W 103 35 13.87
	13600.00	90.00	359.63	10800.00	2984.67	2987.04	360.90	0.00	407440.84	772340.81	N 32 7 4.57	W 103 35 13.87
	13700.00	90.00	359.63	10800.00	3084.67	3087.04	360.26	0.00	407540.84	772340.18	N 32 7 5.56	W 103 35 13.87
	13800.00	90.00	359.63	10800.00	3184.67	3187.03	359.62	0.00	407640.83	772339.54	N 32 7 6.55	W 103 35 13.87
	13900.00	90.00	359.63	10800.00	3284.67	3287.03	358.98	0.00	407740.83	772338.90	N 32 7 7.54	W 103 35 13.86
	14000.00	90.00	359.63	10800.00	3384.67	3387.03	358.34	0.00	407840.82	772338.26	N 32 7 8.53	W 103 35 13.86
	14100.00	90.00	359.63	10800.00	3484.67	3487.03	357.70	0.00	407940.82	772337.62	N 32 7 9.52	W 103 35 13.86
	14200.00	90.00	359.63	10800.00	3584.67	3587.03	357.06	0.00	408040.81	772336.98	N 32 7 10.51	W 103 35 13.86
	14300.00	90.00	359.63	10800.00	3684.67	3687.02	356.42	0.00	408140.81	772336.34	N 32 7 11.49	W 103 35 13.86
	14400.00	90.00	359.63	10800.00	3784.67	3787.02	355.79	0.00	408240.80	772335.70	N 32 7 12.48	W 103 35 13.86
	14500.00	90.00	359.63	10800.00	3884.67	3887.02	355.15	0.00	408340.80	772335.07	N 32 7 13.47	W 103 35 13.86
	14600.00	90.00	359.63	10800.00	3984.67	3987.02	354.51	0.00	408440.79	772334.43	N 32 7 14.46	W 103 35 13.86
	14700.00	90.00	359.63	10800.00	4084.67	4087.02	353.87	0.00	408540.79	772333.79	N 32 7 15.45	W 103 35 13.86
	14800.00	90.00	359.63	10800.00	4184.67	4187.01	353.23	0.00	408640.78	772333.15	N 32 7 16.44	W 103 35 13.86
	14900.00	90.00	359.63	10800.00	4284.67	4287.01	352.59	0.00	408740.78	772332.51	N 32 7 17.43	W 103 35 13.86
	15000.00	90.00	359.63	10800.00	4384.67	4387.01	351.95	0.00	408840.77	772331.87	N 32 7 18.42	W 103 35 13.86
	15100.00	90.00	359.63	10800.00	4484.67	4487.01	351.31	0.00	408940.76	772331.23	N 32 7 19.41	W 103 35 13.86
	15200.00	90.00	359.63	10800.00	4584.67	4587.01	350.68	0.00	409040.76	772330.59	N 32 7 20.40	W 103 35 13.86
	15300.00	90.00	359.63	10800.00	4684.67	4687.00	350.04	0.00	409140.75	772329.96	N 32 7 21.39	W 103 35 13.86
	15400.00	90.00	359.63	10800.00	4784.67	4787.00	349.40	0.00	409240.75	772329.32	N 32 7 22.38	W 103 35 13.86
	15500.00	90.00	359.63	10800.00	4884.67	4887.00	348.76	0.00	409340.74	772328.68	N 32 7 23.37	W 103 35 13.86
	15600.00	90.00	359.63	10800.00	4984.67	4987.00	348.12	0.00	409440.74	772328.04	N 32 7 24.36	W 103 35 13.85
	15700.00	90.00	359.63	10800.00	5084.67	5087.00	347.48	0.00	409540.73	772327.40	N 32 7 25.35	W 103 35 13.85
	15800.00	90.00	359.63	10800.00	5184.67	5186.99	346.84	0.00	409640.73	772326.76	N 32 7 26.34	W 103 35 13.85
	15900.00	90.00	359.63	10800.00	5284.67	5286.99	346.20	0.00	409740.72	772326.12	N 32 7 27.33	W 103 35 13.85
	16000.00	90.00	359.63	10800.00	5384.67	5386.99	345.57	0.00	409840.72	772325.48	N 32 7 28.32	W 103 35 13.85
	16100.00	90.00	359.63	10800.00	5484.67	5486.99	344.93	0.00	409940.71	772324.85	N 32 7 29.31	W 103 35 13.85
	16200.00	90.00	359.63	10800.00	5584.67	5586.99	344.29	0.00	410040.71	772324.21	N 32 7 30.30	W 103 35 13.85
	16300.00	90.00	359.63	10800.00	5684.67	5686.98	343.65	0.00	410140.70	772323.57	N 32 7 31.29	W 103 35 13.85
	16400.00	90.00	359.63	10800.00	5784.67	5786.98	343.01	0.00	410240.70	772322.93	N 32 7 32.27	W 103 35 13.85
	16500.00	90.00	359.63	10800.00	5884.67	5886.98	342.37	0.00	410340.69	772322.29	N 32 7 33.26	W 103 35 13.85
	16600.00	90.00	359.63	10800.00	5984.67	5986.98	341.73	0.00	410440.69	772321.65	N 32 7 34.25	W 103 35 13.85
	16700.00	90.00	359.63	10800.00	6084.67	6086.98	341.09	0.00	410540.68	772321.01	N 32 7 35.24	W 103 35 13.85
	16800.00	90.00	359.63	10800.00	6184.67	6186.97	340.45	0.00	410640.68	772320.37	N 32 7 36.23	W 103 35 13.85
	16900.00	90.00	359.63	10800.00	6284.67	6286.97	339.82	0.00	410740.67	772319.74	N 32 7 37.22	W 103 35 13.85
	17000.00	90.00	359.63	10800.00	6384.67	6386.97	339.18	0.00	410840.67	772319.10	N 32 7 38.21	W 103 35 13.85
	17100.00	90.00	359.63	10800.00	6484.67	6486.97	338.54	0.00	410940.66	772318.46	N 32 7 39.20	W 103 35 13.84
	17200.00	90.00	359.63	10800.00	6584.67	6586.97	337.90	0.00	411040.65	772317.82	N 32 7 40.19	W 103 35 13.84
	17300.00	90.00	359.63	10800.00	6684.67	6686.96	337.26	0.00	411140.65	772317.18	N 32 7 41.18	W 103 35 13.84
	17400.00	90.00	359.63	10800.00	6784.67	6786.96	336.62	0.00	411240.64	772316.54	N 32 7 42.17	W 103 35 13.84
	17500.00	90.00	359.63	10800.00	6884.67	6886.96	335.98	0.00	411340.64	772315.90	N 32 7 43.16	W 103 35 13.84
	17600.00	90.00	359.63	10800.00	6984.67	6986.96	335.34	0.00	411440.63	772315.26	N 32 7 44.15	W 103 35 13.84
	17700.00	90.00	359.63	10800.00	7084.67	7086.96	334.71	0.00	411540.63	772314.63	N 32 7 45.14	W 103 35 13.84
	17800.00	90.00	359.63	10800.00	7184.67	7186.95	334.07	0.00	411640.62	772313.99	N 32 7 46.13	W 103 35 13.84
	17900.00	90.00	359.63	10800.00	7284.67	7286.95	333.43	0.00	411740.62	772313.35	N 32 7 47.12	W 103 35 13.84

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	18000.00	90.00	359.63	10800.00	7384.67	7386.95	332.79	0.00	411840.61	772312.71	N 32 7 48.11	W 103 35 13.84
	18100.00	90.00	359.63	10800.00	7484.67	7486.95	332.15	0.00	411940.61	772312.07	N 32 7 49.10	W 103 35 13.84
	18200.00	90.00	359.63	10800.00	7584.67	7586.95	331.51	0.00	412040.60	772311.43	N 32 7 50.09	W 103 35 13.84
	18300.00	90.00	359.63	10800.00	7684.67	7686.94	330.87	0.00	412140.60	772310.79	N 32 7 51.08	W 103 35 13.84
	18400.00	90.00	359.63	10800.00	7784.67	7786.94	330.23	0.00	412240.59	772310.15	N 32 7 52.07	W 103 35 13.84
	18500.00	90.00	359.63	10800.00	7884.67	7886.94	329.60	0.00	412340.59	772309.52	N 32 7 53.05	W 103 35 13.84
	18600.00	90.00	359.63	10800.00	7984.67	7986.94	328.96	0.00	412440.58	772308.88	N 32 7 54.04	W 103 35 13.84
	18700.00	90.00	359.63	10800.00	8084.67	8086.94	328.32	0.00	412540.58	772308.24	N 32 7 55.03	W 103 35 13.83
	18800.00	90.00	359.63	10800.00	8184.67	8186.93	327.68	0.00	412640.57	772307.60	N 32 7 56.02	W 103 35 13.83
	18900.00	90.00	359.63	10800.00	8284.67	8286.93	327.04	0.00	412740.57	772306.96	N 32 7 57.01	W 103 35 13.83
	19000.00	90.00	359.63	10800.00	8384.67	8386.93	326.40	0.00	412840.56	772306.32	N 32 7 58.00	W 103 35 13.83
	19100.00	90.00	359.63	10800.00	8484.67	8486.93	325.76	0.00	412940.56	772305.68	N 32 7 58.99	W 103 35 13.83
	19200.00	90.00	359.63	10800.00	8584.67	8586.92	325.12	0.00	413040.55	772305.04	N 32 7 59.98	W 103 35 13.83
	19300.00	90.00	359.63	10800.00	8684.67	8686.92	324.49	0.00	413140.54	772304.41	N 32 8 0.97	W 103 35 13.83
	19400.00	90.00	359.63	10800.00	8784.67	8786.92	323.85	0.00	413240.54	772303.77	N 32 8 1.96	W 103 35 13.83
	19500.00	90.00	359.63	10800.00	8884.67	8886.92	323.21	0.00	413340.53	772303.13	N 32 8 2.95	W 103 35 13.83
	19600.00	90.00	359.63	10800.00	8984.67	8986.92	322.57	0.00	413440.53	772302.49	N 32 8 3.94	W 103 35 13.83
	19700.00	90.00	359.63	10800.00	9084.67	9086.91	321.93	0.00	413540.52	772301.85	N 32 8 4.93	W 103 35 13.83
	19800.00	90.00	359.63	10800.00	9184.67	9186.91	321.29	0.00	413640.52	772301.21	N 32 8 5.92	W 103 35 13.83
	19900.00	90.00	359.63	10800.00	9284.67	9286.91	320.65	0.00	413740.51	772300.57	N 32 8 6.91	W 103 35 13.83
	20000.00	90.00	359.63	10800.00	9384.67	9386.91	320.01	0.00	413840.51	772299.93	N 32 8 7.90	W 103 35 13.83
	20100.00	90.00	359.63	10800.00	9484.67	9486.91	319.38	0.00	413940.50	772299.30	N 32 8 8.89	W 103 35 13.83
	20200.00	90.00	359.63	10800.00	9584.67	9586.90	318.74	0.00	414040.50	772298.66	N 32 8 9.88	W 103 35 13.83
	20300.00	90.00	359.63	10800.00	9684.67	9686.90	318.10	0.00	414140.49	772298.02	N 32 8 10.87	W 103 35 13.82
	20400.00	90.00	359.63	10800.00	9784.67	9786.90	317.46	0.00	414240.49	772297.38	N 32 8 11.86	W 103 35 13.82
	20500.00	90.00	359.63	10800.00	9884.67	9886.90	316.82	0.00	414340.48	772296.74	N 32 8 12.85	W 103 35 13.82
	20600.00	90.00	359.63	10800.00	9984.67	9986.90	316.18	0.00	414440.48	772296.10	N 32 8 13.84	W 103 35 13.82
	20700.00	90.00	359.63	10800.00	10084.67	10086.89	315.54	0.00	414540.47	772295.46	N 32 8 14.82	W 103 35 13.82
Cimarex Vaca Draw 20-17 Federal #61H - PBHL [100' FNL, 440' FEL]	20745.83	90.00	359.63	10800.00	10130.50	10132.72	315.25	0.00	414586.30	772295.17	N 32 8 15.28	W 103 35 13.82

Survey Type: Non-Def Plan

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

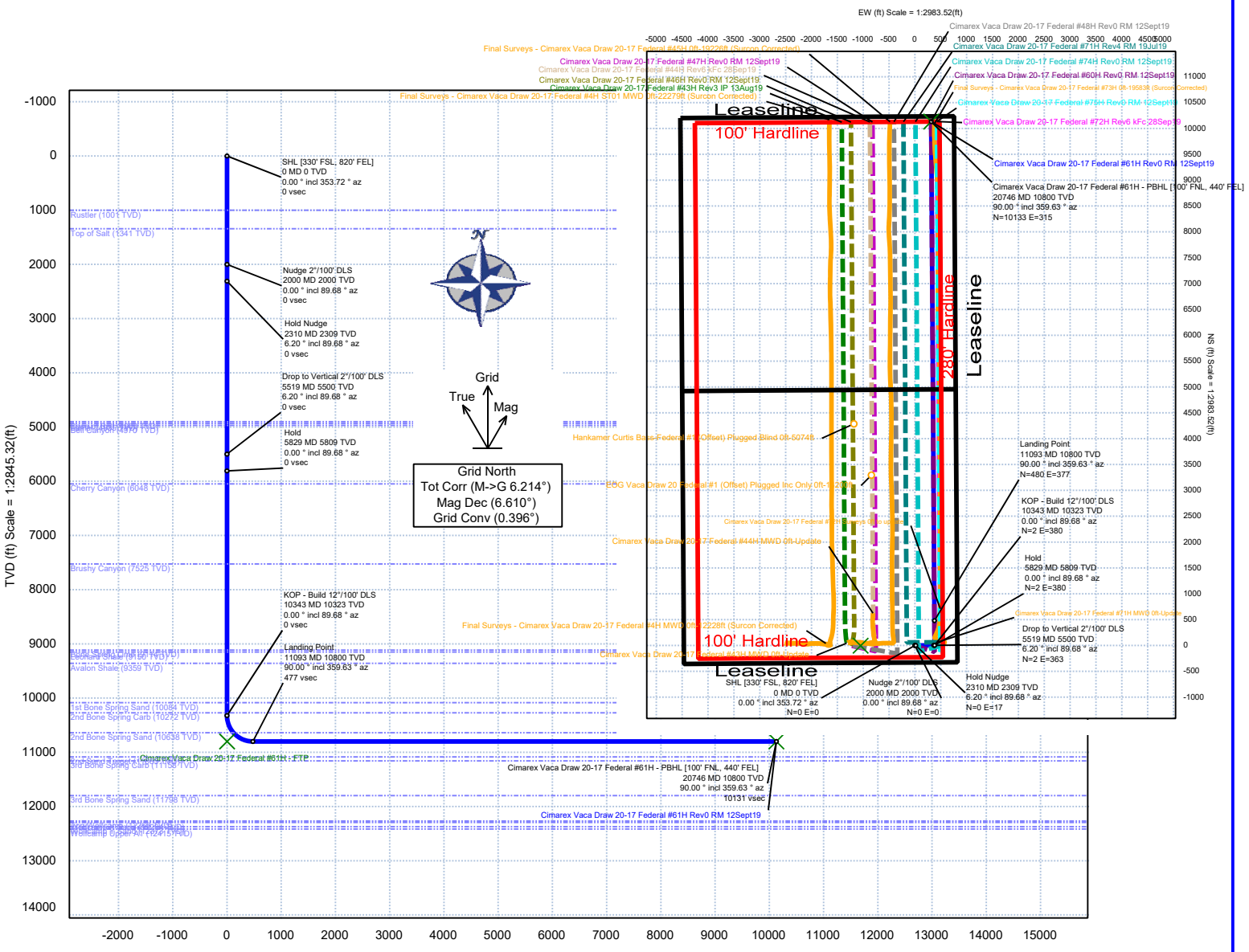
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Vaca Draw 20-17 Federal #61H / Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM
	1	26.000	20745.831	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Vaca Draw 20-17 Federal #61H / Cimarex Vaca Draw 20-17

Cimarex Energy Rev 0

Borehole:	Well:	Field:	Structure:
Vaca Draw 20-17 Federal #61H	Vaca Draw 20-17 Federal #61H	NM Lea County (NAD 83)	Cimarex Vaca Draw 20-17 Federal #61H

Gravity & Magnetic Parameters						Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet					Miscellaneous			
Model:	HDGM 2019	Dip:	59.707°	Date:	04-Oct-2019	Lat:	N 32 6 35.04	Northing:	404453.9ftUS	Grid Conv:	0.396°	Slot:	New Slot	TVD Ref:	RKB(3424.8ft above MSL)
MagDec:	6.61°	FS:	47738.783nT	Gravity FS:	998.433mgn (9.80665 Based)	Lon:	W 103 35 18.30	Easting:	771979.93ftUS	Scale Fact:	0.99997002	Plan:	Cimarex Vaca Draw 20-17 Federal #61H Rev0 RM 12Sept19		

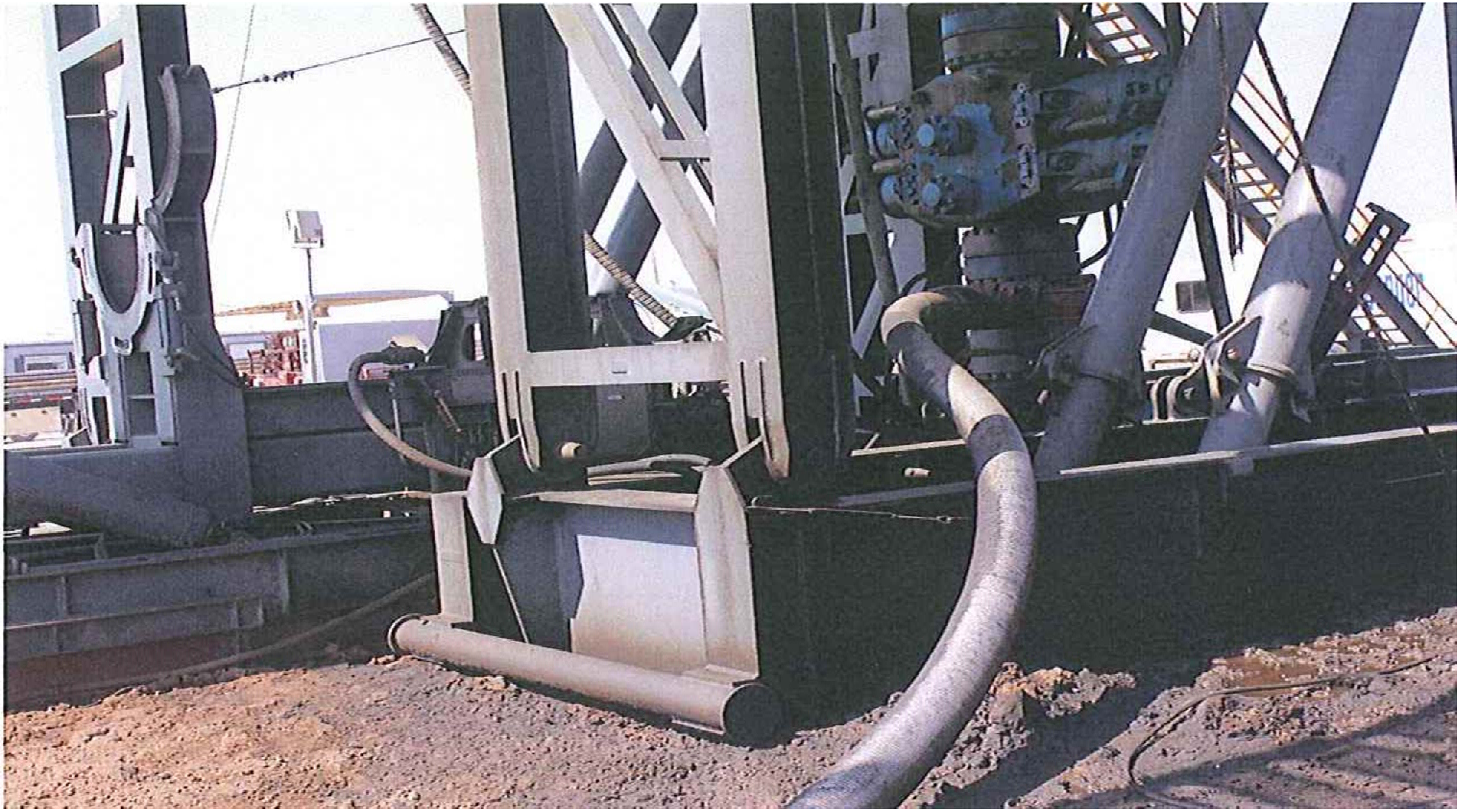


Vertical Section (ft) Azim = 359.63° Scale = 1:2845.32(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [330' FSL, 820' FEL]	0.00	0.00	353.72	0.00	0.00	0.00	0.00	
Rustler	1001.00	0.00	89.68	1001.00	0.00	0.00	0.00	0.00
Top of Salt	1341.00	0.00	89.68	1341.00	0.00	0.00	0.00	0.00
Nudge 2°/100' DLS	2000.00	0.00	89.68	2000.00	0.00	0.00	0.00	0.00
Hold Nudge	2309.88	6.20	89.68	2309.27	-0.01	0.09	16.74	2.00
Base of Salt	4915.83	6.20	89.68	4900.00	-0.23	1.68	298.07	0.00
Lamar	4951.04	6.20	89.68	4935.00	-0.23	1.70	301.87	0.00
Bell Canyon	4986.25	6.20	89.68	4970.00	-0.23	1.72	305.67	0.00
Drop to Vertical 2°/100' DLS	5519.36	6.20	89.68	5500.00	-0.28	2.04	363.22	0.00
Hold	5829.24	0.00	89.68	5809.27	-0.29	2.14	379.96	2.00
Cherry Canyon	6067.97	0.00	89.68	6048.00	-0.29	2.14	379.96	0.00
Brushy Canyon	7544.97	0.00	89.68	7525.00	-0.29	2.14	379.96	0.00
Bone Spring Lime	9133.97	0.00	89.68	9114.00	-0.29	2.14	379.96	0.00
Leonard Shale	9169.97	0.00	89.68	9150.00	-0.29	2.14	379.96	0.00
Avalon Shale	9378.97	0.00	89.68	9359.00	-0.29	2.14	379.96	0.00
1st Bone Spring Sand	10103.97	0.00	89.68	10084.00	-0.29	2.14	379.96	0.00
2nd Bone Spring Carb	10291.97	0.00	89.68	10272.00	-0.29	2.14	379.96	0.00
KOP - Build 12°/100' DLS	10342.50	0.00	89.68	10322.54	-0.29	2.14	379.96	0.00
2nd Bone Spring Sand	10687.12	41.35	359.63	10638.00	118.77	121.19	379.20	12.00
Landing Point	11092.50	90.00	359.63	10800.00	477.17	479.59	376.91	12.00
Cimarex Vaca Draw 20-17 Federal #61H - PBHL [100' FNL, 440' FEL]	20745.83	90.00	359.63	10800.00	10130.50	10132.72	315.25	0.00
3rd Bone Spring Carb	NaN			11158.00				
3rd Bone Spring Sand	NaN			11798.00				
Wolfcamp X Sand	NaN			12294.00				
Wolfcamp Upper A1	NaN			12415.00				
2nd Sand Target	NaN			11085.00				
Top Wolfcamp	NaN			12269.00				
Wolfcamp Y Sand	NaN			12373.00				

Co-Flex Hose
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM



Co-
Flex Hose Hydrostatic Test
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Midwest Hose & Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT

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

HOSE SPECIFICATIONS

Type: Stainless Steel Armor Choke & Kill Hose	Hose Length: 45'ft.
I.D. 4 *INCHES*	O.D. 9 *INCHES*

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

COUPLINGS

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

PROCEDURE

Hose assembly pressure tested with water at ambient temperature.

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

Hose Assembly Serial Number:	Hose Serial Number:
79793	OKC

Comments:

Date:	Tested:	Approved:
3/8/2011	A. Jaime Jaime	

Midwest Hose & Specialty, Inc.

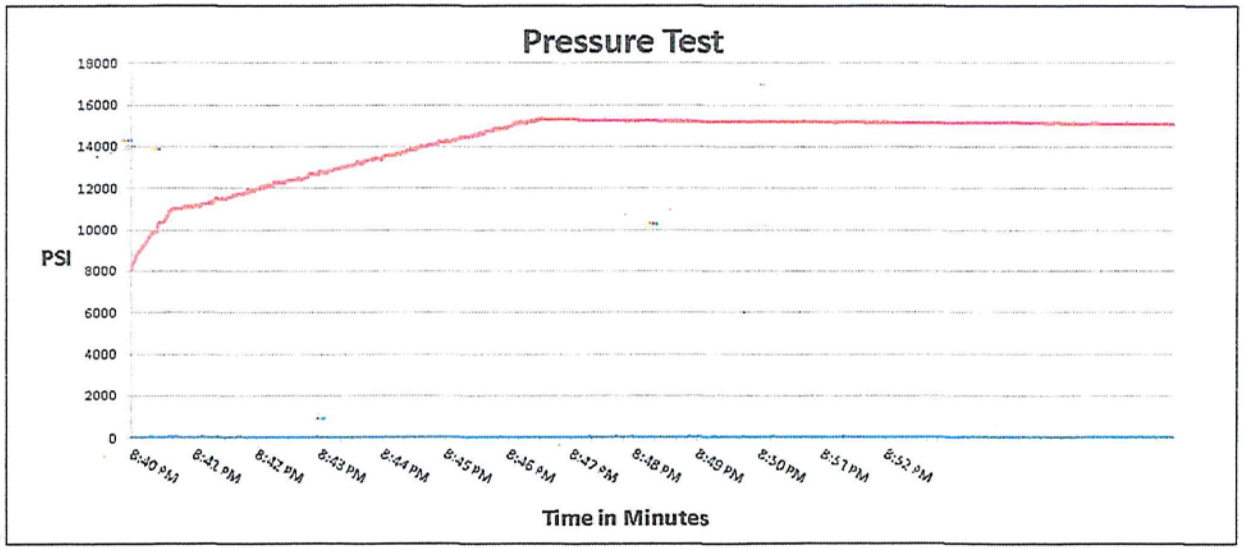
Internal Hydrostatic Test Graph

March 3, 2011

Customer: Houston

Pick Ticket #: 94260

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



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

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

Tested By: *Zac Mcconnell*

Approved By: *Kim Thomas*

Co-
Flex Hose Hydrostatic Test
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Co-Flex Hose
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer:	PO
DEM	ODYD-271

SPECIFICATIONS

Sales Order	Dated:
79793	3/8/2011

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

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

Comments:

Approved:	Date:
Jamal Garcia	3/8/2011

Midwest Hose & Specialty, Inc.

Co-Flex Hose
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Specification Sheet
Choke & Kill Hose

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

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

P.O. Box 96558 – 1421 S.E. 29th St. Oklahoma City, OK 73143 * (405) 670-6718 * Fax: (405) 670-6816

1. Geological Formations

TVD of target 10,800 Pilot Hole TD N/A
MD at TD 20,745 Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	935	N/A	
Top of Salt	1298	N/A	
Base of Salt	4714	N/A	
Lamar	4909	N/A	
Bell Canyon	4937	N/A	
Cherry Canyon	5990	N/A	
Brushy Canyon	7536	N/A	
Bone Spring	9032	N/A	
Leonard Shale	9087	N/A	
Avalon Shale	9312	N/A	
1st Bone Spring Sand	10011	N/A	
2nd Bone Spring Carb	10223	N/A	
2nd Bone Spring Sand	10583	N/A	
3rd Bone Spring Carb	11071	N/A	
3rd Bone Spring Sand	11722	N/A	
Wolfcamp	12189	N/A	
Wolfcamp Y Sand	12302	N/A	
Wolfcamp A1 Shale	12341	N/A	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	985	985	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.64	3.84	6.81
12 1/4	0	4814	4814	9-5/8"	40.00	J-55	LT&C	1.35	1.55	2.70
8 3/4	0	10250	10250	5-1/2"	17.00	L-80	LT&C	1.31	1.61	1.84
8 3/4	9173	20745	10800	5-1/2"	17.00	L-80	BT&C	1.24	1.53	42.46
						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?	N

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	415	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	914	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	282	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	496	10.30	3.64	22.18		Lead: Tuned Light + LCM
	2527	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	4600	25

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

4. Pressure Control Equipment

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

BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram	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 985'	FW Spud Mud	8.30 - 8.80	30-32	N/C
985' to 4814'	Brine Water	9.70 - 10.20	30-32	N/C
4814' to 20745'	Cut Brine or OBM	8.50 - 9.00	27-70	N/C

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

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

6. Logging and Testing Procedures

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

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	5054 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 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

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

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

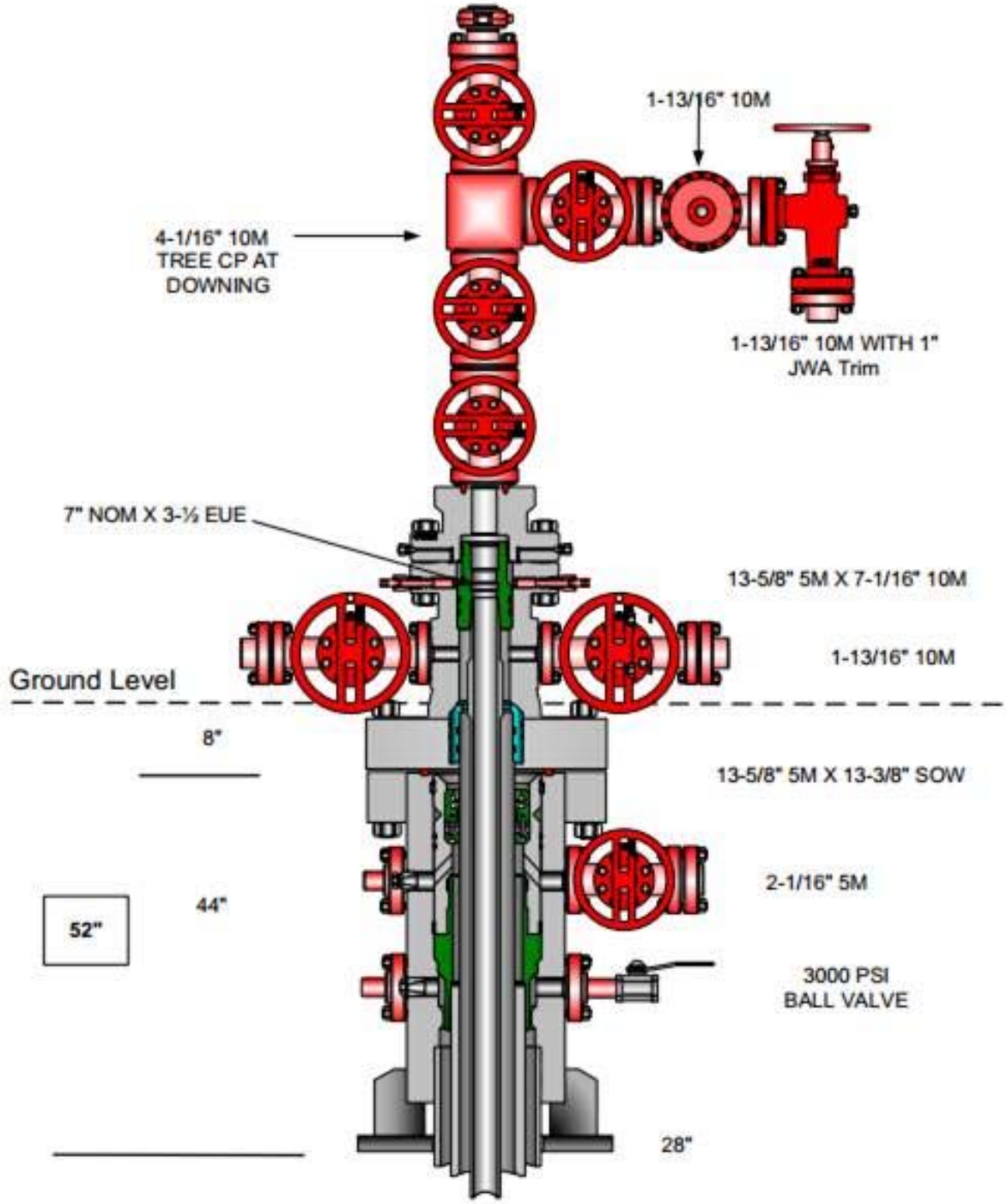
All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi.

All casing strings will be tested as per Onshore Order No.2 to atleast 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.

Multi-bowl Wellhead Diagram



PREPARED ON 6-1-17

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	985	985	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.64	3.84	6.81
12 1/4	0	4814	4814	9-5/8"	40.00	J-55	LT&C	1.35	1.55	2.70
8 3/4	0	10250	10250	5-1/2"	17.00	L-80	LT&C	1.31	1.61	1.84
8 3/4	9173	20745	10800	5-1/2"	17.00	L-80	BT&C	1.24	1.53	42.46
						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

Multibowl Wellhead Diagram
Vaca Draw 20-17 Fed 61H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

APD ID: 10400038013 **Submission Date:** 01/18/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Well Type: OIL WELL **Well Work Type:** Drill

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): **PWD surface owner:**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL **Well Number:** 61H

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

11/03/2020

APD ID: 10400038013

Submission Date: 01/18/2019

Operator Name: CIMAREX ENERGY COMPANY

Well Name: VACA DRAW 20-17 FEDERAL

Well Number: 61H

Well Type: OIL WELL

Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001188

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

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

☐ AMENDED REPORT

OCD – HOBBS
11/03/2020
RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-025-47961	97994	WC-025 G-08 S253235G;LWR BONE SPRING

4 Property Code	5 Property Name	6 Well Number
319775	VACA DRAW 20-17 FEDERAL	061H

7 OGRID No.	8 Operator Name	9 Elevation
215099	CIMAREX ENERGY CO.	3399

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
P	20	25S	33E		330	SOUTH	820	EAST	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
B	17	25S	33E		100	NORTH	1870	EAST	LEA

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

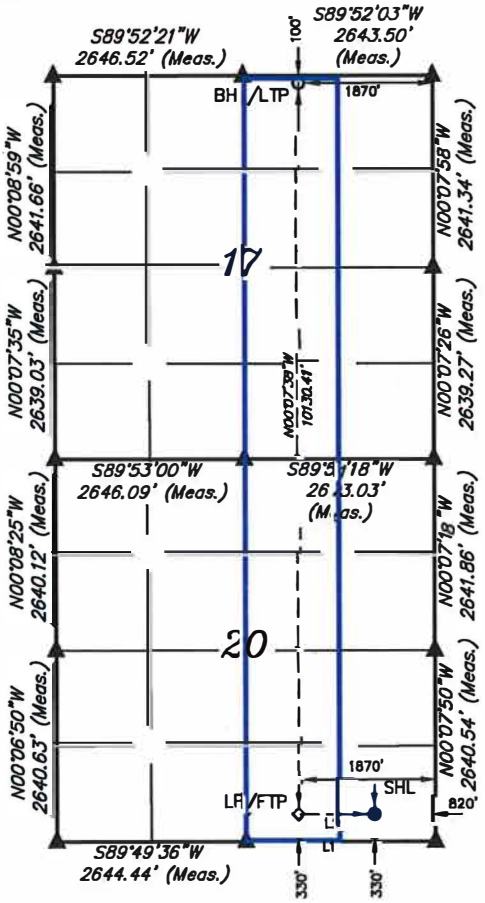
No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

16

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

LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S89°58'49"W	2644.60'
L2	S89°58'52"W	1049.91'

2000' 1000' 0' 2000'
SCALE
DRAWN BY: T.A. 08-08-19



NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°06'35.04" (32.109732°)
LONGITUDE = 103°35'18.30" (103.588417°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°06'34.59" (32.109607°)
LONGITUDE = 103°35'16.60" (103.587946°)
STATE PLANE NAD 83 (N.M. EAST)
N: 404453.90' E: 771979.93'
STATE PLANE NAD 27 (N.M. EAST)
N: 404396.1[illegible] E: 730793.75'

NAD 83 (LP/FTP)
LATITUDE = 32°06'35.05" (32.109737°)
LONGITUDE = 103°35'30.51" (103.591808°)
NAD 27 (LP/FTP)
LATITUDE = 32°06'34.61" (32.109613°)
LONGITUDE = 103°35'28.81" (103.591336°)
STATE PLANE NAD 83 (N.M. EAST)
N: 404448.56' E: 770930.22'
STATE PLANE NAD 27 (N.M. EAST)
N: 404390.78' E: 729744.01'

NAD 83 (BHL/LTP)
LATITUDE = 32°08'15.28" (32.137579°)
LONGITUDE = 103°35'30.45" (103.591792°)
NAD 27 (BHL/LTP)
LATITUDE = 32°08'14.84" (32.137454°)
LONGITUDE = 103°35'28.75" (103.591318°)
STATE PLANE NAD 83 (N.M. EAST)
N: 414577.0[illegible] E: 770865.45'
STATE PLANE NAD [illegible]7 (N.M. EAST)
N: 414518.99' E: 729679.75'

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"

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.

Signature 1-14-20 Date

Hope Knauls
Printed Name

hknauls@cimarex.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.

July 27, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
08-08-19
PROFESSIONAL SURVEYOR

Certificate Number:

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

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Submit Original
to Appropriate
District Office

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11/03/2020
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GAS CAPTURE PLAN

Date: 1-14-20

☒ Original
☐ Amended - Reason for Amendment:

Operator & OGRID No.: Cimarex Energy Co- 215099

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

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

Well(s)/Production Facility – Name of facility

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Vaca Draw 20-17 Fed 61H	Pending 30-025-47961	20-25S-33E	330'FSL & 820' FEL	5000		

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to Gas Transporter and will be connected to Gas Transporter low/high pressure gathering system located in _Eddy___ County, New Mexico. It will require _3500_' of pipeline to connect the facility to low/high pressure gathering system. Operator provides (periodically) to Gas Transporter a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Operator and Gas Transporter have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Gas Transporter Processing Plant located in _Sec 1-25S-30E , _Eddy__County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

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

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

Alternatives to Reduce Flaring

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

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