Form 3160-3
(June 2015)

OCD – HOBBS
08/04/2020
RECEIVED

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM132073

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.
DANDIE 22 FEDERAL COM
503H [318001]

2. Name of Operator
CENTENNIAL RESOURCE PRODUCTION LLC [372165]

9. API Well No.
30-025-47524

3a. Address
1001 17th Street, Suite 1800 Denver CO 80202

3b. Phone No. *(include area code)*
(720)499-1400

10. Field and Pool, or Exploratory [2209]
2ND BONESPRING SAND / ANTELOPE

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SESE / 300 FSL / 1149 FEL / LAT 32.283669 / LONG -103.453114
At proposed prod. zone NWNE / 100 FNL / 2310 FEL / LAT 32.297088 / LONG -103.456873

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 22 / T23S / R34E / NMP

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
320

17. Spacing Unit dedicated to this well
160

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

19. Proposed Depth
10500 feet / 15434 feet

20. BLM/BIA Bond No. in file
FED: NMB001471

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3433 feet

22. Approximate date work will start*
02/17/2020

23. Estimated duration
25 days

24. Attachments

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

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

25. Signature
(Electronic Submission)

Name *(Printed/Typed)*
Kanicia Schlichting / Ph: (720)499-1537

Date
01/17/2019

Title
Sr. Regulatory Analyst

Approved by *(Signature)*
(Electronic Submission)

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

Date
07/29/2020

Title
Assistant Field Manager Lands & Minerals

Office
CARLSBAD

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

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

GCP Rec 08/04/2020

SL

APPROVED WITH CONDITIONS

KZ
08/20/2020

Approval Date: 07/29/2020

(Continued on page 2)

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**CENTENNIAL RESOURCES**
LEASE NO.:	**NMNM132073**
WELL NAME & NO.:	**DANDIE 22 FED COM 503H**
SURFACE HOLE FOOTAGE:	**300'/S & 1149'/E**
BOTTOM HOLE FOOTAGE	**100'/N & 2310'/E**
LOCATION:	**Section 22, T.23 S., R.34 E., NMPM**
COUNTY:	**Lea County, New Mexico**

COA

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

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Bone Springs** 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 **1,600** feet (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

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

Intermediate Casing must be kept at least 1/3 fluid filled to meet BLM Collapse Requirement.

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

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

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

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

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.

JJP07252020

GENERAL REQUIREMENTS

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

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

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

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

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

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure

rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).

b. When the operator proposes to set surface casing with Spudder Rig
   - Notify the BLM when moving in and removing the Spudder Rig.
   - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
   - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

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

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

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

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

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

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.

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

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

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

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

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

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall

have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Centennial Resource Production LLC
LEASE NO.:	NMNM132073
LOCATION:	S23 R24 S22
COUNTY:	Lea County, NM

Wells:

Dandie 22 Federal Com 303H
Surface Hole Location: 450' FSL & 1149' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 2310' FEL, Section 22, T. 23 S, R 34 E.

Dandie 22 Federal Com 503H
Surface Hole Location: 300' FSL & 1149' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 2310' FEL, Section 22, T. 23 S, R 34 E.

Mastiff 22 Federal Com 301H
Surface Hole Location: 450' FSL & 1089' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 330' FEL, Section 22, T. 23 S, R 34 E.

Mastiff 22 Federal Com 302H
Surface Hole Location: 450' FSL & 1119' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 1320' FEL, Section 22, T. 23 S, R 34 E.

Mastiff 22 Federal Com 501H
Surface Hole Location: 300' FSL & 1089' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 330' FEL, Section 22, T. 23 S, R 34 E.

Mastiff 22 Federal Com 502H
Surface Hole Location: 300' FSL & 1119' FEL, Section 22, T. 23 S., R. 34 E.
Bottom Hole Location: 100' FNL & 1320' FEL, Section 22, T. 23 S, R 34 E.

TABLE OF CONTENTS

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

- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☐ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult

with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Watershed:

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

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the at least 3 working days prior to commencing construction of the access road and/or well pad.

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the .

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

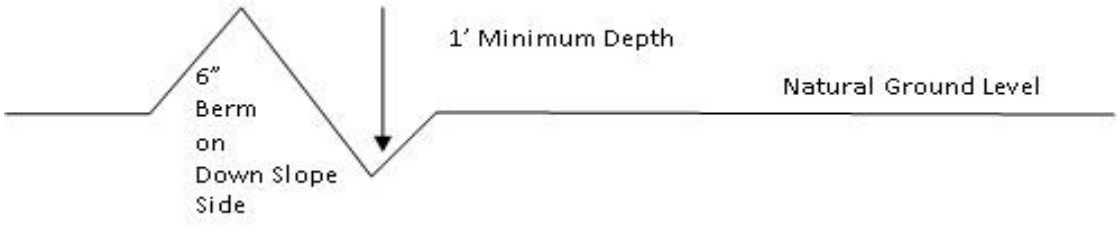
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

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

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

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

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



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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

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

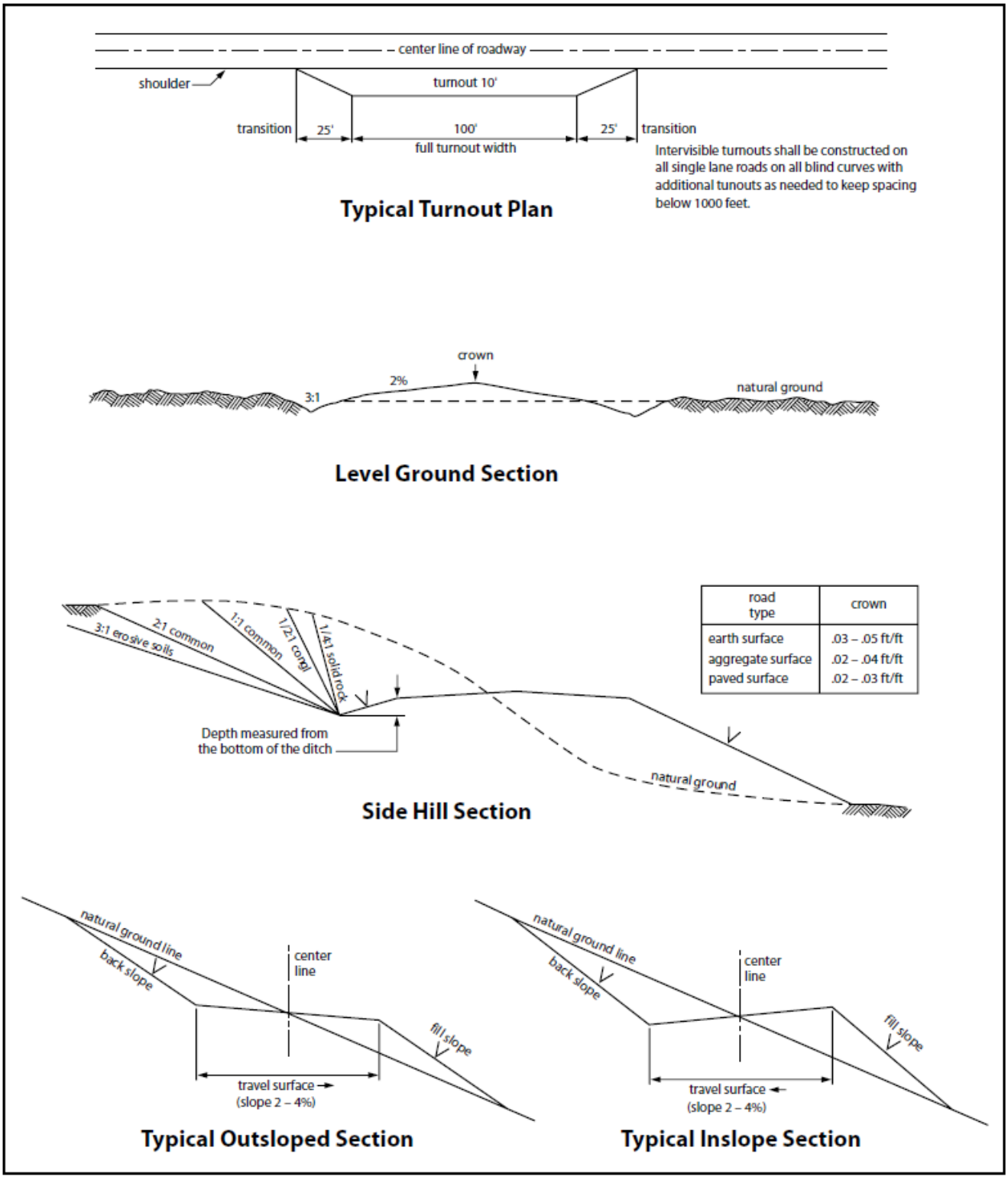


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures

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

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

B. **PIPELINES**

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

(Insert Seed Mixture Here)

AFMSS

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

Operator Certification Data Report

08/04/2020

Operator Certification

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

NAME: Kanicia Schlichting **Signed on:** 01/17/2019

Title: Sr. Regulatory Analyst

Street Address: 1001 17th Street, Suite 1800

City: Denver **State:** CO **Zip:** 80202

Phone: (720)499-1537

Email address: Kanicia.schlichting@cdevinc.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

APD ID: 10400037954 **Submission Date:** 01/17/2019

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400037954 **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: DANDIE 22 FEDERAL COM **Well Number:** 503H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** 2ND BONESPRING SAND **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: DANDIE 22 FEDERAL COM **Well Number:** 503H

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:** DANDIE/MASTIFF 22 FEDERAL COM **Number:** 6

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: DANDIE_22_FEDERAL_COM_503H_C102_20190114113901.pdf

DANDIE_22_FEDERAL_COM_503H_LEASE_C102_20190114114403.pdf

Well work start Date: 02/17/2020 **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	1149	FEL	23S	34E	22	Aliquot SESE	32.283669	-103.453114	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 132073	3433	0	0	
KOP Leg #1	97	FSL	2295	FEL	23S	34E	22	Aliquot SESE	32.2831141	-103.4566667	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 127446	-6494	10024	9927	

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

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	2310	FEL	23S	34E	22	Aliquot SWSE	32.283121	-103.456869	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 127446	-7067	10923	10500	
EXIT Leg #1	100	FNL	2310	FEL	23S	34E	22	Aliquot NWNE	32.297088	-103.456873	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-7067	15434	10500	
BHL Leg #1	100	FNL	2310	FEL	23S	34E	22	Aliquot NWNE	32.297088	-103.456873	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-7067	15434	10500	

APD ID: 10400037954 **Submission Date:** 01/17/2019

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
372983	RUSTLER	3433	935	935	SANDSTONE	NONE	N
372984	CAPITAN REEF	-1651	5084	5084	OTHER : CARBONATE	USEABLE WATER	N
372989	BELL CANYON	-1742	5175	5175	SANDSTONE	NATURAL GAS, OIL	N
372988	CHERRY CANYON	-2510	5943	5943	SANDSTONE	NATURAL GAS, OIL	N
372990	BRUSHY CANYON	-3893	7326	7326	SANDSTONE	NATURAL GAS, OIL	N
372991	BONE SPRING LIME	-5160	8593	8593	OTHER : CARBONATE	NATURAL GAS, OIL	N
372985	AVALON SAND	-5288	8721	8721	SHALE	CO2, NATURAL GAS, OIL	N
372986	FIRST BONE SPRING SAND	-6270	9703	9703	SANDSTONE	NATURAL GAS, OIL	N
372994	BONE SPRING 2ND	-6475	9908	9908	OTHER, SHALE : Carbonate	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: DANDIE 22 FEDERAL COM **Well Number:** 503H

Requesting Variance? YES

Variance request: Centennial Resource Production, LLC hereby requests to use a flex hose on the choke manifold for this well. Please see attached Multi-bowl.

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_20190114115157.pdf

BOP Diagram Attachment:

BOP_Diagram_5M_20190114115207.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	10024	0	9927	3433	-6494	10024	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	10024	15434	9927	10500	-6494	-7067	5410	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: DANDIE 22 FEDERAL COM **Well Number:** 503H

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_20190114124621.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CASING_ASSUMPTIONS_WORKSHEET_20190114124631.pdf

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CASING_ASSUMPTIONS_WORKSHEET_20190114124651.pdf

Technical_Data_Sheet_TMK_UP_DQX_5.5_x_20_P110_CY_20191028130652.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CASING_ASSUMPTIONS_WORKSHEET_20190114124701.pdf

Technical_Data_Sheet_TMK_UP_DQX_5.5_x_20_P110_CY_20191028130706.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: DANDIE 22 FEDERAL COM **Well Number:** 503H

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	10024	981	3.41	10.6	3345	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		10024	15434	1249	1.24	14.2	1549	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: DANDIE 22 FEDERAL COM **Well Number:** 503H

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	15434	OTHER : Brine/OBM	8.8	9.5							
0	1800	OTHER : Fresh 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 geoharzards 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_20190114124330.pdf

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

DANDIE_22_FEDERAL_COM_503H___CDEV_PLAN__1_20190114124434.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:

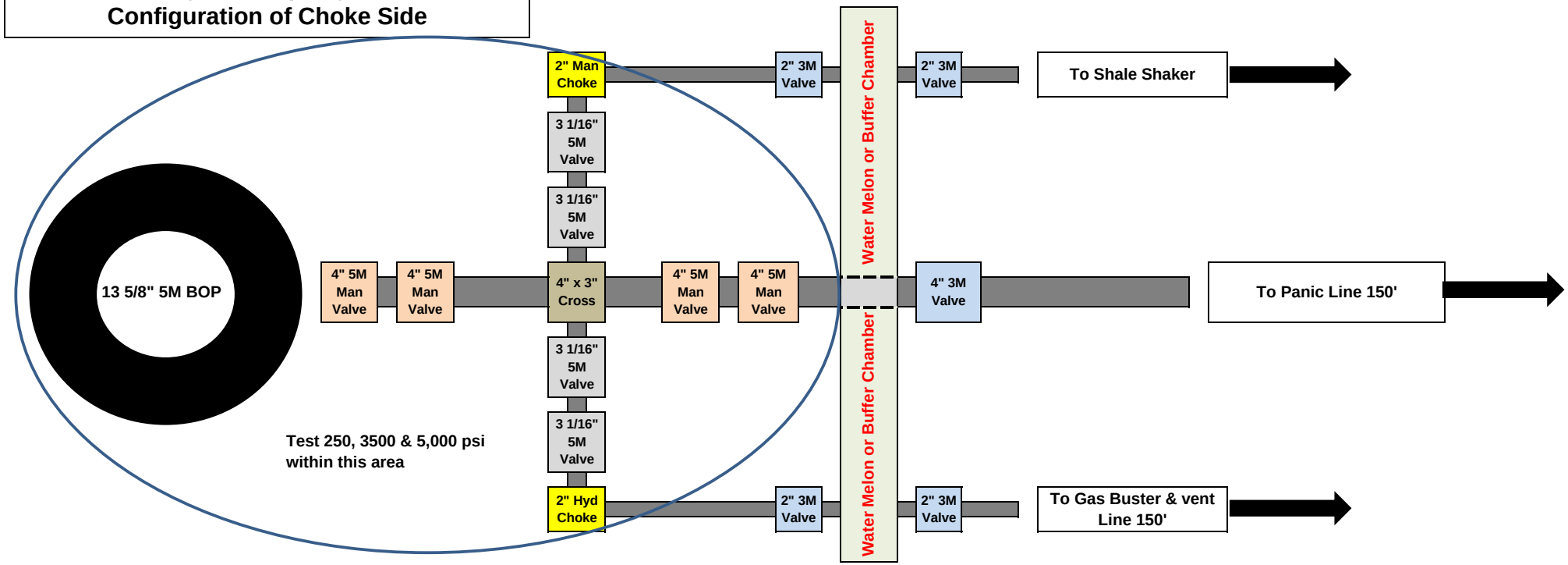
DandieMastiff_Gas_Capture_Plan_20190114124556.pdf

Other Variance attachment:

Flex_Hose_Specs_20190114124540.pdf

CDEV_Multi_Bowl_Procedure_Dandie_22_Federal_Com_503H_20191122091254.pdf

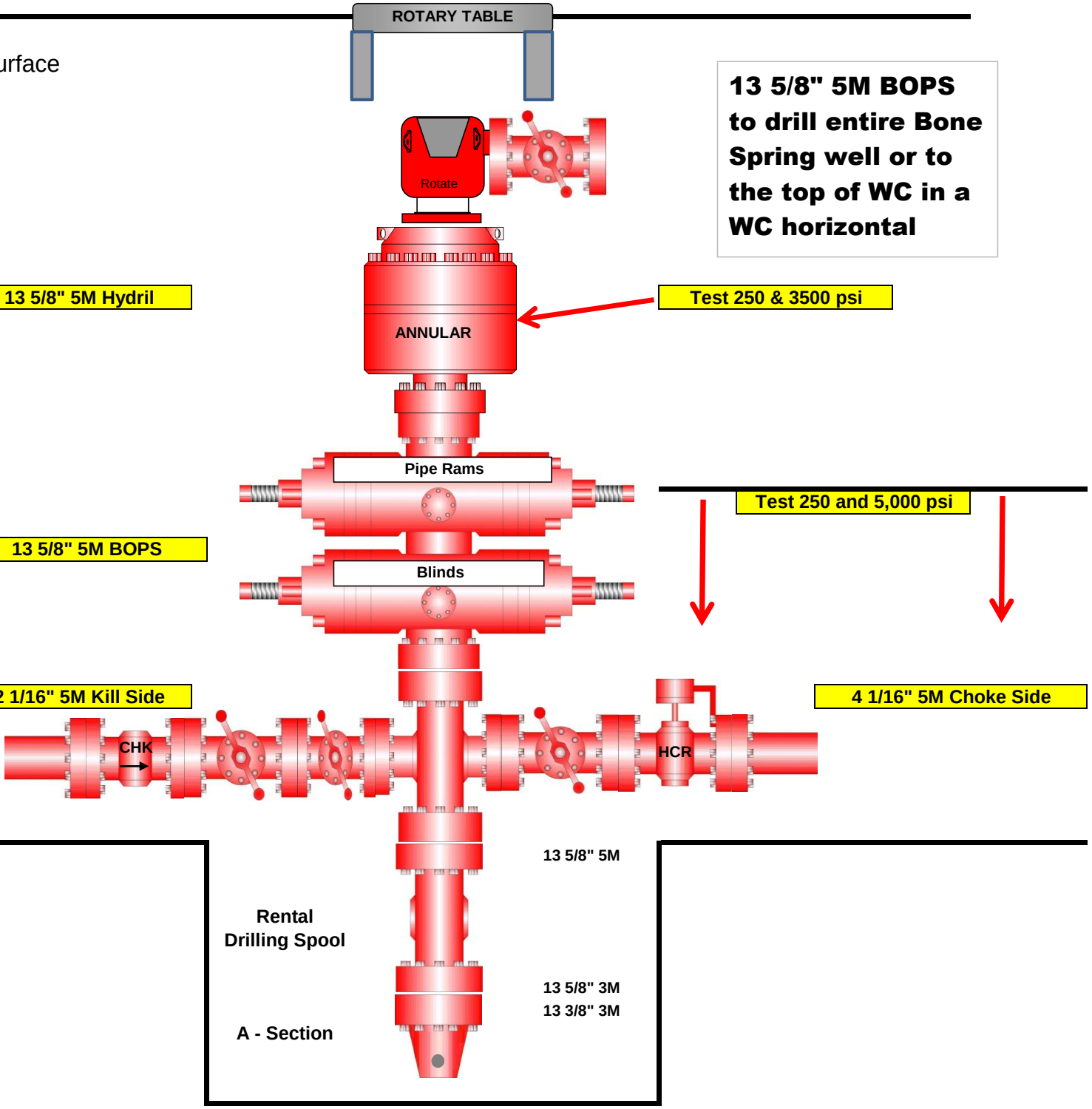
Centennial - Any Bone Spring Well: Minimum Configuration of Choke Side



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

Well Name: _____

Surface



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

Test 250 and 5,000 psi

13 5/8" 5M BOPS

2 1/16" 5M Kill Side

4 1/16" 5M Choke Side

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 DEVELOPOMENT 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.

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
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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 DEVELOPOMENT 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.

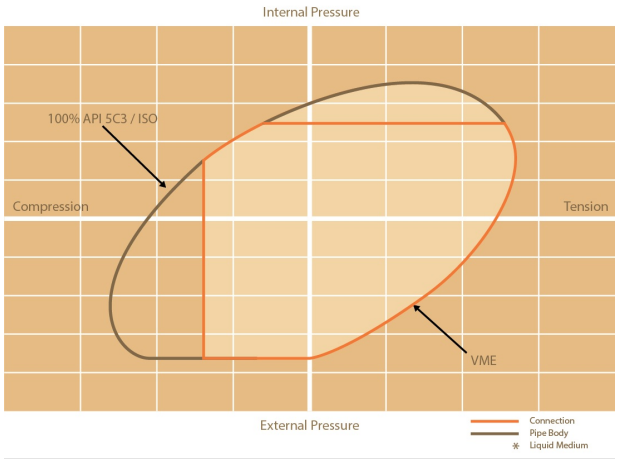
TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110 CY

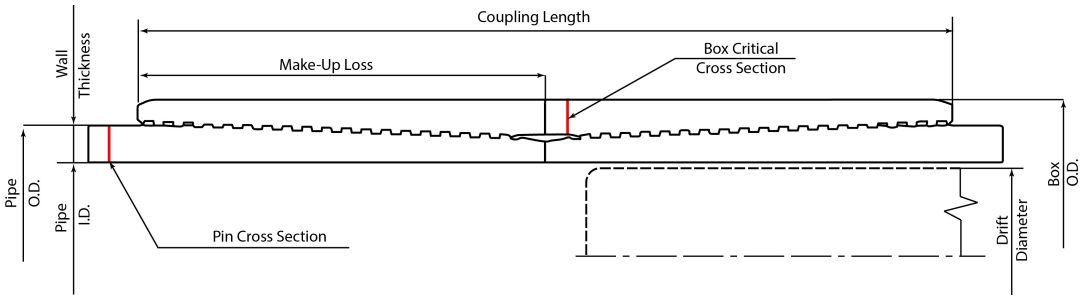
TUBULAR PARAMETERS	
Nominal OD, (inch)	5.500
Wall Thickness, (inch)	0.361
Pipe Grade	P110 CY
Coupling	Regular
Coupling Grade	P110 CY
Drift	Standard

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
Yeld 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

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	19.81
Nominal Weight, (lbs/ft)	20.00
Nominal ID, (inch)	4.778
Drift Diameter, (inch)	4.653
Nominal Pipe Body Area, (sq inch)	5.828
Yield Strength in Tension, (klbs)	641
Min. Internal Yield Pressure, (psi)	12 640
Collapse Pressure, (psi)	11 110





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Make-Up Loss, (inch)	4.122
Connection Critical Area, (sq inch)	5.828
Yield Strength in Tension, (klbs)	641
Yeld 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

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	19.81
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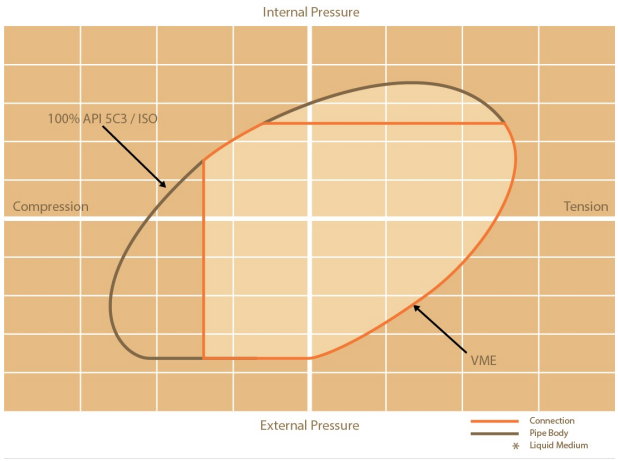

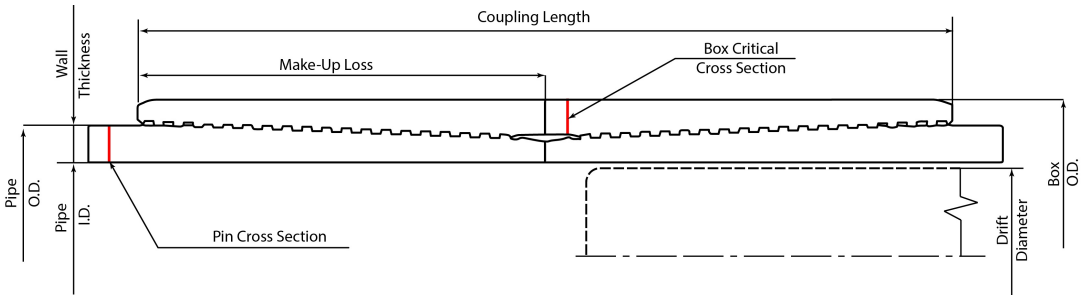

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HYDROGEN SULFIDE CONTINGENCY PLAN

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

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_2S) 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 H2S 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_2S 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_2S 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 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_2S 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.

DANGER
POISONOUS GAS
HYDROGEN SULFIDE
DO NOT APPROACH IF AMBER LIGHTS ARE FLASHING

An amber strobe light system will be activated for H_2S concentrations of 10 PPM or greater and an audible alarm will sound when H_2S 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

TOXICITY OF GASES (Taken from API RP-49 September 1974 – Re-issued August 1978)					
Common Name	**Chemical Formula**	**Gravity (Air = 1)**	**Threshold 1 Limit**	**Hazardous 2 Limit**	**Lethal 3 Limit**
Hydrogen Sulfide	H_2S	1.18	10 ppm	250 ppm/1hr	600 ppm
Sulfur Dioxide	SO_2	2.21	20 ppm	---	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/1hr	1000 ppm
Carbon Dioxide	CO_2	1.52	5000 ppm	5%	10%
Methane	CH_4	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_2) 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_2 without losing consciousness. Air containing 5% CO_2 will cause disorientation in a few minutes.

Continued exposures to CO_2 after being affected will cause convulsions, coma, and respiratory failure.

The threshold limit of CO_2 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_2S) 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_2S 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.

HYDROGEN SULFIDE TOXICITY			
Concentration			Effects
$\%H_2S$	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_2) is produced during the burning of H_2S. Although SO_2 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.

SULFUR DIOXIDE TOXICITY		
Concentration		Effects
$\%SO_2$	PPM	
0.0005	3 to 5	Pungent odor-normally a person can detect SO_2 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_2S 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 H2S monitor
- 4 wireless H2S monitors
- H2S 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 H2S

METALLURGY
- All drill strings, casing, tubing, wellhead, BOP, spools, kill lines, choke manifold and lines, and valves shall be suitable for anticipated H2S 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 H2S concentration and flow rate that it may result in radius of exposure-calculated ambient concentrations of 100 ppm H2S 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 H2S 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

H2S Concentration- 50 PPM (Block 13)

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

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

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

EMERGENCY CONTACT LIST

911 is available in the area			
NAME	**POSITION**	**COMPANY**	**NUMBER**
Centennial Contacts			
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
Local Emergency Response			
Fire Department			575-395-2511
Jal Community Hospital			505-395-2511
State Police			505-827-9000
Lea County Sheriff			575-396-3611
Safety Contractor			
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
Well Control Company			
Wild Well Control			866-404-9564
Contractors			
Tommy E Lee	Pump Trucks		432-813-7140
Paul Smith	Drilling Fluids	Momentum	307-258-6254
Compass Coordinators	Cement	Compass	432-561-5970

CENTENNIAL
RESOURCE DEVELOPMENT, INC

NEW MEXICO

LEA
DANDIE/ MASTIFF
DANDIE 22 FEDERAL COM 503H

DANDIE 22 FEDERAL COM 503H

Plan: PWP0

Survey Report - Geographic

19 December, 2018

Company:	NEW MEXICO	**Local Co-ordinate Reference:**	Well DANDIE 22 FEDERAL COM 503H
Project:	LEA	**TVD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Site:	DANDIE/ MASTIFF	**MD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Well:	DANDIE 22 FEDERAL COM 503H	**North Reference:**	True
Wellbore:	DANDIE 22 FEDERAL COM 503H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	Centennial EDM SQL Server

Project LEA

Map System:	Universal Transverse Mercator (US Survey Feet)	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site DANDIE/ MASTIFF

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

Well DANDIE 22 FEDERAL COM 503H

Well Position	**+N/-S**	0.0 usft	**Northing:**	11,722,185.91 usft	**Latitude:**	32° 17' 1.209 N
	+E/-W	0.0 usft	**Easting:**	2,118,327.99 usft	**Longitude:**	103° 27' 11.211 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,433.2 usft

Wellbore DANDIE 22 FEDERAL COM 503H

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	7.70	60.32	48,842.00826597

Design PWP0

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	346.62

Survey Tool Program **Date** 12/19/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	15,434.2	PWP0 (DANDIE 22 FEDERAL COM 503H	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Planned Survey

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	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
100.0	0.00	0.00	100.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
200.0	0.00	0.00	200.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
300.0	0.00	0.00	300.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
400.0	0.00	0.00	400.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
500.0	0.00	0.00	500.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
600.0	0.00	0.00	600.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
700.0	0.00	0.00	700.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
800.0	0.00	0.00	800.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
900.0	0.00	0.00	900.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W

Company:	NEW MEXICO	**Local Co-ordinate Reference:**	Well DANDIE 22 FEDERAL COM 503H
Project:	LEA	**TVD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Site:	DANDIE/ MASTIFF	**MD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Well:	DANDIE 22 FEDERAL COM 503H	**North Reference:**	True
Wellbore:	DANDIE 22 FEDERAL COM 503H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	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	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	11,722,185.91	2,118,327.99	32° 17' 1.209 N	103° 27' 11.211 W
1,600.0	1.00	260.01	1,600.0	-0.2	-0.9	11,722,185.75	2,118,327.13	32° 17' 1.208 N	103° 27' 11.221 W
1,700.0	2.00	260.01	1,700.0	-0.6	-3.4	11,722,185.26	2,118,324.56	32° 17' 1.203 N	103° 27' 11.251 W
1,800.0	3.00	260.01	1,799.9	-1.4	-7.7	11,722,184.44	2,118,320.27	32° 17' 1.196 N	103° 27' 11.301 W
1,900.0	4.00	260.01	1,899.7	-2.4	-13.7	11,722,183.29	2,118,314.28	32° 17' 1.185 N	103° 27' 11.371 W
2,000.0	5.00	260.01	1,999.4	-3.8	-21.5	11,722,181.82	2,118,306.57	32° 17' 1.172 N	103° 27' 11.461 W
2,100.0	6.00	260.01	2,098.9	-5.4	-30.9	11,722,180.02	2,118,297.16	32° 17' 1.155 N	103° 27' 11.571 W
2,200.0	7.00	260.01	2,198.3	-7.4	-42.1	11,722,177.90	2,118,286.04	32° 17' 1.136 N	103° 27' 11.701 W
2,300.0	8.00	260.01	2,297.4	-9.7	-54.9	11,722,175.45	2,118,273.22	32° 17' 1.113 N	103° 27' 11.851 W
2,400.0	9.00	260.01	2,396.3	-12.2	-69.5	11,722,172.67	2,118,258.70	32° 17' 1.088 N	103° 27' 12.020 W
2,500.0	10.00	260.01	2,494.9	-15.1	-85.7	11,722,169.58	2,118,242.49	32° 17' 1.060 N	103° 27' 12.210 W
2,600.0	10.00	260.01	2,593.4	-18.1	-102.8	11,722,166.32	2,118,225.43	32° 17' 1.030 N	103° 27' 12.409 W
2,700.0	10.00	260.01	2,691.9	-21.1	-119.9	11,722,163.06	2,118,208.38	32° 17' 1.000 N	103° 27' 12.608 W
2,800.0	10.00	260.01	2,790.4	-24.1	-137.0	11,722,159.80	2,118,191.32	32° 17' 0.970 N	103° 27' 12.807 W
2,900.0	10.00	260.01	2,888.9	-27.1	-154.1	11,722,156.54	2,118,174.26	32° 17' 0.940 N	103° 27' 13.006 W
3,000.0	10.00	260.01	2,987.3	-30.2	-171.2	11,722,153.28	2,118,157.21	32° 17' 0.911 N	103° 27' 13.206 W
3,100.0	10.00	260.01	3,085.8	-33.2	-188.3	11,722,150.02	2,118,140.15	32° 17' 0.881 N	103° 27' 13.405 W
3,200.0	10.00	260.01	3,184.3	-36.2	-205.4	11,722,146.77	2,118,123.09	32° 17' 0.851 N	103° 27' 13.604 W
3,300.0	10.00	260.01	3,282.8	-39.2	-222.5	11,722,143.51	2,118,106.04	32° 17' 0.821 N	103° 27' 13.803 W
3,400.0	10.00	260.01	3,381.3	-42.2	-239.6	11,722,140.25	2,118,088.98	32° 17' 0.791 N	103° 27' 14.003 W
3,500.0	10.00	260.01	3,479.7	-45.2	-256.7	11,722,136.99	2,118,071.93	32° 17' 0.761 N	103° 27' 14.202 W
3,600.0	10.00	260.01	3,578.2	-48.2	-273.8	11,722,133.73	2,118,054.87	32° 17' 0.732 N	103° 27' 14.401 W
3,700.0	10.00	260.01	3,676.7	-51.2	-290.9	11,722,130.47	2,118,037.81	32° 17' 0.702 N	103° 27' 14.600 W
3,800.0	10.00	260.01	3,775.2	-54.3	-308.0	11,722,127.21	2,118,020.76	32° 17' 0.672 N	103° 27' 14.800 W
3,900.0	10.00	260.01	3,873.7	-57.3	-325.1	11,722,123.95	2,118,003.70	32° 17' 0.642 N	103° 27' 14.999 W
4,000.0	10.00	260.01	3,972.1	-60.3	-342.2	11,722,120.70	2,117,986.64	32° 17' 0.612 N	103° 27' 15.198 W
4,100.0	10.00	260.01	4,070.6	-63.3	-359.3	11,722,117.44	2,117,969.59	32° 17' 0.583 N	103° 27' 15.397 W
4,200.0	10.00	260.01	4,169.1	-66.3	-376.5	11,722,114.18	2,117,952.53	32° 17' 0.553 N	103° 27' 15.596 W
4,300.0	10.00	260.01	4,267.6	-69.3	-393.6	11,722,110.92	2,117,935.48	32° 17' 0.523 N	103° 27' 15.796 W
4,400.0	10.00	260.01	4,366.1	-72.3	-410.7	11,722,107.66	2,117,918.42	32° 17' 0.493 N	103° 27' 15.995 W
4,500.0	10.00	260.01	4,464.5	-75.3	-427.8	11,722,104.40	2,117,901.36	32° 17' 0.463 N	103° 27' 16.194 W
4,600.0	10.00	260.01	4,563.0	-78.4	-444.9	11,722,101.14	2,117,884.31	32° 17' 0.433 N	103° 27' 16.393 W
4,700.0	10.00	260.01	4,661.5	-81.4	-462.0	11,722,097.88	2,117,867.25	32° 17' 0.404 N	103° 27' 16.593 W
4,800.0	10.00	260.01	4,760.0	-84.4	-479.1	11,722,094.63	2,117,850.19	32° 17' 0.374 N	103° 27' 16.792 W
4,900.0	10.00	260.01	4,858.5	-87.4	-496.2	11,722,091.37	2,117,833.14	32° 17' 0.344 N	103° 27' 16.991 W
5,000.0	10.00	260.01	4,957.0	-90.4	-513.3	11,722,088.11	2,117,816.08	32° 17' 0.314 N	103° 27' 17.190 W
5,100.0	10.00	260.01	5,055.4	-93.4	-530.4	11,722,084.85	2,117,799.02	32° 17' 0.284 N	103° 27' 17.390 W
5,200.0	10.00	260.01	5,153.9	-96.4	-547.5	11,722,081.59	2,117,781.97	32° 17' 0.255 N	103° 27' 17.589 W
5,300.0	10.00	260.01	5,252.4	-99.4	-564.6	11,722,078.33	2,117,764.91	32° 17' 0.225 N	103° 27' 17.788 W
5,400.0	10.00	260.01	5,350.9	-102.5	-581.7	11,722,075.07	2,117,747.86	32° 17' 0.195 N	103° 27' 17.987 W
5,500.0	10.00	260.01	5,449.4	-105.5	-598.8	11,722,071.81	2,117,730.80	32° 17' 0.165 N	103° 27' 18.186 W
5,600.0	10.00	260.01	5,547.8	-108.5	-615.9	11,722,068.56	2,117,713.74	32° 17' 0.135 N	103° 27' 18.386 W
5,700.0	10.00	260.01	5,646.3	-111.5	-633.0	11,722,065.30	2,117,696.69	32° 17' 0.106 N	103° 27' 18.585 W
5,800.0	10.00	260.01	5,744.8	-114.5	-650.1	11,722,062.04	2,117,679.63	32° 17' 0.076 N	103° 27' 18.784 W
5,900.0	10.00	260.01	5,843.3	-117.5	-667.2	11,722,058.78	2,117,662.57	32° 17' 0.046 N	103° 27' 18.983 W
6,000.0	10.00	260.01	5,941.8	-120.5	-684.3	11,722,055.52	2,117,645.52	32° 17' 0.016 N	103° 27' 19.183 W
6,100.0	10.00	260.01	6,040.2	-123.5	-701.4	11,722,052.26	2,117,628.46	32° 16' 59.986 N	103° 27' 19.382 W
6,200.0	10.00	260.01	6,138.7	-126.6	-718.5	11,722,049.00	2,117,611.41	32° 16' 59.956 N	103° 27' 19.581 W
6,300.0	10.00	260.01	6,237.2	-129.6	-735.6	11,722,045.75	2,117,594.35	32° 16' 59.927 N	103° 27' 19.780 W
6,400.0	10.00	260.01	6,335.7	-132.6	-752.7	11,722,042.49	2,117,577.29	32° 16' 59.897 N	103° 27' 19.979 W
6,500.0	10.00	260.01	6,434.2	-135.6	-769.8	11,722,039.23	2,117,560.24	32° 16' 59.867 N	103° 27' 20.179 W
6,600.0	10.00	260.01	6,532.6	-138.6	-786.9	11,722,035.97	2,117,543.18	32° 16' 59.837 N	103° 27' 20.378 W

Company:	NEW MEXICO	**Local Co-ordinate Reference:**	Well DANDIE 22 FEDERAL COM 503H
Project:	LEA	**TVD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Site:	DANDIE/ MASTIFF	**MD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Well:	DANDIE 22 FEDERAL COM 503H	**North Reference:**	True
Wellbore:	DANDIE 22 FEDERAL COM 503H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	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	10.00	260.01	6,631.1	-141.6	-804.0	11,722,032.71	2,117,526.12	32° 16' 59.807 N	103° 27' 20.577 W
6,800.0	10.00	260.01	6,729.6	-144.6	-821.1	11,722,029.45	2,117,509.07	32° 16' 59.778 N	103° 27' 20.776 W
6,900.0	10.00	260.01	6,828.1	-147.6	-838.2	11,722,026.19	2,117,492.01	32° 16' 59.748 N	103° 27' 20.976 W
7,000.0	10.00	260.01	6,926.6	-150.7	-855.3	11,722,022.93	2,117,474.95	32° 16' 59.718 N	103° 27' 21.175 W
7,100.0	10.00	260.01	7,025.0	-153.7	-872.4	11,722,019.68	2,117,457.90	32° 16' 59.688 N	103° 27' 21.374 W
7,200.0	10.00	260.01	7,123.5	-156.7	-889.5	11,722,016.42	2,117,440.84	32° 16' 59.658 N	103° 27' 21.573 W
7,300.0	10.00	260.01	7,222.0	-159.7	-906.6	11,722,013.16	2,117,423.79	32° 16' 59.628 N	103° 27' 21.773 W
7,400.0	10.00	260.01	7,320.5	-162.7	-923.7	11,722,009.90	2,117,406.73	32° 16' 59.599 N	103° 27' 21.972 W
7,500.0	10.00	260.01	7,419.0	-165.7	-940.8	11,722,006.64	2,117,389.67	32° 16' 59.569 N	103° 27' 22.171 W
7,600.0	10.00	260.01	7,517.5	-168.7	-957.9	11,722,003.38	2,117,372.62	32° 16' 59.539 N	103° 27' 22.370 W
7,700.0	10.00	260.01	7,615.9	-171.7	-975.0	11,722,000.12	2,117,355.56	32° 16' 59.509 N	103° 27' 22.569 W
7,800.0	10.00	260.01	7,714.4	-174.8	-992.1	11,721,996.86	2,117,338.50	32° 16' 59.479 N	103° 27' 22.769 W
7,900.0	10.00	260.01	7,812.9	-177.8	-1,009.2	11,721,993.61	2,117,321.45	32° 16' 59.450 N	103° 27' 22.968 W
8,000.0	10.00	260.01	7,911.4	-180.8	-1,026.3	11,721,990.35	2,117,304.39	32° 16' 59.420 N	103° 27' 23.167 W
8,100.0	10.00	260.01	8,009.9	-183.8	-1,043.4	11,721,987.09	2,117,287.34	32° 16' 59.390 N	103° 27' 23.366 W
8,200.0	10.00	260.01	8,108.3	-186.8	-1,060.5	11,721,983.83	2,117,270.28	32° 16' 59.360 N	103° 27' 23.566 W
8,300.0	9.00	260.01	8,207.0	-189.7	-1,076.8	11,721,980.73	2,117,254.07	32° 16' 59.332 N	103° 27' 23.755 W
8,400.0	8.00	260.01	8,305.9	-192.2	-1,091.3	11,721,977.96	2,117,239.55	32° 16' 59.306 N	103° 27' 23.925 W
8,500.0	7.00	260.01	8,405.0	-194.5	-1,104.2	11,721,975.51	2,117,226.73	32° 16' 59.284 N	103° 27' 24.074 W
8,600.0	6.00	260.01	8,504.4	-196.5	-1,115.3	11,721,973.38	2,117,215.61	32° 16' 59.265 N	103° 27' 24.204 W
8,700.0	5.00	260.01	8,603.9	-198.1	-1,124.8	11,721,971.59	2,117,206.20	32° 16' 59.248 N	103° 27' 24.314 W
8,800.0	4.00	260.01	8,703.6	-199.5	-1,132.5	11,721,970.11	2,117,198.49	32° 16' 59.235 N	103° 27' 24.404 W
8,900.0	3.00	260.01	8,803.4	-200.5	-1,138.5	11,721,968.97	2,117,192.49	32° 16' 59.224 N	103° 27' 24.474 W
9,000.0	2.00	260.01	8,903.3	-201.3	-1,142.8	11,721,968.15	2,117,188.21	32° 16' 59.217 N	103° 27' 24.524 W
9,100.0	1.00	260.01	9,003.3	-201.8	-1,145.4	11,721,967.66	2,117,185.64	32° 16' 59.212 N	103° 27' 24.554 W
9,200.0	0.00	0.00	9,103.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,300.0	0.00	0.00	9,203.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,400.0	0.00	0.00	9,303.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,500.0	0.00	0.00	9,403.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,600.0	0.00	0.00	9,503.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,700.0	0.00	0.00	9,603.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,800.0	0.00	0.00	9,703.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
9,900.0	0.00	0.00	9,803.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
10,000.0	0.00	0.00	9,903.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
10,024.0	0.00	0.00	9,927.3	-201.9	-1,146.2	11,721,967.49	2,117,184.78	32° 16' 59.211 N	103° 27' 24.564 W
10,100.0	7.60	358.71	10,003.0	-196.9	-1,146.4	11,721,972.53	2,117,184.59	32° 16' 59.260 N	103° 27' 24.566 W
10,200.0	17.61	358.71	10,100.5	-175.1	-1,146.8	11,721,994.31	2,117,183.79	32° 16' 59.476 N	103° 27' 24.571 W
10,300.0	27.61	358.71	10,192.7	-136.7	-1,147.7	11,722,032.67	2,117,182.37	32° 16' 59.856 N	103° 27' 24.581 W
10,400.0	37.61	358.71	10,276.8	-82.9	-1,148.9	11,722,086.47	2,117,180.38	32° 17' 0.389 N	103° 27' 24.596 W
10,500.0	47.62	358.71	10,350.3	-15.3	-1,150.4	11,722,154.04	2,117,177.89	32° 17' 1.058 N	103° 27' 24.613 W
10,600.0	57.62	358.71	10,411.0	64.1	-1,152.2	11,722,233.35	2,117,174.96	32° 17' 1.843 N	103° 27' 24.634 W
10,700.0	67.63	358.71	10,456.9	152.7	-1,154.2	11,722,321.98	2,117,171.68	32° 17' 2.720 N	103° 27' 24.657 W
10,800.0	77.63	358.71	10,486.7	248.0	-1,156.4	11,722,417.23	2,117,168.16	32° 17' 3.663 N	103° 27' 24.683 W
10,900.0	87.63	358.71	10,499.5	347.0	-1,158.6	11,722,516.21	2,117,164.50	32° 17' 4.643 N	103° 27' 24.709 W
10,923.6	90.00	358.71	10,500.0	370.7	-1,159.1	11,722,539.84	2,117,163.63	32° 17' 4.877 N	103° 27' 24.715 W
11,000.0	90.00	358.78	10,500.0	447.0	-1,160.8	11,722,616.14	2,117,160.86	32° 17' 5.633 N	103° 27' 24.734 W
11,100.0	90.00	358.88	10,500.0	547.0	-1,162.8	11,722,716.08	2,117,157.38	32° 17' 6.622 N	103° 27' 24.758 W
11,200.0	90.00	358.98	10,500.0	647.0	-1,164.7	11,722,816.02	2,117,154.07	32° 17' 7.612 N	103° 27' 24.780 W
11,300.0	90.00	359.08	10,500.0	747.0	-1,166.4	11,722,915.97	2,117,150.93	32° 17' 8.601 N	103° 27' 24.800 W
11,400.0	90.00	359.17	10,500.0	847.0	-1,167.9	11,723,015.93	2,117,147.96	32° 17' 9.591 N	103° 27' 24.817 W
11,500.0	90.00	359.27	10,500.0	946.9	-1,169.3	11,723,115.89	2,117,145.16	32° 17' 10.580 N	103° 27' 24.833 W
11,600.0	90.00	359.37	10,500.0	1,046.9	-1,170.5	11,723,215.86	2,117,142.53	32° 17' 11.570 N	103° 27' 24.847 W
11,700.0	90.00	359.46	10,500.0	1,146.9	-1,171.5	11,723,315.83	2,117,140.07	32° 17' 12.559 N	103° 27' 24.859 W
11,800.0	90.00	359.56	10,500.0	1,246.9	-1,172.4	11,723,415.80	2,117,137.77	32° 17' 13.549 N	103° 27' 24.869 W
11,900.0	90.00	359.66	10,500.0	1,346.9	-1,173.0	11,723,515.78	2,117,135.65	32° 17' 14.539 N	103° 27' 24.877 W

Company:	NEW MEXICO	**Local Co-ordinate Reference:**	Well DANDIE 22 FEDERAL COM 503H
Project:	LEA	**TVD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Site:	DANDIE/ MASTIFF	**MD Reference:**	RKB=3433.2+25 @ 3458.2usft (HP 650)
Well:	DANDIE 22 FEDERAL COM 503H	**North Reference:**	True
Wellbore:	DANDIE 22 FEDERAL COM 503H	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	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	359.76	10,500.0	1,446.9	-1,173.5	11,723,615.76	2,117,133.70	32° 17' 15.528 N	103° 27' 24.883 W
12,100.0	90.00	359.85	10,500.0	1,546.9	-1,173.9	11,723,715.74	2,117,131.91	32° 17' 16.518 N	103° 27' 24.887 W
12,200.0	90.00	359.95	10,500.0	1,646.9	-1,174.1	11,723,815.73	2,117,130.30	32° 17' 17.507 N	103° 27' 24.889 W
12,300.0	90.00	0.05	10,500.0	1,746.9	-1,174.1	11,723,915.72	2,117,128.85	32° 17' 18.497 N	103° 27' 24.889 W
12,400.0	90.00	0.14	10,500.0	1,846.9	-1,173.9	11,724,015.71	2,117,127.58	32° 17' 19.487 N	103° 27' 24.887 W
12,497.4	90.00	0.24	10,500.0	1,944.4	-1,173.6	11,724,113.15	2,117,126.50	32° 17' 20.451 N	103° 27' 24.884 W
12,500.0	90.00	0.24	10,500.0	1,946.9	-1,173.6	11,724,115.70	2,117,126.47	32° 17' 20.476 N	103° 27' 24.883 W
12,600.0	90.00	0.24	10,500.0	2,046.9	-1,173.1	11,724,215.70	2,117,125.45	32° 17' 21.466 N	103° 27' 24.879 W
12,700.0	90.00	0.24	10,500.0	2,146.9	-1,172.7	11,724,315.69	2,117,124.42	32° 17' 22.456 N	103° 27' 24.874 W
12,800.0	90.00	0.24	10,500.0	2,246.9	-1,172.3	11,724,415.69	2,117,123.40	32° 17' 23.445 N	103° 27' 24.869 W
12,900.0	90.00	0.24	10,500.0	2,346.9	-1,171.9	11,724,515.68	2,117,122.37	32° 17' 24.435 N	103° 27' 24.864 W
13,000.0	90.00	0.24	10,500.0	2,446.9	-1,171.5	11,724,615.68	2,117,121.35	32° 17' 25.425 N	103° 27' 24.859 W
13,100.0	90.00	0.24	10,500.0	2,546.9	-1,171.1	11,724,715.67	2,117,120.32	32° 17' 26.414 N	103° 27' 24.855 W
13,200.0	90.00	0.24	10,500.0	2,646.9	-1,170.6	11,724,815.67	2,117,119.30	32° 17' 27.404 N	103° 27' 24.850 W
13,300.0	90.00	0.24	10,500.0	2,746.9	-1,170.2	11,724,915.66	2,117,118.27	32° 17' 28.393 N	103° 27' 24.845 W
13,400.0	90.00	0.24	10,500.0	2,846.9	-1,169.8	11,725,015.66	2,117,117.25	32° 17' 29.383 N	103° 27' 24.840 W
13,500.0	90.00	0.24	10,500.0	2,946.9	-1,169.4	11,725,115.65	2,117,116.22	32° 17' 30.373 N	103° 27' 24.835 W
13,600.0	90.00	0.24	10,500.0	3,046.9	-1,169.0	11,725,215.65	2,117,115.19	32° 17' 31.362 N	103° 27' 24.830 W
13,700.0	90.00	0.24	10,500.0	3,146.9	-1,168.6	11,725,315.64	2,117,114.17	32° 17' 32.352 N	103° 27' 24.826 W
13,800.0	90.00	0.24	10,500.0	3,246.9	-1,168.1	11,725,415.64	2,117,113.14	32° 17' 33.342 N	103° 27' 24.821 W
13,900.0	90.00	0.24	10,500.0	3,346.9	-1,167.7	11,725,515.63	2,117,112.12	32° 17' 34.331 N	103° 27' 24.816 W
14,000.0	90.00	0.24	10,500.0	3,446.9	-1,167.3	11,725,615.63	2,117,111.09	32° 17' 35.321 N	103° 27' 24.811 W
14,100.0	90.00	0.24	10,500.0	3,546.9	-1,166.9	11,725,715.62	2,117,110.07	32° 17' 36.311 N	103° 27' 24.806 W
14,200.0	90.00	0.24	10,500.0	3,646.9	-1,166.5	11,725,815.61	2,117,109.04	32° 17' 37.300 N	103° 27' 24.801 W
14,300.0	90.00	0.24	10,500.0	3,746.9	-1,166.0	11,725,915.61	2,117,108.02	32° 17' 38.290 N	103° 27' 24.797 W
14,400.0	90.00	0.24	10,500.0	3,846.9	-1,165.6	11,726,015.60	2,117,106.99	32° 17' 39.279 N	103° 27' 24.792 W
14,500.0	90.00	0.24	10,500.0	3,946.9	-1,165.2	11,726,115.60	2,117,105.97	32° 17' 40.269 N	103° 27' 24.787 W
14,600.0	90.00	0.24	10,500.0	4,046.9	-1,164.8	11,726,215.59	2,117,104.94	32° 17' 41.259 N	103° 27' 24.782 W
14,700.0	90.00	0.24	10,500.0	4,146.9	-1,164.4	11,726,315.59	2,117,103.92	32° 17' 42.248 N	103° 27' 24.777 W
14,800.0	90.00	0.24	10,500.0	4,246.9	-1,164.0	11,726,415.58	2,117,102.89	32° 17' 43.238 N	103° 27' 24.773 W
14,900.0	90.00	0.24	10,500.0	4,346.9	-1,163.5	11,726,515.58	2,117,101.87	32° 17' 44.228 N	103° 27' 24.768 W
15,000.0	90.00	0.24	10,500.0	4,446.9	-1,163.1	11,726,615.57	2,117,100.84	32° 17' 45.217 N	103° 27' 24.763 W
15,100.0	90.00	0.24	10,500.0	4,546.9	-1,162.7	11,726,715.57	2,117,099.82	32° 17' 46.207 N	103° 27' 24.758 W
15,200.0	90.00	0.24	10,500.0	4,646.9	-1,162.3	11,726,815.56	2,117,098.79	32° 17' 47.197 N	103° 27' 24.753 W
15,300.0	90.00	0.24	10,500.0	4,746.9	-1,161.9	11,726,915.56	2,117,097.76	32° 17' 48.186 N	103° 27' 24.748 W
15,400.0	90.00	0.24	10,500.0	4,846.9	-1,161.5	11,727,015.55	2,117,096.74	32° 17' 49.176 N	103° 27' 24.744 W
15,434.3	90.00	0.24	10,500.0	4,881.2	-1,161.3	11,727,049.89	2,117,096.39	32° 17' 49.516 N	103° 27' 24.742 W

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP - DANDIE 22 FEDE	0.00	0.00	10,500.0	-199.4	-1,160.4	11,721,969.76	2,117,170.61	32° 16' 59.235 N	103° 27' 24.729 W
- plan misses target center by 236.0usft at 10485.6usft MD (10340.5 TVD, -25.8 N, -1150.2 E)									
- Circle (radius 50.0)									
LTP/BHL - DANDIE 22 F	0.00	0.00	10,500.0	4,881.2	-1,161.3	11,727,049.89	2,117,096.39	32° 17' 49.516 N	103° 27' 24.742 W
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					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.

Pressure test with water at
ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.
→ 10 mm = 20 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	9251	9254	AISI 4130	A0579N
4 1/16" 10K API b.w. Flange end			AISI 4130	035608

Not Designed For Well Testing **API Spec 16 C**

Temperature rate:"B"

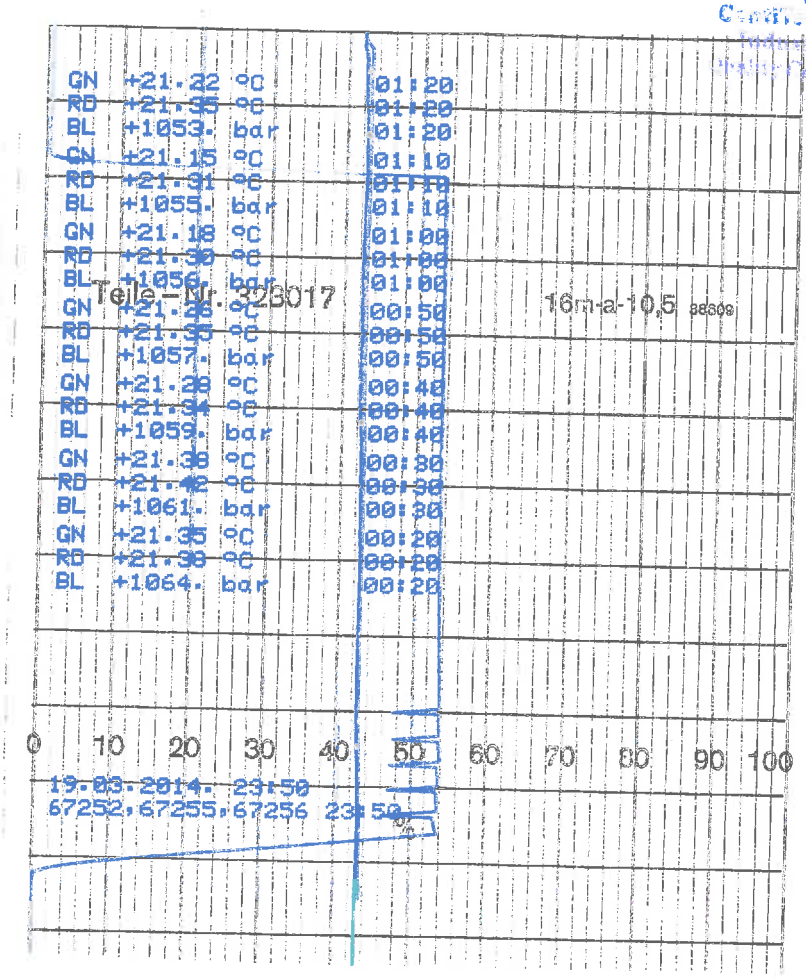
All metal parts are flawless

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.

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.		ContiTech Rubber Industrial Kft. Quality Control Dept.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BL +1061. bar 00:30
GN +21.35 °C 00:20
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Hose Data Sheet

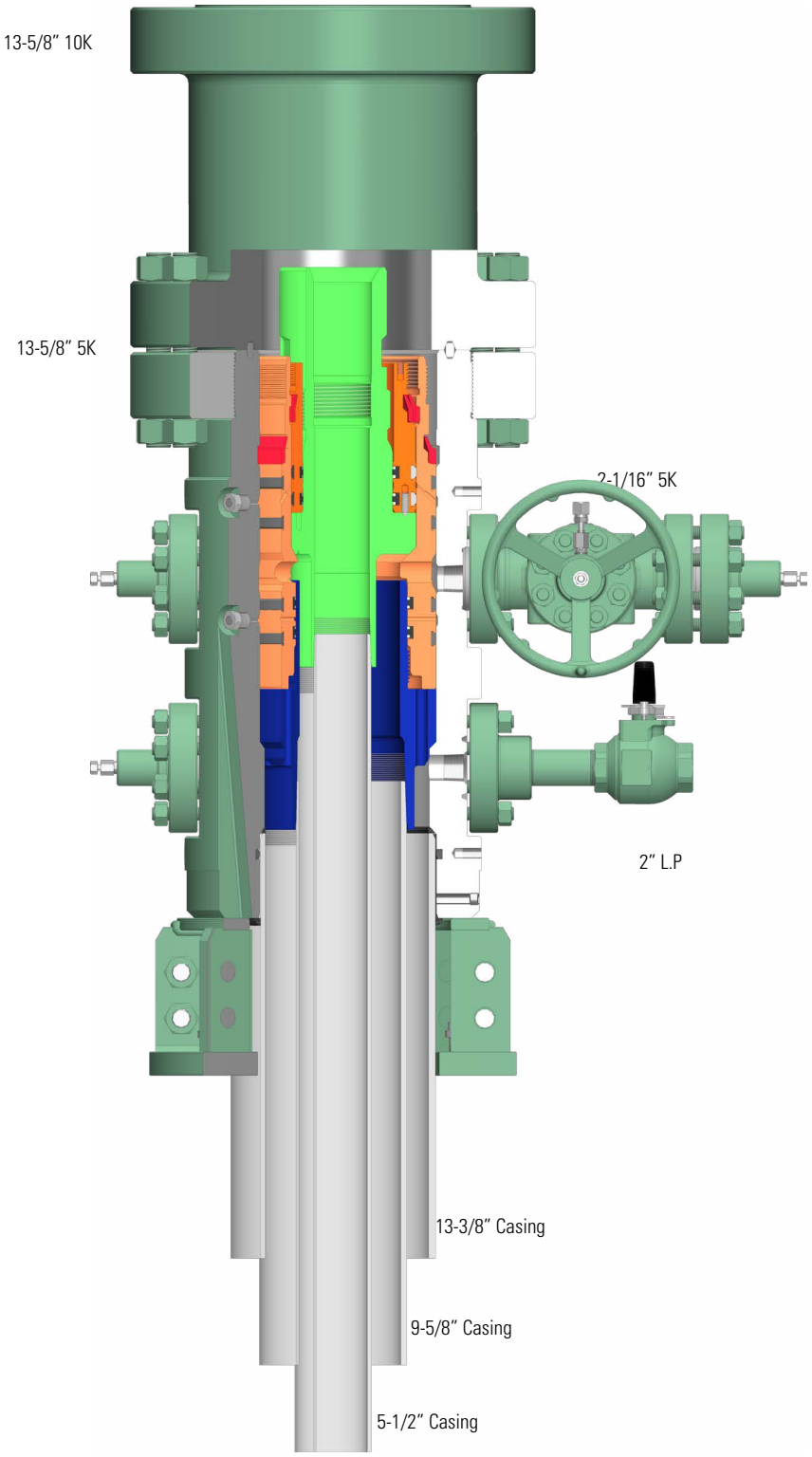
CRI Order No.	538236
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500409659
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	35 ft
Type of coupling one end	FLANGE 4.1/16" 10K API SPEC 6A TYPE 6BX FLANGE C/W BX155 R.GR.SOUR
Type of coupling other 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

Dandie 22 Federal Com 503H

Centennial Drilling Plan for 3-Casing String Bone Springs Formation

13-3/8" x 9-5/8" x 5-1/2" Casing Design

1. Drill 17-1/2" surface hole to Total Depth with Spudder Rig and perform wellbore cleanup cycles.
2. Run and land 13-3/8" casing to Depth.
3. Cement 13-3/8" casing – cement to surface.
4. Cut / Dress Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor.
5. Test Weld to 70% of 13-3/8" casing collapse. Place nightcap with Pressure Gauge on wellhead and test seals to 70% of Casing Collapse.
6. Bleed Pressure if necessary and remove nightcap. Nipple up and test BOPE with test plug per Onshore Order 2.
7. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
8. Install wear bushing then drill out 13-3/8" shoe-track plus 20' and conduct FIT to minimum of the MW equivalent anticipated to control the formation pressure to the next casing point.
9. Drill 12-1/4" Intermediate hole to 9-5/8" casing point. (Base Capitan Reef).
10. Remove wear bushing then run and land 9-5/8" Intermediate Casing with mandrel hanger in wellhead.
11. Cement 9-5/8 casing – cement to surface.
12. Washout stack then run wash tool in wellhead and wash hanger and pack-off setting area.
13. Install pack-off and test to 5000 psi for 15 minutes.
    a. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
14. Install wear bushing then drill out 9-5/8" shoe-track plus 20' and conduct FIT to minimum MW equivalent to control the formation pressure to TD of well.
15. Drill 8-3/4" Vertical hole to KOP – Trip out for Curve BHA.
16. Drill 8-3/4" Curve, landing in production interval – Trip for Lateral BHA.
17. Drill 8-1/2" Lateral to Permitted BHL, perform cleanup cycles and trip out to run 5-1/2" Production Casing.
18. Remove wear bushing then run 5-1/2" production casing to TD landing casing mandrel in wellhead.
19. Cement 5-1/2" Production string to surface.
20. Run in with wash tool and wash wellhead area – install pack-off and test to 5000psi for 15 minutes.
21. Install BPV in 5-1/2" mandrel hanger – Nipple down BOPE and install nightcap.
22. Test nightcap void to 5000psi for 30 minutes.



CENTENNIAL
RESOURCE DEVELOPMENT, INC

CAMERON CONFIDENTIAL INFORMATION			
DO NOT SCALE		CAMERON A Schlumberger Company	Surface Systems
Drawn by: C.Moore	Date: 7/1/19		
Checked by: V.Atwell	Date: 7/1/19	13-5/8" 10k MN-DS	Rev: 02
Drawing No: 1655807-A			

AFMSS

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

Bond Info Data Report

08/04/2020

APD ID: 10400037954 **Submission Date:** 01/17/2019

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: DANDIE 22 FEDERAL COM **Well Number:** 503H

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

Highlighted data reflects the most recent changes

Show Final Text

Bond Information

Federal/Indian APD: FED

BLM Bond number: 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

☐ AMENDED REPORT

OCD – HOBBS
08/04/2020
RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-47524	2209	Antelope Ridge; Bones Spring, West

[4] Property Code	[5] Property Name	[6] Well Number
318001	DANDIE 22 FEDERAL COM	#503H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372165	CENTENNIAL RESOURCE PRODUCTION, LLC	3433.2'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	22	23S	34E		300	SOUTH	1149	EAST	LEA

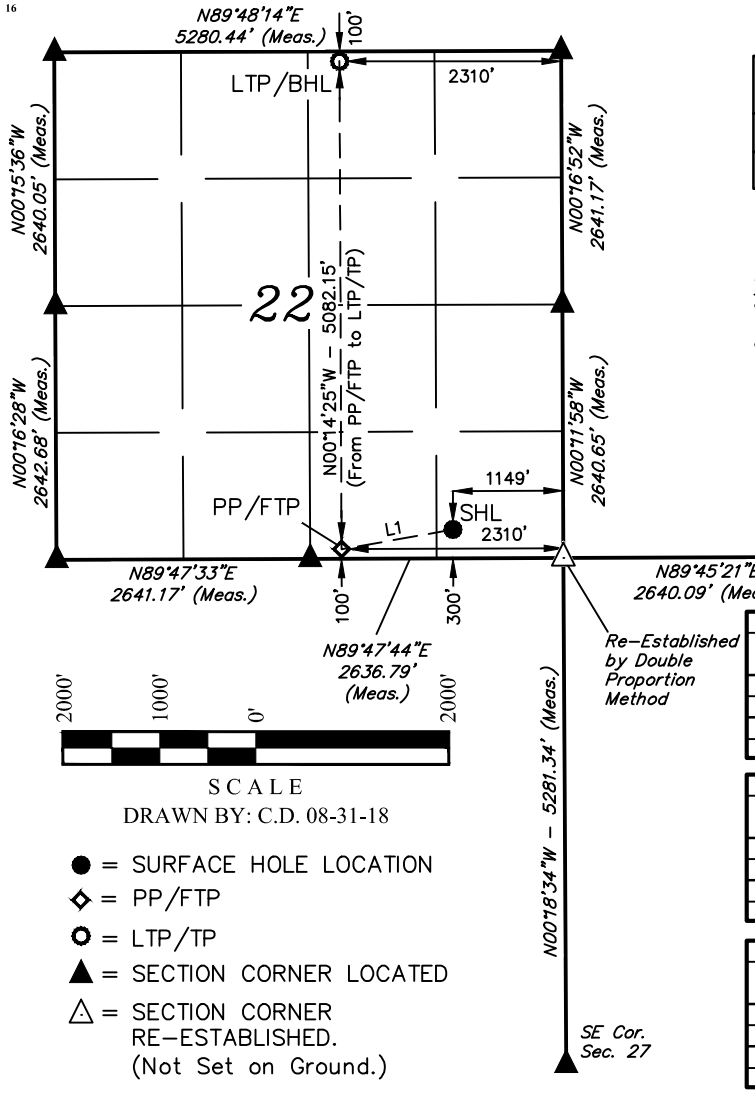
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	22	23S	34E		100	NORTH	2310	EAST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160			

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

[16]



SCALE
DRAWN BY: C.D. 08-31-18

● = SURFACE HOLE LOCATION
◇ = PP/FTP
○ = LTP/TP
▲ = SECTION CORNER LOCATED
△ = SECTION CORNER RE-ESTABLISHED. (Not Set on Ground.)

LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S80°01'05"W	1177.74'

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

NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°17'01.21" (32.283669°)
LONGITUDE = 103°27'11.21" (103.453114°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 468047.70' X: 813356.18'
UTM, NAD 83 (ZONE 13)
Y: 11722185.91' X: 2118327.99'

NAD 83 (PP/FTP)
LATITUDE = 32°16'59.24" (32.283121°)
LONGITUDE = 103°27'24.73" (103.456869°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 467838.72' X: 812197.32'
UTM, NAD 83 (ZONE 13)
Y: 11721969.76' X: 2117170.61'

NAD 83 (LTP/TP)
LATITUDE = 32°17'49.52" (32.297088°)
LONGITUDE = 103°27'24.74" (103.456873°)
STATE PLANE NAD 83 (N.M. EAST)
Y: 472919.89' X: 812154.69'
UTM, NAD 83 (ZONE 13)
Y: 11727049.89' X: 2117096.39'

[17] OPERATOR CERTIFICATION

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

K. C. 1/2/19
Signature Date

Kanicia Castillo
Printed Name

kanicia.castillo@cdevinc.com
E-mail Address

[18] SURVEYOR CERTIFICATION

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

August 13, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
PROFESSIONAL SURVEYOR
08-31-18

Certificate Number:

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Form C-102
Revised August 1, 2011
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☐ AMENDED REPORT

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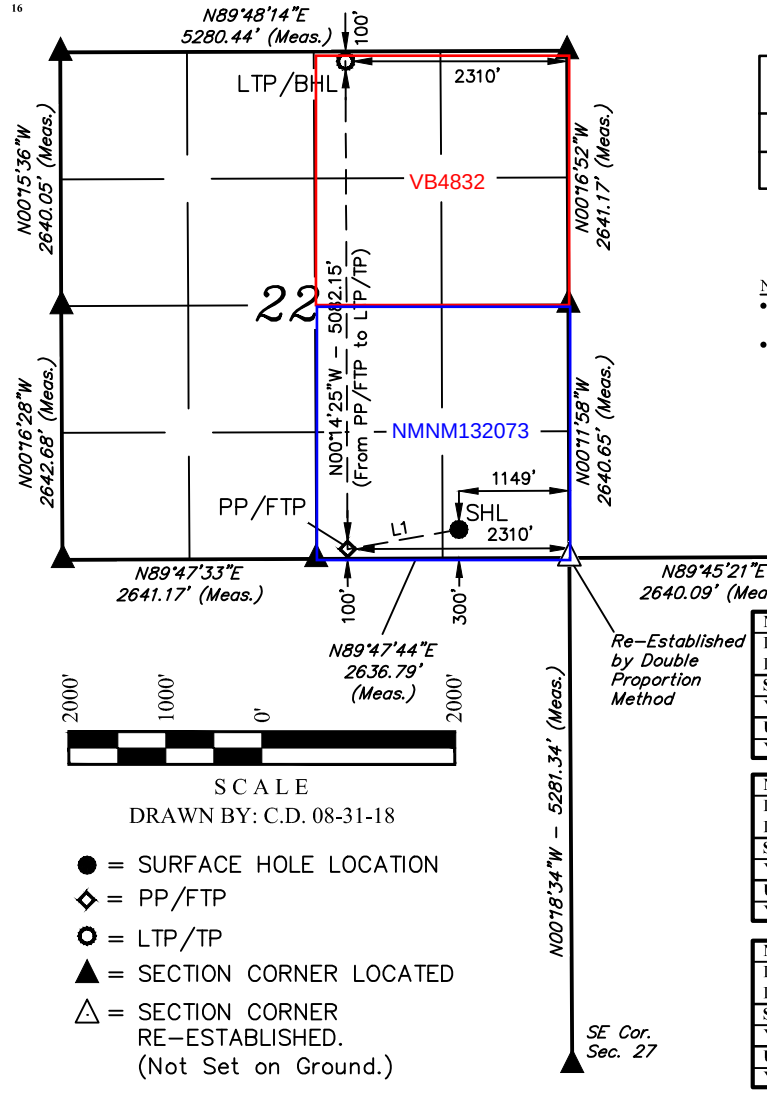

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DRAWN BY: C.D. 08-31-18

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K. C. 1/2/19
Signature Date

Kanicia Castillo
Printed Name

kanicia.castillo@cdevinc.com
E-mail Address

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Submit Original
to Appropriate
District Office

OCD – HOBBS
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GAS CAPTURE PLAN

Date: 01/11/2019

☒ Original
☐ Amended - Reason for Amendment:

Operator & OGRID No.: Centennial Resource Production, LLC 372165

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

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

Well(s)/Production Facility – Name of facility

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Dandie 22 Federal Com 303H	Pending	P-22-23S-34E	450 FSL 1149 FEL	2860 MCF/D	Neither	New Well
Dandie 22 Federal Com 503H	Pending **30-025-47524**	P-22-23S-34E	300 FSL 1149 FEL	2660 MCF/D	Neither	New Well
Mastiff 22 Federal Com 301H	Pending	P-22-23S-34E	450 FSL 1089 FEL	2740 MCF/D	Neither	New Well
Mastiff 22 Federal Com 302H	Pending	P-22-23S-34E	450 FSL 1119 FEL	2420 MCF/D	Neither	New Well
Mastiff 22 Federal Com 501H	Pending	P-22-23S-34E	300 FSL 1089 FEL	2220 MCF/D	Neither	New Well
Mastiff 22 Federal Com 502H	Pending	P-22-23S-34E	300 FSL 1119 FEL	2540 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