Form 3160-3
(June 2015)

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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.
NMNM0024368A

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.
RED HILLS UNIT
37H (300545)

2. Name of Operator
CIMAREX ENERGY COMPANY OF COLORADO (162683)

9. API Well No.
30-025-46600

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
600 N. Marienfeld St., Suite 600 Midland TX 79701	(432)620-1936	RUSSELL / BONE SPRING WC (97994)

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

At surface NWNW / 437 FNL / 490 FWL / LAT 32.093103 / LONG -103.584196

At proposed prod. zone SWSW / 100 FSL / 750 FWL / LAT 32.065558 / LONG -103.583355

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 33 / T25S / R33E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
23 miles	LEA	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
437 feet	160	320

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
20 feet	9940 feet / 19882 feet	FED: NMB001187

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3378 feet	04/01/2019	30 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Aricka Easterling / Ph: (918)560-7060	09/05/2018

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Christopher Walls / Ph: (575)234-2234	12/08/2019

Title	Office
Petroleum Engineer	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.

OCD Rec 12/11/19

KB 12/12/19

APPROVED WITH CONDITIONS

Approval Date: 12/08/2019

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**CIMAREX ENERGY COMPANY**
LEASE NO.:	**NMNM024368A**
LOCATION:	**Section. 33.,T25S.,R.33E., NMP**
COUNTY:	**LEA County, New Mexico**

WELL NAME & NO.:	**37H- RED HILLS UNIT**
SURFACE HOLE FOOTAGE:	**437'/N & 490'/W**
BOTTOM HOLE FOOTAGE	**100'/S & 750'/W**

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **976** 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 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. **Excess cement calculates to 14%, additional cement might be required.**

C. PRESSURE CONTROL

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

2. 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. 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.

D. SPECIAL REQUIREMENT (S)

Unit Wells

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

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

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.
JJP10202019

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BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

12/09/2019

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Amithy Crawford **Signed on:** 09/05/2018

Title: Regulatory Analyst

Street Address:

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

Phone: (432)620-1909

Email address: acrawford@cimarex.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

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

Application Data Report

12/09/2019

APD ID: 10400033640 **Submission Date:** 09/05/2018

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400033640 **Tie to previous NOS?** Y **Submission Date:** 09/05/2018

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

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

Lease number: NMNM0024368A **Lease Acres:** 160

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 OF COLORADO

Operator letter of designation:

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY OF COLORADO

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: RED HILLS UNIT **Well Number:** 37H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** RUSSELL **Pool Name:** BONE SPRING WC

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

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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:** RED HILLS UNIT **Number:** W2W2 PAD

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

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 23 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 437 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Red_Hills_Unit_37H_C102_Plat_20180904100355.pdf

Well work start Date: 04/01/2019 **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
SHL Leg #1	437	FNL	490	FWL	25S	33E	33	Aliquot NWNW	32.093103	-103.584196	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 002436 8A	3378	0	0	
KOP Leg #1	554	FNL	720	FWL	25S	33E	33	Aliquot NWNW	32.093419 4	-103.58345	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 002436 8A	-6084	9473	9462	
PPP Leg	1320	FSL	750	FWL	25S	33E	33	Aliquot SWS	32.083375	-103.5834	LEA	NEW MEXI	NEW MEXI	F	NMNM 000579	-656	13400	9940	

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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
PPP Leg #1-2	2640	FSL	750	FWL	25S	33E	33	Aliquot NWSW	32.08695	-103.5834639	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 000579 2A	-6562	12100	9940	
EXIT Leg #1	0	FNL	750	FWL	25S	33E	33	Aliquot SWSW	32.0798028	-103.5834806	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 089425	-6562	14700	9940	
BHL Leg #1	100	FSL	750	FWL	26S	33E	4	Aliquot SWSW	32.065558	-103.583355	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 089425	-6562	19882	9940	

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

Drilling Plan Data Report

12/09/2019

APD ID: 10400033640 **Submission Date:** 09/05/2018

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

Well Type: CONVENTIONAL GAS 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
1	RUSTLER	3378	939	939		USEABLE WATER	N
2	TOP SALT	2111	1267	1267		NONE	N
3	BASE OF SALT	-1319	4697	4697		NONE	N
4	LAMAR	-1528	4906	4906		NONE	N
5	BELL CANYON	-1554	4932	4932		NATURAL GAS,OIL	N
6	CHERRY CANYON	-2649	6027	6027		NATURAL GAS,OIL	N
7	BRUSHY CANYON	-4213	7591	7591		NATURAL GAS,OIL	N
8	BONE SPRING	-5646	9024	9024		NATURAL GAS,OIL	Y
9	WOLFCAMP	-8762	12140	12140		NATURAL GAS,OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M **Rating Depth:** 976

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

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:

Red_Hills_Unit_37H_Choke__2M3M_20180904104015.pdf

BOP Diagram Attachment:

Red_Hills_Unit_37H_BOP_2M_20180904104027.pdf

Pressure Rating (PSI): 3M **Rating Depth:** 19882

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:

Red_Hills_Unit_37H_Choke__2M3M_20180904104041.pdf

BOP Diagram Attachment:

Red_Hills_Unit_37H_BOP_3M_20180904104051.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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	976	0	976	0	976	976	H-40	48	ST&C	1.66	3.87	BUOY	6.87	BUOY	6.87
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4908	0	4908	0	4908	4908	J-55	36	LT&C	1.15	1.35	BUOY	2.56	BUOY	2.56
3	PRODUCTION	8.75	5.5	NEW	API	N	0	9473	0	9473	0	9473	9473	L-80	17	LT&C	1.39	1.71	BUOY	2	BUOY	2
4	PRODUCTION	8.75	5.5	NEW	API	N	9473	19882	9473	19882	9473	19882	10409	L-80	17	BUTT	1.32	1.63	BUOY	50.01	BUOY	50.01

Casing Attachments

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

Inspection Document:

Spec Document:

Red_Hills_Unit_37H_Surf_Casing_Spec_Sheet_20180904104227.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_Unit_37H_Casing_Assumptions_20180904104239.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_Unit_37H_Casing_Assumptions_20180904104325.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_Unit_37H_Casing_Assumptions_20180904104409.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_Unit_37H_Casing_Assumptions_20180904104459.pdf

Section 4 - Cement

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	976	410	1.72	13.5	704	50	Class C	Bentonite
SURFACE	Tail		0	976	185	1.34	14.8	260	25	Class C	LCM
INTERMEDIATE	Lead		0	4908	933	1.88	12.9	1754	50	35:65 (Poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		0	4908	287	1.34	14.8	384	25	Class C	LCM
PRODUCTION	Lead		0	9473	434	3.45	10.5	1496	25	NeoCem	n/a
PRODUCTION	Tail		0	9473	2226	1.3	14.2	2893	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
PRODUCTION	Lead		9473	19882	434	3.45	10.5	1496	25	NeoCem	n/a
PRODUCTION	Tail		9473	19882	2226	1.3	14.2	2893	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

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

Circulating Medium Table

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	976	SPUD MUD	8.3	8.8							

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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
976	4908	SALT SATURATED	9.7	10.2							
4908	19882	OTHER : FW/Cut Brine	8.7	9.2							

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: 4755 **Anticipated Surface Pressure:** 2568.19

Anticipated Bottom Hole Temperature(F): 169

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:

Red_Hills_Unit_37H_H2S_Plan_20180904104914.pdf

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Red_Hills_Unit_37H_AC_Report_20180904104930.pdf

Red_Hills_Unit_37H_Directional_Plan_20180904104931.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Red_Hills_Unit_37H_Drilling_Plan_20180904104959.pdf

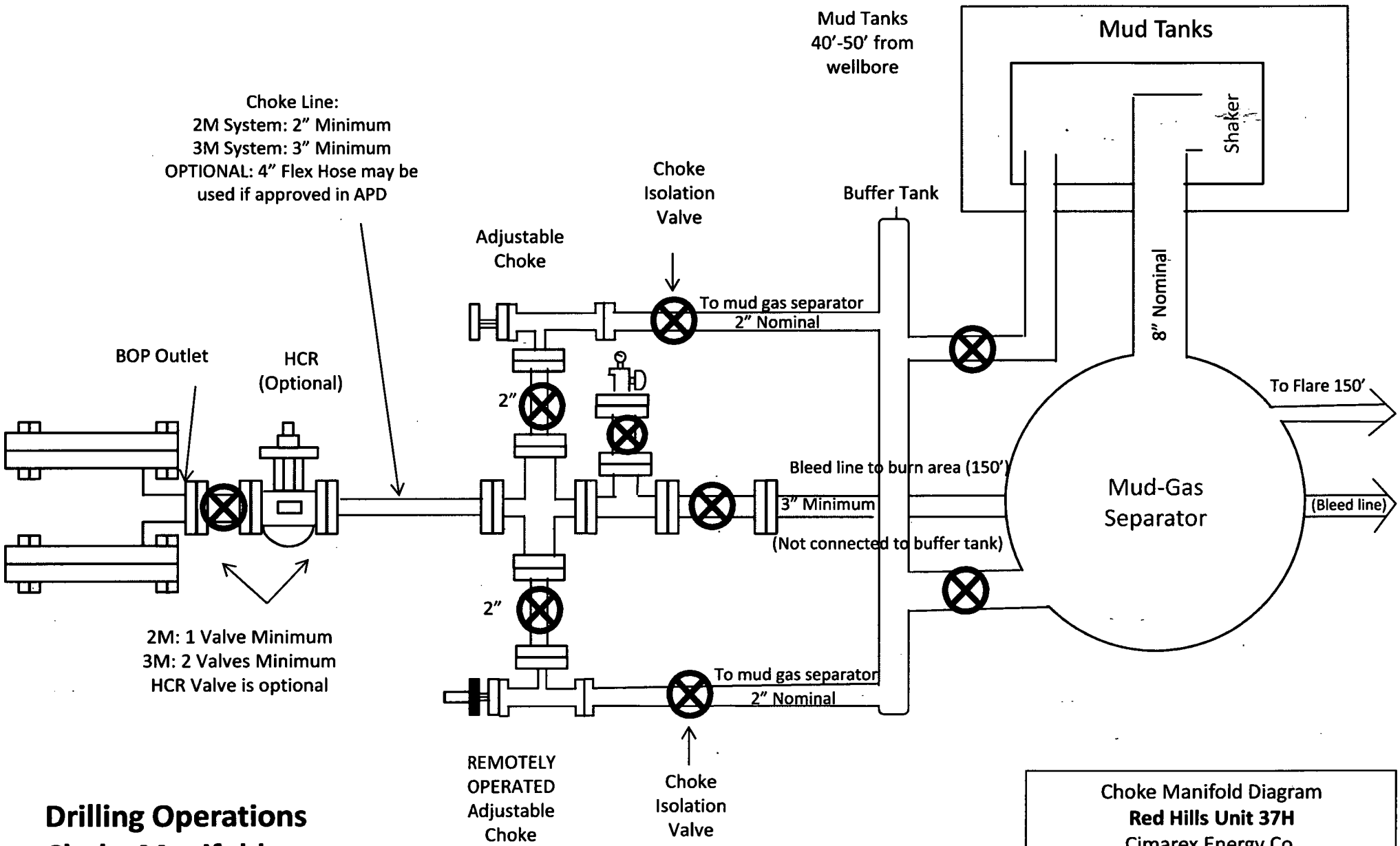
Red_Hills_Unit_37H_Flex_Hose_20180904105014.pdf

Red_Hills_Unit_37H_Gas_Capture_Plan_20180904105015.pdf

Red_Hills_Unit_37H_Multibowl_Procedure_20180904105018.pdf

Red_Hills_Unit_37H_Multibowl_Wellhead_20180904105019.pdf

Other Variance attachment:



Drilling Operations
Choke Manifold
2M/3M Service

Choke Manifold Diagram
Red Hills Unit 37H
Cimarex Energy Co.
33-25S-33E
Lea Co., NM

Schlumberger

CIMAREX

Cimarex Red Hills Unit #37H Rev0 RM 27Aug18 Proposal Geodetic Report

(Non-Def Plan)

Report Date:	August 29, 2018 - 11:27 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex Energy	**Vertical Section Azimuth:**	179.705 ° (Grid North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Red Hills Unit #37H / New Slot	**TVD Reference Datum:**	RKB
Well:	Red Hills Unit #37H	**TVD Reference Elevation:**	3404.500 ft above MSL
Borehole:	Red Hills Unit #37H	**Seabed / Ground Elevation:**	3378.500 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.731 °
Survey Name:	Cimarex Red Hills Unit #37H Rev0 RM 27Aug18	**Total Gravity Field Strength:**	998.4328mgn (9.80665 Based)
Survey Date:	August 09, 2018	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	99.838 ° / 10394.241 ft / 6.317 / 1.046	**Total Magnetic Field Strength:**	47832.548 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.741 °
Location Lat / Long:	N 32° 5' 35.17000", W 103° 35' 3.10490"	**Declination Date:**	August 28, 2018
Location Grid N/E Y/X:	N 398413.410 ftUS, E 773329.130 ftUS	**Magnetic Declination Model:**	HDGM 2018
CRS Grid Convergence Angle:	0.3980 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99997073	**Grid Convergence Used:**	0.3980 °
Version / Patch:	2.10.740.0	**Total Corr Mag North->Grid North:**	6.3331 °
		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 [435' FNL, 470' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	100.00	0.00	63.00	100.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	200.00	0.00	63.00	200.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	300.00	0.00	63.00	300.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	400.00	0.00	63.00	400.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	500.00	0.00	63.00	500.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	600.00	0.00	63.00	600.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	700.00	0.00	63.00	700.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	800.00	0.00	63.00	800.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	900.00	0.00	63.00	900.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1000.00	0.00	63.00	1000.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1100.00	0.00	63.00	1100.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1200.00	0.00	63.00	1200.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1300.00	0.00	63.00	1300.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1400.00	0.00	63.00	1400.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
Nudge 2°/100' DLS	1500.00	0.00	63.00	1500.00	0.00	0.00	0.00	0.00	398413.41	773329.13	N 32 5 35.17	W 103 35 3.10
	1600.00	2.00	63.00	1599.98	-0.78	0.79	1.55	2.00	398414.20	773330.68	N 32 5 35.18	W 103 35 3.09
	1700.00	4.00	63.00	1699.84	-3.14	3.17	6.22	2.00	398416.58	773335.35	N 32 5 35.20	W 103 35 3.03
Hold Nudge	1745.95	4.92	63.00	1745.65	-4.74	4.79	9.40	2.00	398418.20	773338.53	N 32 5 35.22	W 103 35 3.00
	1800.00	4.92	63.00	1799.50	-6.82	6.89	13.53	0.00	398420.30	773342.66	N 32 5 35.24	W 103 35 2.95
	1900.00	4.92	63.00	1899.13	-10.68	10.79	21.17	0.00	398424.20	773350.30	N 32 5 35.28	W 103 35 2.86
	2000.00	4.92	63.00	1998.76	-14.53	14.68	28.81	0.00	398428.09	773357.94	N 32 5 35.31	W 103 35 2.77
	2100.00	4.92	63.00	2098.39	-18.38	18.57	36.45	0.00	398431.98	773365.58	N 32 5 35.35	W 103 35 2.68
	2200.00	4.92	63.00	2198.03	-22.24	22.47	44.09	0.00	398435.87	773373.22	N 32 5 35.39	W 103 35 2.59
	2300.00	4.92	63.00	2297.66	-26.09	26.36	51.73	0.00	398439.77	773380.86	N 32 5 35.43	W 103 35 2.50
	2400.00	4.92	63.00	2397.29	-29.95	30.25	59.37	0.00	398443.66	773388.50	N 32 5 35.47	W 103 35 2.41
	2500.00	4.92	63.00	2496.92	-33.80	34.14	67.01	0.00	398447.55	773396.14	N 32 5 35.50	W 103 35 2.32

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 ° ' ")
	2600.00	4.92	63.00	2596.55	-37.65	38.04	74.65	0.00	398451.45	773403.78	N 32 5 35.54	W 103 35 2.23
	2700.00	4.92	63.00	2696.18	-41.51	41.93	82.29	0.00	398455.34	773411.42	N 32 5 35.58	W 103 35 2.14
	2800.00	4.92	63.00	2795.82	-45.36	45.82	89.93	0.00	398459.23	773419.06	N 32 5 35.62	W 103 35 2.06
	2900.00	4.92	63.00	2895.45	-49.21	49.72	97.57	0.00	398463.12	773426.70	N 32 5 35.66	W 103 35 1.97
	3000.00	4.92	63.00	2995.08	-53.07	53.61	105.21	0.00	398467.02	773434.34	N 32 5 35.69	W 103 35 1.88
	3100.00	4.92	63.00	3094.71	-56.92	57.50	112.85	0.00	398470.91	773441.98	N 32 5 35.73	W 103 35 1.79
	3200.00	4.92	63.00	3194.34	-60.77	61.39	120.49	0.00	398474.80	773449.62	N 32 5 35.77	W 103 35 1.70
	3300.00	4.92	63.00	3293.97	-64.63	65.29	128.13	0.00	398478.69	773457.26	N 32 5 35.81	W 103 35 1.61
	3400.00	4.92	63.00	3393.61	-68.48	69.18	135.77	0.00	398482.59	773464.90	N 32 5 35.85	W 103 35 1.52
	3500.00	4.92	63.00	3493.24	-72.33	73.07	143.41	0.00	398486.48	773472.54	N 32 5 35.88	W 103 35 1.43
	3600.00	4.92	63.00	3592.87	-76.19	76.97	151.05	0.00	398490.37	773480.18	N 32 5 35.92	W 103 35 1.34
	3700.00	4.92	63.00	3692.50	-80.04	80.86	158.69	0.00	398494.27	773487.82	N 32 5 35.96	W 103 35 1.25
	3800.00	4.92	63.00	3792.13	-83.89	84.75	166.33	0.00	398498.16	773495.46	N 32 5 36.00	W 103 35 1.16
	3900.00	4.92	63.00	3891.76	-87.75	88.64	173.97	0.00	398502.05	773503.10	N 32 5 36.04	W 103 35 1.08
	4000.00	4.92	63.00	3991.40	-91.60	92.54	181.61	0.00	398505.94	773510.74	N 32 5 36.07	W 103 35 0.99
	4100.00	4.92	63.00	4091.03	-95.45	96.43	189.25	0.00	398509.84	773518.38	N 32 5 36.11	W 103 35 0.90
	4200.00	4.92	63.00	4190.66	-99.31	100.32	196.89	0.00	398513.73	773526.02	N 32 5 36.15	W 103 35 0.81
	4300.00	4.92	63.00	4290.29	-103.16	104.22	204.53	0.00	398517.62	773533.66	N 32 5 36.19	W 103 35 0.72
	4400.00	4.92	63.00	4389.92	-107.01	108.11	212.17	0.00	398521.51	773541.30	N 32 5 36.23	W 103 35 0.63
	4500.00	4.92	63.00	4489.55	-110.87	112.00	219.81	0.00	398525.41	773548.94	N 32 5 36.26	W 103 35 0.54
Drop to Vertical 2°/100' DLS	4510.48	4.92	63.00	4500.00	-111.27	112.41	220.62	0.00	398525.82	773549.74	N 32 5 36.27	W 103 35 0.53
	4600.00	3.13	63.00	4589.29	-114.09	115.26	226.21	2.00	398528.67	773555.34	N 32 5 36.29	W 103 35 0.47
	4700.00	1.13	63.00	4689.22	-115.76	116.95	229.52	2.00	398530.35	773558.64	N 32 5 36.31	W 103 35 0.43
Hold Vertical	4756.43	0.00	63.00	4745.65	-116.01	117.20	230.02	2.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	4800.00	0.00	63.00	4789.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	4900.00	0.00	63.00	4889.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5000.00	0.00	63.00	4989.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5100.00	0.00	63.00	5089.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5200.00	0.00	63.00	5189.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5300.00	0.00	63.00	5289.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5400.00	0.00	63.00	5389.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5500.00	0.00	63.00	5489.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5600.00	0.00	63.00	5589.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5700.00	0.00	63.00	5689.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5800.00	0.00	63.00	5789.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	5900.00	0.00	63.00	5889.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6000.00	0.00	63.00	5989.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6100.00	0.00	63.00	6089.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6200.00	0.00	63.00	6189.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6300.00	0.00	63.00	6289.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6400.00	0.00	63.00	6389.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6500.00	0.00	63.00	6489.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6600.00	0.00	63.00	6589.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6700.00	0.00	63.00	6689.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6800.00	0.00	63.00	6789.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	6900.00	0.00	63.00	6889.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7000.00	0.00	63.00	6989.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7100.00	0.00	63.00	7089.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7200.00	0.00	63.00	7189.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7300.00	0.00	63.00	7289.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7400.00	0.00	63.00	7389.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7500.00	0.00	63.00	7489.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7600.00	0.00	63.00	7589.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7700.00	0.00	63.00	7689.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7800.00	0.00	63.00	7789.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	7900.00	0.00	63.00	7889.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8000.00	0.00	63.00	7989.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8100.00	0.00	63.00	8089.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	8200.00	0.00	63.00	8189.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8300.00	0.00	63.00	8289.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8400.00	0.00	63.00	8389.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8500.00	0.00	63.00	8489.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8600.00	0.00	63.00	8589.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8700.00	0.00	63.00	8689.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8800.00	0.00	63.00	8789.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	8900.00	0.00	63.00	8889.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9000.00	0.00	63.00	8989.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9100.00	0.00	63.00	9089.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9200.00	0.00	63.00	9189.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9300.00	0.00	63.00	9289.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9400.00	0.00	63.00	9389.21	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
KOP - Build 12°/100' DLS	9473.32	0.00	63.00	9462.54	-116.01	117.20	230.02	0.00	398530.61	773559.14	N 32 5 36.31	W 103 35 0.42
	9500.00	3.20	179.71	9489.20	-115.27	116.45	230.02	12.00	398529.86	773559.14	N 32 5 36.31	W 103 35 0.42
	9600.00	15.20	179.71	9587.73	-99.31	100.49	230.10	12.00	398513.90	773559.23	N 32 5 36.15	W 103 35 0.42
	9700.00	27.20	179.71	9680.79	-63.21	64.39	230.29	12.00	398477.80	773559.41	N 32 5 35.79	W 103 35 0.42
	9800.00	39.20	179.71	9764.32	-8.55	9.74	230.57	12.00	398423.15	773559.69	N 32 5 35.25	W 103 35 0.42
	9900.00	51.20	179.71	9834.65	62.28	-61.09	230.93	12.00	398352.32	773560.06	N 32 5 34.55	W 103 35 0.43
	10000.00	63.20	179.71	9888.72	146.18	-144.99	231.37	12.00	398268.42	773560.49	N 32 5 33.72	W 103 35 0.43
	10100.00	75.20	179.71	9924.16	239.50	-238.31	231.85	12.00	398175.11	773560.97	N 32 5 32.80	W 103 35 0.43
	10200.00	87.20	179.71	9939.43	338.14	-336.95	232.35	12.00	398076.47	773561.48	N 32 5 31.82	W 103 35 0.43
Avalon Landing Point	10223.32	90.00	179.71	9940.00	361.45	-360.26	232.47	12.00	398053.16	773561.60	N 32 5 31.59	W 103 35 0.43
	10300.00	90.00	179.71	9940.00	438.13	-436.94	232.87	0.00	397976.49	773561.99	N 32 5 30.83	W 103 35 0.43
	10400.00	90.00	179.71	9940.00	538.13	-536.94	233.38	0.00	397876.49	773562.51	N 32 5 29.84	W 103 35 0.44
	10500.00	90.00	179.71	9940.00	638.13	-636.93	233.90	0.00	397776.50	773563.02	N 32 5 28.85	W 103 35 0.44
	10600.00	90.00	179.71	9940.00	738.13	-736.93	234.41	0.00	397676.50	773563.54	N 32 5 27.86	W 103 35 0.44
	10700.00	90.00	179.71	9940.00	838.13	-836.93	234.93	0.00	397576.50	773564.05	N 32 5 26.87	W 103 35 0.44
	10800.00	90.00	179.71	9940.00	938.13	-936.93	235.44	0.00	397476.51	773564.57	N 32 5 25.88	W 103 35 0.44
	10900.00	90.00	179.71	9940.00	1038.13	-1036.93	235.96	0.00	397376.51	773565.08	N 32 5 24.89	W 103 35 0.45
	11000.00	90.00	179.71	9940.00	1138.13	-1136.93	236.47	0.00	397276.52	773565.60	N 32 5 23.90	W 103 35 0.45
	11100.00	90.00	179.71	9940.00	1238.13	-1236.93	236.99	0.00	397176.52	773566.11	N 32 5 22.91	W 103 35 0.45
	11200.00	90.00	179.71	9940.00	1338.13	-1336.92	237.50	0.00	397076.53	773566.63	N 32 5 21.92	W 103 35 0.45
	11300.00	90.00	179.71	9940.00	1438.13	-1436.92	238.02	0.00	396976.53	773567.14	N 32 5 20.94	W 103 35 0.45
	11400.00	90.00	179.71	9940.00	1538.13	-1536.92	238.53	0.00	396876.54	773567.66	N 32 5 19.95	W 103 35 0.46
	11500.00	90.00	179.71	9940.00	1638.13	-1636.92	239.05	0.00	396776.54	773568.17	N 32 5 18.96	W 103 35 0.46
	11600.00	90.00	179.71	9940.00	1738.13	-1736.92	239.56	0.00	396676.54	773568.68	N 32 5 17.97	W 103 35 0.46
	11700.00	90.00	179.71	9940.00	1838.13	-1836.92	240.08	0.00	396576.55	773569.20	N 32 5 16.98	W 103 35 0.46
	11800.00	90.00	179.71	9940.00	1938.13	-1936.92	240.59	0.00	396476.55	773569.71	N 32 5 15.99	W 103 35 0.46
	11900.00	90.00	179.71	9940.00	2038.13	-2036.92	241.11	0.00	396376.56	773570.23	N 32 5 15.00	W 103 35 0.47
	12000.00	90.00	179.71	9940.00	2138.13	-2136.91	241.62	0.00	396276.56	773570.74	N 32 5 14.01	W 103 35 0.47
	12100.00	90.00	179.71	9940.00	2238.13	-2236.91	242.14	0.00	396176.57	773571.26	N 32 5 13.02	W 103 35 0.47
	12200.00	90.00	179.71	9940.00	2338.13	-2336.91	242.65	0.00	396076.57	773571.77	N 32 5 12.03	W 103 35 0.47
	12300.00	90.00	179.71	9940.00	2438.13	-2436.91	243.17	0.00	395976.58	773572.29	N 32 5 11.04	W 103 35 0.48
	12400.00	90.00	179.71	9940.00	2538.13	-2536.91	243.68	0.00	395876.58	773572.80	N 32 5 10.05	W 103 35 0.48
	12500.00	90.00	179.71	9940.00	2638.13	-2636.91	244.20	0.00	395776.58	773573.32	N 32 5 9.06	W 103 35 0.48
	12600.00	90.00	179.71	9940.00	2738.13	-2736.91	244.71	0.00	395676.59	773573.83	N 32 5 8.07	W 103 35 0.48
	12700.00	90.00	179.71	9940.00	2838.13	-2836.91	245.23	0.00	395576.59	773574.35	N 32 5 7.08	W 103 35 0.48
	12800.00	90.00	179.71	9940.00	2938.13	-2936.90	245.74	0.00	395476.60	773574.86	N 32 5 6.09	W 103 35 0.49
	12900.00	90.00	179.71	9940.00	3038.13	-3036.90	246.26	0.00	395376.60	773575.38	N 32 5 5.10	W 103 35 0.49
	13000.00	90.00	179.71	9940.00	3138.13	-3136.90	246.77	0.00	395276.61	773575.89	N 32 5 4.11	W 103 35 0.49
	13100.00	90.00	179.71	9940.00	3238.13	-3236.90	247.28	0.00	395176.61	773576.41	N 32 5 3.12	W 103 35 0.49
	13200.00	90.00	179.71	9940.00	3338.13	-3336.90	247.80	0.00	395076.62	773576.92	N 32 5 2.13	W 103 35 0.49
	13300.00	90.00	179.71	9940.00	3438.13	-3436.90	248.31	0.00	394976.62	773577.44	N 32 5 1.14	W 103 35 0.50
	13400.00	90.00	179.71	9940.00	3538.13	-3536.90	248.83	0.00	394876.62	773577.95	N 32 5 0.15	W 103 35 0.50
	13500.00	90.00	179.71	9940.00	3638.13	-3636.89	249.34	0.00	394776.63	773578.47	N 32 4 59.17	W 103 35 0.50
	13600.00	90.00	179.71	9940.00	3738.13	-3736.89	249.86	0.00	394676.63	773578.98	N 32 4 58.18	W 103 35 0.50

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 ° ' ")
	13700.00	90.00	179.71	9940.00	3838.13	-3836.89	250.37	0.00	394576.64	773579.50	N 32 4 57.19	W 103 35 0.50
	13800.00	90.00	179.71	9940.00	3938.13	-3936.89	250.89	0.00	394476.64	773580.01	N 32 4 56.20	W 103 35 0.51
	13900.00	90.00	179.71	9940.00	4038.13	-4036.89	251.40	0.00	394376.65	773580.53	N 32 4 55.21	W 103 35 0.51
	14000.00	90.00	179.71	9940.00	4138.13	-4136.89	251.92	0.00	394276.65	773581.04	N 32 4 54.22	W 103 35 0.51
	14100.00	90.00	179.71	9940.00	4238.13	-4236.89	252.43	0.00	394176.66	773581.56	N 32 4 53.23	W 103 35 0.51
	14200.00	90.00	179.71	9940.00	4338.13	-4336.89	252.95	0.00	394076.66	773582.07	N 32 4 52.24	W 103 35 0.52
	14300.00	90.00	179.71	9940.00	4438.13	-4436.88	253.46	0.00	393976.66	773582.58	N 32 4 51.25	W 103 35 0.52
	14400.00	90.00	179.71	9940.00	4538.13	-4536.88	253.98	0.00	393876.67	773583.10	N 32 4 50.26	W 103 35 0.52
	14500.00	90.00	179.71	9940.00	4638.13	-4636.88	254.49	0.00	393776.67	773583.61	N 32 4 49.27	W 103 35 0.52
	14600.00	90.00	179.71	9940.00	4738.13	-4736.88	255.01	0.00	393676.68	773584.13	N 32 4 48.28	W 103 35 0.52
	14700.00	90.00	179.71	9940.00	4838.13	-4836.88	255.52	0.00	393576.68	773584.64	N 32 4 47.29	W 103 35 0.53
	14800.00	90.00	179.71	9940.00	4938.13	-4936.88	256.04	0.00	393476.69	773585.16	N 32 4 46.30	W 103 35 0.53
	14900.00	90.00	179.71	9940.00	5038.13	-5036.88	256.55	0.00	393376.69	773585.67	N 32 4 45.31	W 103 35 0.53
	15000.00	90.00	179.71	9940.00	5138.13	-5136.87	257.07	0.00	393276.70	773586.19	N 32 4 44.32	W 103 35 0.53
	15100.00	90.00	179.71	9940.00	5238.13	-5236.87	257.58	0.00	393176.70	773586.70	N 32 4 43.33	W 103 35 0.53
	15200.00	90.00	179.71	9940.00	5338.13	-5336.87	258.10	0.00	393076.70	773587.22	N 32 4 42.34	W 103 35 0.54
	15300.00	90.00	179.71	9940.00	5438.13	-5436.87	258.61	0.00	392976.71	773587.73	N 32 4 41.35	W 103 35 0.54
	15400.00	90.00	179.71	9940.00	5538.13	-5536.87	259.13	0.00	392876.71	773588.25	N 32 4 40.36	W 103 35 0.54
	15500.00	90.00	179.71	9940.00	5638.13	-5636.87	259.64	0.00	392776.72	773588.76	N 32 4 39.37	W 103 35 0.54
	15600.00	90.00	179.71	9940.00	5738.13	-5736.87	260.16	0.00	392676.72	773589.28	N 32 4 38.39	W 103 35 0.54
	15700.00	90.00	179.71	9940.00	5838.13	-5836.87	260.67	0.00	392576.73	773589.79	N 32 4 37.40	W 103 35 0.55
	15800.00	90.00	179.71	9940.00	5938.13	-5936.86	261.19	0.00	392476.73	773590.31	N 32 4 36.41	W 103 35 0.55
	15900.00	90.00	179.71	9940.00	6038.13	-6036.86	261.70	0.00	392376.74	773590.82	N 32 4 35.42	W 103 35 0.55
	16000.00	90.00	179.71	9940.00	6138.13	-6136.86	262.21	0.00	392276.74	773591.34	N 32 4 34.43	W 103 35 0.55
	16100.00	90.00	179.71	9940.00	6238.13	-6236.86	262.73	0.00	392176.75	773591.85	N 32 4 33.44	W 103 35 0.55
	16200.00	90.00	179.71	9940.00	6338.13	-6336.86	263.24	0.00	392076.75	773592.37	N 32 4 32.45	W 103 35 0.56
	16300.00	90.00	179.71	9940.00	6438.13	-6436.86	263.76	0.00	391976.75	773592.88	N 32 4 31.46	W 103 35 0.56
	16400.00	90.00	179.71	9940.00	6538.13	-6536.86	264.27	0.00	391876.76	773593.40	N 32 4 30.47	W 103 35 0.56
	16500.00	90.00	179.71	9940.00	6638.13	-6636.85	264.79	0.00	391776.76	773593.91	N 32 4 29.48	W 103 35 0.56
	16600.00	90.00	179.71	9940.00	6738.13	-6736.85	265.30	0.00	391676.77	773594.43	N 32 4 28.49	W 103 35 0.57
	16700.00	90.00	179.71	9940.00	6838.13	-6836.85	265.82	0.00	391576.77	773594.94	N 32 4 27.50	W 103 35 0.57
	16800.00	90.00	179.71	9940.00	6938.13	-6936.85	266.33	0.00	391476.78	773595.46	N 32 4 26.51	W 103 35 0.57
	16900.00	90.00	179.71	9940.00	7038.13	-7036.85	266.85	0.00	391376.78	773595.97	N 32 4 25.52	W 103 35 0.57
	17000.00	90.00	179.71	9940.00	7138.13	-7136.85	267.36	0.00	391276.79	773596.48	N 32 4 24.53	W 103 35 0.57
	17100.00	90.00	179.71	9940.00	7238.13	-7236.85	267.88	0.00	391176.79	773597.00	N 32 4 23.54	W 103 35 0.58
	17200.00	90.00	179.71	9940.00	7338.13	-7336.85	268.39	0.00	391076.79	773597.51	N 32 4 22.55	W 103 35 0.58
	17300.00	90.00	179.71	9940.00	7438.13	-7436.84	268.91	0.00	390976.80	773598.03	N 32 4 21.56	W 103 35 0.58
	17400.00	90.00	179.71	9940.00	7538.13	-7536.84	269.42	0.00	390876.80	773598.54	N 32 4 20.57	W 103 35 0.58
	17500.00	90.00	179.71	9940.00	7638.13	-7636.84	269.94	0.00	390776.81	773599.06	N 32 4 19.58	W 103 35 0.58
	17600.00	90.00	179.71	9940.00	7738.13	-7736.84	270.45	0.00	390676.81	773599.57	N 32 4 18.59	W 103 35 0.59
	17700.00	90.00	179.71	9940.00	7838.13	-7836.84	270.97	0.00	390576.82	773600.09	N 32 4 17.60	W 103 35 0.59
	17800.00	90.00	179.71	9940.00	7938.13	-7936.84	271.48	0.00	390476.82	773600.60	N 32 4 16.62	W 103 35 0.59
	17900.00	90.00	179.71	9940.00	8038.13	-8036.84	272.00	0.00	390376.83	773601.12	N 32 4 15.63	W 103 35 0.59
	18000.00	90.00	179.71	9940.00	8138.13	-8136.83	272.51	0.00	390276.83	773601.63	N 32 4 14.64	W 103 35 0.59
	18100.00	90.00	179.71	9940.00	8238.13	-8236.83	273.03	0.00	390176.83	773602.15	N 32 4 13.65	W 103 35 0.60
	18200.00	90.00	179.71	9940.00	8338.13	-8336.83	273.54	0.00	390076.84	773602.66	N 32 4 12.66	W 103 35 0.60
	18300.00	90.00	179.71	9940.00	8438.13	-8436.83	274.06	0.00	389976.84	773603.18	N 32 4 11.67	W 103 35 0.60
	18400.00	90.00	179.71	9940.00	8538.13	-8536.83	274.57	0.00	389876.85	773603.69	N 32 4 10.68	W 103 35 0.60
	18500.00	90.00	179.71	9940.00	8638.13	-8636.83	275.09	0.00	389776.85	773604.21	N 32 4 9.69	W 103 35 0.61
	18600.00	90.00	179.71	9940.00	8738.13	-8736.83	275.60	0.00	389676.86	773604.72	N 32 4 8.70	W 103 35 0.61
	18700.00	90.00	179.71	9940.00	8838.13	-8836.83	276.12	0.00	389576.86	773605.24	N 32 4 7.71	W 103 35 0.61
	18800.00	90.00	179.71	9940.00	8938.13	-8936.82	276.63	0.00	389476.87	773605.75	N 32 4 6.72	W 103 35 0.61
	18900.00	90.00	179.71	9940.00	9038.13	-9036.82	277.14	0.00	389376.87	773606.27	N 32 4 5.73	W 103 35 0.61
	19000.00	90.00	179.71	9940.00	9138.13	-9136.82	277.66	0.00	389276.87	773606.78	N 32 4 4.74	W 103 35 0.62
	19100.00	90.00	179.71	9940.00	9238.13	-9236.82	278.17	0.00	389176.88	773607.30	N 32 4 3.75	W 103 35 0.62
	19200.00	90.00	179.71	9940.00	9338.13	-9336.82	278.69	0.00	389076.88	773607.81	N 32 4 2.76	W 103 35 0.62
	19300.00	90.00	179.71	9940.00	9438.13	-9436.82	279.20	0.00	388976.89	773608.33	N 32 4 1.77	W 103 35 0.62
	19400.00	90.00	179.71	9940.00	9538.13	-9536.82	279.72	0.00	388876.89	773608.84	N 32 4 0.78	W 103 35 0.62
	19500.00	90.00	179.71	9940.00	9638.13	-9636.81	280.23	0.00	388776.90	773609.35	N 32 3 59.79	W 103 35 0.63

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 ° ' ")
	19600.00	90.00	179.71	9940.00	9738.13	-9736.81	280.75	0.00	388676.90	773609.87	N 32 3 58.80	W 103 35 0.63
	19700.00	90.00	179.71	9940.00	9838.13	-9836.81	281.26	0.00	388576.91	773610.38	N 32 3 57.81	W 103 35 0.63
	19800.00	90.00	179.71	9940.00	9938.13	-9936.81	281.78	0.00	388476.91	773610.90	N 32 3 56.82	W 103 35 0.63
Cimarex Red Hills Unit #37H - PBHL [100' FSL, 750' FWL]	19881.94	90.00	179.71	9940.00	10020.07	-10018.75	282.20	0.00	388394.97	773611.32	N 32 3 56.01	W 103 35 0.63

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	Red Hills Unit #37H / Cimarex Red Hills Unit #37H Rev0 RM 27Aug18
	1	26.000	19881.943	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Red Hills Unit #37H / Cimarex Red Hills Unit #37H Rev0 RM

Schlumberger

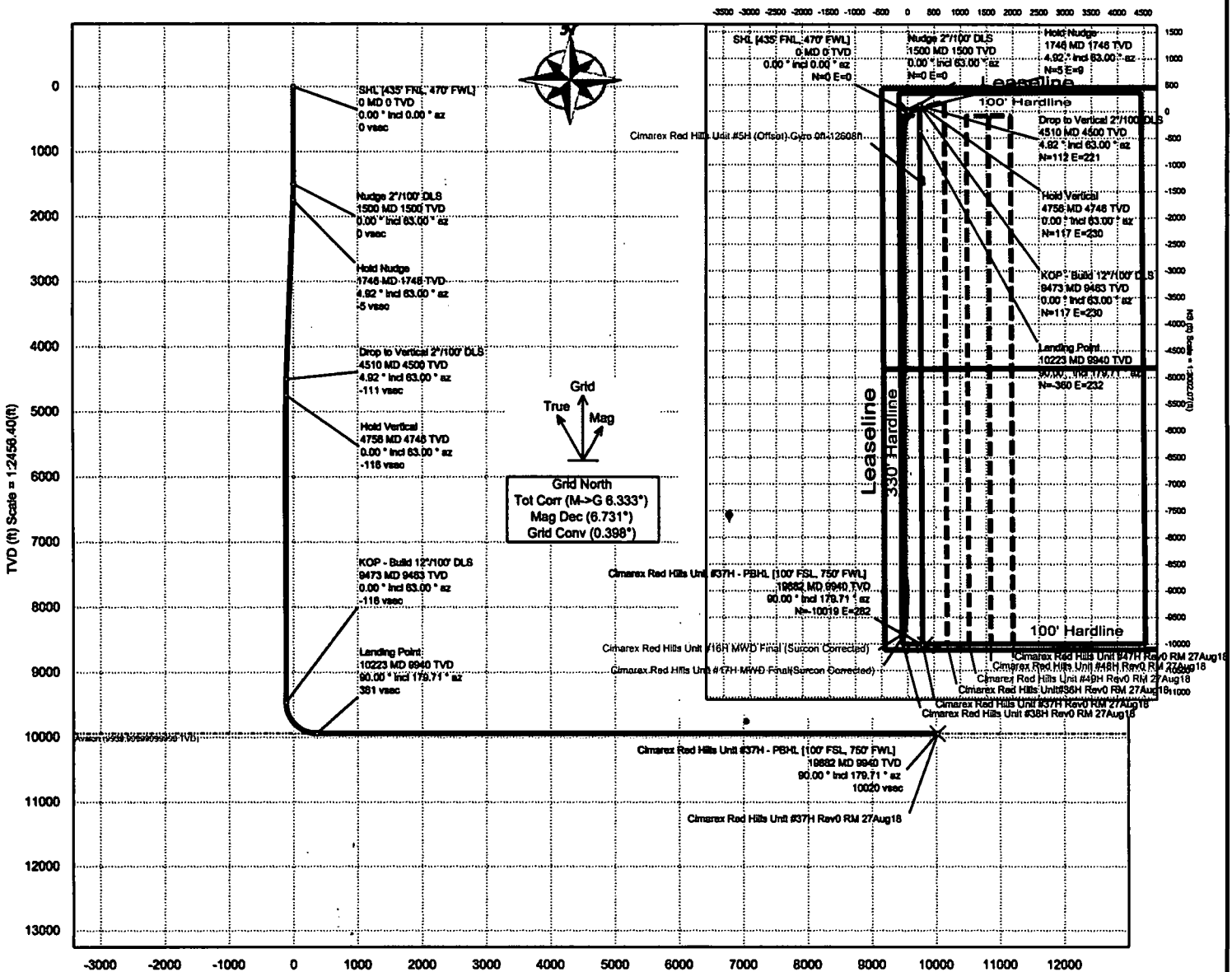
Cimarex Energy Rev 0

CIMAREX

Borehole:	Well:	Field:	Structure:
Red Hills Unit #37H	Red Hills Unit #37H	NM Lea County (NAD 83)	Cimarex Red Hills Unit #37H

Gravity & Magnetic Parameters						Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet					Miscellaneous				
Model:	HDGM 2018	Dip:	59.741°	Date:	29-Aug-2018	Lat:	N 32 8 35.17	Northing:	338413.41ftUS	Grid Conv:	0.398°	Slot:	New Slot	TVD Ref:	RKB(3494.5ft above MSL)	
MagDec:	6.731°	FS:	47833.848nT	Gravity FS:	998.433mgn (9.80665 Based)	Lon:	W 103 35 3.10	Easting:	773329.13ftUS	Scale Fact:	0.99997073	Plan:	Cimarex Red Hills Unit #37H Rev0 RM 27Aug18			

EW (A) Scale = 1:3002.07(ft)



Vertical Section (ft) Azim = 179.71° Scale = 1:2456.40(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [435' FNL, 470' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nudge 2°/100' DLS	1500.00	0.00	63.00	1500.00	0.00	0.00	0.00	0.00
Hold Nudge	1745.65	4.92	63.00	1745.65	-4.74	4.79	9.40	2.00
Drop to Vertical 2°/100' DLS	4510.48	4.92	63.00	4500.00	-111.27	112.41	220.62	0.00
Hold Vertical	4756.43	0.00	63.00	4745.65	-116.01	117.20	230.02	2.00
KOP - Build 12°/100' DLS	9473.32	0.00	63.00	9462.54	-116.01	117.20	230.02	0.00
Landing Point	10223.32	90.00	179.71	9940.00	381.45	-360.26	232.47	12.00
Avalon	10223.32	90.00	179.71	9940.00	381.45	-360.26	232.47	12.00
Cimarex Red Hills Unit #37H - PBHL [100' FSL, 750' FWL]	19881.94	90.00	179.71	9940.00	10020.07	-10018.75	282.20	0.00

1. Geological Formations

TVD of target 9,940
MD at TD 19,882

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	939	N/A	
Top Salt	1267	N/A	
Base Salt	4697	N/A	
Lamar	4906	N/A	
Bell Canyon	4932	N/A	
Cherry Canyon	6027	N/A	
Brushy Canyon	7591	Hydrocarbons	
Top Bone Spring	9024	Hydrocarbons	
Bone Spring Target	9940	Hydrocarbons	
Wolfcamp	12140	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	976	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.66	3.87	6.87
12 1/4	0	4908	9-5/8"	36.00	J-55	LT&C	1.15	1.35	2.56
8 3/4	0	9473	5-1/2"	17.00	L-80	LT&C	1.39	1.71	2.00
8 3/4	9473	19882	5-1/2"	17.00	L-80	BT&C	1.32	1.63	50.01
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

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

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

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	410	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	933	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	287	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	434	10.50	3.45	22.18	N/A	Lead: NeoCem
	2226	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	4708	15

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	X	2M
			Pipe Ram	X	
			Double Ram		
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram	X	3M
			Pipe Ram	X	
			Double Ram		
			Other		

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

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

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

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 976'	FW Spud Mud	8.30 - 8.80	30-32	N/C
976' to 4908'	Brine Water	9.70 - 10.20	30-32	N/C
4908' to 19882'	FW/Cut Brine	8.70 - 9.20	30-32	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	
X	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	4755 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.

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.

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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 OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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):**

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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

12/09/2019

APD ID: 10400033640 **Submission Date:** 09/05/2018

Operator Name: CIMAREX ENERGY COMPANY OF COLORADO

Well Name: RED HILLS UNIT **Well Number:** 37H

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

Highlighted data reflects the most recent changes

Show Final Text

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001187

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: