

**OCD - HOBBS**  
**06/30/2020**  
**RECEIVED**

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

|   |                                       |  |
|---|---------------------------------------|--|
| 1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER   |                                       | 5. Lease Serial No.                              |
| 1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other                              |                                       | 6. If Indian, Allottee or Tribe Name             |
| 1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone |                                       | 7. If Unit or CA Agreement, Name and No.         |
| 2. Name of Operator<br><b>[372165]</b>  |                                       | 8. Lease Name and Well No.<br><b>[328512]</b>    |
| 3a. Address   | 3b. Phone No. (include area code)     | 9. API Well No. <b>30-025-47404</b>              |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *)<br>At surface<br>At proposed prod. zone            |                                       | 10. Field and Pool, or Exploratory <b>[2209]</b> |
| 14. Distance in miles and direction from nearest town or post office*   |                                       | 11. Sec., T. R. M. or Blk. and Survey or Area    |
| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)                             |                                       | 12. County or Parish                             |
| 16. No of acres in lease  |                                       | 13. State  |
| 17. Spacing Unit dedicated to this well   |                                       |  |
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.  |                                       | 20. BLM/BIA Bond No. in file                     |
| 19. Proposed Depth  |                                       |  |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)   | 22. Approximate date work will start* | 23. Estimated duration                           |
| 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.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification.  |
| 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). | 6. Such other site specific information and/or plans as may be requested by the BLM.            |

|                         |                      |      |
|-------------------------|----------------------|------|
| 25. Signature           | Name (Printed/Typed) | Date |
| Title                   |                      |      |
| Approved by (Signature) | Name (Printed/Typed) | Date |
| Title                   |                      |      |
| Office                  |                      |      |

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 06/30/2020**

SL

**APPROVED WITH CONDITIONS**  
Approval Date: 06/30/2020

*KZ*  
07/08/2020

## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

|                              |   |
|------------------------------|---|
| <b>OPERATOR'S NAME:</b>      | <b>CENTENNIAL RESOURCE PRODUCTION LLC</b> |
| <b>WELL NAME &amp; NO.:</b>  | <b>MASTIFF 22 FEDERAL COM 501H</b>        |
| <b>SURFACE HOLE FOOTAGE:</b> | <b>300'/S &amp; 1089'/E</b>               |
| <b>BOTTOM HOLE FOOTAGE:</b>  | <b>100'/N &amp; 330'/E</b>                |
| <b>LOCATION:</b>             | <b>Section 22, T.23 S., R.34 E., NMPM</b> |
| <b>COUNTY:</b>               | <b>Lea County, New Mexico</b>             |

COA

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

### A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Wolfcamp** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

### B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1600** 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.
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.

### **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 **5000 (5M)** psi.
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

## D. SPECIAL REQUIREMENT (S)

### Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

## 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 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
  - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
  3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

#### A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for 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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

**B. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in 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.

**JJP006232020**

**APD ID:** 10400038195

**Submission Date:** 01/17/2019

Highlighted data reflects the most recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - General

**APD ID:** 10400038195

**Tie to previous NOS?**

**Submission Date:** 01/17/2019

**BLM Office:** CARLSBAD

**User:** Kanicia Schlichting

**Title:** Sr. Regulatory Analyst

**Federal/Indian APD:** FED

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

**Lease number:** NMNM132073

**Lease Acres:** 320

**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:** CENTENNIAL RESOURCE PRODUCTION LLC

**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Operator Address:** 1001 17th Street, Suite 1800

**Zip:** 80202

**Operator PO Box:**

**Operator City:** Denver

**State:** CO

**Operator Phone:** (720)499-1400

**Operator Internet Address:**

## Section 2 - Well Information

**Well in Master Development Plan?** EXISTING

**Master Development Plan name:** Dandie/Mastiff 22 Federal Com

**Well in Master SUPO?** NO

**Master SUPO name:**

**Well in Master Drilling Plan?** NO

**Master Drilling Plan name:**

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Well API Number:**

**Field/Pool or Exploratory?** Field and Pool

**Field Name:** 2N BONESPRING SANDD

**Pool Name:** ANTELOPE RIDGE; BONE SPRING, WEST

**Is the proposed well in an area containing other mineral resources?** NONE

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Is the proposed well in an area containing other mineral resources?** NONE

**Is the proposed well in a Helium production area?** N

**Use Existing Well Pad?** YES

**New surface disturbance?** N

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:**

**Number:** 6

DANDIE/MASTIFF 22 FEDERAL COM

**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:** 29 Miles

**Distance to nearest well:** 30 FT

**Distance to lease line:** 300 FT

**Reservoir well spacing assigned acres Measurement:** 160 Acres

**Well plat:** MASTIFF\_22\_FEDERAL\_COM\_501H\_C102\_20190117143428.pdf

MASTIFF\_22\_FEDERAL\_COM\_501H\_LEASE\_C102\_20190117143429.pdf

**Well work start Date:** 01/14/2020

**Duration:** 25 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** 23782

**Reference Datum:**

| Wellbore   | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude   | Longitude   | County | State       | Meridian    | Lease Type | Lease Number | Elevation | MD   | TVD  | Will this well produce from this lease? |
|------------|---------|--------------|---------|--------------|------|-------|---------|-------------------|------------|-------------|--------|-------------|-------------|------------|--------------|-----------|------|------|---|
| SHL Leg #1 | 300     | FSL          | 1089    | FEL          | 23S  | 34E   | 22      | Aliquot SESE      | 32.283669  | -103.45292  | LEA    | NEW MEXI CO | NEW MEXI CO | F          | NMNM 132073  | 3433      | 0    | 0    |   |
| KOP Leg #1 | 114     | FSL          | 369     | FEL          | 23S  | 34E   | 22      | Aliquot SESE      | 32.2831389 | -103.450556 | LEA    | NEW MEXI CO | NEW MEXI CO | F          | NMNM 132073  | -6494     | 9971 | 9927 |   |

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

| 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 | 100     | FSL          | 330     | FEL          | 23S  | 34E   | 22      | Aliquot SESE      | 32.283118 | -103.450464 | LEA    | NEW MEXI CO | NEW MEXI CO | F          | NMNM 132073  | -7067     | 10870 | 10500 |   |
| EXIT Leg #1  | 100     | FNL          | 330     | FEL          | 23S  | 34E   | 22      | Aliquot NENE      | 32.297085 | -103.450466 | LEA    | NEW MEXI CO | NEW MEXI CO | S          | STATE        | -7067     | 15364 | 10500 |   |
| BHL Leg #1   | 100     | FNL          | 330     | FEL          | 23S  | 34E   | 22      | Aliquot NENE      | 32.297085 | -103.450466 | LEA    | NEW MEXI CO | NEW MEXI CO | S          | STATE        | -7067     | 15364 | 10500 |   |

**APD ID:** 10400038195

**Submission Date:** 01/17/2019

Highlighted data reflects the most recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - Geologic Formations

| Formation ID | Formation Name         | Elevation | True Vertical Depth | Measured Depth | Lithologies       | Mineral Resources     | Producing Formation |
|--------------|------------------------|-----------|---------------------|----------------|-------------------|-----------------------|---------------------|
| 377588       | RUSTLER                | 3433      | 935                 | 935            | SANDSTONE         | NONE                  | N                   |
| 377589       | CAPITAN REEF           | -1651     | 5084                | 5084           | OTHER : CARBONATE | USEABLE WATER         | N                   |
| 377594       | BELL CANYON            | -1742     | 5175                | 5175           | SANDSTONE         | NATURAL GAS, OIL      | N                   |
| 377593       | CHERRY CANYON          | -2510     | 5943                | 5943           | SANDSTONE         | NATURAL GAS, OIL      | N                   |
| 377595       | BRUSHY CANYON          | -3893     | 7326                | 7326           | SANDSTONE         | NATURAL GAS, OIL      | N                   |
| 377596       | BONE SPRING LIME       | -5160     | 8593                | 8593           | OTHER : CARBONATE | NATURAL GAS, OIL      | N                   |
| 377590       | AVALON SAND            | -5288     | 8721                | 8721           | SHALE             | CO2, NATURAL GAS, OIL | N                   |
| 377591       | FIRST BONE SPRING SAND | -6270     | 9703                | 9703           | SANDSTONE         | NATURAL GAS, OIL      | N                   |
| 377655       | BONE SPRING 2ND        | -6475     | 9908                | 9908           |                   | NATURAL GAS, OIL      | Y                   |

## Section 2 - Blowout Prevention

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

**Rating Depth:** 9700

**Equipment:** The BOP and related equipment will meet or exceed the requirements of a 5M-psi system as set forth in On Shore Order No. 2. See attached BOP Schematic. A. Casinghead: 13 5/8" – 5,000 psi SOW x 13" – 5,000 psi WP Intermediate Spool: 13" – 5,000 psi WP x 11" – 5,000 psi WP Tubinghead: 11" – 5,000 psi WP x 7 1/16" – 15,000 psi WP B. Minimum Specified Pressure Control Equipment • Annular preventer • One Pipe ram, One blind ram • Drilling spool, or blowout preventer with 2 side outlets. Choke side will be a 3-inch minimum diameter, kill line shall be at least 2-inch diameter • 3 inch diameter choke line • 2 – 3 inch choke line valves • 2 inch kill line • 2 chokes with 1 remotely controlled from rig floor (see Figure 2) • 2 – 2 inch kill line valves and a check valve • Upper kelly cock valve with handle available • When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed) • Lower kelly cock valve with handle available • Safety valve(s) and subs to fit all drill string connections in use • Inside BOP or float sub available • Pressure gauge on choke manifold • All BOPE connections subjected to well pressure shall be flanged, welded, or clamped • Fill-up line above the uppermost preventer. C. Auxiliary Equipment • Audio and visual mud monitoring equipment shall be placed to detect volume changes indicating loss or gain of circulating fluid volume. (OOS 1, III.C.2) • Gas Buster will be used below intermediate casing setting depth. • Upper and lower kelly cocks with handles, safety valve and subs to fit all drill string connections and a pressure gauge installed on choke manifold.

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Requesting Variance?** YES

**Variance request:** Centennial Resource Production, LLC hereby requests to use a flex hose on the choke manifold for this well.

**Testing Procedure:** The BOP test shall be performed before drilling out of the surface casing shoe and will occur at a minimum: a. when initially installed b. whenever any seal subject to test pressure is broken c. following related repairs d. at 30 day intervals e. checked daily as to mechanical operating conditions. The ram type preventer(s) will be tested using a test plug to 250 psi (low) and 5,000 psi (high) (casinghead WP) with a test plug upon its installation onto the 13" surface casing. If a test plug is not used, the ram type preventer(s) shall be tested to 70% of the minimum internal yield pressure of the casing. The annular type preventer(s) shall be tested to 50% of its working pressure. Pressure will be maintained for at least 10 minutes or until provisions of the test are met, whichever is longer. • A Sundry Notice (Form 3160 5), along with a copy of the BOP test report, shall be submitted to the local BLM office within 5 working days following the test. • If the bleed line is connected into the buffer tank (header), all BOP equipment including the buffer tank and associated valves will be rated at the required BOP pressure. • The BLM office will be provided with a minimum of four (4) hours' notice of BOP testing to allow witnessing. The BOP Configuration, choke manifold layout, and accumulator system, will be in compliance with Onshore Order 2 for a 5,000 psi system. A remote accumulator will be used. Pressures, capacities, and specific placement and use of the manual and/or hydraulic controls, accumulator controls, bleed lines, etc., will be identified at the time of the BLM 'witnessed BOP test. Any remote controls will be capable of both opening and closing all preventers and shall be readily accessible

**Choke Diagram Attachment:**

Choke\_Diagram\_5K\_20190117144554.pdf

**BOP Diagram Attachment:**

BOP\_Diagram\_5M\_20190117144604.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         | CONDUCTOR    | 26        | 20.0     | NEW       | API      | N              | 0          | 120           | 0           | 120            | 3433        | 3313           | 120                         | H-40  | 94     | OTHER - WELD       |             |          |               |          |              |         |
| 2         | SURFACE      | 17.5      | 13.375   | NEW       | API      | N              | 0          | 1800          | 0           | 1800           | 3433        | 1633           | 1800                        | J-55  | 54.5   | OTHER - BTC        | 1.27        | 3.07     | DRY           | 9.27     | DRY          | 8.7     |
| 3         | INTERMEDIATE | 12.25     | 9.625    | NEW       | API      | N              | 0          | 5050          | 0           | 5050           | 3433        | -1617          | 5050                        | J-55  | 40     | LT&C               | 1.39        | 1.51     | DRY           | 2.57     | DRY          | 3.12    |
| 4         | PRODUCTION   | 8.75      | 5.5      | NEW       | API      | N              | 0          | 9971          | 0           | 9927           | 3433        | -6494          | 9971                        | P-110 | 20     | OTHER - TMK UP DQX | 2.27        | 2.58     | DRY           | 3.23     | DRY          | 3.23    |
| 5         | PRODUCTION   | 8.5       | 5.5      | NEW       | API      | N              | 9971       | 15364         | 9927        | 10500          | -6494       | -7067          | 5393                        | P-110 | 20     | OTHER - TMK UP DQX | 2.14        | 2.44     | DRY           | 55.93    | DRY          | 55.93   |

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

### Casing Attachments

---

**Casing ID:** 1      **String Type:** CONDUCTOR

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

---

**Casing ID:** 2      **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

CASING\_ASSUMPTIONS\_WORKSHEET\_20190117145057.pdf

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**Casing ID:** 3      **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

CASING\_ASSUMPTIONS\_WORKSHEET\_20190117145105.pdf

---

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

CASING\_ASSUMPTIONS\_WORKSHEET\_20190117145115.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190628091653.pdf

**Casing ID:** 5      **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

CASING\_ASSUMPTIONS\_WORKSHEET\_20190117145124.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190628091708.pdf

**Section 4 - Cement**

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|-------------|-----------|------------------|--------|-----------|--------------|-------|---------|-------|---------|-------------|-----------|
| PRODUCTION  | Lead      |                  | 0      | 0         | 0            | 0     | 0       | 0     |         | 0           | 0         |

|           |      |  |   |     |     |      |      |     |  |       |  |
|-----------|------|--|---|-----|-----|------|------|-----|--|-------|--|
| CONDUCTOR | Lead |  | 0 | 120 | 121 | 1.49 | 12.9 | 181 |  | Grout | Bentonite 4% BWOC, Cellophane #/sx, CaCl2 2% BWOC. |
|-----------|------|--|---|-----|-----|------|------|-----|--|-------|--|

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

| String Type  | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type                  | Additives  |
|--------------|-----------|------------------|--------|-----------|--------------|-------|---------|-------|---------|------------------------------|--|
| SURFACE      | Lead      |                  | 0      | 1300      | 1038         | 1.74  | 13.5    | 1806  | 100     | Class C Premium              | Premium Gel Bentonite 4%, C-45 Econolite 0.25%, Phenoseal 0.25#/sk, CaCl 1%, Defoamer C-41P 0.75%  |
| SURFACE      | Tail      |                  | 1300   | 1800      | 518          | 1.34  | 14.8    | 695   | 100     | Class C Premium              | C-45 Econolite 0.10%, CaCl 1.0%  |
| INTERMEDIATE | Lead      |                  | 0      | 4550      | 1100         | 3.44  | 10.7    | 3785  | 150     | TXI Lightweight              | Salt 1.77/sk, C-45 Econolite 2.25%, STE 6.00%, Citric Acid 0.18%, C-19 0.10%, CSA-1000 0.20%, C-530P 0.30%, CTB-15 LCM 7#/sk, Gyp Seal 8#/sk |
| INTERMEDIATE | Tail      |                  | 4550   | 5050      | 141          | 1.33  | 14.8    | 188   | 20      | Class C Premium              | C-45 Econolite 0.10%, Citric acid 0.05%, C503P 0.25%   |
| PRODUCTION   | Lead      |                  | 0      | 9971      | 976          | 3.41  | 10.6    | 3328  | 30      | TXI Lightweight              | Salt 8.98#/sk, STE 6.00%, Citric acid 0.20%, CSA-1000 0.23%, C47B 0.10%, C-503P 0.30%  |
| PRODUCTION   | Tail      |                  | 9971   | 15364     | 1245         | 1.24  | 14.2    | 1544  | 25      | 50:25:25 Class H: Poz: CPO18 | Citric acid 0.03%, CSA-1000 0.05%, C47B 0.25%, C-503P 0.30%  |

### 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 quantities of mud materials will be on the well site at all times for the purpose of assuring well control and maintaining wellbore integrity. Surface interval will employ fresh water mud. The intermediate hole will utilize a diesel emulsified brine fluid to inhibit salt washout and prevent severe fluid losses. The production hole will employ oil base fluid to inhibit formation reactivity and of the appropriate density to maintain well control.

**Describe the mud monitoring system utilized:** Centrifuge separation system. Open tank monitoring with EDR will be used for drilling fluids and return volumes. Open tank monitoring will be used for cement and cuttings return volumes. Mud properties will be monitored at least every 24 hours using industry accepted mud check practices.

### Circulating Medium Table

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

| 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         | 1536<br>4    | OTHER :<br>Brine/OBM   | 8.8                  | 9.5                  |                     |                             |    |                |                |                 |                            |
| 0         | 1800         | OTHER : Fresh<br>Water | 8.6                  | 9.5                  |                     |                             |    |                |                |                 |                            |
| 1800      | 5050         | OTHER : Brine          | 9.8                  | 10                   |                     |                             |    |                |                |                 |                            |

### Section 6 - Test, Logging, Coring

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

Will utilize MWD/LWD (Gamma ray logging) from intermediate hole to TD of the well.

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

GR

**Coring operation description for the well:**

n/a

### Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4904

**Anticipated Surface Pressure:** 2594

**Anticipated Bottom Hole Temperature(F):** 170

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

Dandie\_503\_and\_Mastiff\_501\_502\_H2S\_plan\_20190117145756.pdf

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

## Section 8 - Other Information

**Proposed horizontal/directional/multi-lateral plan submission:**

MASTIFF\_22\_FEDERAL\_COM\_501H\_\_\_CDEV\_PLAN\_\_1\_20190117145824.pdf

**Other proposed operations facets description:**

We are planning to use a spudder rig to preset surface casing.  
Gas Capture Plan is attached.

**Other proposed operations facets attachment:**

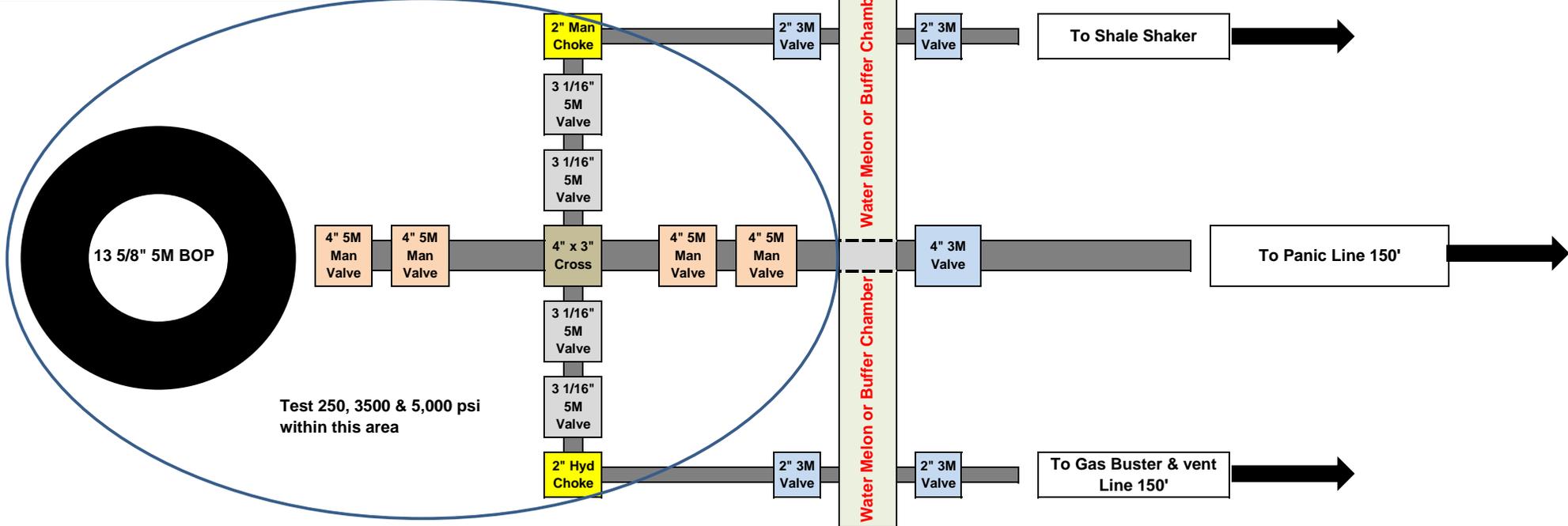
DandieMastiff\_Gas\_Capture\_Plan\_20190117145837.pdf

**Other Variance attachment:**

Flex\_Hose\_Specs\_20190117145917.pdf

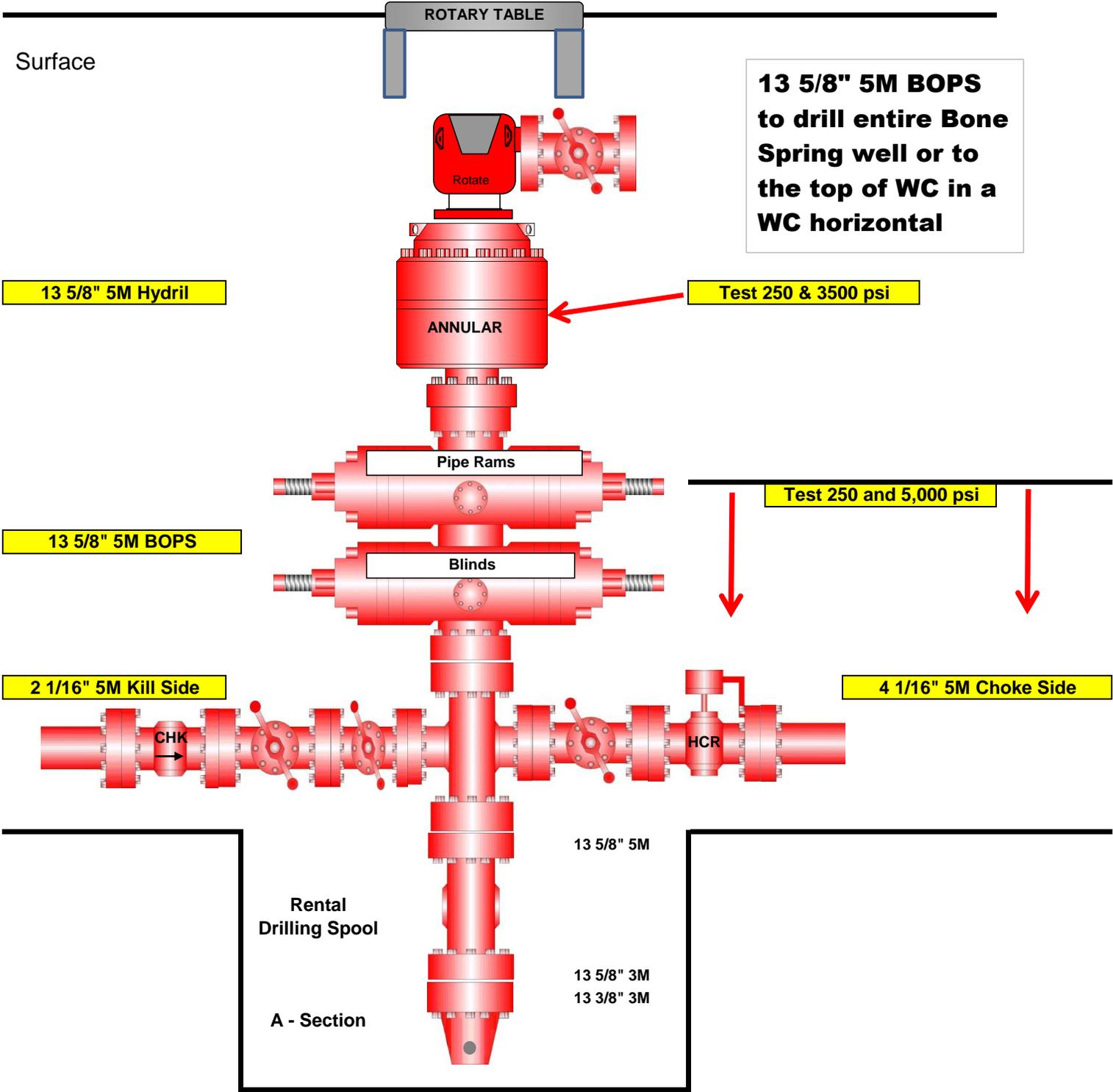
CONFIDENTIAL

**Centennial - Any Bone Spring Well: Minimum Configuration of Choke Side**



| For Well Design |        |
|-----------------|--------|
| Surface         | 13 3/8 |
| Inter.          | 9 5/8  |
| Prod.           | 5 1/2  |

Well Name: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**13 5/8" 5M BOPS to drill entire Bone Spring well or to the top of WC in a WC horizontal**

13 5/8" 5M Hydril

Test 250 & 3500 psi

13 5/8" 5M BOPS

Test 250 and 5,000 psi

2 1/16" 5M Kill Side

4 1/16" 5M Choke Side

Rental Drilling Spool

13 5/8" 5M

13 5/8" 3M

13 3/8" 3M

A - Section

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

Surface:           - 3 welded bow spring centralizers, one on each of the bottom 3 joints, plus one on the shoe joint (4 minimum)  
                      - No Cement baskets will be run

Production:       - 1 welded bow spring centralizer on a stop ring 6' above float shoe  
                      - 1 centralizer every other joint to the top of the tail cement  
                      - 1 centralizer every 4 joints to 500' below the top of the lead cement  
                      - The actual number and placement of centralizers will be determined from hole deviation and potential production zones. Centralizers will be run for maximum practical standoff and through all potential productive zones.

- All casing strings below the conductor shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

No freshly hard banded pipe will be rotated in the surface casing

- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

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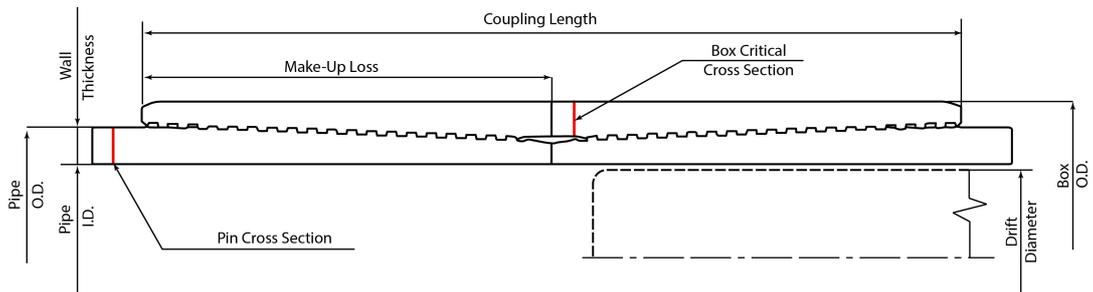
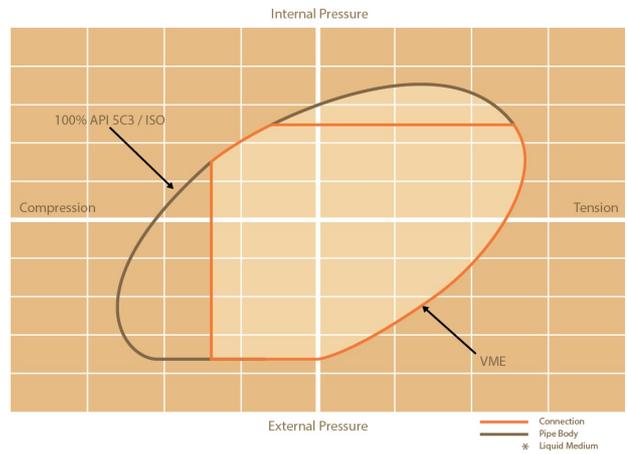
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# TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110 CY

| TUBULAR PARAMETERS     |          | PIPE BODY PROPERTIES                |        |
|------------------------|----------|-------------------------------------|--------|
| Nominal OD, (inch)     | 5.500    | PE Weight, (lbs/ft)                 | 19.81  |
| Wall Thickness, (inch) | 0.361    | Nominal Weight, (lbs/ft)            | 20.00  |
| Pipe Grade             | P110 CY  | Nominal ID, (inch)                  | 4.778  |
| Coupling               | Regular  | Drift Diameter, (inch)              | 4.653  |
| Coupling Grade         | P110 CY  | Nominal Pipe Body Area, (sq inch)   | 5.828  |
| Drift                  | Standard | Yield Strength in Tension, (klbs)   | 641    |
|                        |          | Min. Internal Yield Pressure, (psi) | 12 640 |
|                        |          | Collapse Pressure, (psi)            | 11 110 |

| CONNECTION PARAMETERS                 |        |
|---------------------------------------|--------|
| Connection OD (inch)                  | 6.05   |
| Connection ID, (inch)                 | 4.778  |
| Make-Up Loss, (inch)                  | 4.122  |
| Connection Critical Area, (sq inch)   | 5.828  |
| Yield Strength in Tension, (klbs)     | 641    |
| Yield Strength in Compression, (klbs) | 641    |
| Tension Efficiency                    | 100%   |
| Compression Efficiency                | 100%   |
| Min. Internal Yield Pressure, (psi)   | 12 640 |
| Collapse Pressure, (psi)              | 11 110 |
| Uniaxial Bending (deg/100ft)          | 92.0   |

| MAKE-UP TORQUES                 |        |
|---------------------------------|--------|
| Yield Torque, (ft-lb)           | 20 600 |
| Minimum Make-Up Torque, (ft-lb) | 11 600 |
| Optimum Make-Up Torque, (ft-lb) | 12 900 |
| Maximum Make-Up Torque, (ft-lb) | 14 100 |
| Operating Torque, (ft-lb)       | 17 500 |



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## CASING ASSUMPTIONS WORKSHEET:

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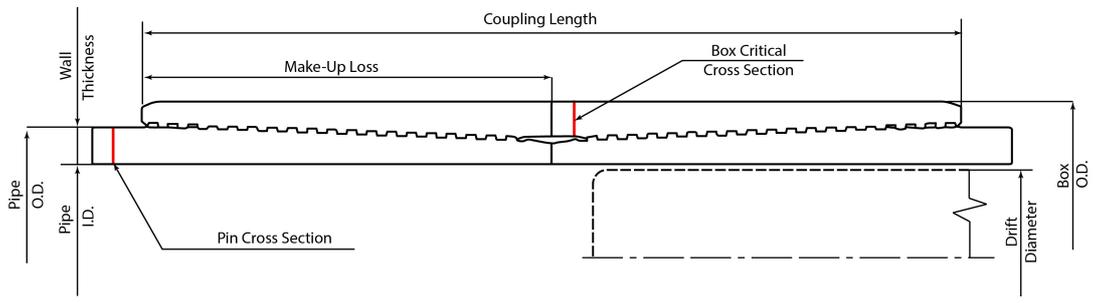
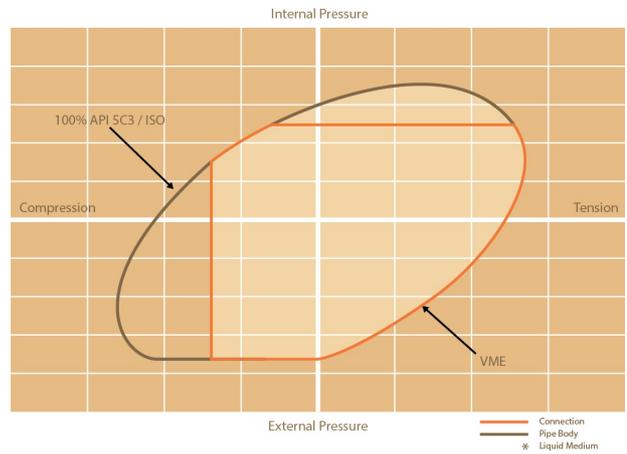
- CENTENNIAL RESOURCE DEVELOPMENT will not employ an air-drill rig for the surface casing. The casing shoe will be tested by drilling 5'-10' out from under the shoe and pressure testing to the maximum expected mud weight equivalent as shown in the mud program listed in the drilling plan.

# TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110 CY

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| Pipe Grade             | P110 CY  | Nominal ID, (inch)                  | 4.778  |
| Coupling               | Regular  | Drift Diameter, (inch)              | 4.653  |
| Coupling Grade         | P110 CY  | Nominal Pipe Body Area, (sq inch)   | 5.828  |
| Drift                  | Standard | Yield Strength in Tension, (klbs)   | 641    |
|                        |          | Min. Internal Yield Pressure, (psi) | 12 640 |
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| Yield Strength in Compression, (klbs) | 641    |
| Tension Efficiency                    | 100%   |
| Compression Efficiency                | 100%   |
| Min. Internal Yield Pressure, (psi)   | 12 640 |
| Collapse Pressure, (psi)              | 11 110 |
| Uniaxial Bending (deg/100ft)          | 92.0   |

| MAKE-UP TORQUES                 |        |
|---------------------------------|--------|
| Yield Torque, (ft-lb)           | 20 600 |
| Minimum Make-Up Torque, (ft-lb) | 11 600 |
| Optimum Make-Up Torque, (ft-lb) | 12 900 |
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**HYDROGEN SULFIDE CONTINGENCY PLAN**

**Dandie 22 Fed Com 503H and Mastiff 22 501H, 502H**

**Section 22**

**T 23S R 34E**

**Lea County, NM**

**Initial Date: 12/17/18**

**Revision Date:**

# **Table of Contents**

Page 3: Introduction

Page 4: Directions to Location

Page 5: Safe Briefing Areas

Page 6: Drill Site Location Setup

Page 7: Toxicity of Various Gases

Page 10: H<sub>2</sub>S Required Equipment

Page 11: Determination of Radius of Exposure

Page 12: Emergency Contact List

## INTRODUCTION

This plan specifies precautionary measures, safety equipment, emergency procedures, responsibilities, duties, and the compliance status pertaining to the production operations of Hydrogen Sulfide producing wells on:

Centennial Resource Development, Inc.

This plan will be in full effect prior to and continuing with all drilling operations for all wells producing potential Hydrogen Sulfide on the

### **Dandie 22 Fed Com 503H and Mastiff 22 501H, 502H**

This plan was developed in response to the potential hazards involved when producing formations that may contain Hydrogen Sulfide (H<sub>2</sub>S) It has been written in compliance with current New Mexico Oil Conservation Division Rule 118 and Bureau of Land Management 43 CFR 3160 Onshore Order No. 6.

### **All personnel shall receive proper H<sub>2</sub>S training in accordance with Onshore Order III.C.3.a**

This plan shall require the full cooperation and efforts of all individuals participating in the production of potential H<sub>2</sub>S wells.

Each individual is required to know their assigned responsibilities and duties in regard to normal production operations and emergency procedures.

Each person should thoroughly understand and be able to use all safety related equipment on the production facility.

Each person should become familiar with the location of all safety equipment and become involved in ensuring that all equipment is properly stored, easily accessible, and routinely maintained.

An ongoing training program will remain in effect with regular training, equipment inspections, and annual certifications for all personnel.

Centennial Resource Development, Inc. shall make every reasonable effort to provide all possible safeguards to protect all personnel, both on this location and in the immediate vicinity, from the harmful effects of H<sub>2</sub>S exposure, if a release to the atmosphere should occur.

## **DIRECTIONS TO LOCATION**

**Dandie 22 Fed Com 503H and Mastiff 22 501H, 502H**

**Section 22**

**T 23S R 34E**

**Lea County, NM**

COMMENCING AT THE INTERSECTION OF HIGHWAY 18 AND HIGHWAY 128 IN JAL, NEW MEXICO, PROCEED IN A NORTHWESTERLY, THEN WESTERLY DIRECTION ALONG HIGHWAY 128 APPROXIMATELY 20.6 MILES TO THE JUNCTION OF THIS ROAD AND DELAWARE BASIN ROAD TO THE NORTH; TURN RIGHT AND PROCEED IN A NORTHERLY DIRECTION APPROXIMATELY 3.0 MILES TO THE JUNCTION OF THIS ROAD AND SHELL ROAD TO THE EAST; TURN RIGHT AND PROCEED IN AN EASTERLY DIRECTION APPROXIMATELY 2.3 MILES TO THE JUNCTION OF THIS ROAD AND ANTELOPE RIDGE ROAD TO THE NORTH; TURN LEFT AND PROCEED IN A NORTHERLY DIRECTION APPROXIMATELY 1.6 MILES TO THE JUNCTION OF THIS ROAD AND ADOBE ROAD TO THE NORTHEAST; TURN RIGHT AND PROCEED IN A NORTHEASTERLY DIRECTION APPROXIMATELY 1.0 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN RIGHT AND PROCEED IN A EASTERLY DIRECTION APPROXIMATELY 0.3 MILES TO THE BEGINNING OF THE PROPOSED ACCESS FOR THE MASTIFF 22 FEDERAL STATE COM 4H WELL PAD TO THE SOUTH; FOLLOW ROAD FLAGS IN A SOUTHERLY DIRECTION APPROXIMATELY 579' TO THE BEGINNING OF THE PROPOSED ACCESS ROAD TO THE SOUTHWEST; FOLLOW ROAD FLAGS IN A SOUTHWESTERLY, THEN SOUTHERLY, THEN WESTERLY DIRECTION APPROXIMATELY 314' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM JAL, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 29.0 MILES.

## **SAFE BRIEFING AREAS**

Two areas will be designated as “SAFE BRIEFING AREAS”.

### **The Primary Safe Briefing Area**

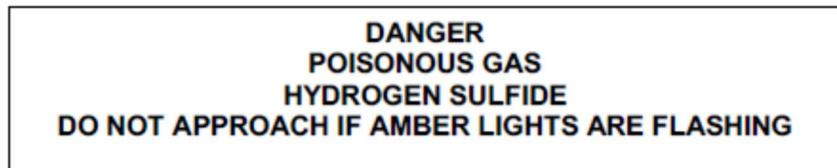
If the Primary Safe Briefing Area cannot be used due to wind conditions; the designated secondary safe briefing area will be used.

These two areas are so designated for accessibility reasons related to self-contained safe breathing air device locations, evacuation muster point utility, and for ease of overall communication, organizational support, as well as the all-important prevailing wind directions. Drawings of the facility denoting these locations are included on Page 15.

If H<sub>2</sub>S is detected in concentrations equal to or in excess of 15 PPM, all personnel not assigned emergency duties are to assemble in the appropriate “SAFE BRIEFING AREA” for instructions.

**Wind Direction Indicators:** A windsock, shall be positioned, allowing the wind direction to be observed from anywhere on the charted facility location.

**Warning-DANGER SIGNS for Approaching Traffic:** All signs shall also be illuminated under conditions of poor visibility.



An amber strobe light system will be activated for H<sub>2</sub>S concentrations of 10 PPM or greater and an audible alarm will sound when H<sub>2</sub>S exceeds 15 ppm, and. This condition will exist until the all clear is given.

## **DRILL SITE LOCATION:**

1. The drilling rig should be situated on location such that the prevailing winds blow across the rig toward the reserve pit or at right angles to a line from the rig to the reserve pit.
2. The entrance to the location should be designated so that it can be barricaded if Hydrogen Sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available in case of a catastrophe; a shift in wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.
3. Once H2S safety procedures are established on location, no beards or facial hair, which will interfere with face seal or mask, will be allowed on location.
4. A minimum of two BRIEFING AREAS will be established, no less than 250 feet from the wellhead and in such location that at least one area will be up-wind from the well at all times. Upon recognition of an emergency situation, all personnel should assemble at the designated briefing areas for instructions.
5. A safety equipment trailer will be station at one of the briefing areas.
6. Windsocks will be installed and wind streamers (6 to 8 feet above ground level) placed at the location entrance. Windsocks shall be illuminated for nighttime operations. Personnel should develop wind direction consciousness.
7. The mud-logging trailer will be located so as to minimize the danger from the gas that breaks out of the drilling fluid.
8. Shale shaker mud tanks will be located so as to minimize the danger from gas that breaks out of the drilling fluid.
9. Electric power plant(s) will be located as far from the well bore as practical so that it may be used under conditions where it otherwise would have to be shut down.
10. When approaching depth where Hydrogen Sulfide may be encountered, appropriate warning signs will be posted on all access roads to the location and at the foot of all stairways to the derrick floor.
11. Appropriate smoking areas will be designated, and smoking will be prohibited elsewhere.

The table below lists various poisonous gases and the concentrations at which they become dangerous.

**TOXICITY OF VARIOUS GASES**

| <b>TOXICITY OF GASES</b>                                      |                         |                          |                          |                             |                       |
|---|-------------------------|--------------------------|--------------------------|-----------------------------|-----------------------|
| (Taken from API RP-49 September 1974 – Re-issued August 1978) |                         |                          |                          |                             |                       |
| <b>Common Name</b>  | <b>Chemical Formula</b> | <b>Gravity (Air = 1)</b> | <b>Threshold 1 Limit</b> | <b>Hazardous 2 Limit</b>    | <b>Lethal 3 Limit</b> |
| Hydrogen Sulfide  | H <sub>2</sub> S        | 1.18                     | 10 ppm                   | 250 ppm/1hr                 | 600 ppm               |
| Sulfur Dioxide  | SO <sub>2</sub>         | 2.21                     | 20 ppm                   | ---                         | 1000 ppm              |
| Carbon Monoxide   | CO                      | 0.97                     | 50 ppm                   | 400 ppm/1hr                 | 1000 ppm              |
| Carbon Dioxide  | CO <sub>2</sub>         | 1.52                     | 5000 ppm                 | 5%                          | 10%                   |
| Methane   | CH <sub>4</sub>         | 0.55                     | 90000 ppm                | Combustible Above 5% in Air |                       |

|   |   |  |
|---|---|--|
| 1. Threshold concentration at which it is believed that all workers may repeatedly be exposed day after day, without adverse effect | 2. Hazardous concentration that may cause death | 3. Lethal concentration that will cause death with short-term exposure |
|---|---|--|

Properties of Gases

The produced gas will probably be a mixture of Carbon Dioxide, Hydrogen Sulfide, and Methane.

**Carbon Dioxide**

Carbon Dioxide (CO<sub>2</sub>) is usually considered inert and is commonly used to extinguish fires.

It is heavier than air (1.52 times) and it will concentrate in low areas of still air.

Humans cannot breathe air containing more than 10% CO<sub>2</sub> without losing consciousness. Air containing 5% CO<sub>2</sub> will cause disorientation in a few minutes.

Continued exposures to CO<sub>2</sub> after being affected will cause convulsions, coma, and respiratory failure.

The threshold limit of CO<sub>2</sub> is 5000 ppm.

Short-term exposure to 50,000 PPM (5%) is reasonable. This gas is colorless and odorless and can be tolerated in relatively high concentrations.

## Hydrogen Sulfide

Hydrogen Sulfide (H<sub>2</sub>S) itself is a colorless, transparent gas and is flammable. It is heavier than air and, hence, may accumulate in low places.

Although the slightest presence of H<sub>2</sub>S in the air is normally detectable by its characteristic “rotten egg” odor, it is dangerous to rely on the odor as a means of detecting excessive concentrations because the sense of smell is rapidly lost, allowing lethal concentrations to be accumulated without warning. The following table indicates the poisonous nature of Hydrogen Sulfide.

| <b>HYDROGEN SULFIDE TOXICITY</b> |      |              |   |
|----------------------------------|------|--------------|---|
| Concentration                    |      |              | Effects   |
| %H <sub>2</sub> S                | PPM  | GR/100 SCF 1 |   |
| 0.001                            | 10   | 0.65         | Safe for 8 hours without respirator. Obvious and unpleasant odor.                 |
| 0.002                            | 20   | 1.30         | Burning in eyes and irritation of respiratory tract after on hour.                |
| 0.01                             | 100  | 6.48         | Kills smell in 3 to 15 minutes; may sting eyes and throat.                        |
| 0.02                             | 200  | 12.96        | Kills smell shortly; stings eyes and throat.                                      |
| 0.05                             | 500  | 32.96        | Dizziness; breathing ceases in a few minutes; need prompt artificial respiration. |
| 0.07                             | 700  | 45.92        | Unconscious quickly; death will result if not rescued promptly                    |
| 0.10                             | 1000 | 64.80        | DEATH!  |
| Note: 1 grain per 100 cubic feet |      |              |   |

## Sulfur Dioxide

Sulfur Dioxide is a colorless, transparent gas and is non-flammable.

Sulfur Dioxide (SO<sub>2</sub>) is produced during the burning of H<sub>2</sub>S. Although SO<sub>2</sub> is heavier than air, it will be picked up by a breeze and carried downwind at elevated temperatures. Since Sulfur Dioxide is extremely irritating to the eyes and mucous membranes of the upper respiratory tract, it has exceptionally good warning powers in this respect. The following table indicates the toxic nature of the gas.

| <b>SULFUR DIOXIDE TOXICITY</b> |        |  |
|--------------------------------|--------|--|
| Concentration                  |        | Effects  |
| %SO <sub>2</sub>               | PPM    |  |
| 0.0005                         | 3 to 5 | Pungent odor-normally a person can detect SO <sub>2</sub> in this range.                 |
| 0.0012                         | 12     | Throat irritation, coughing, and constriction of the chest tearing and smarting of eyes. |
| 0.15                           | 150    | So irritating that it can only be endured for a few minutes.                             |
| 0.05                           | 500    | Causes a sense of suffocation, even with first breath.                                   |

## **H<sub>2</sub>S REQUIRED EQUIPMENT LIST**

### **RESPIRATORY SAFETY SYSTEMS**

- Working cascade system available on rig floor and pit system & 750' of air line hose
- Four (4) breathing air manifolds
- Four (4) 30-minute rescue packs
- Five (5) work/Escape units
- Five (5) escape units
- One (1) filler hose for the work/escape/rescue units

### **DETECTION AND ALARM SYSTEM**

- 4 channel H<sub>2</sub>S monitor
- 4 wireless H<sub>2</sub>S monitors
- H<sub>2</sub>S alarm system (Audible/Red strobe)
- Personal gas monitor for each person on location
- Gas sample tubes

### **WELL CONTROL EQUIPMENT**

- Flare line with remote ignitor and backup flare gun, placed 150' from wellhead
- Choke manifold with remotely operated choke
- Mud gas separator

### **VISUAL WARNING SYSTEMS**

- One color code condition sign will be placed at each entrance reflecting possible conditions at the site
- A colored condition flag will be on display, reflecting current condition at the site at the time
- At least 4 wind socks placed on location, visible at all angles and locations

### **MUD PROGRAM**

- Mud will contain sufficient weight and additives to control and minimize H<sub>2</sub>S

### **METALLURGY**

- All drill strings, casing, tubing, wellhead, BOP, spools, kill lines, choke manifold and lines, and valves shall be suitable for anticipated H<sub>2</sub>S volume and pressure

### **COMMUNICATION**

- Cell phones, intercoms, and satellite phones will be available on location

### **ADDITIONAL SAFETY RELATED ITEMS**

- Stretcher
- 2 OSHA full body harness
- 20# class ABC fire extinguisher

## DETERMINATION OF RADIUS OF EXPOSURE

**Potentially hazardous volume** means a volume of gas of such H<sub>2</sub>S concentration and flow rate that it may result in radius of exposure-calculated ambient concentrations of 100 ppm H<sub>2</sub>S at any occupied residence, school, church, park, school bus stop, place of business or other area where the public could reasonably be expected to frequent, or 500 ppm H<sub>2</sub>S at any Federal, State, County or municipal road or highway.

**Currently there are no residence located within the ROE**

**Radius of exposure** means the calculation resulting from using the Pasquill -Gifford derived equation, or by such other method(s) that may be approved by the authorized officer. Advanced Fire and Safety has provided the Pasquill-Gifford formula in excel format for simple calculations.

## NEW MEXICO OIL & GAS CONSERVATION DIVISION 118

### **Dandie 22 Fed Com 503H and Mastiff 22 501H, 502H**

H<sub>2</sub>S Concentration- **50** PPM (Block 13)

Maximum Escape Volume- **3000** MCF/Day (Block 13)

100 PPM Radius of Exposure (Block 15)- **31**  
(Formula=  $1.589 \times (B5/1000000) \times (B6 \times 1000) \times .6258$ )

500 PPM Radius of Exposure (Block 16)- **14**  
Formula=  $.4546 \times (B5/1000000) \times (B6 \times 1000) \times .6258$

## EMERGENCY CONTACT LIST

| <b>911 is available in the area</b> |                      |                 |               |
|-------------------------------------|----------------------|-----------------|---------------|
| <b>NAME</b>                         | <b>POSITION</b>      | <b>COMPANY</b>  | <b>NUMBER</b> |
| <b>Centennial Contacts</b>          |                      |                 |               |
| Jeremy Ray                          | Drilling Engineer    | CDEV            | 303-263-7872  |
| Ricky Mills/John Helm               | Superintendent       | CDEV            | 432-305-1068  |
| Mike Ponder/Wayne Miller            | Field Superintendent | CDEV            | 432-287-3003  |
| Brett Thompson                      | Drilling Manager     | CDEV            | 720-656-7027  |
| Reggie Phillips                     | HSE Manager          | CDEV            | 432-638-3380  |
| H&P 650 Drilling Office             | Drilling Supervisor  | CDEV            | 432-538-3343  |
| <b>Local Emergency Response</b>     |                      |                 |               |
| Fire Department                     |                      |                 | 575-395-2511  |
| Jal Community Hospital              |                      |                 | 505-395-2511  |
| State Police                        |                      |                 | 505-827-9000  |
| Lea County Sheriff                  |                      |                 | 575-396-3611  |
| <b>Safety Contractor</b>            |                      |                 |               |
| Advanced Safety                     | Office               | Advanced Safety | 833-296-3913  |
| Joe Gadway                          | Permian Supervisor   | Advanced Safety | 318-446-3716  |
| Clint Hudson                        | Operations Manager   | Advanced Safety | 337-552-8330  |
| <b>Well Control Company</b>         |                      |                 |               |
| Wild Well Control                   |                      |                 | 866-404-9564  |
| <b>Contractors</b>                  |                      |                 |               |
| Tommy E Lee                         | Pump Trucks          |                 | 432-813-7140  |
| Paul Smith                          | Drilling Fluids      | Momentum        | 307-258-6254  |
| Compass Coordinators                | Cement               | Compass         | 432-561-5970  |



# **NEW MEXICO**

**LEA**

**DANDIE/ MASTIFF**

**MASTIFF 22 FEDERAL COM 501H**

**MASTIFF 22 FEDERAL COM 501H**

**Plan: PWP0**

## **Survey Report - Geographic**

**19 December, 2018**

|  |  |
|--|--|
| <b>Company:</b> NEW MEXICO                   | <b>Local Co-ordinate Reference:</b> Well MASTIFF 22 FEDERAL COM 501H |
| <b>Project:</b> LEA                          | <b>TVD Reference:</b> RKB=3431.4 @ 3456.4usft (HP 650)               |
| <b>Site:</b> DANDIE/ MASTIFF                 | <b>MD Reference:</b> RKB=3431.4 @ 3456.4usft (HP 650)                |
| <b>Well:</b> MASTIFF 22 FEDERAL COM 501H     | <b>North Reference:</b> True   |
| <b>Wellbore:</b> MASTIFF 22 FEDERAL COM 501H | <b>Survey Calculation Method:</b> Minimum Curvature                  |
| <b>Design:</b> PWP0                          | <b>Database:</b> Centennial EDM SQL Server                           |

|   |                                     |
|---|-------------------------------------|
| <b>Project</b> LEA  |                                     |
| <b>Map System:</b> Universal Transverse Mercator (US Survey Feet) | <b>System Datum:</b> Mean Sea Level |
| <b>Geo Datum:</b> North American Datum 1983                       |                                     |
| <b>Map Zone:</b> Zone 13N (108 W to 102 W)                        |                                     |

|                                       |                               |                                     |  |
|---------------------------------------|-------------------------------|-------------------------------------|--|
| <b>Site</b> DANDIE/ MASTIFF           |                               |                                     |  |
| <b>Site Position:</b>                 | <b>Northing:</b> 0.00 usft    | <b>Latitude:</b> 0° 0' 0.000 N      |  |
| <b>From:</b> Map                      | <b>Easting:</b> 0.00 usft     | <b>Longitude:</b> 109° 29' 19.478 W |  |
| <b>Position Uncertainty:</b> 0.0 usft | <b>Slot Radius:</b> 13-3/16 " | <b>Grid Convergence:</b> 0.00 °     |  |

|   |                       |                                     |                                     |
|---|-----------------------|-------------------------------------|-------------------------------------|
| <b>Well</b> MASTIFF 22 FEDERAL COM 501H |                       |                                     |                                     |
| <b>Well Position</b>                    | <b>+N/-S</b> 0.0 usft | <b>Northing:</b> 11,722,186.72 usft | <b>Latitude:</b> 32° 17' 1.208 N    |
|   | <b>+E/-W</b> 0.0 usft | <b>Easting:</b> 2,118,387.97 usft   | <b>Longitude:</b> 103° 27' 10.512 W |
| <b>Position Uncertainty</b>             | 0.0 usft              | <b>Wellhead Elevation:</b> usft     | <b>Ground Level:</b> 3,431.4 usft   |

| <b>Wellbore</b> MASTIFF 22 FEDERAL COM 501H |            |             |                 |               |                     |
|---|------------|-------------|-----------------|---------------|---------------------|
| Magnetics                                   | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|   | IGRF200510 | 12/31/2009  | 7.70            | 60.32         | 48,842.04309527     |

| <b>Design</b> PWP0  |                         |                          |              |               |
|---------------------|-------------------------|--------------------------|--------------|---------------|
| <b>Audit Notes:</b> |                         |                          |              |               |
| <b>Version:</b>     | <b>Phase:</b> PROTOTYPE | <b>Tie On Depth:</b> 0.0 |              |               |
| Vertical Section:   | Depth From (TVD) (usft) | +N/-S (usft)             | +E/-W (usft) | Direction (°) |
|                     | 0.0                     | 0.0                      | 0.0          | 8.83          |

| <b>Survey Tool Program</b> |  | <b>Date</b> 12/19/2018            |
|----------------------------|--|-----------------------------------|
| From (usft)                | To (usft)                                  | Survey (Wellbore)                 |
| 0.0                        | 15,363.5                                   | PWP0 (MASTIFF 22 FEDERAL COM 501) |
| Tool Name                  | Description                                |                                   |
| MWD+IFR1+MS                | OWSG MWD + IFR1 + Multi-Station Correction |                                   |

| <b>Planned Survey</b> |                 |             |                       |              |              |                     |                    |                 |                   |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-----------------|-------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude        | Longitude         |  |
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 100.0                 | 0.00            | 0.00        | 100.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 200.0                 | 0.00            | 0.00        | 200.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 300.0                 | 0.00            | 0.00        | 300.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 400.0                 | 0.00            | 0.00        | 400.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 500.0                 | 0.00            | 0.00        | 500.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 600.0                 | 0.00            | 0.00        | 600.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 700.0                 | 0.00            | 0.00        | 700.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 800.0                 | 0.00            | 0.00        | 800.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 900.0                 | 0.00            | 0.00        | 900.0                 | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,000.0               | 0.00            | 0.00        | 1,000.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,100.0               | 0.00            | 0.00        | 1,100.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |

|                  |                             |                                     |                                  |
|------------------|-----------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | NEW MEXICO                  | <b>Local Co-ordinate Reference:</b> | Well MASTIFF 22 FEDERAL COM 501H |
| <b>Project:</b>  | LEA                         | <b>TVD Reference:</b>               | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Site:</b>     | DANDIE/ MASTIFF             | <b>MD Reference:</b>                | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Well:</b>     | MASTIFF 22 FEDERAL COM 501H | <b>North Reference:</b>             | True                             |
| <b>Wellbore:</b> | MASTIFF 22 FEDERAL COM 501H | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | PWP0                        | <b>Database:</b>                    | Centennial EDM SQL Server        |

| Planned Survey        |                 |             |                       |              |              |                     |                    |                 |                   |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-----------------|-------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude        | Longitude         |  |
| 1,200.0               | 0.00            | 0.00        | 1,200.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,300.0               | 0.00            | 0.00        | 1,300.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,400.0               | 0.00            | 0.00        | 1,400.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,500.0               | 0.00            | 0.00        | 1,500.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,600.0               | 0.00            | 0.00        | 1,600.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,700.0               | 0.00            | 0.00        | 1,700.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,800.0               | 0.00            | 0.00        | 1,800.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 1,900.0               | 0.00            | 0.00        | 1,900.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,000.0               | 0.00            | 0.00        | 2,000.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,100.0               | 0.00            | 0.00        | 2,100.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,200.0               | 0.00            | 0.00        | 2,200.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,300.0               | 0.00            | 0.00        | 2,300.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,400.0               | 0.00            | 0.00        | 2,400.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,500.0               | 0.00            | 0.00        | 2,500.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,600.0               | 0.00            | 0.00        | 2,600.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,700.0               | 0.00            | 0.00        | 2,700.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,800.0               | 0.00            | 0.00        | 2,800.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 2,900.0               | 0.00            | 0.00        | 2,900.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 3,000.0               | 0.00            | 0.00        | 3,000.0               | 0.0          | 0.0          | 11,722,186.72       | 2,118,387.97       | 32° 17' 1.208 N | 103° 27' 10.512 W |  |
| 3,100.0               | 1.00            | 104.45      | 3,100.0               | -0.2         | 0.8          | 11,722,186.52       | 2,118,388.82       | 32° 17' 1.206 N | 103° 27' 10.502 W |  |
| 3,200.0               | 2.00            | 104.45      | 3,200.0               | -0.9         | 3.4          | 11,722,185.90       | 2,118,391.36       | 32° 17' 1.200 N | 103° 27' 10.473 W |  |
| 3,300.0               | 3.00            | 104.45      | 3,299.9               | -2.0         | 7.6          | 11,722,184.87       | 2,118,395.60       | 32° 17' 1.189 N | 103° 27' 10.423 W |  |
| 3,400.0               | 4.00            | 104.45      | 3,399.7               | -3.5         | 13.5         | 11,722,183.43       | 2,118,401.53       | 32° 17' 1.174 N | 103° 27' 10.355 W |  |
| 3,500.0               | 5.00            | 104.45      | 3,499.4               | -5.4         | 21.1         | 11,722,181.59       | 2,118,409.16       | 32° 17' 1.155 N | 103° 27' 10.266 W |  |
| 3,600.0               | 6.00            | 104.45      | 3,598.9               | -7.8         | 30.4         | 11,722,179.33       | 2,118,418.47       | 32° 17' 1.131 N | 103° 27' 10.158 W |  |
| 3,700.0               | 7.00            | 104.45      | 3,698.3               | -10.7        | 41.4         | 11,722,176.66       | 2,118,429.47       | 32° 17' 1.103 N | 103° 27' 10.030 W |  |
| 3,800.0               | 7.00            | 104.45      | 3,797.5               | -13.7        | 53.2         | 11,722,173.79       | 2,118,441.32       | 32° 17' 1.073 N | 103° 27' 9.893 W  |  |
| 3,900.0               | 7.00            | 104.45      | 3,896.8               | -16.7        | 65.0         | 11,722,170.92       | 2,118,453.16       | 32° 17' 1.043 N | 103° 27' 9.755 W  |  |
| 4,000.0               | 7.00            | 104.45      | 3,996.0               | -19.8        | 76.8         | 11,722,168.05       | 2,118,465.01       | 32° 17' 1.013 N | 103° 27' 9.618 W  |  |
| 4,100.0               | 7.00            | 104.45      | 4,095.3               | -22.8        | 88.6         | 11,722,165.18       | 2,118,476.85       | 32° 17' 0.983 N | 103° 27' 9.480 W  |  |
| 4,200.0               | 7.00            | 104.45      | 4,194.5               | -25.9        | 100.4        | 11,722,162.31       | 2,118,488.69       | 32° 17' 0.953 N | 103° 27' 9.343 W  |  |
| 4,300.0               | 7.00            | 104.45      | 4,293.8               | -28.9        | 112.2        | 11,722,159.44       | 2,118,500.54       | 32° 17' 0.922 N | 103° 27' 9.205 W  |  |
| 4,400.0               | 7.00            | 104.45      | 4,393.0               | -31.9        | 124.0        | 11,722,156.57       | 2,118,512.38       | 32° 17' 0.892 N | 103° 27' 9.068 W  |  |
| 4,500.0               | 7.00            | 104.45      | 4,492.3               | -35.0        | 135.8        | 11,722,153.70       | 2,118,524.23       | 32° 17' 0.862 N | 103° 27' 8.930 W  |  |
| 4,600.0               | 7.00            | 104.45      | 4,591.6               | -38.0        | 147.6        | 11,722,150.83       | 2,118,536.07       | 32° 17' 0.832 N | 103° 27' 8.793 W  |  |
| 4,700.0               | 7.00            | 104.45      | 4,690.8               | -41.1        | 159.4        | 11,722,147.96       | 2,118,547.91       | 32° 17' 0.802 N | 103° 27' 8.655 W  |  |
| 4,800.0               | 7.00            | 104.45      | 4,790.1               | -44.1        | 171.2        | 11,722,145.09       | 2,118,559.76       | 32° 17' 0.772 N | 103° 27' 8.518 W  |  |
| 4,900.0               | 7.00            | 104.45      | 4,889.3               | -47.1        | 183.0        | 11,722,142.22       | 2,118,571.60       | 32° 17' 0.742 N | 103° 27' 8.380 W  |  |
| 5,000.0               | 7.00            | 104.45      | 4,988.6               | -50.2        | 194.8        | 11,722,139.35       | 2,118,583.45       | 32° 17' 0.712 N | 103° 27' 8.243 W  |  |
| 5,100.0               | 7.00            | 104.45      | 5,087.8               | -53.2        | 206.6        | 11,722,136.48       | 2,118,595.29       | 32° 17' 0.682 N | 103° 27' 8.105 W  |  |
| 5,200.0               | 7.00            | 104.45      | 5,187.1               | -56.3        | 218.4        | 11,722,133.60       | 2,118,607.13       | 32° 17' 0.652 N | 103° 27' 7.968 W  |  |
| 5,300.0               | 7.00            | 104.45      | 5,286.3               | -59.3        | 230.2        | 11,722,130.73       | 2,118,618.98       | 32° 17' 0.621 N | 103° 27' 7.830 W  |  |
| 5,400.0               | 7.00            | 104.45      | 5,385.6               | -62.4        | 242.0        | 11,722,127.86       | 2,118,630.82       | 32° 17' 0.591 N | 103° 27' 7.693 W  |  |
| 5,500.0               | 7.00            | 104.45      | 5,484.8               | -65.4        | 253.8        | 11,722,124.99       | 2,118,642.67       | 32° 17' 0.561 N | 103° 27' 7.555 W  |  |
| 5,600.0               | 7.00            | 104.45      | 5,584.1               | -68.4        | 265.6        | 11,722,122.12       | 2,118,654.51       | 32° 17' 0.531 N | 103° 27' 7.418 W  |  |
| 5,700.0               | 7.00            | 104.45      | 5,683.4               | -71.5        | 277.4        | 11,722,119.25       | 2,118,666.35       | 32° 17' 0.501 N | 103° 27' 7.280 W  |  |
| 5,800.0               | 7.00            | 104.45      | 5,782.6               | -74.5        | 289.2        | 11,722,116.38       | 2,118,678.20       | 32° 17' 0.471 N | 103° 27' 7.143 W  |  |
| 5,900.0               | 7.00            | 104.45      | 5,881.9               | -77.6        | 301.0        | 11,722,113.51       | 2,118,690.04       | 32° 17' 0.441 N | 103° 27' 7.006 W  |  |
| 6,000.0               | 7.00            | 104.45      | 5,981.1               | -80.6        | 312.8        | 11,722,110.64       | 2,118,701.89       | 32° 17' 0.411 N | 103° 27' 6.868 W  |  |
| 6,100.0               | 7.00            | 104.45      | 6,080.4               | -83.6        | 324.6        | 11,722,107.77       | 2,118,713.73       | 32° 17' 0.381 N | 103° 27' 6.731 W  |  |
| 6,200.0               | 7.00            | 104.45      | 6,179.6               | -86.7        | 336.4        | 11,722,104.90       | 2,118,725.57       | 32° 17' 0.351 N | 103° 27' 6.593 W  |  |
| 6,300.0               | 7.00            | 104.45      | 6,278.9               | -89.7        | 348.2        | 11,722,102.03       | 2,118,737.42       | 32° 17' 0.321 N | 103° 27' 6.456 W  |  |
| 6,400.0               | 7.00            | 104.45      | 6,378.1               | -92.8        | 360.0        | 11,722,099.16       | 2,118,749.26       | 32° 17' 0.290 N | 103° 27' 6.318 W  |  |
| 6,500.0               | 7.00            | 104.45      | 6,477.4               | -95.8        | 371.8        | 11,722,096.29       | 2,118,761.11       | 32° 17' 0.260 N | 103° 27' 6.181 W  |  |
| 6,600.0               | 7.00            | 104.45      | 6,576.6               | -98.8        | 383.6        | 11,722,093.42       | 2,118,772.95       | 32° 17' 0.230 N | 103° 27' 6.043 W  |  |

|                  |                             |                                     |                                  |
|------------------|-----------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | NEW MEXICO                  | <b>Local Co-ordinate Reference:</b> | Well MASTIFF 22 FEDERAL COM 501H |
| <b>Project:</b>  | LEA                         | <b>TVD Reference:</b>               | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Site:</b>     | DANDIE/ MASTIFF             | <b>MD Reference:</b>                | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Well:</b>     | MASTIFF 22 FEDERAL COM 501H | <b>North Reference:</b>             | True                             |
| <b>Wellbore:</b> | MASTIFF 22 FEDERAL COM 501H | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | PWPO                        | <b>Database:</b>                    | Centennial EDM SQL Server        |

| Planned Survey        |                 |             |                       |              |              |                     |                    |                  |                  |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude         | Longitude        |  |
| 6,700.0               | 7.00            | 104.45      | 6,675.9               | -101.9       | 395.4        | 11,722,090.55       | 2,118,784.79       | 32° 17' 0.200 N  | 103° 27' 5.906 W |  |
| 6,800.0               | 7.00            | 104.45      | 6,775.2               | -104.9       | 407.2        | 11,722,087.68       | 2,118,796.64       | 32° 17' 0.170 N  | 103° 27' 5.768 W |  |
| 6,900.0               | 7.00            | 104.45      | 6,874.4               | -108.0       | 419.0        | 11,722,084.81       | 2,118,808.48       | 32° 17' 0.140 N  | 103° 27' 5.631 W |  |
| 7,000.0               | 7.00            | 104.45      | 6,973.7               | -111.0       | 430.8        | 11,722,081.94       | 2,118,820.33       | 32° 17' 0.110 N  | 103° 27' 5.493 W |  |
| 7,100.0               | 7.00            | 104.45      | 7,072.9               | -114.1       | 442.6        | 11,722,079.07       | 2,118,832.17       | 32° 17' 0.080 N  | 103° 27' 5.356 W |  |
| 7,200.0               | 7.00            | 104.45      | 7,172.2               | -117.1       | 454.4        | 11,722,076.19       | 2,118,844.01       | 32° 17' 0.050 N  | 103° 27' 5.218 W |  |
| 7,300.0               | 7.00            | 104.45      | 7,271.4               | -120.1       | 466.2        | 11,722,073.32       | 2,118,855.86       | 32° 17' 0.020 N  | 103° 27' 5.081 W |  |
| 7,400.0               | 7.00            | 104.45      | 7,370.7               | -123.2       | 478.0        | 11,722,070.45       | 2,118,867.70       | 32° 16' 59.989 N | 103° 27' 4.943 W |  |
| 7,500.0               | 7.00            | 104.45      | 7,469.9               | -126.2       | 489.8        | 11,722,067.58       | 2,118,879.55       | 32° 16' 59.959 N | 103° 27' 4.806 W |  |
| 7,600.0               | 7.00            | 104.45      | 7,569.2               | -129.3       | 501.6        | 11,722,064.71       | 2,118,891.39       | 32° 16' 59.929 N | 103° 27' 4.668 W |  |
| 7,700.0               | 7.00            | 104.45      | 7,668.4               | -132.3       | 513.4        | 11,722,061.84       | 2,118,903.24       | 32° 16' 59.899 N | 103° 27' 4.531 W |  |
| 7,800.0               | 7.00            | 104.45      | 7,767.7               | -135.3       | 525.2        | 11,722,058.97       | 2,118,915.08       | 32° 16' 59.869 N | 103° 27' 4.393 W |  |
| 7,900.0               | 7.00            | 104.45      | 7,867.0               | -138.4       | 537.0        | 11,722,056.10       | 2,118,926.92       | 32° 16' 59.839 N | 103° 27' 4.256 W |  |
| 8,000.0               | 7.00            | 104.45      | 7,966.2               | -141.4       | 548.8        | 11,722,053.23       | 2,118,938.77       | 32° 16' 59.809 N | 103° 27' 4.118 W |  |
| 8,100.0               | 7.00            | 104.45      | 8,065.5               | -144.5       | 560.6        | 11,722,050.36       | 2,118,950.61       | 32° 16' 59.779 N | 103° 27' 3.981 W |  |
| 8,200.0               | 7.00            | 104.45      | 8,164.7               | -147.5       | 572.4        | 11,722,047.49       | 2,118,962.46       | 32° 16' 59.749 N | 103° 27' 3.843 W |  |
| 8,300.0               | 7.00            | 104.45      | 8,264.0               | -150.5       | 584.2        | 11,722,044.62       | 2,118,974.30       | 32° 16' 59.719 N | 103° 27' 3.706 W |  |
| 8,400.0               | 7.00            | 104.45      | 8,363.2               | -153.6       | 596.0        | 11,722,041.75       | 2,118,986.14       | 32° 16' 59.688 N | 103° 27' 3.568 W |  |
| 8,500.0               | 7.00            | 104.45      | 8,462.5               | -156.6       | 607.8        | 11,722,038.88       | 2,118,997.99       | 32° 16' 59.658 N | 103° 27' 3.431 W |  |
| 8,600.0               | 7.00            | 104.45      | 8,561.7               | -159.7       | 619.6        | 11,722,036.01       | 2,119,009.83       | 32° 16' 59.628 N | 103° 27' 3.293 W |  |
| 8,700.0               | 7.00            | 104.45      | 8,661.0               | -162.7       | 631.4        | 11,722,033.14       | 2,119,021.68       | 32° 16' 59.598 N | 103° 27' 3.156 W |  |
| 8,800.0               | 7.00            | 104.45      | 8,760.2               | -165.8       | 643.2        | 11,722,030.27       | 2,119,033.52       | 32° 16' 59.568 N | 103° 27' 3.018 W |  |
| 8,900.0               | 7.00            | 104.45      | 8,859.5               | -168.8       | 655.0        | 11,722,027.40       | 2,119,045.36       | 32° 16' 59.538 N | 103° 27' 2.881 W |  |
| 9,000.0               | 7.00            | 104.45      | 8,958.8               | -171.8       | 666.8        | 11,722,024.53       | 2,119,057.21       | 32° 16' 59.508 N | 103° 27' 2.744 W |  |
| 9,100.0               | 7.00            | 104.45      | 9,058.0               | -174.9       | 678.6        | 11,722,021.65       | 2,119,069.05       | 32° 16' 59.478 N | 103° 27' 2.606 W |  |
| 9,200.0               | 6.00            | 104.45      | 9,157.4               | -177.7       | 689.6        | 11,722,018.99       | 2,119,080.89       | 32° 16' 59.448 N | 103° 27' 2.468 W |  |
| 9,300.0               | 5.00            | 104.45      | 9,256.9               | -180.1       | 698.9        | 11,722,016.73       | 2,119,089.37       | 32° 16' 59.426 N | 103° 27' 2.330 W |  |
| 9,400.0               | 4.00            | 104.45      | 9,356.6               | -182.0       | 706.5        | 11,722,014.88       | 2,119,096.99       | 32° 16' 59.407 N | 103° 27' 2.282 W |  |
| 9,500.0               | 3.00            | 104.45      | 9,456.4               | -183.6       | 712.4        | 11,722,013.45       | 2,119,102.93       | 32° 16' 59.392 N | 103° 27' 2.213 W |  |
| 9,600.0               | 2.00            | 104.45      | 9,556.3               | -184.7       | 716.6        | 11,722,012.42       | 2,119,107.17       | 32° 16' 59.381 N | 103° 27' 2.164 W |  |
| 9,700.0               | 1.00            | 104.45      | 9,656.3               | -185.3       | 719.1        | 11,722,011.80       | 2,119,109.71       | 32° 16' 59.374 N | 103° 27' 2.134 W |  |
| 9,800.0               | 0.00            | 0.00        | 9,756.3               | -185.5       | 720.0        | 11,722,011.60       | 2,119,110.56       | 32° 16' 59.372 N | 103° 27' 2.124 W |  |
| 9,900.0               | 0.00            | 0.00        | 9,856.3               | -185.5       | 720.0        | 11,722,011.60       | 2,119,110.56       | 32° 16' 59.372 N | 103° 27' 2.124 W |  |
| 9,970.5               | 0.00            | 0.00        | 9,926.8               | -185.5       | 720.0        | 11,722,011.60       | 2,119,110.56       | 32° 16' 59.372 N | 103° 27' 2.124 W |  |
| 10,000.0              | 2.95            | 0.79        | 9,956.3               | -184.8       | 720.0        | 11,722,012.35       | 2,119,110.56       | 32° 16' 59.380 N | 103° 27' 2.124 W |  |
| 10,100.0              | 12.94           | 0.79        | 10,055.2              | -171.0       | 720.2        | 11,722,026.16       | 2,119,110.55       | 32° 16' 59.516 N | 103° 27' 2.122 W |  |
| 10,200.0              | 22.94           | 0.79        | 10,150.2              | -140.2       | 720.6        | 11,722,056.93       | 2,119,110.53       | 32° 16' 59.821 N | 103° 27' 2.117 W |  |
| 10,300.0              | 32.93           | 0.79        | 10,238.4              | -93.4        | 721.3        | 11,722,103.72       | 2,119,110.50       | 32° 17' 0.284 N  | 103° 27' 2.109 W |  |
| 10,400.0              | 42.93           | 0.79        | 10,317.2              | -32.0        | 722.1        | 11,722,165.11       | 2,119,110.46       | 32° 17' 0.891 N  | 103° 27' 2.100 W |  |
| 10,500.0              | 52.92           | 0.79        | 10,384.1              | 42.1         | 723.1        | 11,722,239.25       | 2,119,110.41       | 32° 17' 1.625 N  | 103° 27' 2.088 W |  |
| 10,600.0              | 62.92           | 0.79        | 10,437.2              | 126.7        | 724.3        | 11,722,323.87       | 2,119,110.36       | 32° 17' 2.462 N  | 103° 27' 2.074 W |  |
| 10,700.0              | 72.92           | 0.79        | 10,474.7              | 219.3        | 725.6        | 11,722,416.42       | 2,119,110.30       | 32° 17' 3.378 N  | 103° 27' 2.059 W |  |
| 10,800.0              | 82.91           | 0.79        | 10,495.6              | 316.9        | 726.9        | 11,722,514.08       | 2,119,110.24       | 32° 17' 4.345 N  | 103° 27' 2.043 W |  |
| 10,870.9              | 90.00           | 0.79        | 10,500.0              | 387.6        | 727.9        | 11,722,584.83       | 2,119,110.19       | 32° 17' 5.045 N  | 103° 27' 2.032 W |  |
| 10,900.0              | 90.00           | 0.78        | 10,500.0              | 416.7        | 728.3        | 11,722,613.90       | 2,119,110.17       | 32° 17' 5.332 N  | 103° 27' 2.027 W |  |
| 11,000.0              | 90.00           | 0.76        | 10,500.0              | 516.7        | 729.6        | 11,722,713.90       | 2,119,110.08       | 32° 17' 6.322 N  | 103° 27' 2.012 W |  |
| 11,100.0              | 90.00           | 0.74        | 10,500.0              | 616.7        | 730.9        | 11,722,813.90       | 2,119,109.94       | 32° 17' 7.311 N  | 103° 27' 1.996 W |  |
| 11,200.0              | 90.00           | 0.71        | 10,500.0              | 716.7        | 732.2        | 11,722,913.90       | 2,119,109.76       | 32° 17' 8.301 N  | 103° 27' 1.982 W |  |
| 11,300.0              | 90.00           | 0.69        | 10,500.0              | 816.7        | 733.4        | 11,723,013.90       | 2,119,109.54       | 32° 17' 9.291 N  | 103° 27' 1.967 W |  |
| 11,400.0              | 90.00           | 0.67        | 10,500.0              | 916.7        | 734.6        | 11,723,113.90       | 2,119,109.28       | 32° 17' 10.280 N | 103° 27' 1.954 W |  |
| 11,500.0              | 90.00           | 0.64        | 10,500.0              | 1,016.7      | 735.8        | 11,723,213.90       | 2,119,108.98       | 32° 17' 11.270 N | 103° 27' 1.940 W |  |
| 11,600.0              | 90.00           | 0.62        | 10,500.0              | 1,116.7      | 736.9        | 11,723,313.90       | 2,119,108.64       | 32° 17' 12.259 N | 103° 27' 1.927 W |  |
| 11,700.0              | 90.00           | 0.59        | 10,500.0              | 1,216.7      | 737.9        | 11,723,413.89       | 2,119,108.25       | 32° 17' 13.249 N | 103° 27' 1.915 W |  |
| 11,800.0              | 90.00           | 0.57        | 10,500.0              | 1,316.6      | 738.9        | 11,723,513.89       | 2,119,107.83       | 32° 17' 14.239 N | 103° 27' 1.903 W |  |
| 11,900.0              | 90.00           | 0.55        | 10,500.0              | 1,416.6      | 739.9        | 11,723,613.89       | 2,119,107.36       | 32° 17' 15.228 N | 103° 27' 1.892 W |  |

|                  |                             |                                     |                                  |
|------------------|-----------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | NEW MEXICO                  | <b>Local Co-ordinate Reference:</b> | Well MASTIFF 22 FEDERAL COM 501H |
| <b>Project:</b>  | LEA                         | <b>TVD Reference:</b>               | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Site:</b>     | DANDIE/ MASTIFF             | <b>MD Reference:</b>                | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Well:</b>     | MASTIFF 22 FEDERAL COM 501H | <b>North Reference:</b>             | True                             |
| <b>Wellbore:</b> | MASTIFF 22 FEDERAL COM 501H | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | PWPO                        | <b>Database:</b>                    | Centennial EDM SQL Server        |

| Planned Survey        |                 |             |                       |              |              |                     |                    |                  |                  |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude         | Longitude        |  |
| 12,000.0              | 90.00           | 0.52        | 10,500.0              | 1,516.6      | 740.8        | 11,723,713.89       | 2,119,106.85       | 32° 17' 16.218 N | 103° 27' 1.881 W |  |
| 12,100.0              | 90.00           | 0.50        | 10,500.0              | 1,616.6      | 741.7        | 11,723,813.89       | 2,119,106.31       | 32° 17' 17.207 N | 103° 27' 1.870 W |  |
| 12,200.0              | 90.00           | 0.48        | 10,500.0              | 1,716.6      | 742.6        | 11,723,913.89       | 2,119,105.72       | 32° 17' 18.197 N | 103° 27' 1.860 W |  |
| 12,300.0              | 90.00           | 0.45        | 10,500.0              | 1,816.6      | 743.4        | 11,724,013.89       | 2,119,105.09       | 32° 17' 19.187 N | 103° 27' 1.851 W |  |
| 12,400.0              | 90.00           | 0.43        | 10,500.0              | 1,916.6      | 744.2        | 11,724,113.88       | 2,119,104.41       | 32° 17' 20.176 N | 103° 27' 1.842 W |  |
| 12,500.0              | 90.00           | 0.41        | 10,500.0              | 2,016.6      | 744.9        | 11,724,213.88       | 2,119,103.70       | 32° 17' 21.166 N | 103° 27' 1.833 W |  |
| 12,600.0              | 90.00           | 0.38        | 10,500.0              | 2,116.6      | 745.6        | 11,724,313.88       | 2,119,102.95       | 32° 17' 22.155 N | 103° 27' 1.825 W |  |
| 12,700.0              | 90.00           | 0.36        | 10,500.0              | 2,216.6      | 746.2        | 11,724,413.88       | 2,119,102.15       | 32° 17' 23.145 N | 103° 27' 1.818 W |  |
| 12,800.0              | 90.00           | 0.34        | 10,500.0              | 2,316.6      | 746.8        | 11,724,513.87       | 2,119,101.32       | 32° 17' 24.135 N | 103° 27' 1.811 W |  |
| 12,900.0              | 90.00           | 0.31        | 10,500.0              | 2,416.6      | 747.4        | 11,724,613.87       | 2,119,100.44       | 32° 17' 25.124 N | 103° 27' 1.804 W |  |
| 13,000.0              | 90.00           | 0.29        | 10,500.0              | 2,516.6      | 747.9        | 11,724,713.86       | 2,119,099.52       | 32° 17' 26.114 N | 103° 27' 1.798 W |  |
| 13,100.0              | 90.00           | 0.27        | 10,500.0              | 2,616.6      | 748.4        | 11,724,813.86       | 2,119,098.56       | 32° 17' 27.104 N | 103° 27' 1.792 W |  |
| 13,183.3              | 90.00           | 0.25        | 10,500.0              | 2,699.9      | 748.8        | 11,724,897.11       | 2,119,097.73       | 32° 17' 27.927 N | 103° 27' 1.788 W |  |
| 13,200.0              | 90.00           | 0.25        | 10,500.0              | 2,716.6      | 748.9        | 11,724,913.85       | 2,119,097.56       | 32° 17' 28.093 N | 103° 27' 1.787 W |  |
| 13,300.0              | 90.00           | 0.25        | 10,500.0              | 2,816.6      | 749.3        | 11,725,013.85       | 2,119,096.55       | 32° 17' 29.083 N | 103° 27' 1.782 W |  |
| 13,400.0              | 90.00           | 0.25        | 10,500.0              | 2,916.6      | 749.7        | 11,725,113.84       | 2,119,095.54       | 32° 17' 30.072 N | 103° 27' 1.777 W |  |
| 13,500.0              | 90.00           | 0.25        | 10,500.0              | 3,016.6      | 750.1        | 11,725,213.84       | 2,119,094.52       | 32° 17' 31.062 N | 103° 27' 1.772 W |  |
| 13,600.0              | 90.00           | 0.25        | 10,500.0              | 3,116.6      | 750.6        | 11,725,313.83       | 2,119,093.51       | 32° 17' 32.052 N | 103° 27' 1.767 W |  |
| 13,700.0              | 90.00           | 0.25        | 10,500.0              | 3,216.6      | 751.0        | 11,725,413.83       | 2,119,092.49       | 32° 17' 33.041 N | 103° 27' 1.762 W |  |
| 13,800.0              | 90.00           | 0.25        | 10,500.0              | 3,316.6      | 751.4        | 11,725,513.82       | 2,119,091.48       | 32° 17' 34.031 N | 103° 27' 1.757 W |  |
| 13,900.0              | 90.00           | 0.25        | 10,500.0              | 3,416.6      | 751.9        | 11,725,613.82       | 2,119,090.47       | 32° 17' 35.021 N | 103° 27' 1.752 W |  |
| 14,000.0              | 90.00           | 0.25        | 10,500.0              | 3,516.6      | 752.3        | 11,725,713.81       | 2,119,089.45       | 32° 17' 36.010 N | 103° 27' 1.747 W |  |
| 14,100.0              | 90.00           | 0.25        | 10,500.0              | 3,616.6      | 752.7        | 11,725,813.81       | 2,119,088.44       | 32° 17' 37.000 N | 103° 27' 1.742 W |  |
| 14,200.0              | 90.00           | 0.25        | 10,500.0              | 3,716.6      | 753.1        | 11,725,913.80       | 2,119,087.42       | 32° 17' 37.989 N | 103° 27' 1.737 W |  |
| 14,300.0              | 90.00           | 0.25        | 10,500.0              | 3,816.6      | 753.6        | 11,726,013.80       | 2,119,086.41       | 32° 17' 38.979 N | 103° 27' 1.732 W |  |
| 14,400.0              | 90.00           | 0.25        | 10,500.0              | 3,916.6      | 754.0        | 11,726,113.79       | 2,119,085.40       | 32° 17' 39.969 N | 103° 27' 1.727 W |  |
| 14,500.0              | 90.00           | 0.25        | 10,500.0              | 4,016.6      | 754.4        | 11,726,213.79       | 2,119,084.38       | 32° 17' 40.958 N | 103° 27' 1.722 W |  |
| 14,600.0              | 90.00           | 0.25        | 10,500.0              | 4,116.6      | 754.9        | 11,726,313.78       | 2,119,083.37       | 32° 17' 41.948 N | 103° 27' 1.717 W |  |
| 14,700.0              | 90.00           | 0.25        | 10,500.0              | 4,216.6      | 755.3        | 11,726,413.78       | 2,119,082.35       | 32° 17' 42.938 N | 103° 27' 1.712 W |  |
| 14,800.0              | 90.00           | 0.25        | 10,500.0              | 4,316.6      | 755.7        | 11,726,513.77       | 2,119,081.34       | 32° 17' 43.927 N | 103° 27' 1.707 W |  |
| 14,900.0              | 90.00           | 0.25        | 10,500.0              | 4,416.6      | 756.1        | 11,726,613.77       | 2,119,080.33       | 32° 17' 44.917 N | 103° 27' 1.702 W |  |
| 15,000.0              | 90.00           | 0.25        | 10,500.0              | 4,516.6      | 756.6        | 11,726,713.76       | 2,119,079.31       | 32° 17' 45.907 N | 103° 27' 1.697 W |  |
| 15,100.0              | 90.00           | 0.25        | 10,500.0              | 4,616.6      | 757.0        | 11,726,813.76       | 2,119,078.30       | 32° 17' 46.896 N | 103° 27' 1.692 W |  |
| 15,200.0              | 90.00           | 0.25        | 10,500.0              | 4,716.6      | 757.4        | 11,726,913.75       | 2,119,077.29       | 32° 17' 47.886 N | 103° 27' 1.687 W |  |
| 15,300.0              | 90.00           | 0.25        | 10,500.0              | 4,816.6      | 757.9        | 11,727,013.75       | 2,119,076.27       | 32° 17' 48.875 N | 103° 27' 1.682 W |  |
| 15,363.5              | 90.00           | 0.25        | 10,500.0              | 4,880.1      | 758.1        | 11,727,077.28       | 2,119,075.63       | 32° 17' 49.504 N | 103° 27' 1.678 W |  |

| Design Targets   |               |              |            |              |              |                 |                |                  |                  |  |
|--|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|------------------|--|
| Target Name  | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude        |  |
| FTP - MASTIFF 22 FED<br>- hit/miss target<br>- Shape                                       | 0.00          | 0.00         | 10,500.0   | -200.3       | 759.1        | 11,721,997.43   | 2,119,149.84   | 32° 16' 59.227 N | 103° 27' 1.669 W |  |
| - plan misses target center by 251.2usft at 10400.0usft MD (10317.2 TVD, -32.0 N, 722.1 E) |               |              |            |              |              |                 |                |                  |                  |  |
| - Circle (radius 50.0)   |               |              |            |              |              |                 |                |                  |                  |  |
| LTP/BHL - MASTIFF 22<br>- plan hits target center<br>- Point                               | 0.00          | 0.00         | 10,500.0   | 4,880.1      | 758.1        | 11,727,077.28   | 2,119,075.63   | 32° 17' 49.504 N | 103° 27' 1.678 W |  |
| Interp @ 10500.0 (MAS)<br>- plan hits target center<br>- Point                             | 0.00          | 0.00         | 10,500.0   | 387.6        | 727.9        | 11,722,584.83   | 2,119,110.19   | 32° 17' 5.045 N  | 103° 27' 2.032 W |  |

|                  |                             |                                     |                                  |
|------------------|-----------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | NEW MEXICO                  | <b>Local Co-ordinate Reference:</b> | Well MASTIFF 22 FEDERAL COM 501H |
| <b>Project:</b>  | LEA                         | <b>TVD Reference:</b>               | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Site:</b>     | DANDIE/ MASTIFF             | <b>MD Reference:</b>                | RKB=3431.4 @ 3456.4usft (HP 650) |
| <b>Well:</b>     | MASTIFF 22 FEDERAL COM 501H | <b>North Reference:</b>             | True                             |
| <b>Wellbore:</b> | MASTIFF 22 FEDERAL COM 501H | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | PWP0                        | <b>Database:</b>                    | Centennial EDM SQL Server        |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|

|  |  |  |         |
|--|--|--|---------|
| <b>QUALITY CONTROL<br/>INSPECTION AND TEST CERTIFICATE</b>   |  | CERT. N°: 504  |         |
| PURCHASER: ContiTech Oil & Marine Corp.  |  | P.O. N°: 4500409659  |         |
| CONTITECH RUBBER order N°: 538236  | HOSE TYPE: 3" ID                           | Choke and Kill Hose  |         |
| HOSE SERIAL N°: 67255  | NOMINAL / ACTUAL LENGTH: 10,67 m / 10,77 m |  |         |
| W.P. 68,9 MPa 10000 psi  | T.P. 103,4 MPa 15000 psi                   | Duration:  | 60 min. |
| <p>Pressure test with water at ambient temperature</p> <p style="text-align: center;">See attachment. ( 1 page )</p> <p>↑ 10 mm = 10 Min.<br/>→ 10 mm = 20 MPa</p>   |  |  |         |
| COUPLINGS Type   | Serial N°                                  | Quality  | Heat N° |
| 3" coupling with<br>4 1/16" 10K API b.w. Flange end  | 9251 9254                                  | AISI 4130  | A0579N  |
|  |  | AISI 4130  | 035608  |
| <b>Not Designed For Well Testing</b>   |  | <b>API Spec 16 C</b>   |         |
| <b>Temperature rate:"B"</b>  |  |  |         |
| All metal parts are flawless   |  |  |         |
| <b>WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.</b>   |  |  |         |
| STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements. |  |  |         |
| COUNTRY OF ORIGIN HUNGARY/EU   |  |  |         |
| Date:  | Inspector                                  | Quality Control  |         |
| 20. March 2014.  |  |  |         |

*Belang*  
 Control Rubber  
 Industrial Kft.  
 Quality Control Dept.

|                                  |        |     |       |            |       |
|----------------------------------|--------|-----|-------|------------|-------|
| GN                               | +21.22 | °C  | 01:20 |            |       |
| RD                               | +21.35 | °C  | 01:20 |            |       |
| BL                               | +1053. | bar | 01:20 |            |       |
| GN                               | +21.15 | °C  | 01:10 |            |       |
| RD                               | +21.31 | °C  | 01:10 |            |       |
| BL                               | +1055. | bar | 01:10 |            |       |
| GN                               | +21.18 | °C  | 01:00 |            |       |
| RD                               | +21.30 | °C  | 01:00 |            |       |
| BL                               | +1056. | bar | 01:00 |            |       |
| GN                               | +21.26 | °C  | 00:50 | 16m-a-10.5 | 88309 |
| RD                               | +21.33 | °C  | 00:50 |            |       |
| BL                               | +1057. | bar | 00:50 |            |       |
| GN                               | +21.28 | °C  | 00:40 |            |       |
| RD                               | +21.34 | °C  | 00:40 |            |       |
| BL                               | +1059. | bar | 00:40 |            |       |
| GN                               | +21.30 | °C  | 00:30 |            |       |
| RD                               | +21.42 | °C  | 00:30 |            |       |
| BL                               | +1061. | bar | 00:30 |            |       |
| GN                               | +21.35 | °C  | 00:20 |            |       |
| RD                               | +21.33 | °C  | 00:20 |            |       |
| BL                               | +1064. | bar | 00:20 |            |       |
| 0 10 20 30 40 50 60 70 80 90 100 |        |     |       |            |       |
| 19-03-2014. 23:50                |        |     |       |            |       |
| 67252, 67255, 67256 23:50        |        |     |       |            |       |

### Hose Data Sheet

|                                |  |
|--------------------------------|--|
| CRI Order No.                  | 538236   |
| Customer                       | ContiTech Oil & Marine Corp.                                       |
| Customer Order No              | 4500409659   |
| Item No.                       | 1  |
| Hose Type                      | Flexible Hose  |
| <b>Standard</b>                | <b>API SPEC 16 C</b>   |
| Inside dia in inches           | 3  |
| Length                         | 35 ft  |
| Type of coupling one end       | FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR |
| Type of coupling other end     | FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR |
| H2S service NACE MR0175        | Yes  |
| Working Pressure               | 10 000 psi   |
| Design Pressure                | 10 000 psi   |
| Test Pressure                  | 15 000 psi   |
| Safety Factor                  | 2,25   |
| Marking                        | USUAL PHOENIX  |
| Cover                          | NOT FIRE RESISTANT   |
| Outside protection             | St.steel outer wrap  |
| Internal stripwound tube       | No   |
| Lining                         | OIL + GAS RESISTANT SOUR   |
| Safety clamp                   | No   |
| Lifting collar                 | No   |
| Element C                      | No   |
| Safety chain                   | No   |
| Safety wire rope               | No   |
| Max.design temperature [°C]    | 100  |
| Min.design temperature [°C]    | -20  |
| Min. Bend Radius operating [m] | 0,90   |
| Min. Bend Radius storage [m]   | 0,90   |
| Electrical continuity          | The Hose is electrically continuous                                |
| Type of packing                | WOODEN CRATE ISPM-15   |

**APD ID:** 10400038195

**Submission Date:** 01/17/2019

Highlighted data reflects the most recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

### Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

MASTIFF\_22\_FEDERAL\_COM\_Road\_Maps\_20190117145958.pdf

**Existing Road Purpose:** ACCESS,FLUID TRANSPORT

**Row(s) Exist?** YES

#### ROW ID(s)

**ID:**

**Do the existing roads need to be improved?** NO

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

### Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** YES

**New Road Map:**

MASTIFF\_22\_FEDERAL\_COM\_New\_Roads\_Map\_20190117150022.pdf

**New road type:** RESOURCE

**Length:** 514.2 Feet

**Width (ft.):** 65

**Max slope (%):** 2

**Max grade (%):** 4

**Army Corp of Engineers (ACOE) permit required?** NO

**ACOE Permit Number(s):**

**New road travel width:** 33

**New road access erosion control:** Drainage and erosion will be constantly monitored to prevent compromising the road integrity and to protect the surrounding native topography.

**New road access plan or profile prepared?** NO

**New road access plan attachment:**

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Turnout?** N

**Access surfacing type:** OTHER

**Access topsoil source:** ONSITE

**Access surfacing type description:** Caliche

**Access onsite topsoil source depth:** 4

**Offsite topsoil source description:**

**Onsite topsoil removal process:** Equipment will be used to strip 4 inches in depth and stockpile, utilizing berms for run-off

**Access other construction information:**

**Access miscellaneous information:**

**Number of access turnouts:**

**Access turnout map:**

### Drainage Control

**New road drainage crossing:** OTHER

**Drainage Control comments:** Ditches will be utilized for drainage

**Road Drainage Control Structures (DCS) description:**

**Road Drainage Control Structures (DCS) attachment:**

TYPICAL\_ACCESS\_CROSS\_SECTIONS\_20190117140916.pdf

### Access Additional Attachments

### Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Attach Well map:**

Dandie\_Mastif\_Existing\_wells\_20190117150101.xlsx

MASTIFF\_22\_FEDERAL\_COM\_EXISTING\_WELLS\_20190117150102.pdf

### Section 4 - Location of Existing and/or Proposed Production Facilities

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** Handles/Separates Gas, Oil, and Water Facility is located on the South of the pad 565' x 100'

**Production Facilities map:**

Dandie\_Mastiff\_Comingle\_FAC\_FED\_Layout\_20190717065523.pdf

MASTIFF\_22\_FEDERAL\_COM\_501H\_\_\_Location\_Layout\_REV\_10\_26\_2018\_20190830074458.pdf

### Section 5 - Location and Types of Water Supply

#### Water Source Table

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Water source type:** OTHER

**Describe type:** East Gramma Ridge Pit: located in SWSW Sec 24, T22S, R34E

**Water source use type:** SURFACE CASING  
STIMULATION  
DUST CONTROL

**Source latitude:**

**Source longitude:**

**Source datum:**

**Water source permit type:** PRIVATE CONTRACT

**Water source transport method:** PIPELINE

**Source land ownership:** PRIVATE

**Source transportation land ownership:** STATE

**Water source volume (barrels):** 350000

**Source volume (acre-feet):** 45.112583

**Source volume (gal):** 14700000

**Water source and transportation map:**

Dandie\_Mastiff\_water\_transfer\_route\_20190117150143.pdf

**Water source comments:** Temporary surface lines will be used to transport water for drilling and completion operations from the East Gramma Ridge Pit to the Dandie/Mastiff pad.

**New water well?** NO

### New Water Well Info

**Well latitude:**

**Well Longitude:**

**Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):**

**Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):**

**Well casing type:**

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

## Section 6 - Construction Materials

**Using any construction materials:** YES

**Construction Materials description:** Caliche will be hauled from the existing Limestone pit located in {NE4 NE4, Sec 21, T23S, R34E}. Pit has been identified for use in the attached exhibit. Any native caliche on the proposed site can be used by "flipping" the location and using all native soils.

**Construction Materials source location attachment:**

Dandie\_Mastiff\_caliche\_route\_20190117150215.pdf

## Section 7 - Methods for Handling Waste

**Waste type:** DRILLING

**Waste content description:** Brine water based drilling fluid

**Amount of waste:** 1500 barrels

**Waste disposal frequency :** Monthly

**Safe containment description:** Steel tanks with plastic-lined containment berms

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL FACILITY

**Disposal type description:**

**Disposal location description:** Haul to a commercial facility

**Waste type:** DRILLING

**Waste content description:** Fresh water based drilling fluid.

**Amount of waste:** 1500 barrels

**Waste disposal frequency :** Weekly

**Safe containment description:** Steel tanks with plastic-lined containment berms.

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL FACILITY

**Disposal type description:**

**Disposal location description:** Commercial facility

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Waste type:** SEWAGE

**Waste content description:** Grey water/Human waste

**Amount of waste:** 5000 gallons

**Waste disposal frequency :** Weekly

**Safe containment description:** Approved waste storage tanks with containment.

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY      **Disposal location ownership:** COMMERCIAL FACILITY

**Disposal type description:**

**Disposal location description:** Commercial

**Waste type:** GARBAGE

**Waste content description:** General trash/garbage

**Amount of waste:** 5000 pounds

**Waste disposal frequency :** Weekly

**Safe containment description:** Enclosed trash trailer

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY      **Disposal location ownership:** COMMERCIAL FACILITY

**Disposal type description:**

**Disposal location description:** Haul to a commercial facility

**Waste type:** PRODUCED WATER

**Waste content description:** Produced water from the wellbore.

**Amount of waste:** 210000 gallons

**Waste disposal frequency :** Daily

**Safe containment description:** Containment built around the tanks, inside lined.

**Safe containmant attachment:**

**Waste disposal type:** OFF-LEASE INJECTION      **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** Haul to commercial facility

**Reserve Pit**

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Reserve pit length (ft.)**

**Reserve pit width (ft.)**

**Reserve pit depth (ft.)**

**Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

### Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** YES

**Description of cuttings location** Cuttings will be stored on site in steel tanks and hauled to an appropriate commercial facility when drilling operations are complete.

**Cuttings area length (ft.)**

**Cuttings area width (ft.)**

**Cuttings area depth (ft.)**

**Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

### Section 8 - Ancillary Facilities

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

### Section 9 - Well Site Layout

**Well Site Layout Diagram:**

MASTIFF\_22\_FEDERAL\_COM\_WELL\_SITE\_LAYOUT\_20190117150244.pdf

Leasehold\_and\_location\_map\_\_\_20190117150256.pdf

**Comments:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** New Surface Disturbance

**Multiple Well Pad Name:** DANDIE/MASTIFF 22 FEDERAL COM

**Multiple Well Pad Number:** 6

**Recontouring attachment:**

MASTIFF\_22\_FEDERAL\_COM\_IR\_MAP\_20190117150324.pdf

**Drainage/Erosion control construction:** Drainage and erosion will be constantly monitored to prevent compromising the well site integrity, and to protect the surrounding native topography.

**Drainage/Erosion control reclamation:** Upon reclamation, well site will be returned to its native contour. Water breaks will be added if needed, to prevent unnatural erosion and loss of vegetation.

**Well pad proposed disturbance (acres):** 8.859

**Well pad interim reclamation (acres):** 3.989

**Well pad long term disturbance (acres):** 4.87

**Road proposed disturbance (acres):** 0.767

**Road interim reclamation (acres):** 0.47

**Road long term disturbance (acres):** 0.297

**Powerline proposed disturbance (acres):** 0

**Powerline interim reclamation (acres):** 0

**Powerline long term disturbance (acres):** 0

**Pipeline proposed disturbance (acres):** 0

**Pipeline interim reclamation (acres):** 0

**Pipeline long term disturbance (acres):** 0

**Other proposed disturbance (acres):** 0

**Other interim reclamation (acres):** 0

**Other long term disturbance (acres):** 0

**Total proposed disturbance:** 9.626

**Total interim reclamation:** 4.459

**Total long term disturbance:** 5.167

**Disturbance Comments:** During the onsite, Centennial was approved to build this pad in phases. The third phase includes the Donkey Kong wells 301H, 302H and 303H.

**Reconstruction method:** Come back in with heavy equipment, remove caliche in the reclamation area, and replace with native topsoil. Reconstruction of pad will occur once all wells on location have been drilled and completed.

**Topsoil redistribution:** Surface disturbance will be limited to well site surveyed dimensions. Topsoil will be stored along the west edge of the pad site.

**Soil treatment:** Native caliche will be used in the initial construction of the well pad. Pad will be compacted using fresh water, dust control measures will be implemented as needed.

**Existing Vegetation at the well pad:**

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:**

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:**

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:**

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?** NO

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

**Seed Management**

**Seed Table**

**Seed Summary**

**Total pounds/Acre:**

**Seed Type**

**Pounds/Acre**

**Seed reclamation attachment:**

**Operator Contact/Responsible Official Contact Info**

**First Name:**

**Last Name:**

**Phone:** (432)315-0119

**Email:** Coral.Richline@cdevinc.com

**Seedbed prep:** Prepare a 3-5 inch deep seedbed, with the top 3-4 inches consisting of topsoil.

**Seed BMP:** Seeding will be done in the proper season, and monitored for the re-establishment of native vegetation.

**Seed method:** Broadcast

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** Spray for noxious weeds and bare ground as needed.

**Weed treatment plan attachment:**

**Monitoring plan description:** All disturbed areas will be closely monitored for any primary or secondary noxious weeds. Should any be found, chemical spraying in accordance with state regulations will be implemented.

**Monitoring plan attachment:**

**Success standards:** No primary or secondary noxious weed will be allowed. Vegetation will be returned to its native standard.

**Pit closure description:** No open pits will be constructed.

**Pit closure attachment:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

## Section 11 - Surface Ownership

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** EXISTING ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** PIPELINE

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** OTHER

**Describe:** Power Line

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

### Section 12 - Other Information

**Right of Way needed?** NO

**Use APD as ROW?**

**ROW Type(s):**

### ROW Applications

**SUPO Additional Information:**

**Use a previously conducted onsite?** YES

**Previous Onsite information:** Onsite conducted with Paul Murphy 10/18/2018

### Other SUPO Attachment

MASTIFF\_22\_FEDERAL\_COM\_ARCH\_MAP\_20190117150406.pdf

Dandie\_22\_Federal\_Com\_503H\_SUPO\_Revision\_ke\_20190830085459.pdf

**APD ID:** 10400038195

**Submission Date:** 01/17/2019

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**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:**

**Describe 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:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**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:**

**Describe 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:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**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:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**



**APD ID:** 10400038195

**Submission Date:** 01/17/2019

Highlighted data  
reflects the most  
recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** MASTIFF 22 FEDERAL COM

**Well Number:** 501H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB001471

**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

**OCD - HOBBS**  
**06/30/2020**  
**RECEIVED**

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

|  |  |   |
|--|--|---|
| <sup>1</sup> API Number<br><b>30-025-47404</b> | <sup>2</sup> Pool Code<br><b>2209</b>                                    | <sup>3</sup> Pool Name<br><b>Antelope Ridge; Bones Spring, West</b> |
| <sup>4</sup> Property Code<br><b>328512</b>    | <sup>5</sup> Property Name<br><b>MASTIFF 22 FEDERAL COM</b>              |   |
| <sup>7</sup> OGRID No.<br><b>372165</b>        | <sup>8</sup> Operator Name<br><b>CENTENNIAL RESOURCE PRODUCTION, LLC</b> | <sup>6</sup> Well Number<br><b>#501H</b>                            |
|  |  | <sup>9</sup> Elevation<br><b>3431.4'</b>                            |

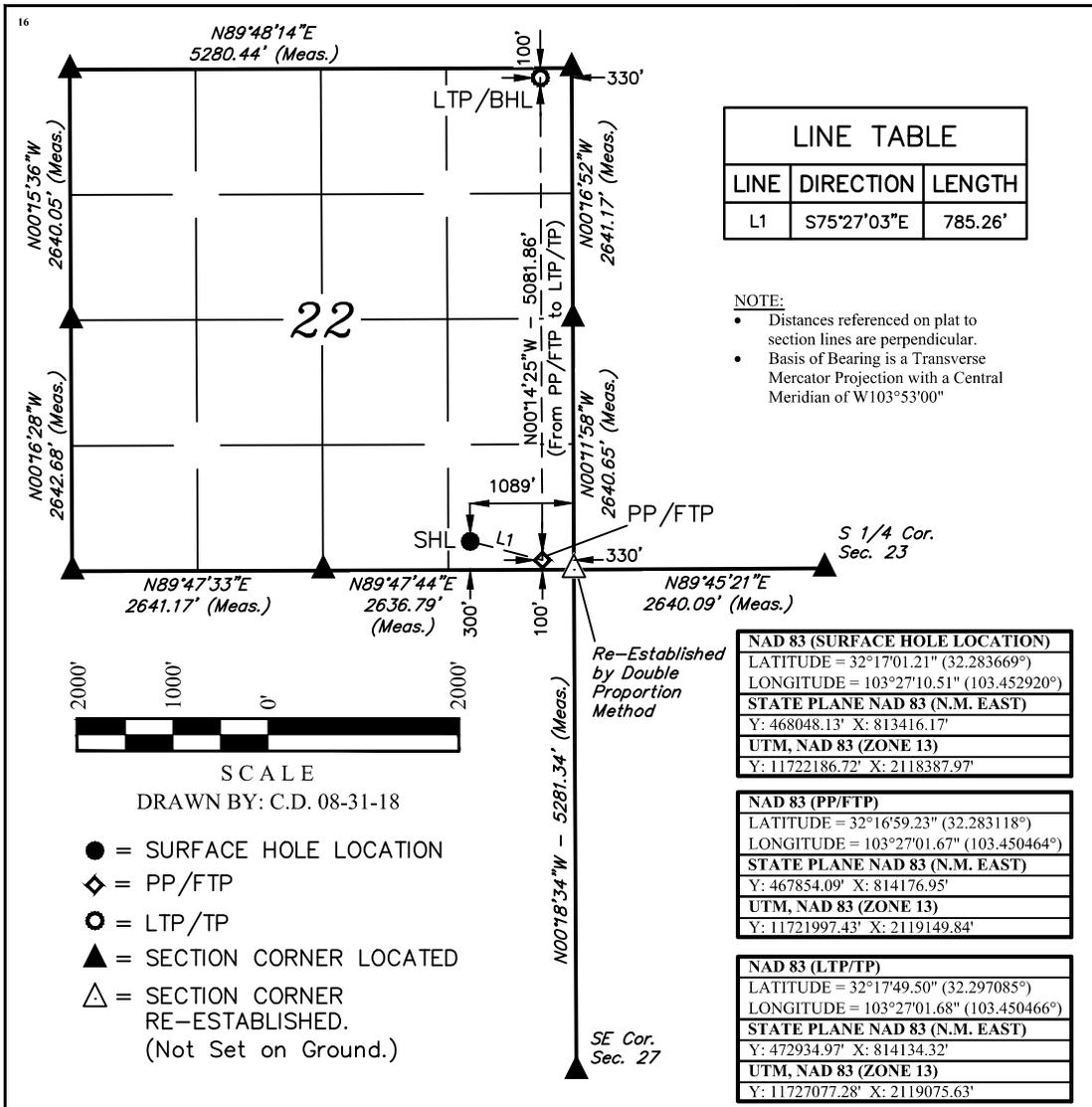
<sup>10</sup> Surface Location

|                    |               |                 |              |         |                      |                           |                       |                        |               |
|--------------------|---------------|-----------------|--------------|---------|----------------------|---------------------------|-----------------------|------------------------|---------------|
| UL or lot no.<br>P | Section<br>22 | Township<br>23S | Range<br>34E | Lot Idn | Feet from the<br>300 | North/South line<br>SOUTH | Feet from the<br>1089 | East/West line<br>EAST | County<br>LEA |
|--------------------|---------------|-----------------|--------------|---------|----------------------|---------------------------|-----------------------|------------------------|---------------|

<sup>11</sup> Bottom Hole Location If Different From Surface

|                                      |               |                               |              |                                  |                      |                           |                      |                        |               |
|--------------------------------------|---------------|-------------------------------|--------------|----------------------------------|----------------------|---------------------------|----------------------|------------------------|---------------|
| UL or lot no.<br>A                   | Section<br>22 | Township<br>23S               | Range<br>34E | Lot Idn                          | Feet from the<br>100 | North/South line<br>NORTH | Feet from the<br>330 | East/West line<br>EAST | County<br>LEA |
| <sup>12</sup> Dedicated Acres<br>160 |               | <sup>13</sup> Joint or Infill |              | <sup>14</sup> Consolidation Code |                      | <sup>15</sup> Order No.   |                      |                        |               |

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.



**<sup>17</sup> 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.

*K.C.* **1/16/19**  
Signature Date

**Kanicia Castillo**  
Printed Name

**kanicia.castillo@cdevinc.com**  
E-mail Address

**<sup>18</sup> 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.

**August 13, 2018**  
Date of Survey

Signature and Seal of Professional Surveyor:

Certificate Number:

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|  |  |   |
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| <sup>1</sup> API Number<br><b>30-025-47404</b> | <sup>2</sup> Pool Code<br><b>2209</b>                                    | <sup>3</sup> Pool Name<br><b>Antelope Ridge; Bones Spring, West</b> |
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| <sup>7</sup> OGRID No.<br><b>372165</b>        | <sup>8</sup> Operator Name<br><b>CENTENNIAL RESOURCE PRODUCTION, LLC</b> |   |
|  |  | <sup>6</sup> Well Number<br><b>#501H</b>                            |
|  |  | <sup>9</sup> Elevation<br><b>3431.4'</b>                            |

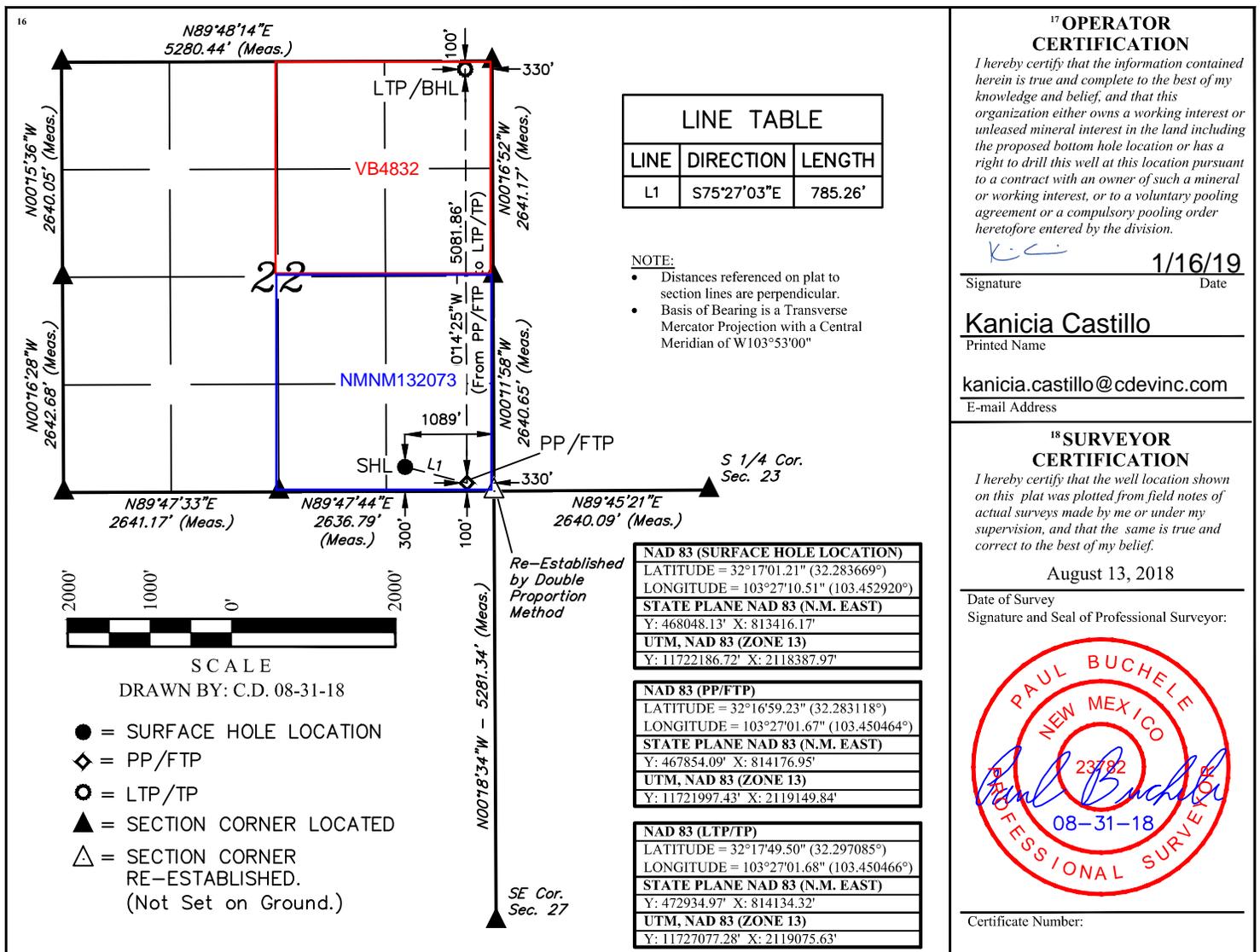
<sup>10</sup> Surface Location

|                    |               |                 |              |         |                      |                           |                       |                        |               |
|--------------------|---------------|-----------------|--------------|---------|----------------------|---------------------------|-----------------------|------------------------|---------------|
| UL or lot no.<br>P | Section<br>22 | Township<br>23S | Range<br>34E | Lot Idn | Feet from the<br>300 | North/South line<br>SOUTH | Feet from the<br>1089 | East/West line<br>EAST | County<br>LEA |
|--------------------|---------------|-----------------|--------------|---------|----------------------|---------------------------|-----------------------|------------------------|---------------|

<sup>11</sup> Bottom Hole Location If Different From Surface

|                                      |               |                               |              |                                  |                      |                           |                      |                        |               |
|--------------------------------------|---------------|-------------------------------|--------------|----------------------------------|----------------------|---------------------------|----------------------|------------------------|---------------|
| UL or lot no.<br>A                   | Section<br>22 | Township<br>23S               | Range<br>34E | Lot Idn                          | Feet from the<br>100 | North/South line<br>NORTH | Feet from the<br>330 | East/West line<br>EAST | County<br>LEA |
| <sup>12</sup> Dedicated Acres<br>160 |               | <sup>13</sup> Joint or Infill |              | <sup>14</sup> Consolidation Code |                      | <sup>15</sup> Order No.   |                      |                        |               |

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.



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State of New Mexico  
Energy, Minerals and Natural Resources Department

Submit Original  
to Appropriate  
District Office

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

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**06/30/2020**  
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**GAS CAPTURE PLAN**

Date: 01/11/2019

Original Operator & OGRID No.: Centennial Resource Production, LLC 372165  
 Amended - Reason for Amendment: \_\_\_\_\_

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple 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 |
|--|---------|-----------------------|---------------------|----------------|------------------|----------|
| Dandie 22 Federal Com 303H                         | Pending | P-22-23S-34E          | 450 FSL<br>1149 FEL | 2860<br>MCF/D  | Neither          | New Well |
| Dandie 22 Federal Com 503H                         | Pending | P-22-23S-34E          | 300 FSL<br>1149 FEL | 2660<br>MCF/D  | Neither          | New Well |
| Mastiff 22 Federal Com 301H                        | Pending | P-22-23S-34E          | 450 FSL<br>1089 FEL | 2740<br>MCF/D  | Neither          | New Well |
| Mastiff 22 Federal Com 302H                        | Pending | P-22-23S-34E          | 450 FSL<br>1119 FEL | 2420<br>MCF/D  | Neither          | New Well |
| Mastiff 22 Federal Com 501H<br><b>30-025-47404</b> | Pending | P-22-23S-34E          | 300 FSL<br>1089 FEL | 2220<br>MCF/D  | Neither          | New Well |
| Mastiff 22 Federal Com 502H                        | Pending | P-22-23S-34E          | 300 FSL<br>1119 FEL | 2540<br>MCF/D  | Neither          | New Well |

**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 Lucid Energy Group low/high pressure gathering system located in Lea County, New Mexico. It will require 0' of pipeline to connect the facility to low/high pressure gathering system. Centennial Resource Production, LLC provides (periodically) to Lucid Energy Group a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Centennial Resource Production, LLC and Lucid Energy Group have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Red Hills Plant located in Sec. 13, Twn. 24S, Rng. 33E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

**Flowback Strategy**

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