

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 <p style="text-align: right;">372165</p>		8. Lease Name and Well No. <p style="text-align: right;">326211</p>
3a. Address	3b. Phone No. (include area code)	9. API Well No. <p style="text-align: right;"><b>30-025-47062</b></p>
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
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area
		12. County or Parish
		13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
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)

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. Well plat certified by a registered surveyor.</li> <li>2. A Drilling Plan.</li> <li>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).</li> </ul> | <ul style="list-style-type: none"> <li>4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).</li> <li>5. Operator certification.</li> <li>6. Such other site specific information and/or plans as may be requested by the BLM.</li> </ul> |
|---|---|

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 04/01/2020



KZ  
04/06/2020

SL

## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	Centennial Resources LLC
<b>LEASE NO.:</b>	NMNM127446
<b>WELL NAME &amp; NO.:</b>	PAC-MAN 36 FED COM 303H
<b>SURFACE HOLE FOOTAGE:</b>	450'/N & 1214'/W
<b>BOTTOM HOLE FOOTAGE:</b>	100'/S & 330'/W
<b>LOCATION:</b>	Section 1, T.23 S., R.34 E., NMPM
<b>COUNTY:</b>	Lea County, New Mexico

COA

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

### A. HYDROGEN SULFIDE

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 **1868** feet (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8**

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

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
  - ❖ In Capitan Reef 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.
  - ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:
    - Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
    - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

## C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

## D. SPECIAL REQUIREMENT (S)

### Communitization Agreement

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

**JJP03302020**

## 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.

**APD ID:** 10400043072

**Submission Date:** 06/24/2019

Highlighted data reflects the most recent changes

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

[Show Final Text](#)

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - General

**APD ID:** 10400043072

**Tie to previous NOS?**

**Submission Date:** 06/24/2019

**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:** NMNM127446

**Lease Acres:** 320.44

**Surface access agreement in place?**

**Allotted?**

**Reservation:**

**Agreement in place?** NO

**Federal or Indian agreement:**

**Agreement number:**

**Agreement name:**

**Keep application confidential?** YES

**Permitting Agent?** NO

**APD Operator:** CENTENNIAL RESOURCE PRODUCTION LLC

**Operator letter of designation:**

## Operator Info

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

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

**Zip:** 80202

**Operator PO Box:**

**Operator City:** Denver

**State:** CO

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

**Operator Internet Address:**

## Section 2 - Well Information

**Well in Master Development Plan?** 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:** PAC-MAN 36 FED COM

**Well Number:** 303H

**Well API Number:**

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

**Field Name:** FIRST BONE SPRING

**Pool Name:** OJO CHISO; BONESPRING,S

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

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

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

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

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:** PAC-MAN SOUTHERN PAD

**Number:** 301H

**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:** 34.4 Miles

**Distance to nearest well:** 30 FT

**Distance to lease line:** 450 FT

**Reservoir well spacing assigned acres Measurement:** 320.14 Acres

**Well plat:** Pac\_Man\_36\_Fed\_Com\_303H\_Lease\_Plat\_20190624072355.pdf

PAC\_MAN\_36\_FED\_COM\_303H\_\_C\_102\_\_Antelope\_Ridge\_\_20190624072356.pdf

PAC\_MAN\_36\_FED\_COM\_303H\_\_C\_102\_\_Ojo\_Chiso\_\_20190624072357.pdf

**Well work start Date:** 08/01/2020

**Duration:** 30 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** 23782

**Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	450	FNL	1214	FWL	23S	34E	1	Lot 4	32.33967	-103.428388	LEA	NEW MEXI CO	NEW MEXI CO	S	STATE	3386	0	0	
KOP Leg #1	450	FNL	1214	FWL	23S	34E	1	Lot 4	32.33967	-103.428388	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 127446	-5761	9211	9147	

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

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	FNL	330	FW L	23S	34E	1	Lot 4	32.340633	-103.43125	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 127446	-6334	10111	9720	
EXIT Leg #1	100	FSL	330	FW L	23S	34E	12	Lot M	32.312145	-103.431239	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	-6334	19551	9720	
BHL Leg #1	100	FSL	330	FW L	23S	34E	12	Lot M	32.312145	-103.431239	LEA	NEW MEXI CO	NEW MEXI CO	F	FEE	-6334	19551	9720	

**APD ID:** 10400043072

**Submission Date:** 06/24/2019

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**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

[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
484707	RUSTLER	3386	1761	1761	SANDSTONE	NONE	N
484708	CAPITAN REEF	-1063	4449	4449	OTHER : Carbonate	USEABLE WATER	N
484709	BELL CANYON	-2064	5450	5450	SANDSTONE	NATURAL GAS, OIL	N
484710	CHERRY CANYON	-2557	5943	5943	SANDSTONE	CO2, NATURAL GAS	N
484711	BRUSHY CANYON	-3758	7144	7144	SANDSTONE	NATURAL GAS, OIL	N
484712	BONE SPRING LIME	-5144	8530	8530	OTHER : Carbonate	NATURAL GAS, OIL	N
484713	AVALON SAND	-5345	8731	8731	SHALE	CO2, NATURAL GAS, OIL	N
484714	FIRST BONE SPRING SAND	-6295	9681	9681	SANDSTONE	NATURAL GAS, OIL	Y
615447	BONE SPRING 2ND	-6500	9886	9886	SHALE	NATURAL GAS, OIL	N

## Section 2 - Blowout Prevention

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

**Rating Depth:** 9720

**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: PAC-MAN 36 FED COM

Well Number: 303H

Requesting Variance? YES

**Variance request:** Centennial Resource Production, LLC hereby requests to use a flex hose on the choke manifold for this well. Please see attached Multi-bowl 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\_20190618110856.pdf

**BOP Diagram Attachment:**

HP650\_BOP\_Schematic\_CoFlex\_Choke\_5K\_2019\_1\_29\_20190618110909.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	3386	3266	120	H-40	94	OTHER - WELD						
2	SURFACE	17.5	13.375	NEW	API	N	0	1800	0	1800	3386	1586	1800	J-55	54.5	OTHER - BTC	1.27	3.07	DRY	8.7	DRY	8.7
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	5300	0	5300	3386	-1914	5300	J-55	40	LT&C	1.32	1.43	DRY	2.45	BUOY	2.97
4	PRODUCTION	8.75	5.5	NEW	API	N	0	9211	0	9147	3386	-5761	9211	P-110	20	OTHER - TMK UP DQX	2.46	2.8	DRY	3.5	DRY	3.5
5	PRODUCTION	8.5	5.5	NEW	API	N	9211	19551	9147	9720	-5761	-6334	10340	P-110	20	OTHER - TMK UP DQX	2.32	2.63	DRY	55.93	DRY	55.93

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

### Casing Attachments

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132208.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20190618111636.pdf

---

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132216.pdf

---

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132222.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190618111548.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

CASING\_ASSUMPTIONS\_WORKSHEET\_20181217132228.pdf

Technical\_Data\_Sheet\_TMK\_UP\_DQX\_5.5\_x\_20\_P110\_CY\_20190618111539.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	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		0								none

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
CONDUCTOR	Lead		0	120	121	1.49	12.9	181		Grout	Bentonite 4% BWOC, Cellophane #/sx, CaCl <sub>2</sub> 2% BWOC.

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	4800	1157	3.44	10.7	3981	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		4800	5300	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	9211	903	3.41	10.6	3081	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		9211	1955 1	2388	1.24	14.2	2961	25	50:25:25 Class H: Poz: CPO18	Citric acid 0.03%, CSA-1000 0.05%, C47B 0.25%, C-503P 0.30%

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

## 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

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	1955 1	OTHER : Brine/OBM	8.8	9.5							
0	1800	WATER-BASED MUD	8.6	9.5							
1800	5300	OTHER : Brine	9.8	10							

## Section 6 - Test, Logging, Coring

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

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

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

DS,GR

**Coring operation description for the well:**

We will not be coring this well.

**Operator Name:** CENTENNIAL RESOURCE PRODUCTION LLC

**Well Name:** PAC-MAN 36 FED COM

**Well Number:** 303H

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4802

**Anticipated Surface Pressure:** 2663.6

**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:**

Pac\_Man\_36\_Fed\_Com\_301H\_302H\_303H\_H2S\_Plan\_20181219151705.pdf

## Section 8 - Other Information

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

PAC\_MAN\_36\_FED\_COM\_303H\_\_CDEV\_PLAN\_\_1\_20190624075029.pdf

**Other proposed operations facets description:**

Centennial Resource Development – New Mexico Multi-Well Pad Drilling

Bone Springs Formations

- o 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 Spudder 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.
- o Intermediate and Production Casing – For all subsequent Intermediate and Production Casing Strings, the well will be drilled below 13-3/8" to it's intended final TD. 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.

Gas Capture Plan attached.

OCD is considering this a preapproved DHC. We are staying in the same field just two state pools.

**Other proposed operations facets attachment:**

Pac\_Man\_36\_Fed\_Com\_301H\_Gas\_Capture\_Plan\_20181219152148.pdf

CRD\_Batch\_Setting\_Procedures\_20191212162112.pdf

**Other Variance attachment:**

Flex\_Hose\_Specs\_20181219152357.pdf

CDEV\_Multi\_Bowl\_Procedure\_Pac\_Man\_36\_Fed\_Com\_303H\_20191212162057.pdf

## CASING ASSUMPTIONS WORKSHEET:

### Centralizer Program:

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

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

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

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

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

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### Centralizer Program:

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**HYDROGEN SULFIDE CONTINGENCY PLAN**

**Pac-Man 36 Fed Com 301H, 302H and 303H**

**Section 36**

**T 22S R 34E**

**Lea County, NM**

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

**Revision Date:**

# **Table of Contents**

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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

### **Pac-Man 36 Fed Com 301H, 302H, 303H**

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

**Pac-Man Fed Com 301H, 302H, 303H**

**Section 36**

**T 22S R 34E**

**Lea County, NM**

BEGINNING AT THE INTERSECTION OF HIGHWAY 18 & HIGHWAY 128 FROM JAL, NEW MEXICO PROCEED IN A WESTERLY, THEN NORTHWESTERLY, THEN

WESTERLY DIRECTION ALONG HIGHWAY 128 APPROXIMATELY 20.6 MILES TO THE JUNCTION OF THIS ROAD AND DELAWARE BASIN ROAD TO THE NORTH; TURN RIGHT AND PROCEED IN A NORTHERLY, THEN EASTERLY DIRECTION APPROXIMATELY 12.2 MILES TO THE JUNCTION OF THIS ROAD AND COUNTY ROAD 32 TO THE NORTH; TURN LEFT AND PROCEED IN A NORTHERLY DIRECTION APPROXIMATELY 1.0 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN RIGHT AND PROCEED IN AN EASTERLY, THEN NORTHEASTERLY DIRECTION APPROXIMATELY 0.3 MILES TO THE EXISTING PRYOR STATE 1H & 4H WELL PAD; AND THE BEGINNING OF THE PROPOSED ACCESS FOR MORTAL KOMBAT 36 STATE COM #502H ACCESS ROAD TO THE SOUTHEAST; FOLLOW

ROAD FLAGS IN A SOUTHEASTERLY DIRECTION APPROXIMATELY 196' TO THE BEGINNING OF THE PROPOSED PAC-MAN 36 FED COM #601H-#603H ACCESS ROAD TO THE EAST; FOLLOW ROAD FLAGS IN AN EASTERLY DIRECTION APPROXIMATELY 339' TO THE BEGINNING OF THE PROPOSED ACCESS ROAD TO THE EAST; FOLLOW ROAD FLAGS IN AN EASTERLY, THEN

SOUTHERLY, THEN WESTERLY DIRECTION APPROXIMATELY 852' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM JAL, NEW MEXICO TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 34.4 MILES.

## **SAFE BRIEFING AREAS**

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

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

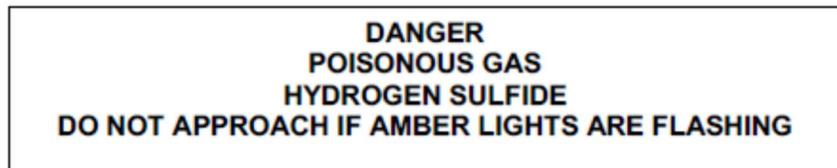
If the Primary Safe Briefing Area cannot be used due to wind conditions; the designated secondary safe briefing area will be used.

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

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

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

## NEW MEXICO OIL & GAS CONSERVATION DIVISION 118

### **Pac-Man 36 Fed Com 301H, 302H, 303H**

H<sub>2</sub>S Concentration- 300 PPM (Block 13)

Maximum Escape Volume- 2400 MCF/Day (Block 13)

100 PPM Radius of Exposure (Block 15)- 82  
(Formula=  $1.589 \times (B5/1000000) \times (B6 \times 1000) \times .6258$ )

500 PPM Radius of Exposure (Block 16)- 37  
Formula=  $.4546 \times (B5/1000000) \times (B6 \times 1000) \times .6258$

**EMERGENCY CONTACT LIST**

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

## **NEW MEXICO**

**LEA**

**PAC-MAN**

**\*PAC-MAN 36 FED COM 303H**

**PAC-MAN 36 FED COM 303H**

**Plan: PWP0**

## **Survey Report - Geographic**

**14 December, 2018**

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well *PAC-MAN 36 FED COM 303H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Well:</b>	*PAC-MAN 36 FED COM 303H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 303H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWP0	<b>Database:</b>	Centennial EDM SQL Server

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

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

<b>Well</b>	*PAC-MAN 36 FED COM 303H					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	11,742,666.48 usft	<b>Latitude:</b>	32° 20' 22.814 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	2,125,669.24 usft	<b>Longitude:</b>	103° 25' 42.197 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	3,387.5 usft

<b>Wellbore</b>	PAC-MAN 36 FED COM 303H				
<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	7.69	60.37	48,878.90082398

<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	185.03	

<b>Survey Tool Program</b>	<b>Date</b>	12/13/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.0	19,551.0	PWP0 (PAC-MAN 36 FED COM 303H)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction	

<b>Planned Survey</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
100.0	0.00	0.00	100.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
200.0	0.00	0.00	200.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
300.0	0.00	0.00	300.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
400.0	0.00	0.00	400.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
500.0	0.00	0.00	500.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
600.0	0.00	0.00	600.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
700.0	0.00	0.00	700.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
800.0	0.00	0.00	800.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
900.0	0.00	0.00	900.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well *PAC-MAN 36 FED COM 303H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Well:</b>	*PAC-MAN 36 FED COM 303H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 303H	<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	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	11,742,666.48	2,125,669.24	32° 20' 22.814 N	103° 25' 42.197 W	
2,600.0	1.00	270.00	2,600.0	0.0	-0.9	11,742,666.47	2,125,668.36	32° 20' 22.814 N	103° 25' 42.207 W	
2,700.0	2.00	270.00	2,700.0	0.0	-3.5	11,742,666.43	2,125,665.75	32° 20' 22.814 N	103° 25' 42.237 W	
2,800.0	3.00	270.00	2,799.9	0.0	-7.9	11,742,666.37	2,125,661.39	32° 20' 22.814 N	103° 25' 42.288 W	
2,900.0	4.00	270.00	2,899.7	0.0	-14.0	11,742,666.28	2,125,655.28	32° 20' 22.814 N	103° 25' 42.359 W	
3,000.0	5.00	270.00	2,999.4	0.0	-21.8	11,742,666.16	2,125,647.44	32° 20' 22.814 N	103° 25' 42.451 W	
3,100.0	6.00	270.00	3,098.9	0.0	-31.4	11,742,666.02	2,125,637.85	32° 20' 22.814 N	103° 25' 42.563 W	
3,200.0	7.00	270.00	3,198.3	0.0	-42.7	11,742,665.86	2,125,626.53	32° 20' 22.814 N	103° 25' 42.695 W	
3,300.0	8.00	270.00	3,297.4	0.0	-55.8	11,742,665.66	2,125,613.48	32° 20' 22.814 N	103° 25' 42.847 W	
3,400.0	9.00	270.00	3,396.3	0.0	-70.5	11,742,665.45	2,125,598.70	32° 20' 22.814 N	103° 25' 43.019 W	
3,500.0	9.00	270.00	3,495.1	0.0	-86.2	11,742,665.22	2,125,583.06	32° 20' 22.814 N	103° 25' 43.201 W	
3,600.0	9.00	270.00	3,593.8	0.0	-101.8	11,742,664.99	2,125,567.42	32° 20' 22.814 N	103° 25' 43.384 W	
3,700.0	9.00	270.00	3,692.6	0.0	-117.5	11,742,664.76	2,125,551.78	32° 20' 22.814 N	103° 25' 43.566 W	
3,800.0	9.00	270.00	3,791.4	0.0	-133.1	11,742,664.53	2,125,536.14	32° 20' 22.814 N	103° 25' 43.748 W	
3,900.0	9.00	270.00	3,890.1	0.0	-148.8	11,742,664.30	2,125,520.50	32° 20' 22.814 N	103° 25' 43.931 W	
4,000.0	9.00	270.00	3,988.9	0.0	-164.4	11,742,664.07	2,125,504.85	32° 20' 22.814 N	103° 25' 44.113 W	
4,100.0	9.00	270.00	4,087.7	0.0	-180.0	11,742,663.84	2,125,489.21	32° 20' 22.814 N	103° 25' 44.295 W	
4,200.0	9.00	270.00	4,186.5	0.0	-195.7	11,742,663.61	2,125,473.57	32° 20' 22.814 N	103° 25' 44.478 W	
4,300.0	9.00	270.00	4,285.2	0.0	-211.3	11,742,663.38	2,125,457.93	32° 20' 22.814 N	103° 25' 44.660 W	
4,400.0	9.00	270.00	4,384.0	0.0	-227.0	11,742,663.15	2,125,442.29	32° 20' 22.814 N	103° 25' 44.843 W	
4,500.0	9.00	270.00	4,482.8	0.0	-242.6	11,742,662.92	2,125,426.65	32° 20' 22.814 N	103° 25' 45.025 W	
4,600.0	9.00	270.00	4,581.5	0.0	-258.3	11,742,662.69	2,125,411.00	32° 20' 22.814 N	103° 25' 45.207 W	
4,700.0	9.00	270.00	4,680.3	0.0	-273.9	11,742,662.46	2,125,395.36	32° 20' 22.814 N	103° 25' 45.390 W	
4,800.0	9.00	270.00	4,779.1	0.0	-289.5	11,742,662.23	2,125,379.72	32° 20' 22.814 N	103° 25' 45.572 W	
4,900.0	9.00	270.00	4,877.8	0.0	-305.2	11,742,662.00	2,125,364.08	32° 20' 22.814 N	103° 25' 45.754 W	
5,000.0	9.00	270.00	4,976.6	0.0	-320.8	11,742,661.77	2,125,348.44	32° 20' 22.814 N	103° 25' 45.937 W	
5,100.0	9.00	270.00	5,075.4	0.0	-336.5	11,742,661.54	2,125,332.79	32° 20' 22.814 N	103° 25' 46.119 W	
5,200.0	9.00	270.00	5,174.1	0.0	-352.1	11,742,661.31	2,125,317.15	32° 20' 22.814 N	103° 25' 46.301 W	
5,300.0	9.00	270.00	5,272.9	0.0	-367.8	11,742,661.08	2,125,301.51	32° 20' 22.814 N	103° 25' 46.484 W	
5,400.0	9.00	270.00	5,371.7	0.0	-383.4	11,742,660.86	2,125,285.87	32° 20' 22.814 N	103° 25' 46.666 W	
5,500.0	9.00	270.00	5,470.4	0.0	-399.1	11,742,660.63	2,125,270.23	32° 20' 22.814 N	103° 25' 46.848 W	
5,600.0	9.00	270.00	5,569.2	0.0	-414.7	11,742,660.40	2,125,254.59	32° 20' 22.814 N	103° 25' 47.031 W	
5,700.0	9.00	270.00	5,668.0	0.0	-430.3	11,742,660.17	2,125,238.94	32° 20' 22.814 N	103° 25' 47.213 W	
5,800.0	9.00	270.00	5,766.8	0.0	-446.0	11,742,659.94	2,125,223.30	32° 20' 22.814 N	103° 25' 47.395 W	
5,900.0	9.00	270.00	5,865.5	0.0	-461.6	11,742,659.71	2,125,207.66	32° 20' 22.814 N	103° 25' 47.578 W	
6,000.0	9.00	270.00	5,964.3	0.0	-477.3	11,742,659.48	2,125,192.02	32° 20' 22.814 N	103° 25' 47.760 W	
6,100.0	9.00	270.00	6,063.1	0.0	-492.9	11,742,659.25	2,125,176.38	32° 20' 22.814 N	103° 25' 47.943 W	
6,200.0	9.00	270.00	6,161.8	0.0	-508.6	11,742,659.02	2,125,160.74	32° 20' 22.814 N	103° 25' 48.125 W	
6,300.0	9.00	270.00	6,260.6	0.0	-524.2	11,742,658.79	2,125,145.09	32° 20' 22.814 N	103° 25' 48.307 W	
6,400.0	9.00	270.00	6,359.4	0.0	-539.8	11,742,658.56	2,125,129.45	32° 20' 22.814 N	103° 25' 48.490 W	
6,500.0	9.00	270.00	6,458.1	0.0	-555.5	11,742,658.33	2,125,113.81	32° 20' 22.814 N	103° 25' 48.672 W	
6,600.0	9.00	270.00	6,556.9	0.0	-571.1	11,742,658.10	2,125,098.17	32° 20' 22.814 N	103° 25' 48.854 W	

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well *PAC-MAN 36 FED COM 303H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Well:</b>	*PAC-MAN 36 FED COM 303H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 303H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPD	<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	9.00	270.00	6,655.7	0.0	-586.8	11,742,657.87	2,125,082.53	32° 20' 22.814 N	103° 25' 49.037 W	
6,800.0	9.00	270.00	6,754.4	0.0	-602.4	11,742,657.64	2,125,066.88	32° 20' 22.814 N	103° 25' 49.219 W	
6,900.0	9.00	270.00	6,853.2	0.0	-618.1	11,742,657.41	2,125,051.24	32° 20' 22.814 N	103° 25' 49.401 W	
7,000.0	9.00	270.00	6,952.0	0.0	-633.7	11,742,657.18	2,125,035.60	32° 20' 22.814 N	103° 25' 49.584 W	
7,100.0	9.00	270.00	7,050.8	0.0	-649.3	11,742,656.95	2,125,019.96	32° 20' 22.814 N	103° 25' 49.766 W	
7,200.0	9.00	270.00	7,149.5	0.0	-665.0	11,742,656.72	2,125,004.32	32° 20' 22.814 N	103° 25' 49.948 W	
7,300.0	9.00	270.00	7,248.3	0.0	-680.6	11,742,656.49	2,124,988.68	32° 20' 22.814 N	103° 25' 50.131 W	
7,400.0	9.00	270.00	7,347.1	0.0	-696.3	11,742,656.26	2,124,973.03	32° 20' 22.814 N	103° 25' 50.313 W	
7,500.0	9.00	270.00	7,445.8	0.0	-711.9	11,742,656.03	2,124,957.39	32° 20' 22.814 N	103° 25' 50.496 W	
7,600.0	9.00	270.00	7,544.6	0.0	-727.6	11,742,655.80	2,124,941.75	32° 20' 22.814 N	103° 25' 50.678 W	
7,700.0	9.00	270.00	7,643.4	0.0	-743.2	11,742,655.57	2,124,926.11	32° 20' 22.814 N	103° 25' 50.860 W	
7,800.0	9.00	270.00	7,742.1	0.0	-758.9	11,742,655.35	2,124,910.47	32° 20' 22.814 N	103° 25' 51.043 W	
7,900.0	9.00	270.00	7,840.9	0.0	-774.5	11,742,655.12	2,124,894.83	32° 20' 22.814 N	103° 25' 51.225 W	
8,000.0	9.00	270.00	7,939.7	0.0	-790.1	11,742,654.89	2,124,879.18	32° 20' 22.814 N	103° 25' 51.407 W	
8,100.0	8.00	270.00	8,038.6	0.0	-804.9	11,742,654.67	2,124,864.40	32° 20' 22.814 N	103° 25' 51.580 W	
8,200.0	7.00	270.00	8,137.7	0.0	-818.0	11,742,654.48	2,124,851.35	32° 20' 22.814 N	103° 25' 51.732 W	
8,300.0	6.00	270.00	8,237.1	0.0	-829.3	11,742,654.31	2,124,840.03	32° 20' 22.813 N	103° 25' 51.864 W	
8,400.0	5.00	270.00	8,336.6	0.0	-838.9	11,742,654.17	2,124,830.45	32° 20' 22.813 N	103° 25' 51.975 W	
8,500.0	4.00	270.00	8,436.3	0.0	-846.7	11,742,654.06	2,124,822.61	32° 20' 22.813 N	103° 25' 52.067 W	
8,600.0	3.00	270.00	8,536.1	0.0	-852.8	11,742,653.97	2,124,816.50	32° 20' 22.813 N	103° 25' 52.138 W	
8,700.0	2.00	270.00	8,636.0	0.0	-857.2	11,742,653.90	2,124,812.14	32° 20' 22.813 N	103° 25' 52.189 W	
8,800.0	1.00	270.00	8,736.0	0.0	-859.8	11,742,653.86	2,124,809.52	32° 20' 22.813 N	103° 25' 52.219 W	
8,900.0	0.00	0.00	8,836.0	0.0	-860.7	11,742,653.85	2,124,808.65	32° 20' 22.813 N	103° 25' 52.230 W	
9,000.0	0.00	0.00	8,936.0	0.0	-860.7	11,742,653.85	2,124,808.65	32° 20' 22.813 N	103° 25' 52.230 W	
9,100.0	0.00	0.00	9,036.0	0.0	-860.7	11,742,653.85	2,124,808.65	32° 20' 22.813 N	103° 25' 52.230 W	
9,200.0	0.00	0.00	9,136.0	0.0	-860.7	11,742,653.85	2,124,808.65	32° 20' 22.813 N	103° 25' 52.230 W	
9,211.0	0.00	0.00	9,147.0	0.0	-860.7	11,742,653.85	2,124,808.65	32° 20' 22.813 N	103° 25' 52.230 W	
9,300.0	8.90	181.40	9,235.6	-6.9	-860.8	11,742,646.95	2,124,808.58	32° 20' 22.745 N	103° 25' 52.232 W	
9,400.0	18.90	181.40	9,332.6	-30.9	-861.4	11,742,622.96	2,124,808.35	32° 20' 22.508 N	103° 25' 52.238 W	
9,500.0	28.90	181.40	9,423.9	-71.3	-862.4	11,742,582.51	2,124,807.95	32° 20' 22.108 N	103° 25' 52.250 W	
9,600.0	38.90	181.40	9,506.8	-127.0	-863.8	11,742,526.81	2,124,807.41	32° 20' 21.557 N	103° 25' 52.266 W	
9,700.0	48.89	181.40	9,578.7	-196.2	-865.5	11,742,457.57	2,124,806.74	32° 20' 20.872 N	103° 25' 52.285 W	
9,800.0	58.89	181.40	9,637.6	-276.9	-867.4	11,742,376.89	2,124,805.95	32° 20' 20.073 N	103° 25' 52.308 W	
9,900.0	68.89	181.40	9,681.6	-366.6	-869.6	11,742,287.21	2,124,805.07	32° 20' 19.186 N	103° 25' 52.334 W	
10,000.0	78.89	181.40	9,709.3	-462.5	-872.0	11,742,191.26	2,124,804.14	32° 20' 18.237 N	103° 25' 52.361 W	
10,100.0	88.89	181.40	9,719.9	-561.8	-874.4	11,742,091.96	2,124,803.17	32° 20' 17.254 N	103° 25' 52.389 W	
10,111.1	90.00	181.40	9,720.0	-572.9	-874.7	11,742,080.85	2,124,803.06	32° 20' 17.144 N	103° 25' 52.393 W	
10,200.0	90.00	181.36	9,720.0	-661.7	-876.8	11,741,991.96	2,124,802.22	32° 20' 16.265 N	103° 25' 52.418 W	
10,300.0	90.00	181.31	9,720.0	-761.7	-879.1	11,741,891.97	2,124,801.37	32° 20' 15.276 N	103° 25' 52.445 W	
10,400.0	90.00	181.26	9,720.0	-861.7	-881.4	11,741,791.97	2,124,800.59	32° 20' 14.286 N	103° 25' 52.471 W	
10,500.0	90.00	181.21	9,720.0	-961.6	-883.5	11,741,691.97	2,124,799.90	32° 20' 13.297 N	103° 25' 52.496 W	
10,600.0	90.00	181.16	9,720.0	-1,061.6	-885.6	11,741,591.97	2,124,799.29	32° 20' 12.307 N	103° 25' 52.520 W	
10,700.0	90.00	181.12	9,720.0	-1,161.6	-887.6	11,741,491.98	2,124,798.77	32° 20' 11.318 N	103° 25' 52.543 W	
10,800.0	90.00	181.07	9,720.0	-1,261.6	-889.5	11,741,391.98	2,124,798.33	32° 20' 10.328 N	103° 25' 52.565 W	
10,900.0	90.00	181.02	9,720.0	-1,361.6	-891.3	11,741,291.98	2,124,797.97	32° 20' 9.339 N	103° 25' 52.587 W	
11,000.0	90.00	180.97	9,720.0	-1,461.6	-893.1	11,741,191.98	2,124,797.70	32° 20' 8.350 N	103° 25' 52.607 W	
11,100.0	90.00	180.92	9,720.0	-1,561.5	-894.7	11,741,091.98	2,124,797.51	32° 20' 7.360 N	103° 25' 52.626 W	
11,200.0	90.00	180.88	9,720.0	-1,661.5	-896.3	11,740,991.98	2,124,797.41	32° 20' 6.371 N	103° 25' 52.644 W	
11,300.0	90.00	180.83	9,720.0	-1,761.5	-897.8	11,740,891.98	2,124,797.39	32° 20' 5.381 N	103° 25' 52.662 W	
11,400.0	90.00	180.78	9,720.0	-1,861.5	-899.2	11,740,791.98	2,124,797.46	32° 20' 4.391 N	103° 25' 52.678 W	
11,500.0	90.00	180.73	9,720.0	-1,961.5	-900.5	11,740,691.98	2,124,797.60	32° 20' 3.402 N	103° 25' 52.693 W	
11,600.0	90.00	180.68	9,720.0	-2,061.5	-901.8	11,740,591.98	2,124,797.84	32° 20' 2.412 N	103° 25' 52.708 W	
11,700.0	90.00	180.64	9,720.0	-2,161.5	-902.9	11,740,491.98	2,124,798.15	32° 20' 1.423 N	103° 25' 52.721 W	
11,800.0	90.00	180.59	9,720.0	-2,261.5	-904.0	11,740,391.98	2,124,798.55	32° 20' 0.433 N	103° 25' 52.734 W	
11,900.0	90.00	180.54	9,720.0	-2,361.5	-905.0	11,740,291.98	2,124,799.04	32° 19' 59.444 N	103° 25' 52.745 W	

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well *PAC-MAN 36 FED COM 303H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Well:</b>	*PAC-MAN 36 FED COM 303H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 303H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	PWPO	<b>Database:</b>	Centennial EDM SQL Server

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
12,000.0	90.00	180.49	9,720.0	-2,461.5	-905.9	11,740,191.98	2,124,799.60	32° 19' 58.454 N	103° 25' 52.755 W	
12,100.0	90.00	180.44	9,720.0	-2,561.5	-906.7	11,740,091.98	2,124,800.25	32° 19' 57.464 N	103° 25' 52.765 W	
12,200.0	90.00	180.40	9,720.0	-2,661.5	-907.4	11,739,991.99	2,124,800.99	32° 19' 56.475 N	103° 25' 52.773 W	
12,300.0	90.00	180.35	9,720.0	-2,761.5	-908.1	11,739,891.99	2,124,801.81	32° 19' 55.485 N	103° 25' 52.781 W	
12,400.0	90.00	180.30	9,720.0	-2,861.5	-908.6	11,739,791.99	2,124,802.71	32° 19' 54.496 N	103° 25' 52.787 W	
12,500.0	90.00	180.25	9,720.0	-2,961.5	-909.1	11,739,692.00	2,124,803.70	32° 19' 53.506 N	103° 25' 52.793 W	
12,600.0	90.00	180.20	9,720.0	-3,061.5	-909.5	11,739,592.01	2,124,804.77	32° 19' 52.516 N	103° 25' 52.798 W	
12,700.0	90.00	180.15	9,720.0	-3,161.5	-909.8	11,739,492.01	2,124,805.93	32° 19' 51.527 N	103° 25' 52.801 W	
12,800.0	90.00	180.11	9,720.0	-3,261.5	-910.0	11,739,392.02	2,124,807.17	32° 19' 50.537 N	103° 25' 52.804 W	
12,900.0	90.00	180.06	9,720.0	-3,361.5	-910.2	11,739,292.03	2,124,808.49	32° 19' 49.548 N	103° 25' 52.805 W	
13,000.0	90.00	180.01	9,720.0	-3,461.5	-910.2	11,739,192.04	2,124,809.90	32° 19' 48.558 N	103° 25' 52.806 W	
13,100.0	90.00	179.96	9,720.0	-3,561.5	-910.2	11,739,092.05	2,124,811.39	32° 19' 47.568 N	103° 25' 52.806 W	
13,200.0	90.00	179.91	9,720.0	-3,661.5	-910.1	11,738,992.06	2,124,812.96	32° 19' 46.579 N	103° 25' 52.805 W	
13,300.0	90.00	179.87	9,720.0	-3,761.5	-909.9	11,738,892.08	2,124,814.62	32° 19' 45.589 N	103° 25' 52.802 W	
13,400.0	90.00	179.82	9,720.0	-3,861.5	-909.6	11,738,792.09	2,124,816.37	32° 19' 44.599 N	103° 25' 52.799 W	
13,500.0	90.00	179.77	9,720.0	-3,961.5	-909.3	11,738,692.11	2,124,818.19	32° 19' 43.610 N	103° 25' 52.795 W	
13,586.0	90.00	179.73	9,720.0	-4,047.5	-908.9	11,738,606.13	2,124,819.83	32° 19' 42.759 N	103° 25' 52.790 W	
13,600.0	90.00	179.73	9,720.0	-4,061.5	-908.8	11,738,592.13	2,124,820.10	32° 19' 42.620 N	103° 25' 52.790 W	
13,700.0	90.00	179.73	9,720.0	-4,161.5	-908.4	11,738,492.14	2,124,822.04	32° 19' 41.631 N	103° 25' 52.784 W	
13,800.0	90.00	179.73	9,720.0	-4,261.5	-907.9	11,738,392.16	2,124,823.98	32° 19' 40.641 N	103° 25' 52.778 W	
13,900.0	90.00	179.73	9,720.0	-4,361.5	-907.4	11,738,292.18	2,124,825.93	32° 19' 39.651 N	103° 25' 52.773 W	
14,000.0	90.00	179.73	9,720.0	-4,461.5	-906.9	11,738,192.20	2,124,827.87	32° 19' 38.662 N	103° 25' 52.767 W	
14,100.0	90.00	179.73	9,720.0	-4,561.4	-906.5	11,738,092.22	2,124,829.81	32° 19' 37.672 N	103° 25' 52.762 W	
14,200.0	90.00	179.73	9,720.0	-4,661.4	-906.0	11,737,992.24	2,124,831.75	32° 19' 36.682 N	103° 25' 52.756 W	
14,300.0	90.00	179.73	9,720.0	-4,761.4	-905.5	11,737,892.26	2,124,833.69	32° 19' 35.693 N	103° 25' 52.751 W	
14,400.0	90.00	179.73	9,720.0	-4,861.4	-905.1	11,737,792.28	2,124,835.63	32° 19' 34.703 N	103° 25' 52.745 W	
14,500.0	90.00	179.73	9,720.0	-4,961.4	-904.6	11,737,692.30	2,124,837.57	32° 19' 33.714 N	103° 25' 52.740 W	
14,600.0	90.00	179.73	9,720.0	-5,061.4	-904.1	11,737,592.31	2,124,839.51	32° 19' 32.724 N	103° 25' 52.734 W	
14,700.0	90.00	179.73	9,720.0	-5,161.4	-903.6	11,737,492.33	2,124,841.45	32° 19' 31.734 N	103° 25' 52.728 W	
14,800.0	90.00	179.73	9,720.0	-5,261.4	-903.2	11,737,392.35	2,124,843.39	32° 19' 30.745 N	103° 25' 52.723 W	
14,900.0	90.00	179.73	9,720.0	-5,361.4	-902.7	11,737,292.37	2,124,845.33	32° 19' 29.755 N	103° 25' 52.717 W	
15,000.0	90.00	179.73	9,720.0	-5,461.4	-902.2	11,737,192.39	2,124,847.28	32° 19' 28.766 N	103° 25' 52.712 W	
15,100.0	90.00	179.73	9,720.0	-5,561.4	-901.7	11,737,092.41	2,124,849.22	32° 19' 27.776 N	103° 25' 52.706 W	
15,200.0	90.00	179.73	9,720.0	-5,661.4	-901.3	11,736,992.43	2,124,851.16	32° 19' 26.786 N	103° 25' 52.701 W	
15,300.0	90.00	179.73	9,720.0	-5,761.4	-900.8	11,736,892.45	2,124,853.10	32° 19' 25.797 N	103° 25' 52.695 W	
15,400.0	90.00	179.73	9,720.0	-5,861.4	-900.3	11,736,792.46	2,124,855.04	32° 19' 24.807 N	103° 25' 52.690 W	
15,500.0	90.00	179.73	9,720.0	-5,961.4	-899.8	11,736,692.48	2,124,856.98	32° 19' 23.817 N	103° 25' 52.684 W	
15,600.0	90.00	179.73	9,720.0	-6,061.4	-899.4	11,736,592.50	2,124,858.92	32° 19' 22.828 N	103° 25' 52.678 W	
15,700.0	90.00	179.73	9,720.0	-6,161.4	-898.9	11,736,492.52	2,124,860.86	32° 19' 21.838 N	103° 25' 52.673 W	
15,800.0	90.00	179.73	9,720.0	-6,261.4	-898.4	11,736,392.54	2,124,862.80	32° 19' 20.849 N	103° 25' 52.667 W	
15,900.0	90.00	179.73	9,720.0	-6,361.4	-898.0	11,736,292.56	2,124,864.74	32° 19' 19.859 N	103° 25' 52.662 W	
16,000.0	90.00	179.73	9,720.0	-6,461.4	-897.5	11,736,192.58	2,124,866.69	32° 19' 18.869 N	103° 25' 52.656 W	
16,100.0	90.00	179.73	9,720.0	-6,561.4	-897.0	11,736,092.60	2,124,868.63	32° 19' 17.880 N	103° 25' 52.651 W	
16,200.0	90.00	179.73	9,720.0	-6,661.4	-896.5	11,735,992.62	2,124,870.57	32° 19' 16.890 N	103° 25' 52.645 W	
16,300.0	90.00	179.73	9,720.0	-6,761.4	-896.1	11,735,892.63	2,124,872.51	32° 19' 15.900 N	103° 25' 52.640 W	
16,400.0	90.00	179.73	9,720.0	-6,861.4	-895.6	11,735,792.65	2,124,874.45	32° 19' 14.911 N	103° 25' 52.634 W	
16,500.0	90.00	179.73	9,720.0	-6,961.4	-895.1	11,735,692.67	2,124,876.39	32° 19' 13.921 N	103° 25' 52.628 W	
16,600.0	90.00	179.73	9,720.0	-7,061.4	-894.6	11,735,592.69	2,124,878.33	32° 19' 12.932 N	103° 25' 52.623 W	
16,700.0	90.00	179.73	9,720.0	-7,161.4	-894.2	11,735,492.71	2,124,880.27	32° 19' 11.942 N	103° 25' 52.617 W	
16,800.0	90.00	179.73	9,720.0	-7,261.4	-893.7	11,735,392.73	2,124,882.21	32° 19' 10.952 N	103° 25' 52.612 W	
16,900.0	90.00	179.73	9,720.0	-7,361.4	-893.2	11,735,292.75	2,124,884.15	32° 19' 9.963 N	103° 25' 52.606 W	
17,000.0	90.00	179.73	9,720.0	-7,461.4	-892.7	11,735,192.77	2,124,886.09	32° 19' 8.973 N	103° 25' 52.601 W	
17,100.0	90.00	179.73	9,720.0	-7,561.4	-892.3	11,735,092.78	2,124,888.04	32° 19' 7.983 N	103° 25' 52.595 W	
17,200.0	90.00	179.73	9,720.0	-7,661.4	-891.8	11,734,992.80	2,124,889.98	32° 19' 6.994 N	103° 25' 52.589 W	
17,300.0	90.00	179.73	9,720.0	-7,761.4	-891.3	11,734,892.82	2,124,891.92	32° 19' 6.004 N	103° 25' 52.584 W	

<b>Company:</b>	NEW MEXICO	<b>Local Co-ordinate Reference:</b>	Well *PAC-MAN 36 FED COM 303H
<b>Project:</b>	LEA	<b>TVD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Site:</b>	PAC-MAN	<b>MD Reference:</b>	RKB=3387.5+25 @ 3412.5usft
<b>Well:</b>	*PAC-MAN 36 FED COM 303H	<b>North Reference:</b>	True
<b>Wellbore:</b>	PAC-MAN 36 FED COM 303H	<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	
17,400.0	90.00	179.73	9,720.0	-7,861.4	-890.9	11,734,792.84	2,124,893.86	32° 19' 5.015 N	103° 25' 52.578 W	
17,500.0	90.00	179.73	9,720.0	-7,961.4	-890.4	11,734,692.86	2,124,895.80	32° 19' 4.025 N	103° 25' 52.573 W	
17,600.0	90.00	179.73	9,720.0	-8,061.4	-889.9	11,734,592.88	2,124,897.74	32° 19' 3.035 N	103° 25' 52.567 W	
17,700.0	90.00	179.73	9,720.0	-8,161.4	-889.4	11,734,492.90	2,124,899.68	32° 19' 2.046 N	103° 25' 52.562 W	
17,800.0	90.00	179.73	9,720.0	-8,261.4	-889.0	11,734,392.92	2,124,901.62	32° 19' 1.056 N	103° 25' 52.556 W	
17,900.0	90.00	179.73	9,720.0	-8,361.4	-888.5	11,734,292.94	2,124,903.56	32° 19' 0.066 N	103° 25' 52.551 W	
18,000.0	90.00	179.73	9,720.0	-8,461.4	-888.0	11,734,192.95	2,124,905.50	32° 18' 59.077 N	103° 25' 52.545 W	
18,100.0	90.00	179.73	9,720.0	-8,561.4	-887.5	11,734,092.97	2,124,907.45	32° 18' 58.087 N	103° 25' 52.539 W	
18,200.0	90.00	179.73	9,720.0	-8,661.4	-887.1	11,733,992.99	2,124,909.39	32° 18' 57.098 N	103° 25' 52.534 W	
18,300.0	90.00	179.73	9,720.0	-8,761.4	-886.6	11,733,893.01	2,124,911.33	32° 18' 56.108 N	103° 25' 52.528 W	
18,400.0	90.00	179.73	9,720.0	-8,861.4	-886.1	11,733,793.03	2,124,913.27	32° 18' 55.118 N	103° 25' 52.523 W	
18,500.0	90.00	179.73	9,720.0	-8,961.4	-885.6	11,733,693.05	2,124,915.21	32° 18' 54.129 N	103° 25' 52.517 W	
18,600.0	90.00	179.73	9,720.0	-9,061.4	-885.2	11,733,593.07	2,124,917.15	32° 18' 53.139 N	103° 25' 52.512 W	
18,700.0	90.00	179.73	9,720.0	-9,161.4	-884.7	11,733,493.09	2,124,919.09	32° 18' 52.150 N	103° 25' 52.506 W	
18,800.0	90.00	179.73	9,720.0	-9,261.4	-884.2	11,733,393.11	2,124,921.03	32° 18' 51.160 N	103° 25' 52.501 W	
18,900.0	90.00	179.73	9,720.0	-9,361.4	-883.8	11,733,293.12	2,124,922.97	32° 18' 50.170 N	103° 25' 52.495 W	
19,000.0	90.00	179.73	9,720.0	-9,461.4	-883.3	11,733,193.14	2,124,924.91	32° 18' 49.181 N	103° 25' 52.489 W	
19,100.0	90.00	179.73	9,720.0	-9,561.4	-882.8	11,733,093.16	2,124,926.85	32° 18' 48.191 N	103° 25' 52.484 W	
19,200.0	90.00	179.73	9,720.0	-9,661.4	-882.3	11,732,993.18	2,124,928.80	32° 18' 47.201 N	103° 25' 52.478 W	
19,300.0	90.00	179.73	9,720.0	-9,761.4	-881.9	11,732,893.20	2,124,930.74	32° 18' 46.212 N	103° 25' 52.473 W	
19,400.0	90.00	179.73	9,720.0	-9,861.4	-881.4	11,732,793.22	2,124,932.68	32° 18' 45.222 N	103° 25' 52.467 W	
19,500.0	90.00	179.73	9,720.0	-9,961.4	-880.9	11,732,693.24	2,124,934.62	32° 18' 44.233 N	103° 25' 52.462 W	
19,551.5	90.00	179.73	9,720.0	-10,012.9	-880.7	11,732,641.77	2,124,935.62	32° 18' 43.723 N	103° 25' 52.459 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 - PAC MAN 36 - hit/miss target - plan hits target center - Shape - Point	0.00	0.00	9,720.0	-10,012.9	-880.7	11,732,641.77	2,124,935.62	32° 18' 43.723 N	103° 25' 52.459 W	
FTP - PAC MAN 36 FED - plan misses target center by 514.5usft at 9511.1usft MD (9433.6 TVD, -76.8 N, -862.6 E) - Circle (radius 50.0)	0.00	0.00	9,720.0	350.1	-883.9	11,743,003.58	2,124,780.26	32° 20' 26.278 N	103° 25' 52.501 W	

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

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

# 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.

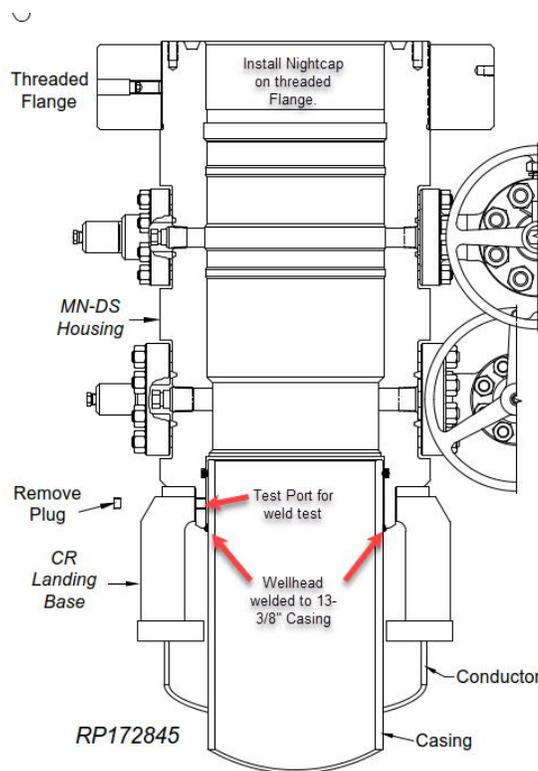


Illustration 1-1

- 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

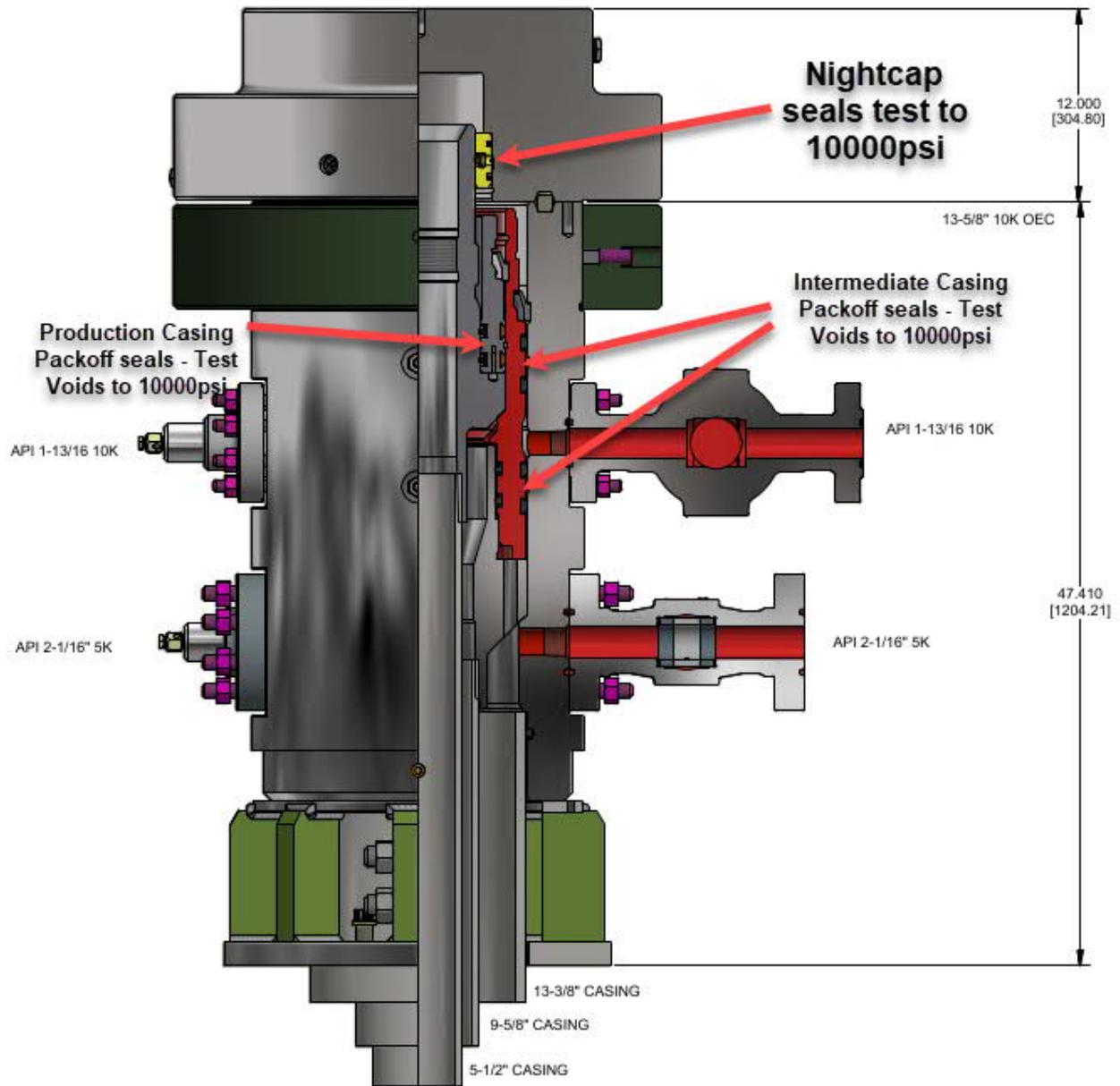
## ➤ Wolfcamp Formations

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.

<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.
<p>Pressure test with water at ambient temperature</p> <p style="text-align: center;">See attachment. ( 1 page )</p> <p>↑ 10 mm = 10 Min. → 10 mm = 20 MPa</p>			
COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with 4 1/16" 10K API b.w. Flange end	9251 9254	AISI 4130	A0579N
		AISI 4130	035608
<b>Not Designed For Well Testing</b>		<b>API Spec 16 C</b>	
<b>Temperature rate:"B"</b>			
All metal parts are flawless			
<b>WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.</b>			
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.			
COUNTRY OF ORIGIN HUNGARY/EU			
Date:	Inspector	Quality Control	
20. March 2014.			



### 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

## Pac-Man 36 Fed Com 303H

### Centennial Drilling Plan for 3-Casing String Bone Springs Formation

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

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