

Form 3160-3  
(June 2015)

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**

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator <b>[372165]</b>		8. Lease Name and Well No. <b>[326046]</b>
3a. Address	3b. Phone No. (include area code)	9. API Well No. <b>30-025-48377</b>
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		10. Field and Pool, or Exploratory <b>[5695]</b>
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)		12. County or Parish
16. No of acres in lease		13. State
17. Spacing Unit dedicated to this well		
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.		19. Proposed Depth
20. BLM/BIA Bond No. in file		
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
24. Attachments		

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

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

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

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

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

**GCP Rec 01/12/2021**

**SL**

(Continued on page 2)



**01/14/2021**

\*(Instructions on page 2)

## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>CENTENNIAL RESOURCE PRODUCTION, LLC</b>
<b>LEASE NO.:</b>	<b>NMNM131588</b>
<b>WELL NAME &amp; NO.:</b>	<b>CHEDDAR FED COM 401H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>603'/S &amp; 440'/W</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>100'/N &amp; 792'/W</b>
<b>LOCATION:</b>	<b>Section 5, T.22 S., R.32 E., NMPM</b>
<b>COUNTY:</b>	<b>LEA County, New Mexico</b>

COA

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

### A. HYDROGEN SULFIDE

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

### B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **750** 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

**24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

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

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate, contact the appropriate BLM office.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
  - ❖ In Secretary Potash Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
  - Cement should tie-back at least **500 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.

**JJP11032020**

**GENERAL REQUIREMENTS**

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

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

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

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

- 1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after

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

#### A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for

details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

#### B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

- a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
  - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
  - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE.

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

- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### C. DRILLING MUD

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

#### D. WASTE MATERIAL AND FLUIDS

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

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



# Operator Certification Data Report

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

11/16/2020



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

# Application Data Report

11/16/2020

APD ID: 10400052335

Submission Date: 12/13/2019

Highlighted data  
reflects the most  
recent changes

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: CHEDDAR FEDERAL COM

Well Number: 401H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

## Section 1 - General

APD ID: 10400052335

Tie to previous NOS? N

Submission Date: 12/13/2019

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: NMNM131588

Lease Acres: 886.41

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? YES

Federal or Indian agreement: FEDERAL

Agreement number: NMNM138602

Agreement name:

Keep application confidential? Y

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? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: CHEDDAR FEDERAL COM

Well Number: 401H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: 2ND BONESPRING Pool Name: RED HILLS; BONE  
SAND SPRING, NORTH

Is the proposed well in an area containing other mineral resources? USEABLE WATER,NATURAL GAS,OIL,POTASH

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Is the proposed well in an area containing other mineral resources?** USEABLE WATER,NATURAL GAS,OIL,POTASH

**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** Y **New surface disturbance?** Y

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:**  
CHEDDAR DRILL ISLAND

**Number:** 1

**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:** 43 Miles

**Distance to nearest well:** 30 FT

**Distance to lease line:** 440 FT

**Reservoir well spacing assigned acres Measurement:** 320 Acres

**Well plat:** CHEDDAR\_FED\_COM\_\_401H\_C102\_20191212122231.pdf

CHEDDAR\_FED\_COM\_\_401H\_C102\_Lease\_20191212122335.pdf

**Well work start Date:** 02/01/2021

**Duration:** 45 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** 23782

**Reference Datum:** GROUND LEVEL

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	603	FSL	440	FW L	22S	32E	5	Aliquot SWS W	32.415006	-103.703956	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 131588	3665	0	0	Y
KOP Leg #1	603	FSL	440	FW L	22S	32E	5	Aliquot SWS W	32.415006	-103.703956	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 131588	-5762	9458	9427	Y

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

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	792	FW L	22S	32E	5	Aliquot SWS W	32.413629	-103.702814	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 131588	-6335	10358	10000	Y
EXIT Leg #1	100	FNL	792	FW L	21S	32E	32	Aliquot NWN W	32.442098	-103.702845	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-6335	20139	10000	Y
BHL Leg #1	100	FNL	792	FW L	21S	32E	32	Aliquot NWN W	32.442098	-103.702845	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-6335	20139	10000	Y



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

# Drilling Plan Data Report

11/16/2020

APD ID: 10400052335

Submission Date: 12/13/2019

Highlighted data  
reflects the most  
recent changes

Operator Name: CENTENNIAL RESOURCE PRODUCTION LLC

Well Name: CHEDDAR FEDERAL COM

Well Number: 401H

Show Final Text

Well Type: OIL WELL

Well Work Type: Drill

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
608084	RUSTLER	3665	624	624	SANDSTONE	NONE	N
608086	CAPITAN REEF	-957	4622	4622	OTHER : Carbonate	USEABLE WATER	N
608087	BELL CANYON	-1065	4730	4730	SANDSTONE	NATURAL GAS, OIL	N
608088	CHERRY CANYON	-1862	5527	5527	SANDSTONE	NATURAL GAS, OIL	N
608091	BRUSHY CANYON	-3192	6857	6857	SANDSTONE	NATURAL GAS, OIL	N
608092	BONE SPRING LIME	-4919	8584	8584	OTHER : Carbonate	NATURAL GAS, OIL	N
608094	AVALON SAND	-5071	8736	8736	SHALE	CO2, NATURAL GAS, OIL	N
608089	BONE SPRING 1ST	-5958	9623	9623	SANDSTONE	NATURAL GAS, OIL	N
608090	BONE SPRING 2ND	-6222	9887	9887	OTHER, SHALE : Carbonate	NATURAL GAS, OIL	Y

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 10000

**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:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Requesting Variance?** YES

**Variance request:** Centennial is requesting to use a flex hose on the choke manifold. Please see section 8 for hose specs attachment. We would also like to request a variance to use a 5M Annular Preventer. Please see attached multi-bowl procedure.

**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:**

HP650\_10M\_Choke\_Manifold\_20190329140051.pdf

**BOP Diagram Attachment:**

CRD\_\_Well\_Control\_Plan\_v2\_20181107133139.pdf

HP650\_BOP\_Schematic\_CoFlex\_Choke\_10K\_2019\_1\_29\_20190325122316.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	3665	3545	120	H-40	94	OTHER - Weld							
2	SURFACE	17.5	13.375	NEW	API	N	0	750	0	750	3665	2915	750	J-55	54.5	OTHER - BTC	3.05	7.38	DRY	20.87	DRY	20.87	
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4610	0	4600	3665	-935	4610	J-55	40	LT&C	1.52	1.65	DRY	2.83	DRY	3.42	
4	PRODUCTION	8.75	5.5	NEW	API	N	0	9458	0	9427	3665	-5762	9458	P-110	20	OTHER - TMK UP DQX	2.27	2.58	DRY	3.4	DRY	3.4	
5	PRODUCTION	8.5	5.5	NEW	API	N	9458	20139	9427	10000	-5762	-6335	10681	P-110	20	OTHER - TMK UP DQX	2.14	2.43	DRY	55.93	DRY	55.93	

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Casing Attachments**

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181031160011.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181031160036.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

TMK\_UP\_DQX\_5.5\_x\_20\_P110\_HC\_20181031161313.pdf

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181107142525.pdf

---

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

TMK\_UP\_DQX\_5\_x\_18\_P110\_HC\_20181031161259.pdf

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181107142600.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20191212111404.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181107142618.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20191212111456.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 0.25 pps CACL2 2% BWOC
-----------	------	--	---	-----	-----	------	------	-----	--	-------	---

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

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	4110	1000	3.44	10.7	3441	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		4110	4610	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	9458	925	3.41	10.6	3155	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		9458	20139	2467	1.24	14.2	3058	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:** CHEDDAR FEDERAL COM

**Well Number:** 401H

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	2013 9	OTHER : Brine/OBM	8.8	10							
1800	4610	OTHER : Brine	9	10							
0	1800	OTHER : FW	8.6	9.5							

### 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:**

DIRECTIONAL SURVEY,GAMMA RAY LOG,

**Coring operation description for the well:**

Will not be coring this well.

### Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 5200

**Anticipated Surface Pressure:** 2999

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

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

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

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

**Hydrogen sulfide drilling operations plan:**

H2S\_Plan\_Chedder\_Fed\_Com\_401H\_20191212125124.pdf

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

## Section 8 - Other Information

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

Chedder\_FC\_401H\_Plan\_Report\_20191212125151.pdf

**Other proposed operations facets description:**

We are planning to use spudder rig to preset surface casing.  
Gas Caputre Plan is attached.See attached geoprog.

**Other proposed operations facets attachment:**

CRD\_Batch\_Setting\_Procedures\_20191212112515.pdf

Gas\_Capture\_Plan\_Cheddar\_301H\_20191213123209.docx

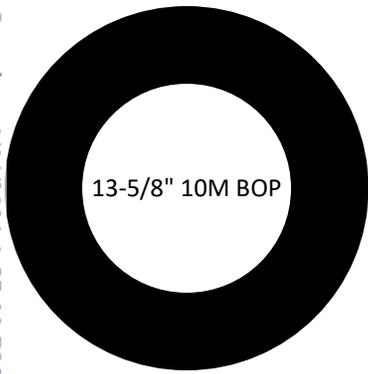
CDEV\_Multi\_Bowl\_Procedure\_Cheddar\_Fed\_Com\_401H\_20191213123300.pdf

GEOPROG\_Cheddar\_Federal\_Com\_401H\_PRELIM\_20200828125056.pdf

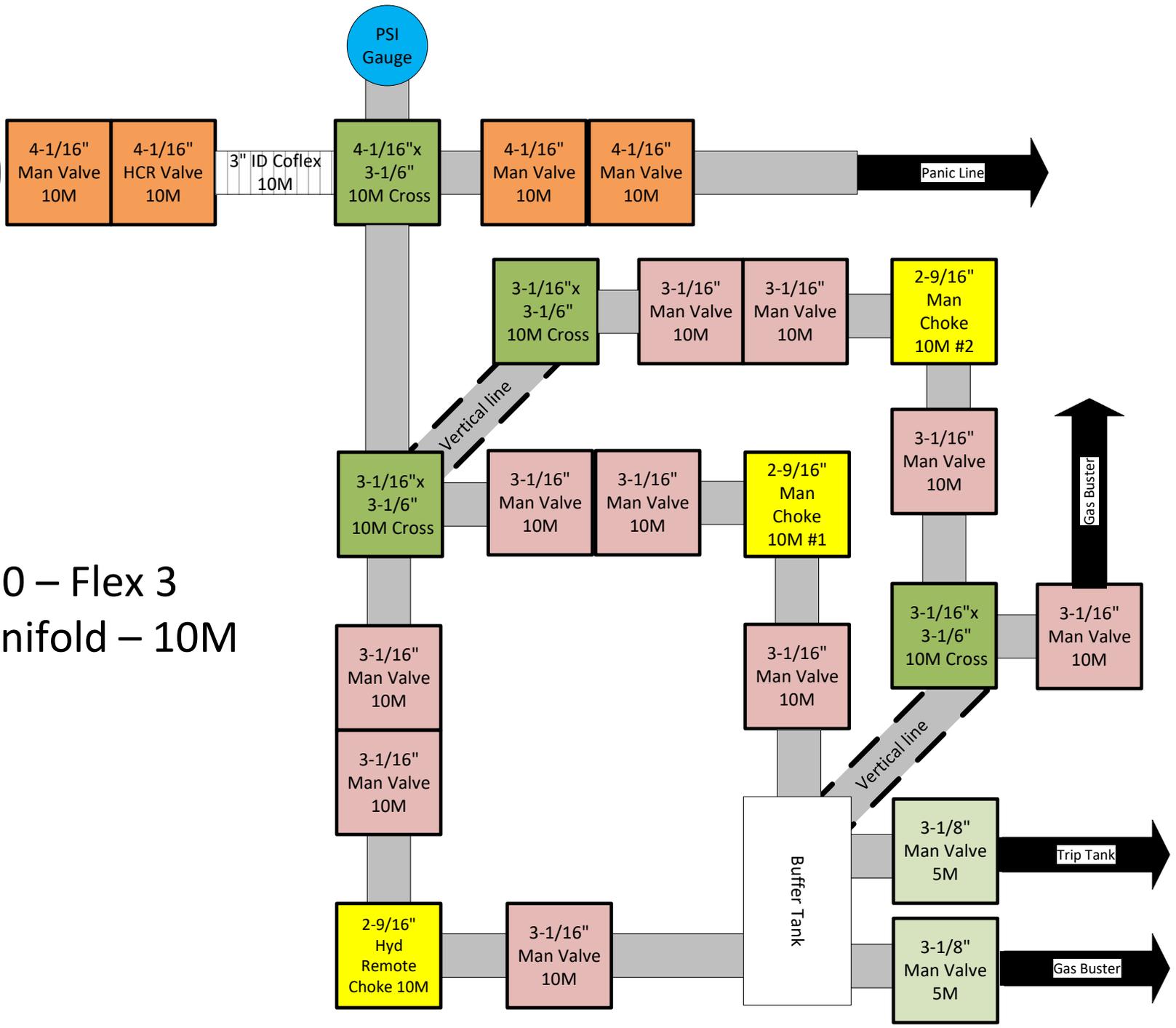
**Other Variance attachment:**

H\_P\_650\_Flex\_Hose\_Specs\_Continental\_Hose\_SN\_67255\_20191212112427.pdf

CONFIDENTIAL



# H&P650 – Flex 3 Choke Manifold – 10M



## Centennial Resource Development - Well Control Plan

### A. Component and Preventer Compatibility Table

Component	OD (inches)	Preventer	RWP
Drillpipe	4	Upper VBR: 3.5 – 5.5 Lower VBR: 3.5 – 5.5	10M
Heavyweight Drillpipe	4	Upper VBR: 3.5 – 5.5 Lower VBR: 3.5 – 5.5	10M
Drill collars and MWD tools	4 ¾	Upper VBR: 3.5 – 5.5 Lower VBR: 3.5 – 5.5	10M
Mud Motor	4 ¾	Upper VBR: 3.5 – 5.5 Lower VBR: 3.5 – 5.5	10M
Production Casing	5.5 & 5	Upper VBR: 3.5 – 5.5 Lower VBR: 3.5 – 5.5	10M
All	0 – 13 5/8	Annular	5M
Open-hole	-	Blind rams	10M

VBR = Variable Bore Rams

RWP = Rated Working Pressure

MWD = Measurement While Drilling (directional tools)

### B. Well Control Procedures

#### I. General Procedures While Drilling:

1. Sound alarm (alert crew).
2. Space out drill-string.
3. Shut down pumps and stop rotary.
4. Open HCR
5. Shut-in well – utilizing upper VBRs.
6. Close choke
7. Confirm shut-in.
8. Notify rig manager and Centennial company representative.
9. Call Centennial drilling engineer
10. Read and record
  - I. Shut-in drillpipe pressure (SIDPP) and shut-in casing pressure (SCIP).
  - II. Pit gain
  - III. Time
11. Regroup, identify forward plan

**II. General Procedure While Tripping**

1. Sound alarm (alert crew).
2. Stab full opening safety valve and close
3. Space out drillstring.
4. Open HCR
5. Shut-in well – utilizing upper VBRs
6. Close choke
7. Confirm shut-in.
8. Notify rig manager and Centennial company representative.
9. Call Centennial drilling engineer
10. Read and record:
  - I. SIDPP AND SICP
  - II. Pit gain
  - III. Time
11. Regroup and identify forward plan.

**III. General Procedure While Running Casing**

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out string.
4. Open HCR
5. Shut-in well – utilizing upper VBRs.
6. Close choke
7. Confirm shut-in.
8. Notify rig manager and Centennial company representative.
9. Call Centennial drilling engineer
10. Read and record:
  - I. SIDPP AND SICP
  - II. Pit gain
  - III. Time
11. Regroup and identify forward plan.

**IV. General Procedure With No Pipe In Hole (Open Hole)**

1. Sound alarm (alert crew)
2. Open HCR
3. Shut-in with blind rams
4. Close choke
5. Confirm shut-in
6. Notify rig manager and Centennial company representative.
7. Call Centennial drilling engineer
8. Read and record:
  - I. SIDPP AND SICP
  - II. Pit gain
  - III. Time
9. Regroup and identify forward plan.

**V. General Procedures While Pulling BHA Thru BOP Stack**

**1. Prior to pulling last joint of drillpipe thru stack:**

- I. Perform flow check, if flowing
  - a. Sound alarm, alert crew
  - b. Stab full opening safety valve and close
  - c. Space out drillstring with tool joint just beneath the upper pipe ram.
  - d. Open HCR
  - e. Shut-in utilizing upper VBRs
  - f. Close choke
  - g. Confirm shut-in
  - h. Notify rig manager and Centennial company representative.
  - i. Call Centennial drilling engineer
  - j. Read and record:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
- II. Regroup and identify forward plan

**2. With BHA in the BOP stack and compatible ram preventer and pipe combo immediately available:**

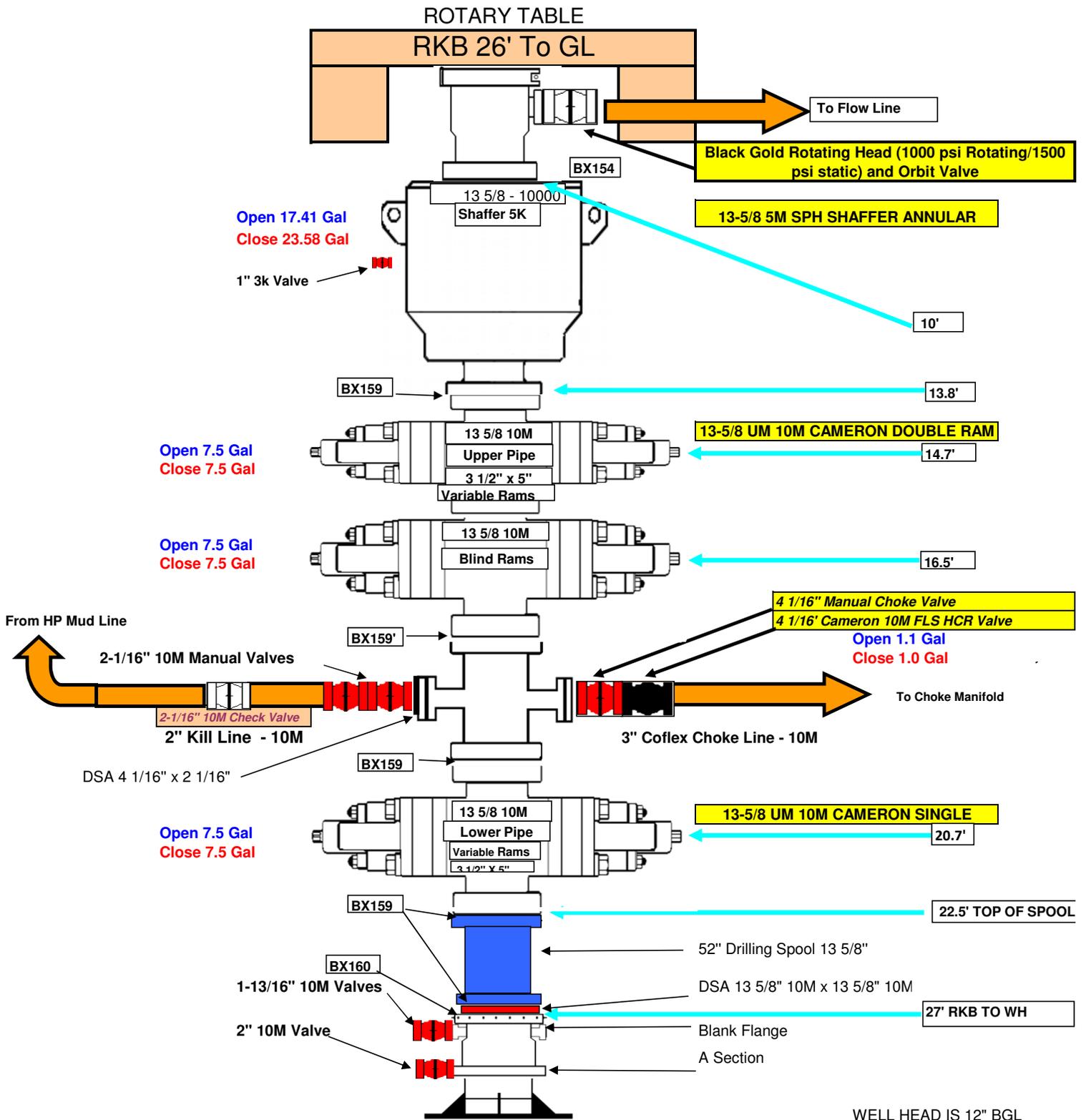
- a. Sound alarm, alert crew
- b. Stab full opening safety valve and close
- c. Space out drillstring with tool joint just beneath the upper pipe ram.
- d. Open HCR
- e. Shut-in utilizing upper VBRs
- f. Close choke
- g. Confirm shut-in
- h. Notify rig manager and Centennial company representative.
- i. Call Centennial drilling engineer
- j. Read and record:
  - i. SIDPP and SICP
  - ii. Pit gain
  - iii. Time
- II. Regroup and identify forward plan

**3. With BHA in the BOP stack and no compatible ram preventer and pipe combo immediately available:**

- I. Sound alarm, alert crew.
- II. If possible to pick up high enough, pull string clear of the stack and follow Open Hole (III) scenario.
- III. If impossible to pick up high enough to pull the string clear of the stack:
  - a. Stab crossover, make up one joint/stand of drill pipe and full opening safety valve and close.
  - b. Space out drillstring with tool joint just beneath the upper pipe ram.
  - c. Open HCR
  - d. Shut-in utilizing upper VBRs.
  - e. Close choke
  - f. Confirm shut-in
  - g. Notify rig manager and Centennial company representative.
  - h. Call Centennial drilling engineer
  - i. Read and record:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
- IV. Regroup and identify forward plan.

**\*\* If annular is used to shut-in well and pressure builds to OR is expected to get to 50% of RWP, confirm space-out and swap to upper VBRs for shut-in.**

# H&P 650



WELL HEAD IS 12" BGL



**HYDROGEN SULFIDE CONTINGENCY PLAN**

**Chedder Fed Com 401H**

**Section 5**

**T 22S R 32E**

**Lea County, NM**

**Initial Date: 3/4/18**

**Revision Date:**

## **Table of Contents**

Page 3: Introduction

Page 4: Directions to Location

Page 5: Safe Briefing Areas

Page 6: Drill Site Location Setup

Page 7: Toxicity of Various Gases

Page 10: H2S Required Equipment

Page 11: Determination of Radius of Exposure

Page 12: Emergency Contact List

## INTRODUCTION

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

Centennial Resource Development, Inc.

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

### **Chedder Fed Com 401H**

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

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

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

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

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

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

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

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

**DIRECTIONS TO LOCATION**

**Chedder Fed Com 401H**

**Section 5**

**T 22S R 32E**

**Lea County, NM**

PROCEED IN A NORTHEASTLY, THEN EASTERLY DIRECTION FROM CARLSBAD, NEW MEXICO ALONG U.S. HIGHWAY 62 APPROXIMATELY 31.1 MILES TO THE JUNCTION OF THIS ROAD AND CAMPBELL ROAD TO THE SOUTH; TURN RIGHT AND PROCEED IN A SOUTHERLY, THEN SOUTHEASTERLY, THEN SOUTHERLY DIRECTION APPROXIMATELY 9.0 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN LEFT AND PROCEED IN AN EASTERLY, THEN NORTHERLY, THEN EASTERLY DIRECTION APPROXIMATELY 1.6 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE SOUTH; TURN RIGHT AND PROCEED IN A SOUTHERLY DIRECTION APPROXIMATELY 1.3 MILES TO THE BEGINNING OF THE PROPOSED ACCESS ROAD TO THE SOUTHWEST; FOLLOW ROAD FLAGS IN AN SOUTHWESTERLY, THEN SOUTHERLY, THEN EASTERLY DIRECTION APPROXIMATELY 1,101' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM CARLSBAD, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 43.2 MILES. TOTAL DISTANCE FROM JAL, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 29.0 MILES.

## **SAFE BRIEFING AREAS**

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

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

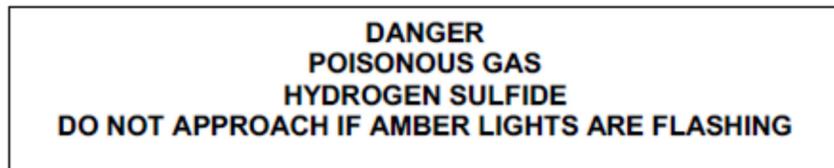
If the Primary Safe Briefing Area cannot be used due to wind conditions; the designated secondary safe briefing area will be used.

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

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

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

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



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

## **DRILL SITE LOCATION:**

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

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

### **TOXICITY OF VARIOUS GASES**

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

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

### Properties of Gases

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

#### **Carbon Dioxide**

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

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

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

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

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

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

### Hydrogen Sulfide

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

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

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

### Sulfur Dioxide

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

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

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

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

### **RESPIRATORY SAFETY SYSTEMS**

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

### **DETECTION AND ALARM SYSTEM**

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

### **WELL CONTROL EQUIPMENT**

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

### **VISUAL WARNING SYSTEMS**

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

### **MUD PROGRAM**

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

### **METALLURGY**

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

### **COMMUNICATION**

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

### **ADDITIONAL SAFETY RELATED ITEMS**

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

**DETERMINATION OF RADIUS OF EXPOSURE**

**Potentially hazardous volume** means a volume of gas of such 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**

**Chedder Fed Com 401H**

H2S Concentration- 250 PPM

Maximum Escape Volume- 5000 MCF/Day

100 PPM Radius of Exposure - 116  
(Formula= 1.589 x (250/1000000) x (5000 x 1000) x .6258

500 PPM Radius of Exposure (Block 16)- 53  
Formula= .4546 x (250/1000000) x (5000 x 1000) x .6258

**EMERGENCY CONTACT LIST**

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

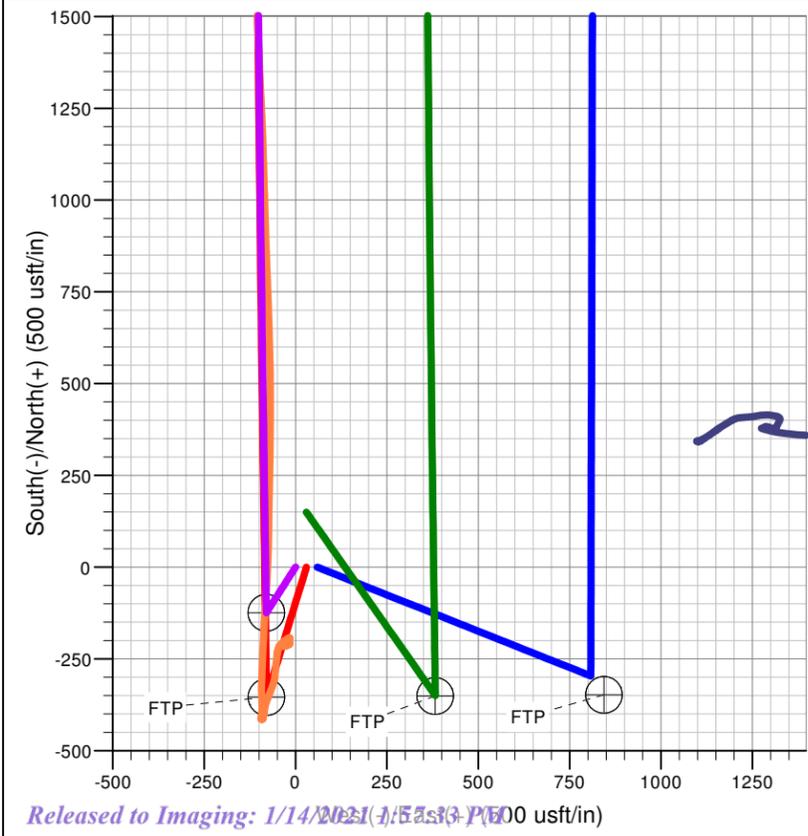
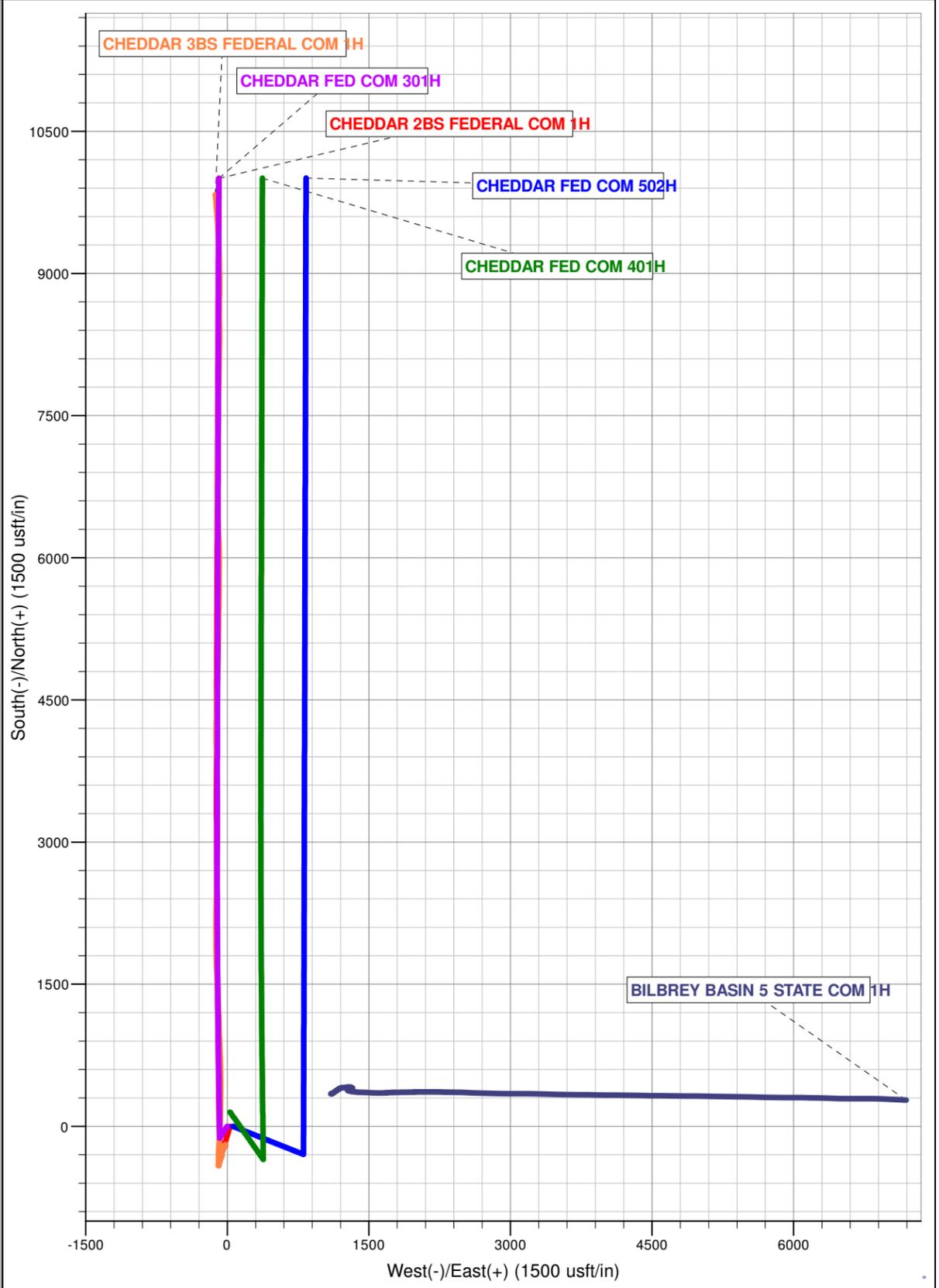
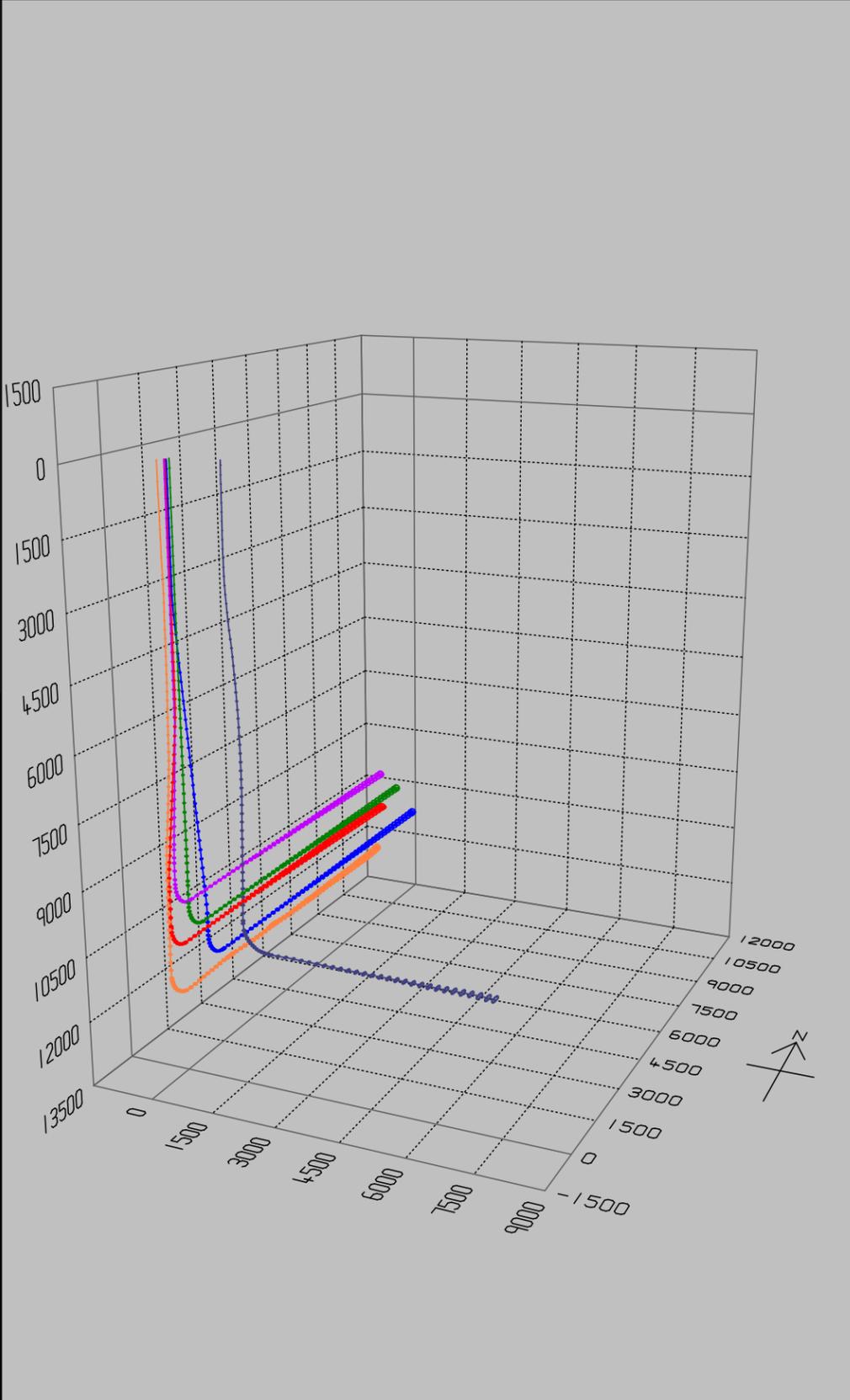
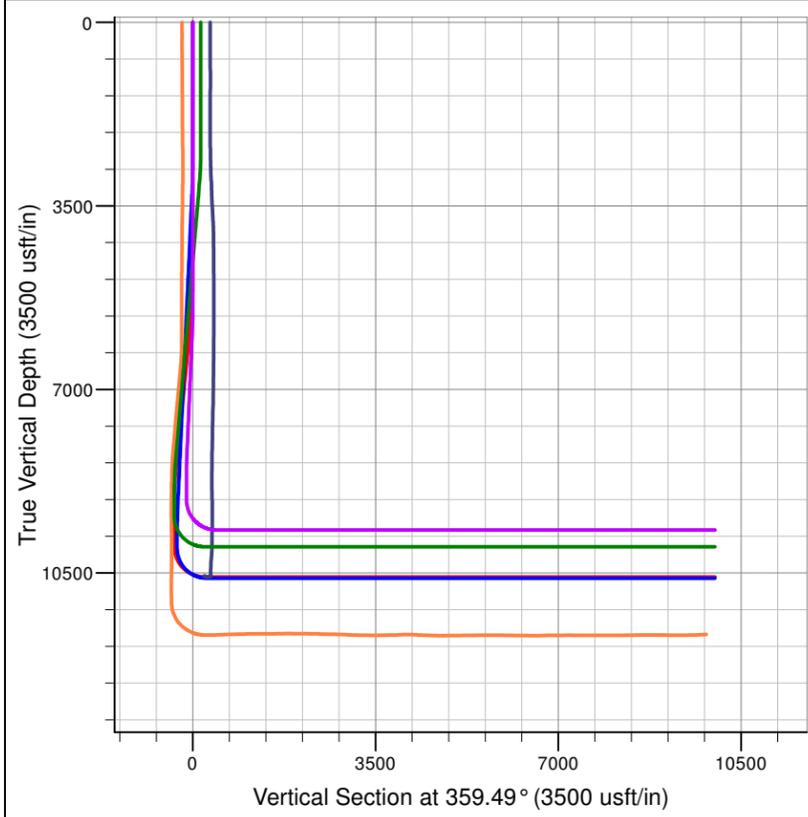


Project: CHEDDAR FEDERAL  
Site: CHEDDAR  
Wells: CHEDDAR FED COM 301H, 401H, 502H  
Design: APD PLAN  
RKB: 3664.7

PROJECT DETAILS: LEA COUNTY  
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)  
System Datum: Mean Sea Level



Page 38 of 68  
Azimuths to True North  
Magnetic North: 7.82°  
Magnetic Field  
Strength: 48891.4snT  
Dip Angle: 60.40°  
Date: 11/6/2018  
Model: IGRF200510



# **NEW MEXICO**

**LEA**

**CHEDDAR**

**CHEDDAR FED COM 401H**

**CHEDDAR FED COM 401H**

**Plan: PWP0**

## **Survey Report - Geographic**

**04 March, 2019**

LGC

Survey Report - Geographic

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well CHEDDAR FED COM 401H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Site:</b>	CHEDDAR	<b>MD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Well:</b>	CHEDDAR FED COM 401H	<b>North Reference:</b>	True
<b>Wellbore:</b>	CHEDDAR FED COM 401H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

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

<b>Site</b>	CHEDDAR				
<b>Site Position:</b>		<b>Northing:</b>	0.00 usft	<b>Latitude:</b>	0° 0' 0.000 N
<b>From:</b>	Map	<b>Easting:</b>	97,504,799.39 usft	<b>Longitude:</b>	152° 28' 52.124 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.00 °

<b>Well</b>	CHEDDAR FED COM 401H		
<b>Well Position</b>	<b>+N/-S</b> 0.0 usft	<b>Northing:</b> 11,768,927.88 usft	<b>Latitude:</b> 32° 24' 54.021 N
	<b>+E/-W</b> 0.0 usft	<b>Easting:</b> 2,040,245.58 usft	<b>Longitude:</b> 103° 42' 14.243 W
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 3,665.1 usft

<b>Wellbore</b>	CHEDDAR FED COM 401H				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	12/31/2009	7.82	60.40	48,891.66918146

<b>Design</b>	PWP0			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b> PROTOTYPE	<b>Tie On Depth:</b> 0.0		
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	1.99

<b>Survey Tool Program</b>	<b>Date</b> 3/4/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	20,139.3	PWP0 (CHEDDAR FED COM 401H)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

<b>Planned Survey</b>									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>
0.0	0.00	0.00	0.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
100.0	0.00	0.00	100.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
200.0	0.00	0.00	200.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
300.0	0.00	0.00	300.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
400.0	0.00	0.00	400.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
500.0	0.00	0.00	500.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
600.0	0.00	0.00	600.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
700.0	0.00	0.00	700.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
800.0	0.00	0.00	800.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
900.0	0.00	0.00	900.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W

LGC

Survey Report - Geographic

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well CHEDDAR FED COM 401H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Site:</b>	CHEDDAR	<b>MD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Well:</b>	CHEDDAR FED COM 401H	<b>North Reference:</b>	True
<b>Wellbore:</b>	CHEDDAR FED COM 401H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPO	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	11,768,927.88	2,040,245.58	32° 24' 54.021 N	103° 42' 14.243 W	
2,600.0	1.00	144.77	2,600.0	-0.7	0.5	11,768,927.18	2,040,246.09	32° 24' 54.014 N	103° 42' 14.237 W	
2,700.0	2.00	144.77	2,700.0	-2.9	2.0	11,768,925.06	2,040,247.62	32° 24' 53.992 N	103° 42' 14.219 W	
2,800.0	3.00	144.77	2,799.9	-6.4	4.5	11,768,921.52	2,040,250.18	32° 24' 53.957 N	103° 42' 14.190 W	
2,900.0	4.00	144.77	2,899.7	-11.4	8.1	11,768,916.58	2,040,253.76	32° 24' 53.908 N	103° 42' 14.149 W	
3,000.0	5.00	144.77	2,999.4	-17.8	12.6	11,768,910.23	2,040,258.37	32° 24' 53.844 N	103° 42' 14.096 W	
3,100.0	6.00	144.77	3,098.9	-25.6	18.1	11,768,902.47	2,040,263.99	32° 24' 53.767 N	103° 42' 14.032 W	
3,200.0	6.00	144.77	3,198.4	-34.2	24.1	11,768,894.00	2,040,270.12	32° 24' 53.682 N	103° 42' 13.961 W	
3,300.0	6.00	144.77	3,297.8	-42.7	30.2	11,768,885.54	2,040,276.26	32° 24' 53.598 N	103° 42' 13.891 W	
3,400.0	6.00	144.77	3,397.3	-51.3	36.2	11,768,877.07	2,040,282.39	32° 24' 53.513 N	103° 42' 13.820 W	
3,500.0	6.00	144.77	3,496.7	-59.8	42.2	11,768,868.61	2,040,288.52	32° 24' 53.429 N	103° 42' 13.750 W	
3,600.0	6.00	144.77	3,596.2	-68.3	48.3	11,768,860.14	2,040,294.66	32° 24' 53.344 N	103° 42' 13.680 W	
3,700.0	6.00	144.77	3,695.6	-76.9	54.3	11,768,851.68	2,040,300.79	32° 24' 53.260 N	103° 42' 13.609 W	
3,800.0	6.00	144.77	3,795.1	-85.4	60.3	11,768,843.21	2,040,306.92	32° 24' 53.175 N	103° 42' 13.539 W	
3,900.0	6.00	144.77	3,894.5	-93.9	66.3	11,768,834.75	2,040,313.05	32° 24' 53.091 N	103° 42' 13.469 W	
4,000.0	6.00	144.77	3,994.0	-102.5	72.4	11,768,826.28	2,040,319.19	32° 24' 53.006 N	103° 42' 13.398 W	
4,100.0	6.00	144.77	4,093.4	-111.0	78.4	11,768,817.82	2,040,325.32	32° 24' 52.922 N	103° 42' 13.328 W	
4,200.0	6.00	144.77	4,192.9	-119.6	84.4	11,768,809.36	2,040,331.45	32° 24' 52.837 N	103° 42' 13.258 W	
4,300.0	6.00	144.77	4,292.3	-128.1	90.5	11,768,800.89	2,040,337.59	32° 24' 52.753 N	103° 42' 13.187 W	
4,400.0	6.00	144.77	4,391.8	-136.6	96.5	11,768,792.43	2,040,343.72	32° 24' 52.668 N	103° 42' 13.117 W	
4,500.0	6.00	144.77	4,491.2	-145.2	102.5	11,768,783.96	2,040,349.85	32° 24' 52.584 N	103° 42' 13.047 W	
4,600.0	6.00	144.77	4,590.7	-153.7	108.6	11,768,775.50	2,040,355.99	32° 24' 52.499 N	103° 42' 12.976 W	
4,700.0	6.00	144.77	4,690.1	-162.3	114.6	11,768,767.03	2,040,362.12	32° 24' 52.415 N	103° 42' 12.906 W	
4,800.0	6.00	144.77	4,789.6	-170.8	120.6	11,768,758.57	2,040,368.25	32° 24' 52.330 N	103° 42' 12.836 W	
4,900.0	6.00	144.77	4,889.0	-179.3	126.6	11,768,750.10	2,040,374.38	32° 24' 52.246 N	103° 42' 12.765 W	
5,000.0	6.00	144.77	4,988.5	-187.9	132.7	11,768,741.64	2,040,380.52	32° 24' 52.161 N	103° 42' 12.695 W	
5,100.0	6.00	144.77	5,087.9	-196.4	138.7	11,768,733.17	2,040,386.65	32° 24' 52.077 N	103° 42' 12.624 W	
5,200.0	6.00	144.77	5,187.4	-204.9	144.7	11,768,724.71	2,040,392.78	32° 24' 51.992 N	103° 42' 12.554 W	
5,300.0	6.00	144.77	5,286.9	-213.5	150.8	11,768,716.25	2,040,398.92	32° 24' 51.908 N	103° 42' 12.484 W	
5,400.0	6.00	144.77	5,386.3	-222.0	156.8	11,768,707.78	2,040,405.05	32° 24' 51.823 N	103° 42' 12.413 W	
5,500.0	6.00	144.77	5,485.8	-230.6	162.8	11,768,699.32	2,040,411.18	32° 24' 51.739 N	103° 42' 12.343 W	
5,600.0	6.00	144.77	5,585.2	-239.1	168.9	11,768,690.85	2,040,417.31	32° 24' 51.654 N	103° 42' 12.273 W	
5,700.0	6.00	144.77	5,684.7	-247.6	174.9	11,768,682.39	2,040,423.45	32° 24' 51.570 N	103° 42' 12.202 W	
5,800.0	6.00	144.77	5,784.1	-256.2	180.9	11,768,673.92	2,040,429.58	32° 24' 51.485 N	103° 42' 12.132 W	
5,900.0	6.00	144.77	5,883.6	-264.7	186.9	11,768,665.46	2,040,435.71	32° 24' 51.401 N	103° 42' 12.062 W	
6,000.0	6.00	144.77	5,983.0	-273.3	193.0	11,768,656.99	2,040,441.85	32° 24' 51.316 N	103° 42' 11.991 W	
6,100.0	6.00	144.77	6,082.5	-281.8	199.0	11,768,648.53	2,040,447.98	32° 24' 51.232 N	103° 42' 11.921 W	
6,200.0	6.00	144.77	6,181.9	-290.3	205.0	11,768,640.06	2,040,454.11	32° 24' 51.147 N	103° 42' 11.851 W	
6,300.0	6.00	144.77	6,281.4	-298.9	211.1	11,768,631.60	2,040,460.25	32° 24' 51.063 N	103° 42' 11.780 W	
6,400.0	6.00	144.77	6,380.8	-307.4	217.1	11,768,623.14	2,040,466.38	32° 24' 50.978 N	103° 42' 11.710 W	
6,500.0	6.00	144.77	6,480.3	-315.9	223.1	11,768,614.67	2,040,472.51	32° 24' 50.894 N	103° 42' 11.640 W	
6,600.0	6.00	144.77	6,579.7	-324.5	229.2	11,768,606.21	2,040,478.64	32° 24' 50.809 N	103° 42' 11.569 W	

LGC

Survey Report - Geographic

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well CHEDDAR FED COM 401H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Site:</b>	CHEDDAR	<b>MD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Well:</b>	CHEDDAR FED COM 401H	<b>North Reference:</b>	True
<b>Wellbore:</b>	CHEDDAR FED COM 401H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPO	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,700.0	6.00	144.77	6,679.2	-333.0	235.2	11,768,597.74	2,040,484.78	32° 24' 50.725 N	103° 42' 11.499 W	
6,800.0	6.00	144.77	6,778.6	-341.6	241.2	11,768,589.28	2,040,490.91	32° 24' 50.640 N	103° 42' 11.428 W	
6,900.0	6.00	144.77	6,878.1	-350.1	247.2	11,768,580.81	2,040,497.04	32° 24' 50.556 N	103° 42' 11.358 W	
7,000.0	6.00	144.77	6,977.5	-358.6	253.3	11,768,572.35	2,040,503.18	32° 24' 50.471 N	103° 42' 11.288 W	
7,100.0	6.00	144.77	7,077.0	-367.2	259.3	11,768,563.88	2,040,509.31	32° 24' 50.387 N	103° 42' 11.217 W	
7,200.0	6.00	144.77	7,176.4	-375.7	265.3	11,768,555.42	2,040,515.44	32° 24' 50.302 N	103° 42' 11.147 W	
7,300.0	6.00	144.77	7,275.9	-384.2	271.4	11,768,546.95	2,040,521.57	32° 24' 50.218 N	103° 42' 11.077 W	
7,400.0	6.00	144.77	7,375.3	-392.8	277.4	11,768,538.49	2,040,527.71	32° 24' 50.133 N	103° 42' 11.006 W	
7,500.0	6.00	144.77	7,474.8	-401.3	283.4	11,768,530.02	2,040,533.84	32° 24' 50.049 N	103° 42' 10.936 W	
7,600.0	6.00	144.77	7,574.3	-409.9	289.4	11,768,521.56	2,040,539.97	32° 24' 49.964 N	103° 42' 10.866 W	
7,700.0	6.00	144.77	7,673.7	-418.4	295.5	11,768,513.10	2,040,546.11	32° 24' 49.880 N	103° 42' 10.795 W	
7,800.0	6.00	144.77	7,773.2	-426.9	301.5	11,768,504.63	2,040,552.24	32° 24' 49.795 N	103° 42' 10.725 W	
7,900.0	6.00	144.77	7,872.6	-435.5	307.5	11,768,496.17	2,040,558.37	32° 24' 49.711 N	103° 42' 10.655 W	
8,000.0	6.00	144.77	7,972.1	-444.0	313.6	11,768,487.70	2,040,564.51	32° 24' 49.626 N	103° 42' 10.584 W	
8,100.0	6.00	144.77	8,071.5	-452.6	319.6	11,768,479.24	2,040,570.64	32° 24' 49.542 N	103° 42' 10.514 W	
8,200.0	6.00	144.77	8,171.0	-461.1	325.6	11,768,470.77	2,040,576.77	32° 24' 49.457 N	103° 42' 10.444 W	
8,300.0	6.00	144.77	8,270.4	-469.6	331.7	11,768,462.31	2,040,582.90	32° 24' 49.373 N	103° 42' 10.373 W	
8,350.0	6.00	144.77	8,320.1	-473.9	334.7	11,768,458.08	2,040,585.97	32° 24' 49.330 N	103° 42' 10.338 W	
8,400.0	5.50	144.77	8,369.9	-478.0	337.6	11,768,454.02	2,040,588.91	32° 24' 49.290 N	103° 42' 10.304 W	
8,500.0	4.50	144.77	8,469.5	-485.1	342.6	11,768,446.96	2,040,594.02	32° 24' 49.219 N	103° 42' 10.246 W	
8,600.0	3.50	144.77	8,569.3	-490.8	346.6	11,768,441.31	2,040,598.12	32° 24' 49.163 N	103° 42' 10.199 W	
8,700.0	2.50	144.77	8,669.1	-495.1	349.6	11,768,437.07	2,040,601.19	32° 24' 49.121 N	103° 42' 10.163 W	
8,800.0	1.50	144.77	8,769.1	-497.9	351.6	11,768,434.25	2,040,603.23	32° 24' 49.093 N	103° 42' 10.140 W	
8,900.0	0.50	144.77	8,869.0	-499.4	352.7	11,768,432.84	2,040,604.26	32° 24' 49.078 N	103° 42' 10.128 W	
8,950.0	0.00	0.00	8,919.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,000.0	0.00	0.00	8,969.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,100.0	0.00	0.00	9,069.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,200.0	0.00	0.00	9,169.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,300.0	0.00	0.00	9,269.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,400.0	0.00	0.00	9,369.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,458.0	0.00	0.00	9,427.0	-499.5	352.8	11,768,432.66	2,040,604.39	32° 24' 49.077 N	103° 42' 10.127 W	
9,500.0	4.20	359.26	9,469.0	-498.0	352.8	11,768,434.20	2,040,604.35	32° 24' 49.092 N	103° 42' 10.127 W	
9,600.0	14.20	359.26	9,567.6	-482.0	352.6	11,768,450.16	2,040,603.95	32° 24' 49.250 N	103° 42' 10.129 W	
9,700.0	24.20	359.26	9,661.9	-449.2	352.1	11,768,482.99	2,040,603.13	32° 24' 49.575 N	103° 42' 10.134 W	
9,800.0	34.20	359.26	9,749.1	-400.5	351.5	11,768,531.70	2,040,601.91	32° 24' 50.057 N	103° 42' 10.142 W	
9,900.0	44.20	359.26	9,826.5	-337.4	350.7	11,768,594.81	2,040,600.32	32° 24' 50.682 N	103° 42' 10.151 W	
10,000.0	54.20	359.26	9,891.8	-261.8	349.7	11,768,670.39	2,040,598.43	32° 24' 51.430 N	103° 42' 10.163 W	
10,100.0	64.20	359.26	9,942.9	-176.0	348.6	11,768,756.15	2,040,596.28	32° 24' 52.279 N	103° 42' 10.175 W	
10,200.0	74.20	359.26	9,978.4	-82.6	347.4	11,768,849.48	2,040,593.95	32° 24' 53.203 N	103° 42' 10.190 W	
10,300.0	84.20	359.26	9,997.1	15.5	346.1	11,768,947.56	2,040,591.49	32° 24' 54.174 N	103° 42' 10.204 W	
10,358.0	90.00	359.26	10,000.0	73.4	345.4	11,769,005.43	2,040,590.04	32° 24' 54.747 N	103° 42' 10.213 W	
10,400.0	90.00	359.27	10,000.0	115.4	344.8	11,769,047.43	2,040,588.99	32° 24' 55.162 N	103° 42' 10.219 W	
10,500.0	90.00	359.29	10,000.0	215.4	343.6	11,769,147.40	2,040,586.53	32° 24' 56.152 N	103° 42' 10.234 W	
10,600.0	90.00	359.32	10,000.0	315.4	342.4	11,769,247.37	2,040,584.10	32° 24' 57.142 N	103° 42' 10.248 W	
10,700.0	90.00	359.34	10,000.0	415.3	341.2	11,769,347.34	2,040,581.72	32° 24' 58.131 N	103° 42' 10.262 W	
10,800.0	90.00	359.37	10,000.0	515.3	340.1	11,769,447.31	2,040,579.38	32° 24' 59.121 N	103° 42' 10.275 W	
10,900.0	90.00	359.39	10,000.0	615.3	339.0	11,769,547.29	2,040,577.09	32° 25' 0.111 N	103° 42' 10.287 W	
11,000.0	90.00	359.42	10,000.0	715.3	338.0	11,769,647.26	2,040,574.83	32° 25' 1.100 N	103° 42' 10.300 W	
11,100.0	90.00	359.44	10,000.0	815.3	337.0	11,769,747.24	2,040,572.62	32° 25' 2.090 N	103° 42' 10.311 W	
11,200.0	90.00	359.46	10,000.0	915.3	336.0	11,769,847.21	2,040,570.45	32° 25' 3.080 N	103° 42' 10.322 W	
11,300.0	90.00	359.49	10,000.0	1,015.3	335.1	11,769,947.19	2,040,568.33	32° 25' 4.069 N	103° 42' 10.333 W	
11,400.0	90.00	359.51	10,000.0	1,115.3	334.2	11,770,047.17	2,040,566.24	32° 25' 5.059 N	103° 42' 10.343 W	
11,500.0	90.00	359.54	10,000.0	1,215.3	333.4	11,770,147.15	2,040,564.20	32° 25' 6.049 N	103° 42' 10.353 W	
11,600.0	90.00	359.56	10,000.0	1,315.3	332.6	11,770,247.13	2,040,562.20	32° 25' 7.038 N	103° 42' 10.362 W	
11,700.0	90.00	359.59	10,000.0	1,415.3	331.9	11,770,347.11	2,040,560.25	32° 25' 8.028 N	103° 42' 10.371 W	

LGC

Survey Report - Geographic

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well CHEDDAR FED COM 401H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Site:</b>	CHEDDAR	<b>MD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Well:</b>	CHEDDAR FED COM 401H	<b>North Reference:</b>	True
<b>Wellbore:</b>	CHEDDAR FED COM 401H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPO	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
11,800.0	90.00	359.61	10,000.0	1,515.3	331.2	11,770,447.09	2,040,558.33	32° 25' 9.018 N	103° 42' 10.379 W	
11,900.0	90.00	359.63	10,000.0	1,615.3	330.5	11,770,547.07	2,040,556.46	32° 25' 10.007 N	103° 42' 10.387 W	
12,000.0	90.00	359.66	10,000.0	1,715.3	329.9	11,770,647.06	2,040,554.63	32° 25' 10.997 N	103° 42' 10.394 W	
12,100.0	90.00	359.68	10,000.0	1,815.3	329.3	11,770,747.04	2,040,552.84	32° 25' 11.987 N	103° 42' 10.400 W	
12,200.0	90.00	359.71	10,000.0	1,915.3	328.8	11,770,847.02	2,040,551.09	32° 25' 12.976 N	103° 42' 10.407 W	
12,300.0	90.00	359.73	10,000.0	2,015.3	328.3	11,770,947.01	2,040,549.39	32° 25' 13.966 N	103° 42' 10.412 W	
12,400.0	90.00	359.76	10,000.0	2,115.3	327.8	11,771,047.00	2,040,547.73	32° 25' 14.956 N	103° 42' 10.418 W	
12,500.0	90.00	359.78	10,000.0	2,215.3	327.4	11,771,146.98	2,040,546.11	32° 25' 15.945 N	103° 42' 10.422 W	
12,600.0	90.00	359.80	10,000.0	2,315.3	327.1	11,771,246.97	2,040,544.54	32° 25' 16.935 N	103° 42' 10.426 W	
12,700.0	90.00	359.83	10,000.0	2,415.3	326.7	11,771,346.96	2,040,543.00	32° 25' 17.925 N	103° 42' 10.430 W	
12,800.0	90.00	359.85	10,000.0	2,515.3	326.5	11,771,446.95	2,040,541.51	32° 25' 18.914 N	103° 42' 10.433 W	
12,900.0	90.00	359.88	10,000.0	2,615.3	326.2	11,771,546.94	2,040,540.06	32° 25' 19.904 N	103° 42' 10.436 W	
13,000.0	90.00	359.90	10,000.0	2,715.3	326.0	11,771,646.93	2,040,538.65	32° 25' 20.894 N	103° 42' 10.438 W	
13,100.0	90.00	359.93	10,000.0	2,815.3	325.9	11,771,746.92	2,040,537.29	32° 25' 21.884 N	103° 42' 10.440 W	
13,200.0	90.00	359.95	10,000.0	2,915.3	325.8	11,771,846.91	2,040,535.97	32° 25' 22.873 N	103° 42' 10.441 W	
13,300.0	90.00	359.97	10,000.0	3,015.3	325.7	11,771,946.90	2,040,534.69	32° 25' 23.863 N	103° 42' 10.442 W	
13,400.0	90.00	360.00	10,000.0	3,115.3	325.7	11,772,046.89	2,040,533.45	32° 25' 24.853 N	103° 42' 10.443 W	
13,500.0	90.00	0.02	10,000.0	3,215.3	325.7	11,772,146.89	2,040,532.26	32° 25' 25.842 N	103° 42' 10.444 W	
13,600.0	90.00	0.05	10,000.0	3,315.3	325.8	11,772,246.88	2,040,531.10	32° 25' 26.832 N	103° 42' 10.444 W	
13,700.0	90.00	0.07	10,000.0	3,415.3	325.9	11,772,346.87	2,040,529.99	32° 25' 27.822 N	103° 42' 10.444 W	
13,800.0	90.00	0.09	10,000.0	3,515.3	326.0	11,772,446.87	2,040,528.92	32° 25' 28.811 N	103° 42' 10.439 W	
13,900.0	90.00	0.12	10,000.0	3,615.3	326.2	11,772,546.86	2,040,527.90	32° 25' 29.801 N	103° 42' 10.436 W	
14,000.0	90.00	0.14	10,000.0	3,715.3	326.4	11,772,646.86	2,040,526.91	32° 25' 30.791 N	103° 42' 10.434 W	
14,032.4	90.00	0.15	10,000.0	3,747.7	326.5	11,772,679.28	2,040,526.60	32° 25' 31.112 N	103° 42' 10.433 W	
14,100.0	90.00	0.15	10,000.0	3,815.3	326.7	11,772,746.85	2,040,525.96	32° 25' 31.781 N	103° 42' 10.431 W	
14,200.0	90.00	0.15	10,000.0	3,915.3	326.9	11,772,846.85	2,040,525.02	32° 25' 32.770 N	103° 42' 10.428 W	
14,300.0	90.00	0.15	10,000.0	4,015.3	327.2	11,772,946.84	2,040,524.07	32° 25' 33.760 N	103° 42' 10.425 W	
14,400.0	90.00	0.15	10,000.0	4,115.3	327.5	11,773,046.84	2,040,523.12	32° 25' 34.750 N	103° 42' 10.421 W	
14,500.0	90.00	0.15	10,000.0	4,215.3	327.7	11,773,146.83	2,040,522.17	32° 25' 35.739 N	103° 42' 10.418 W	
14,600.0	90.00	0.15	10,000.0	4,315.3	328.0	11,773,246.83	2,040,521.22	32° 25' 36.729 N	103° 42' 10.415 W	
14,700.0	90.00	0.15	10,000.0	4,415.3	328.3	11,773,346.83	2,040,520.27	32° 25' 37.719 N	103° 42' 10.412 W	
14,800.0	90.00	0.15	10,000.0	4,515.3	328.5	11,773,446.82	2,040,519.32	32° 25' 38.708 N	103° 42' 10.409 W	
14,900.0	90.00	0.15	10,000.0	4,615.3	328.8	11,773,546.82	2,040,518.38	32° 25' 39.698 N	103° 42' 10.406 W	
15,000.0	90.00	0.15	10,000.0	4,715.3	329.1	11,773,646.81	2,040,517.43	32° 25' 40.688 N	103° 42' 10.403 W	
15,100.0	90.00	0.15	10,000.0	4,815.3	329.3	11,773,746.81	2,040,516.48	32° 25' 41.677 N	103° 42' 10.400 W	
15,200.0	90.00	0.15	10,000.0	4,915.3	329.6	11,773,846.80	2,040,515.53	32° 25' 42.667 N	103° 42' 10.397 W	
15,300.0	90.00	0.15	10,000.0	5,015.3	329.9	11,773,946.80	2,040,514.58	32° 25' 43.657 N	103° 42' 10.394 W	
15,400.0	90.00	0.15	10,000.0	5,115.3	330.1	11,774,046.79	2,040,513.63	32° 25' 44.647 N	103° 42' 10.390 W	
15,500.0	90.00	0.15	10,000.0	5,215.3	330.4	11,774,146.79	2,040,512.68	32° 25' 45.636 N	103° 42' 10.387 W	
15,600.0	90.00	0.15	10,000.0	5,315.3	330.6	11,774,246.79	2,040,511.74	32° 25' 46.626 N	103° 42' 10.384 W	
15,700.0	90.00	0.15	10,000.0	5,415.3	330.9	11,774,346.78	2,040,510.79	32° 25' 47.616 N	103° 42' 10.381 W	
15,800.0	90.00	0.15	10,000.0	5,515.3	331.2	11,774,446.78	2,040,509.84	32° 25' 48.605 N	103° 42' 10.378 W	
15,900.0	90.00	0.15	10,000.0	5,615.3	331.4	11,774,546.77	2,040,508.89	32° 25' 49.595 N	103° 42' 10.375 W	
16,000.0	90.00	0.15	10,000.0	5,715.3	331.7	11,774,646.77	2,040,507.94	32° 25' 50.585 N	103° 42' 10.372 W	
16,100.0	90.00	0.15	10,000.0	5,815.3	332.0	11,774,746.76	2,040,506.99	32° 25' 51.574 N	103° 42' 10.369 W	
16,200.0	90.00	0.15	10,000.0	5,915.3	332.2	11,774,846.76	2,040,506.04	32° 25' 52.564 N	103° 42' 10.366 W	
16,300.0	90.00	0.15	10,000.0	6,015.3	332.5	11,774,946.75	2,040,505.10	32° 25' 53.554 N	103° 42' 10.363 W	
16,400.0	90.00	0.15	10,000.0	6,115.3	332.8	11,775,046.75	2,040,504.15	32° 25' 54.544 N	103° 42' 10.359 W	
16,500.0	90.00	0.15	10,000.0	6,215.3	333.0	11,775,146.74	2,040,503.20	32° 25' 55.533 N	103° 42' 10.356 W	
16,600.0	90.00	0.15	10,000.0	6,315.3	333.3	11,775,246.74	2,040,502.25	32° 25' 56.523 N	103° 42' 10.353 W	
16,700.0	90.00	0.15	10,000.0	6,415.3	333.6	11,775,346.74	2,040,501.30	32° 25' 57.513 N	103° 42' 10.350 W	
16,800.0	90.00	0.15	10,000.0	6,515.3	333.8	11,775,446.73	2,040,500.35	32° 25' 58.502 N	103° 42' 10.347 W	
16,900.0	90.00	0.15	10,000.0	6,615.3	334.1	11,775,546.73	2,040,499.40	32° 25' 59.492 N	103° 42' 10.344 W	
17,000.0	90.00	0.15	10,000.0	6,715.3	334.3	11,775,646.72	2,040,498.46	32° 26' 0.482 N	103° 42' 10.341 W	
17,100.0	90.00	0.15	10,000.0	6,815.3	334.6	11,775,746.72	2,040,497.51	32° 26' 1.471 N	103° 42' 10.338 W	

LGC

Survey Report - Geographic

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well CHEDDAR FED COM 401H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Site:</b>	CHEDDAR	<b>MD Reference:</b>	RKB=3665.1+25 @ 3690.0usft
<b>Well:</b>	CHEDDAR FED COM 401H	<b>North Reference:</b>	True
<b>Wellbore:</b>	CHEDDAR FED COM 401H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPO	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
17,200.0	90.00	0.15	10,000.0	6,915.3	334.9	11,775,846.71	2,040,496.56	32° 26' 2.461 N	103° 42' 10.335 W	
17,300.0	90.00	0.15	10,000.0	7,015.3	335.1	11,775,946.71	2,040,495.61	32° 26' 3.451 N	103° 42' 10.332 W	
17,400.0	90.00	0.15	10,000.0	7,115.3	335.4	11,776,046.70	2,040,494.66	32° 26' 4.440 N	103° 42' 10.328 W	
17,500.0	90.00	0.15	10,000.0	7,215.3	335.7	11,776,146.70	2,040,493.71	32° 26' 5.430 N	103° 42' 10.325 W	
17,600.0	90.00	0.15	10,000.0	7,315.3	335.9	11,776,246.70	2,040,492.76	32° 26' 6.420 N	103° 42' 10.322 W	
17,700.0	90.00	0.15	10,000.0	7,415.3	336.2	11,776,346.69	2,040,491.82	32° 26' 7.410 N	103° 42' 10.319 W	
17,800.0	90.00	0.15	10,000.0	7,515.3	336.5	11,776,446.69	2,040,490.87	32° 26' 8.399 N	103° 42' 10.316 W	
17,900.0	90.00	0.15	10,000.0	7,615.3	336.7	11,776,546.68	2,040,489.92	32° 26' 9.389 N	103° 42' 10.313 W	
18,000.0	90.00	0.15	10,000.0	7,715.3	337.0	11,776,646.68	2,040,488.97	32° 26' 10.379 N	103° 42' 10.310 W	
18,100.0	90.00	0.15	10,000.0	7,815.3	337.3	11,776,746.67	2,040,488.02	32° 26' 11.368 N	103° 42' 10.307 W	
18,200.0	90.00	0.15	10,000.0	7,915.3	337.5	11,776,846.67	2,040,487.07	32° 26' 12.358 N	103° 42' 10.304 W	
18,300.0	90.00	0.15	10,000.0	8,015.3	337.8	11,776,946.66	2,040,486.12	32° 26' 13.348 N	103° 42' 10.300 W	
18,400.0	90.00	0.15	10,000.0	8,115.3	338.0	11,777,046.66	2,040,485.18	32° 26' 14.337 N	103° 42' 10.297 W	
18,500.0	90.00	0.15	10,000.0	8,215.3	338.3	11,777,146.65	2,040,484.23	32° 26' 15.327 N	103° 42' 10.294 W	
18,600.0	90.00	0.15	10,000.0	8,315.3	338.6	11,777,246.65	2,040,483.28	32° 26' 16.317 N	103° 42' 10.291 W	
18,700.0	90.00	0.15	10,000.0	8,415.3	338.8	11,777,346.65	2,040,482.33	32° 26' 17.307 N	103° 42' 10.288 W	
18,800.0	90.00	0.15	10,000.0	8,515.3	339.1	11,777,446.64	2,040,481.38	32° 26' 18.296 N	103° 42' 10.285 W	
18,900.0	90.00	0.15	10,000.0	8,615.3	339.4	11,777,546.64	2,040,480.43	32° 26' 19.286 N	103° 42' 10.282 W	
19,000.0	90.00	0.15	10,000.0	8,715.3	339.6	11,777,646.63	2,040,479.48	32° 26' 20.276 N	103° 42' 10.279 W	
19,100.0	90.00	0.15	10,000.0	8,815.3	339.9	11,777,746.63	2,040,478.54	32° 26' 21.265 N	103° 42' 10.276 W	
19,200.0	90.00	0.15	10,000.0	8,915.3	340.2	11,777,846.62	2,040,477.59	32° 26' 22.255 N	103° 42' 10.273 W	
19,300.0	90.00	0.15	10,000.0	9,015.3	340.4	11,777,946.62	2,040,476.64	32° 26' 23.245 N	103° 42' 10.269 W	
19,400.0	90.00	0.15	10,000.0	9,115.3	340.7	11,778,046.61	2,040,475.69	32° 26' 24.234 N	103° 42' 10.266 W	
19,500.0	90.00	0.15	10,000.0	9,215.3	341.0	11,778,146.61	2,040,474.74	32° 26' 25.224 N	103° 42' 10.263 W	
19,600.0	90.00	0.15	10,000.0	9,315.3	341.2	11,778,246.61	2,040,473.79	32° 26' 26.214 N	103° 42' 10.260 W	
19,700.0	90.00	0.15	10,000.0	9,415.3	341.5	11,778,346.60	2,040,472.84	32° 26' 27.203 N	103° 42' 10.257 W	
19,800.0	90.00	0.15	10,000.0	9,515.3	341.7	11,778,446.60	2,040,471.90	32° 26' 28.193 N	103° 42' 10.254 W	
19,900.0	90.00	0.15	10,000.0	9,615.3	342.0	11,778,546.59	2,040,470.95	32° 26' 29.183 N	103° 42' 10.251 W	
20,000.0	90.00	0.15	10,000.0	9,715.3	342.3	11,778,646.59	2,040,470.00	32° 26' 30.173 N	103° 42' 10.248 W	
20,100.0	90.00	0.15	10,000.0	9,815.3	342.5	11,778,746.58	2,040,469.05	32° 26' 31.162 N	103° 42' 10.245 W	
20,139.4	90.00	0.15	10,000.0	9,854.7	342.6	11,778,785.98	2,040,468.68	32° 26' 31.552 N	103° 42' 10.243 W	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
LTP/BHL - CHEDDAF - hit/miss target - Shape - Point	0.00	0.00	10,000.0	9,854.7	342.6	11,778,785.98	2,040,468.68	32° 26' 31.552 N	103° 42' 10.243 W	
FTP - CHEDDAR FEI - plan misses target center by 238.4usft at 9900.0usft MD (9826.5 TVD, -337.4 N, 350.7 E) - Circle (radius 50.0)	0.00	0.00	10,000.0	-500.8	352.4	11,768,431.37	2,040,604.02	32° 24' 49.064 N	103° 42' 10.131 W	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

## Centennial Resource Development New Mexico Multi-Well Pad Drilling Batch Setting Procedures

### ➤ Avalon and Bone Springs Formations

13-3/8" Surface Casing - CRD intends to preset 13-3/8" casing to a depth approved in the APD. 17-1/2" Surface Holes will be batch drilled by a Surface Preset rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.

1. Drill 17-1/2" Surface hole to Approved Depth with Surface Preset Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land 13-3/8" 54.5# J55 BTC casing to depth approved in APD.
3. Cement 13-3/8" casing with cement to surface and floats holding.
4. Cut / Dress 20" Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor (see [Illustration 1-1 Below](#)). Weld performed per Cameron weld procedure.
5. Test Weld to 70% of 13-3/8" casing collapse or ~ 790psi.
6. Install nightcap with Pressure Gauge on wellhead. Nightcap is shown on final wellhead Stack up [Illustration #2-2 page 3](#).
7. Skid Rig to adjacent well to drill Surface hole.
8. Surface casing test will be performed by the Big Rig in order to allow ample time for Cement to develop 500psi compressive strength. Casing test to 0.22 psi/ft or 1500 psi whichever is greater - not to exceed 70% casing burst.

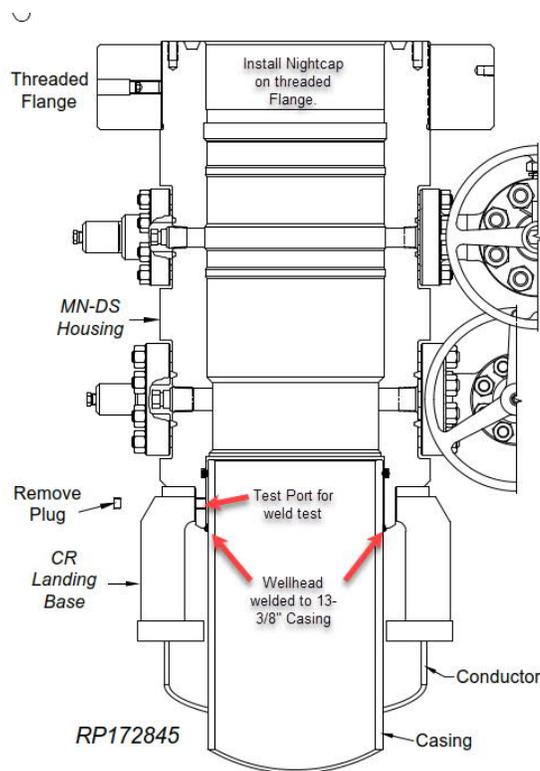


Illustration 1-1

- Intermediate and Production Casing – For all subsequent Intermediate and Production Casing Strings, the Big Rig will remove the nightcap and install and test BOPE. Prior to drill out the 13-3/8" Casing will be tested to 0.22psi/ft or 1500psi whichever is greater. The well will be drilled below 13-3/8" to its intended final TD in the Avalon or Bonesprings formations. Batch drilling will not be executed for casing strings below the 13-3/8". Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings. The

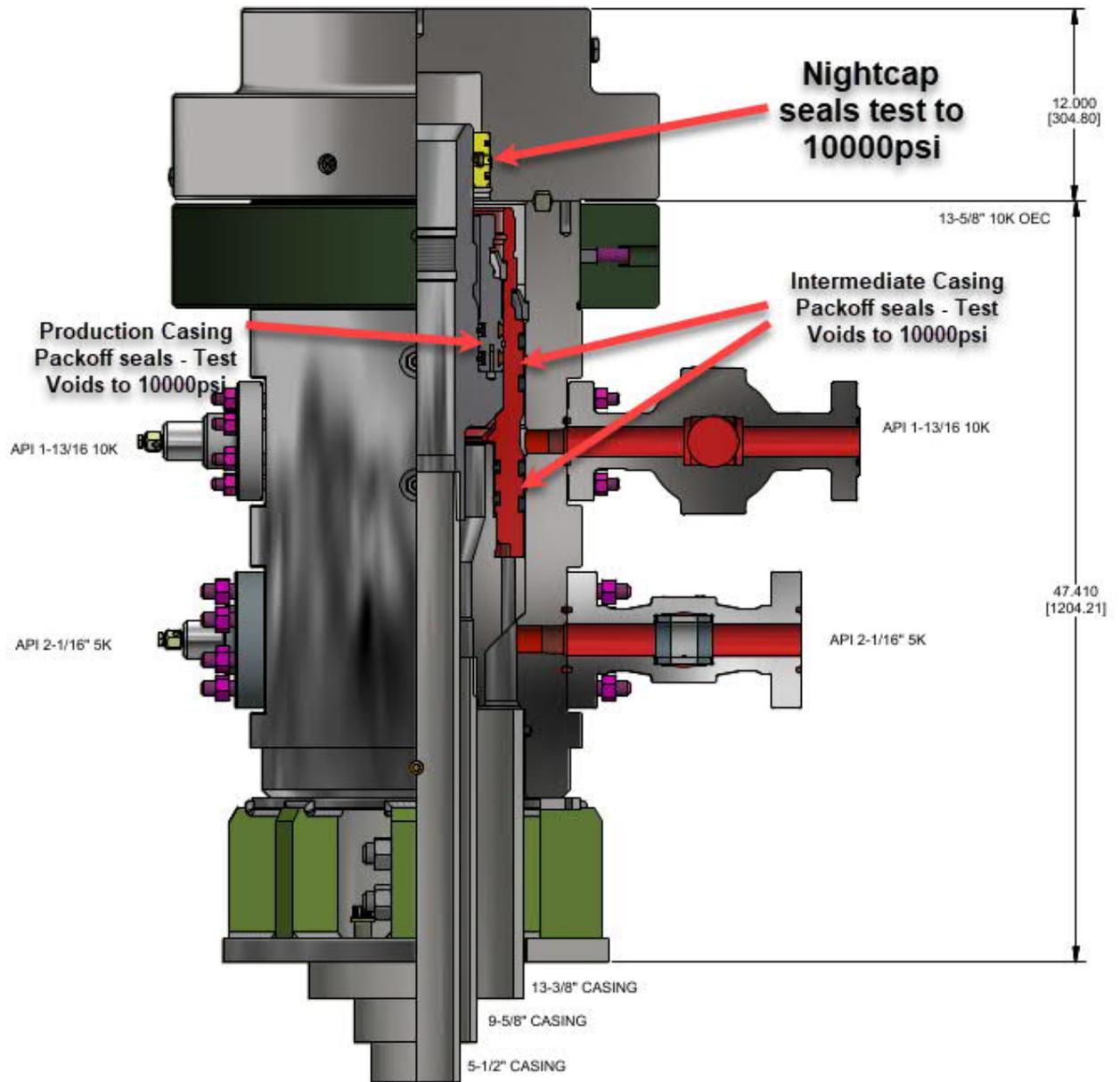
## ➤ Wolfcamp Formations

13-3/8" Surface Casing - CRD intends to preset 13-3/8" casing to a depth approved in the APD. Surface Holes will be batch set by a Surface Preset rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.

1. Drill 17-1/2" Surface hole to Approved Depth with Surface Preset Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land 13-3/8" 54.5# J55 BTC casing to depth approved in APD.
3. Cement 13-3/8" casing with cement to surface and floats holding.
4. Cut / Dress 20" Conductor and 13-3/8" casing as needed, weld on Cameron Multi-bowl system with baseplate supported by 20" conductor (see [Illustration 1-1](#)). Weld performed per Cameron weld procedure.
5. Test Weld to 70% of 13-3/8" casing collapse or ~ 790psi.
6. Install nightcap with Pressure Gauge on wellhead. Nightcap is shown on final wellhead Stack up [Illustration #2-2 on page 3](#).
7. Subsequent casing test will be performed by the Big Rig in order to allow ample time for Cement to develop 500psi compressive strength. Casing test to 0.22 psi/ft or 1500 psi whichever is greater - not to exceed 70% casing burst.

Intermediate Casing – CRD intends to Batch set all intermediate casing strings to a depth approved in the APD, typically set 100' above KOP in the 3<sup>rd</sup> Bonesprings Carbonate. For the last intermediate section drilled on pad, the associated production interval will immediately follow. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Big Rig will remove the nightcap and install and test BOPE.
2. Test Surface 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.
3. 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.
4. Drill Intermediate hole to approved casing point. Trip out of hole with BHA to run Casing.
5. Remove wear bushing then run and land Intermediate Casing with mandrel hanger in wellhead.
6. Cement casing to surface with floats holding.
7. Washout stack then run wash tool in wellhead and wash hanger and pack-off setting area.
8. Install pack-off and test void to 10000 psi for 15 minutes. Nightcap shown on final wellhead stack up [illustration 2-2 on page 3](#).
9. 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.
10. Install nightcap – skid rig to adjacent well to drill Intermediate hole.



WITH CAP

Illustration 2-2

Production Casing – CRD intends to Batch set all Production casings, except for the last intermediate hole. In this case the production interval will immediately follow the intermediate section on that well. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Big Rig will remove the nightcap and install and test BOPE.
2. Install wear bushing then drill Intermediate shoe-track plus 20' and conduct FIT to minimum MW equivalent to control the formation pressure to TD of well.
3. Drill Vertical hole to KOP – Trip out for Curve BHA.
4. Drill Curve, landing in production interval – Trip for Lateral BHA.

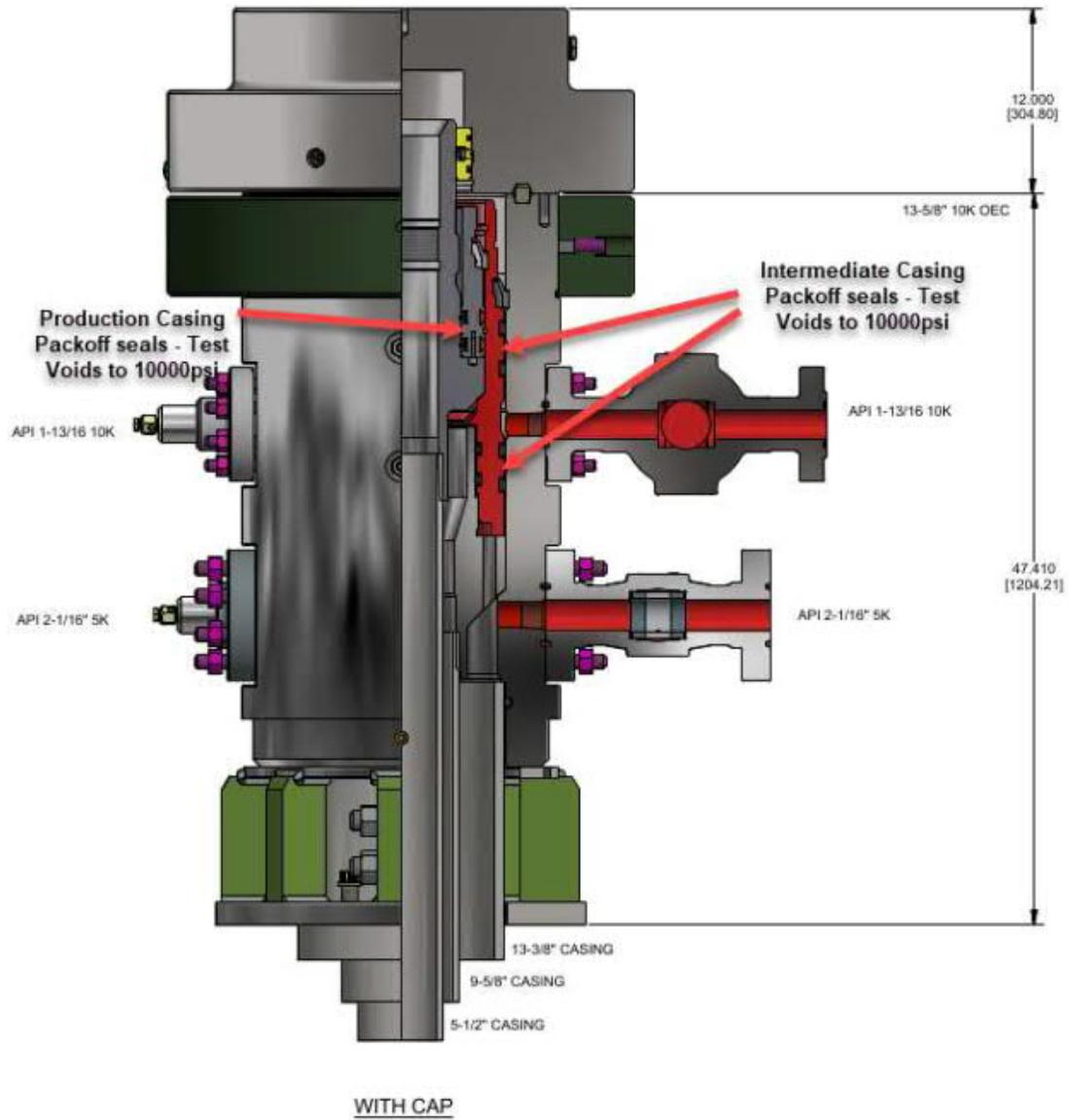
5. Drill Lateral / Production hole to Permitted BHL, perform cleanup cycles and trip out to run 5-1/2" Production Casing.
6. Remove wear bushing then run 5-1/2" production casing to TD landing casing mandrel in wellhead.
7. Cement 5-1/2" Production string to surface with floats holding.
8. Run in with wash tool and wash wellhead area – install pack-off and test void to 10000psi for 15 minutes.
9. Install BPV in 5-1/2" mandrel hanger – Nipple down BOPE and install nightcap.
10. Test nightcap void to 10000psi for 30 minutes per [illustration 2-2 page 3](#).
11. Skid rig to adjacent well on pad to drill production hole.

## Cheddar Fed Com 401H

### 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 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.



## GEOLOGIC PROG

			WELL NAME		Cheddar Federal Com 401H		8/28/2020		
			AREA		Burratta	API			
			HZ TARGET		SBSG Shale	WI %			
			LAT LENGTH		10,000	AFE#			
			TRRC PERMIT			COUNTY		Lea	
	TWNP	RNG	SECTION	FOOTAGE		COMMENT			
SHL	22S	32E	5	603' FSL, 440' FWL		On lease. Drill S to N.			
FTP/PP	22S	32E	5	100' FSL, 792' FWL					
LTP	21S	32E	32	100' FNL, 792' FWL					
BHL	21S	32E	32	100' FNL, 792' FWL					
			GROUND LEVEL	3,665'	RIG KB	26'	KB ELEV	3,691'	
GEOLOGIST	Isabel Harper		<a href="mailto:isabel.harper@cdevinc.com">isabel.harper@cdevinc.com</a>			(303) 589-8841			
LOGGING		No open hole logging. MWD GR from drill out of surface casing to TD.							
MUDLOGGING		Standard mud logging and mud gas detection. Mud loggers on from drill out of surface casing to TD.							
FORMATION		TVD	SSTVD	THICKNESS		FINAL MD	FINAL TVD	DELTA	
Rustler		743'	2,948'	3,900'					
Salado		916'	2,775'	3,811'					
BX BLM (Fletcher Anhydrite)		3,393'	298'	2,131'					
Lamar		4,643'	-952'	84'					
Bell Canyon		4,727'	-1,036'	797'					
Cherry Canyon		5,524'	-1,833'	230'					
Manzanita Lime		5,754'	-2,063'	1,100'					
Brushy Canyon		6,854'	-3,163'	1,727'					
Bone Spring Lime		8,581'	-4,890'	152'					
Avalon		8,733'	-5,042'	887'					
FBSG Sand		9,620'	-5,929'	264'					
SBSG Shale		9,884'	-6,193'	405'					
SBSG Sand		10,289'	-6,598'	454'					
TBSG Carb		10,743'	-7,052'	529'					
TBSG Sand		11,272'	-7,581'						
Target Top at 0'VS		10,074'	-6,383'	77'					
Target Base at 0' VS		10,151'	-6,460'						
HZ TARGET AT 0' VS		10,101'	-6,410'						
TARGET: KBTVD = 10,101' at VS, INC = 90.0 deg Target Window +10/-10'									
COMMENT:									

### GEOLOGIC PROG

OFFSET TYPE WELLS						
	DRILLING WELL		Cheddar Federal Com 401H		8/28/2020	
	HZ TARGET		SBSG Shale		AREA	
	PRIMARY TYPE LOG				SECONDARY TYPE LOG	
	CHEDDAR 3BS FEDERAL 001H				FEDERAL 8 1	
	30-025-44692				30-025-32709	
	LOCATION		22S/32E/5; 244' FSL/370' FWL		22S/32E/8; 1980' FNL/1980' FEL	
	DISTANCE		180' S of SHL		3250' SE of SHL	
	DIRECTION SURVEY		Y		N	
	KB ELEV		3,694'		3,748'	
FORMATION	TVD	SSTVD	DELTA	TVD	SSTVD	DELTA
Rustler	746'	2,948'		722'	3,026'	
Salado	919'	2,775'		894'	2,854'	
Lamar	4,646'	-952'		4,701'	-953'	
Bell Canyon	4,730'	-1,036'	797'	4,768'	-1,020'	836'
Cherry Canyon	5,527'	-1,833'	230'	5,604'	-1,856'	235'
Manzanita Lime	5,757'	-2,063'	1,100'	5,839'	-2,091'	1,105'
Brushy Canyon	6,857'	-3,163'	1,727'	6,944'	-3,196'	1,701'
Bone Spring Lime	8,584'	-4,890'	152'	8,645'	-4,897'	192'
Avalon	8,736'	-5,042'	887'	8,837'	-5,089'	914'
FBSG Sand	9,623'	-5,929'	264'	9,751'	-6,003'	255'
SBSG Shale	9,887'	-6,193'	405'	10,006'	-6,258'	324'
SBSG Sand	10,292'	-6,598'	454'	10,330'	-6,582'	488'
TBSG Carb	10,746'	-7,052'	529'	10,818'	-7,070'	591'
TBSG Sand	11,275'	-7,581'		11,409'	-7,661'	423'
WFMP				11,832'	-8,084'	
Casing Details						
13 3/8	728'			13 3/8	818'	
9 5/8	4,501'			9 5/8	4,560'	
5 1/2	21,661'			7	12,555'	
Reservoir Top	10,081'	-6,387'	77'		10,167'	-6,419'
Reservoir Base	10,158'	-6,464'			10,233'	-6,485'
Comments						

# GEOLOGIC PROG

OFFSET TYPE WELLS				
	DRILLING WELL	Cheddar Federal Com 401H	8/28/2020	
	HZ TARGET	SBSG Shale	AREA Burratta	
	PRIMARY TYPE LOG		SECONDARY TYPE LOG	
	CHEDDAR 3BS FEDERAL 001H		FEDERAL 8 1	
	30-025-44692		30-025-32709	
LOCATION	22S/32E/5; 244' FSL/370' FWL		22S/32E/8; 1980' FNL/1980' FEL	
DISTANCE	180' S of SHL		3250' SE of SHL	
DIRECTION SURVEY	Y		N	
KB ELEV	3,694'		3,748'	

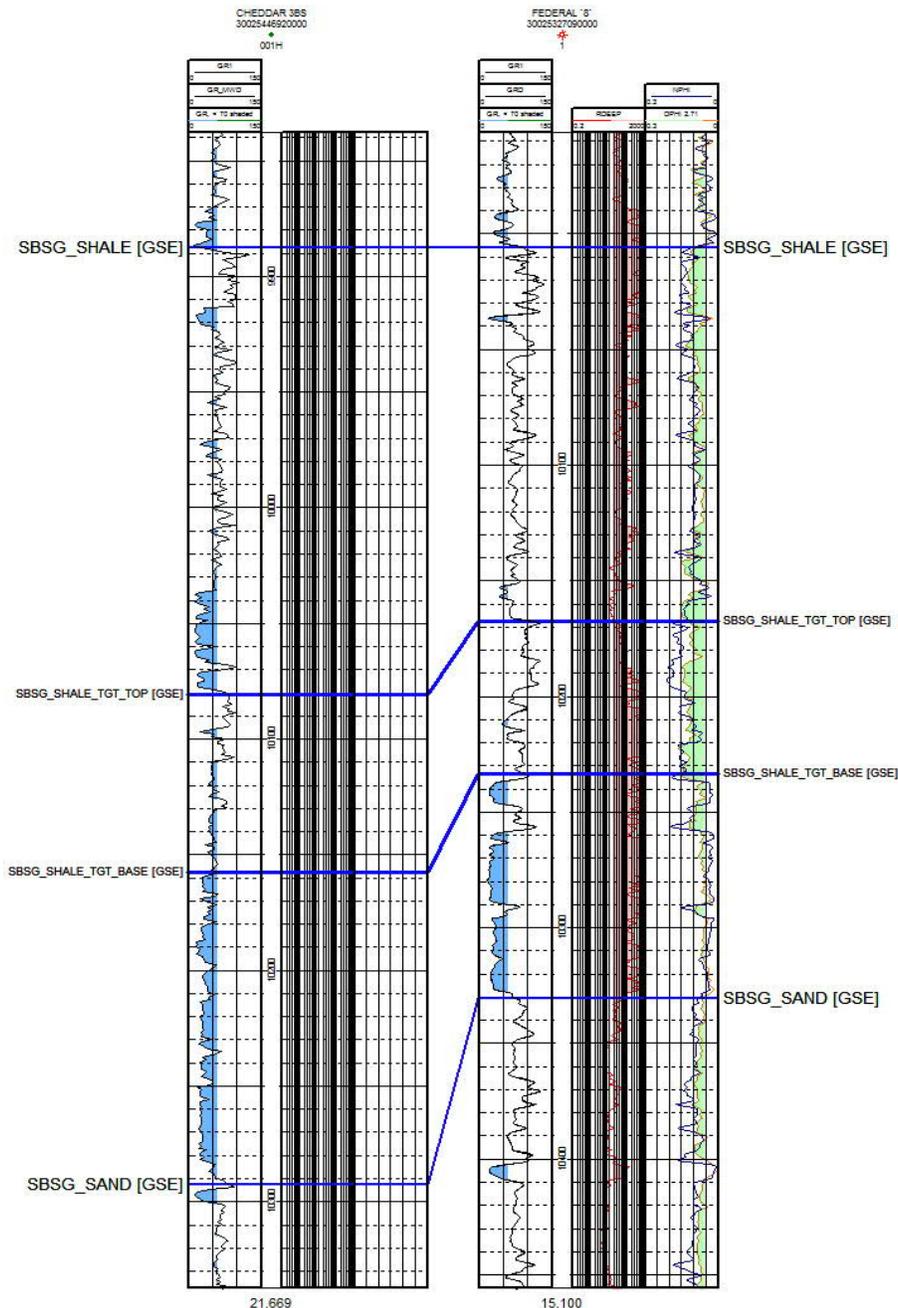
LOCATION & STRUCTURE MAP

WFMP SS Structure Map

# GEOLOGIC PROG

OFFSET TYPE SECTION			
	DRILLING WELL	Cheddar Federal Com 401H	8/28/2020
	HZ TARGET	SBSG Shale	AREA
	PRIMARY TYPE LOG		SECONDARY TYPE LOG
	CHEDDAR 3BS FEDERAL 001H		FEDERAL 8 1
	30-025-44692		30-025-32709
LOCATION	22S/32E/5; 244' FSL/370' FWL	22S/32E/8; 1980' FNL/1980' FEL	
DISTANCE	180' S of SHL	3250' SE of SHL	
DIRECTION SURVEY	Y	N	
KB ELEV	3,694'	3,748'	

## Type Log and Targer Zone



## GEOLOGIC PROG

MUD LOG DISTRIBUTION DETAILS				
 <p><b>CENTENNIAL</b> RESOURCE DEVELOPMENT, LLC</p>	WELL NAME	Cheddar Federal Com 401H		8/28/2020
	AREA	Burratta	API	
	HZ TARGET	SBSG Shale	WI %	
	LAT LENGTH	10000	AFE#	
	TRRC PERMIT		COUNTY	Lea
GEOLOGIST	Isabel Harper	isabel.harper@cdevinc.com		(303) 589-8841
Mud Logging Company				
TBD				
TBD	<a href="#">TBD</a>			TBD
Contact 2	email			phone
Contact 3	email			phone
Daily distribution data requirements and protocol				
geodata@cdevinc.com; joe.woodske@cdevinc.com; drilling@cdevinc.com; dawn.billesbach@cdevinc.com, Andrew.welshhans@cdevinc.com; nick.daniele@cdevinc.com; Isabel.Harper@cdevinc.com				
Daily email distribution list				
Final distribution data requirements				
Final distribution list				
Contact Information	Reports	Hard Copies	Digital data	Cuttings
Centennial Resource Development, c/o Joe Woodske, 1001 17th street, Suite 1800,	email final set	2 copies of 5" MD Vertical, 2 copies of 5" Horizontal and	email final set	
SCAL, Inc., 2613 South County Road 1257, Midland, TX 79706				No Dried Samples to be Collected
<b>MWD Only:</b> Centennial Resource Development, c/o Sarah Ferreyros, 1001 17th street, Suite	email final set	2 copies of the 5" MD vertical logs 2 copies of the 5"	email final set	
Project Geologist:	Isabel Harper		Production:	Brandon Morin
Operations Geologist:	Joe Woodske		Surface Land:	Bailey Joplim
Drilling:	Ronny Hise		Mineral Land:	Gavin Smith



ContiTech

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 210/ 2014
	Page: 9 / 113

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




 CONTITECH RUBBER  
 Industrial Kft.

No:QC-DB- 210/ 2014

Page: 15 / 113

ContiTech

## Hose Data Sheet

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



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

# PWD Data Report

11/16/2020

**APD ID:** 10400052335

**Submission Date:** 12/13/2019

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - General

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

## Section 2 - Lined Pits

**Would you like to utilize Lined Pit PWD options?** N

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Lined pit PWD on or off channel:**

**Lined pit PWD discharge volume (bbl/day):**

**Lined pit specifications:**

**Pit liner description:**

**Pit liner manufacturers information:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Lined pit precipitated solids disposal schedule:**

**Lined pit precipitated solids disposal schedule attachment:**

**Lined pit reclamation description:**

**Lined pit reclamation attachment:**

**Leak detection system description:**

**Leak detection system attachment:**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Lined pit Monitor description:**

**Lined pit Monitor attachment:**

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

**Is the reclamation bond a rider under the BLM bond?**

**Lined pit bond number:**

**Lined pit bond amount:**

**Additional bond information attachment:**

**Section 3 - Unlined Pits**

**Would you like to utilize Unlined Pit PWD options?** N

**Produced Water Disposal (PWD) Location:**

**PWD disturbance (acres):**

**PWD surface owner:**

**Unlined pit PWD on or off channel:**

**Unlined pit PWD discharge volume (bbl/day):**

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Describe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

**Unlined pit precipitated solids disposal schedule attachment:**

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

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

**Beneficial use user confirmation:**

**Estimated depth of the shallowest aquifer (feet):**

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

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

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

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**

**Section 4 - Injection**

**Would you like to utilize Injection PWD options?** N

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

**Section 5 - Surface Discharge**

**Would you like to utilize Surface Discharge PWD options?** N

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

**Section 6 - Other**

**Would you like to utilize Other PWD options?** N

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**



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

# Bond Info Data Report

11/16/2020

**APD ID:** 10400052335

**Submission Date:** 12/13/2019

Highlighted data  
reflects the most  
recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** CHEDDAR FEDERAL COM

**Well Number:** 401H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB001841

**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

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number <b>30-025-48377</b>		<sup>2</sup> Pool Code <b>5695</b>		<sup>3</sup> Pool Name <b>Bilbrey Basin / Bone Spring</b>	
<sup>4</sup> Property Code <b>326046</b>		<sup>5</sup> Property Name <b>CHEDDAR FED COM</b>			<sup>6</sup> Well Number <b>#401H</b>
<sup>7</sup> OGRID No. <b>372165</b>		<sup>8</sup> Operator Name <b>CENTENNIAL RESOURCE PRODUCTION, LLC</b>			<sup>9</sup> Elevation <b>3665.1'</b>

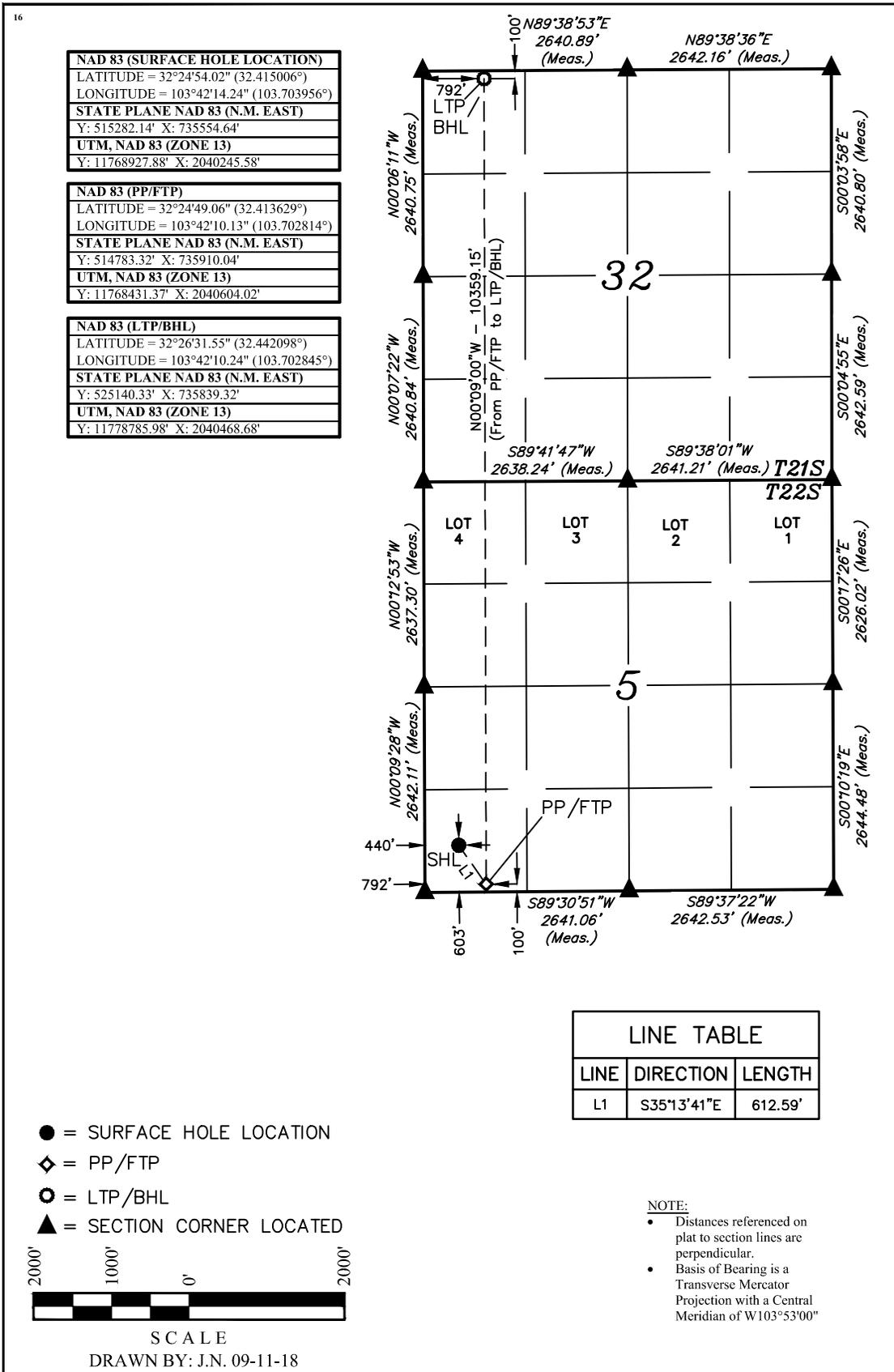
<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	5	22S	32E		603	SOUTH	440	WEST	LEA

<sup>11</sup> 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
D	32	21S	32E		100	NORTH	792	WEST	LEA
<sup>12</sup> Dedicated Acres 319.68		<sup>13</sup> Joint or Infill		<sup>14</sup> Consolidation Code		<sup>15</sup> Order No.			

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



**<sup>17</sup> OPERATOR CERTIFICATION**  
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

*K. Schlichting*      12/12/19  
Signature      Date

**Kanicia Schlichting**  
Printed Name

kanicia.schlichting@cdevinc.com  
E-mail Address

**<sup>18</sup> SURVEYOR CERTIFICATION**  
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

September 11, 2018  
Date of Survey

*Paul Buchele*  
Signature and Seal of Professional Surveyor:

**PAUL BUCHELE**  
NEW MEXICO  
23782  
09-11-18  
PROFESSIONAL SURVEYOR

Certificate Number:



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

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

Submit Original  
to Appropriate  
District Office

**GAS CAPTURE PLAN**

Date: 12/12/2019

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

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

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

**Well(s)/Production Facility – Name of facility**

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Cheddar Fed Com 301H	Pending	M-5-22S-32E	454 FSL & 410 FWL	1500 MCFD Flowrate	Neither	New Well
Cheddar Fed Com 401H 30-025-48377	Pending	M-5-22S-32E	603 FSL & 440 FWL	1500 MCFD Flowrate	Neither	New Well
Cheddar Fed Com 502H	Pending	M-5-22S-32E	453 FSL & 470 FWL	1500 MCFD Flowrate	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 to Lucid Energy Group's Red Hills low/high pressure gathering system located in Lea County, New Mexico. Centennial Resource Production, LLC provides (periodically) to Centennial Resource Production, LLC 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 Centennial Resource Production, LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Lucid Red Hills Processing 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 Centennial Resource Production, LLC system at that time. Based on current information, it is Centennial Resource Production, LLC 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

**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 Rd., Aztec, NM 87410  
 Phone:(505) 334-6178 Fax:(505) 334-6170

**District IV**  
 1220 S. St Francis Dr., Santa Fe, NM 87505  
 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 14475

**CONDITIONS OF APPROVAL**

Operator:	CENTENNIAL RESOURCE PRODUCTION	1001 17th Street, Suite 1800	Denver, CO80202	OGRID:	372165	Action Number:	14475	Action Type:	FORM 3160-3
-----------	--------------------------------	------------------------------	-----------------	--------	--------	----------------	-------	--------------	-------------

OCD Reviewer	Condition
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104
pkautz	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string