Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

HOBBS OCD
DEC 16 2019
RECEIVED

5. Lease Serial No.
NMNM096244

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.
DL 4 33 LOCH NESS FED COM P1
6H
326765

2. Name of Operator
CHEVRON USA INCORPORATED (4323)

9. API Well No.
30-025-46646

3a. Address
6301 Deauville Blvd. Midland TX 79706

3b. Phone No. *(include area code)*
(432)687-7866

10. Field and Pool, or Exploratory
~~Wildcat~~ RED TANK, BE, EAST (51687)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SESE / 264 FSL / 1247 FEL / LAT 32.414284 / LONG -103.572918
At proposed prod. zone NENE / 25 FNL / 550 FEL / LAT 32.442512 / LONG -103.570706

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 4 / T22S / R33E / NMP

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

12. County or Parish
EDDY Lea

13. State
NM

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

16. No of acres in lease
2360.39

17. Spacing Unit dedicated to this well
640

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
1880 feet

19. Proposed Depth
9520 feet / 19814 feet

20. BLM/BIA Bond No. in file
FED: CA0329

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3632 feet

22. Approximate date work will start*
05/01/2020

23. Estimated duration
146 days

24. Attachments

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

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

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Laura Becerra / Ph: (432)687-7665 | 04/30/2019 |

Title
Permitting Specialist

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Cody Layton / Ph: (575)234-5959 | 12/13/2019 |

| Title | Office |
|---|---|
| Assistant Field Manager Lands & Minerals | CARLSBAD |

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

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

GCP Rec 12/16/19

KZ 12/13/19

SL

APPROVED WITH CONDITIONS

Approval Date: 12/13/2019

(Continued on page 2)

*(Instructions on page 2)

## INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48( d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.



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## Additional Operator Remarks

### Location of Well

1. SHL: SESE / 264 FSL / 1247 FEL / TWSP: 22S / RANGE: 33E / SECTION: 4 / LAT: 32.414284 / LONG: -103.572918 ( TVD: 0 feet, MD: 0 feet )
   PPP: SESE / 100 FSL / 550 FEL / TWSP: 22S / RANGE: 33E / SECTION: 4 / LAT: 32.413831 / LONG: -103.57066 ( TVD: 9177 feet, MD: 9233 feet )
   BHL: NENE / 25 FNL / 550 FEL / TWSP: 21S / RANGE: 33E / SECTION: 33 / LAT: 32.442512 / LONG: -103.570706 ( TVD: 9520 feet, MD: 19814 feet )

## BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

## Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

# PECOS DISTRICT
# DRILLING CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | CHEVRON USA INCORPORATED |
| **LEASE NO.:** | NMNM096244 |
| **LOCATION:** | SECTION 4, T22S, R33E, NMPM |
| **COUNTY:** | EDDY |

| | |
|---|---|
| **WELL NAME & NO.:** | 4H - DL 4 33 LOCH NESS FED COM P1 |
| **SURFACE HOLE FOOTAGE:** | 264'/S & 1347'/E |
| **BOTTOM HOLE FOOTAGE** | 25'/N & 2310/'E |

| | |
|---|---|
| **WELL NAME & NO.:** | 5H - DL 4 33 LOCH NESS FED COM P1 |
| **SURFACE HOLE FOOTAGE:** | 264'/S & 1297'/E |
| **BOTTOM HOLE FOOTAGE** | 25'/N & 1430/'E |

| | |
|---|---|
| **WELL NAME & NO.:** | 6H - DL 4 33 LOCH NESS FED COM P1 |
| **SURFACE HOLE FOOTAGE:** | 264'/S & 1247'/E |
| **BOTTOM HOLE FOOTAGE** | 25'/N & 550/'E |

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

## A. HYDROGEN SULFIDE

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

## B. CASING

**Casing Design:**



**Approval Date: 12/13/2019**

1. The **13-3/8** inch surface casing shall be set at approximately **800** feet (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The **9-5/8** inch surface casing shall be set at approximately **4865** feet. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

    **Option 1 (Single Stage):**

    - 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.**

    **Option 2:**

    Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

    a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

    b. Second stage above DV tool:

    - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
      **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

- ❖ In **Secretary Potash Areas** if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

- ❖ 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:

**Option 1 (Single Stage):**

- Cement should tie-back at least **50 feet** on top of Capitan Reef top. 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.**

**Option 2:**

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement should tie-back at least **50 feet** on top of Capitan Reef top. 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.**

**Operator has proposed to pump down 9-5/8" X 5-1/2" annulus. Operator must run a CBL from TD of the 5-1/2" casing to surface. Submit results to BLM.**

## 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 Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.

- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

# GENERAL REQUIREMENTS

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

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

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

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

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

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

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

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

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

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

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

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

B. PRESSURE CONTROL

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

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

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

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

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

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

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

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

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

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

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

**NMK10232019**

## 1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:
Elevation: 3634 ft

| FORMATION | SUB-SEA TVD | TVD | MD | LITHOLOGIES | MIN. RESOURCES | PROD. FORMATION |
|---|---|---|---|---|---|---|
| Rustler | 2374 | 1,260 | 1,260 | ANHYD | N/A | |
| Castile | 94 | 3,540 | 3,575 | SALT | N/A | |
| Lamar | -1231 | 4,865 | 4,914 | LIMESTONE | N/A | |
| Bell Canyon | -1356 | 4,990 | 5,039 | SAND STONE | N/A | |
| Cherry Canyon | -2156 | 5,790 | 5,839 | SAND STONE | N/A | |
| Brushy Canyon | -3391 | 7,025 | 7,074 | SAND STONE | N/A | |
| Bone Spring | -5186 | 8,820 | 8,869 | SHALE/LIMESTONE | N/A | |
| Upper Avalon | -5331 | 8,965 | 9,014 | SHALE | Oil | |
| Upper Avalon Target 1 | -5861 | 9,520 | 19,814 | SHALE | Oil | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| WELLBORE LOCATIONS | SUB-SEA TVD | RKB TVD | MD |
|---|---|---|---|
| SHL | 3634 | - | |
| KOP | -5313 | 8,947 | 8,996 |
| FTP | -5543 | 9,177 | 9,233 |
| LTP | -5886 | 9,520 | 19,739 |

## 2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas, or other mineral bearing formations are expected to be encountered are as follows:

| Substance | Formation | Depth |
|---|---|---|
| Deepest Expected Base of Fresh Water | | 900 |
| Water | Cherry Canyon | 5,790 |
| Oil/Gas | Brushy Canyon | 7,025 |
| Oil/Gas | Avalon | 8,965 |
| | | |

All shows of fresh water and minerals will be reported and protected.

## 3. BOP EQUIPMENT

Chevron will have a minimum of a 5,000 psi rig stack (see proposed schematic) for drill out below surface casing. The stack will be tested as specified in the attached testing requirements. Batch drilling of the surface, intermediate, and production will take place. A full BOP test will be performed per hole section, unless approval from BLM is received otherwise. Flex choke hose will be used for all wells on the pad (see attached specs and variance). BOP test will be conducted by a third party.

Chevron requests a variance to use a FMC Technologies UH-S Multibowl wellhead, which will be run through the rig floor on surface casing. BOPE will be nippled up and tested after cementing surface casing. Subsequent tests will be performed as needed, not to exceed 30 days. The field report from FMC Technologies and BOP test information will be provided in a subsequent report at the end of the well. Please see the attached wellhead schematic. An installation manual has been placed on file with the BLM office and remains unchanged from previous submittal. All tests performed by third party.

4. **CASING PROGRAM**

a. The proposed casing program will be as follows:

| Purpose | From | To | Hole Size | Csg Size | Weight | Grade | Thread | Condition |
|---|---|---|---|---|---|---|---|---|
| Surface | 0' | 800' | 17-1/2" | 13-3/8" | 54.5 # | J-55 | BTC | New |
| Intermediate | 0' | 4,865' | 12-1/4" | 9-5/8" | 40.0 # | HCK-55 | LTC | New |
| Production | 0' | 19,814' | 8-1/2" | 5-1/2" | 20.0 # | P-110 | TXP BTC | New |

| Proposed | Hole Size | Casing Size | Top (MD) | Btm (MD) | Top (TVD) | Btm (TVD) | *Top (SSTVD)* | *Btm (SSTVD)* | Grade | Weight | Joint type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 17-1/2" | 13-3/8" | 0' | 800' | 0' | 800' | 3,634' | 2,834' | J-55 | 54.5 # | BTC |
| Intermediate | 12-1/4" | 9-5/8" | 0' | 4,914' | 0' | 4,865' | 3,634' | -1,231' | HCK-55 | 40.0 # | LTC |
| Production | 8-1/2" | 5-1/2" | 0' | 19,814' | 0' | 9,520' | 3,634' | -5,886' | P110 | 20.0 # | TXP-BTC |

b. **Casing design subject to revision based on geologic conditions encountered.**

c. **A "Worst Case" casing design for wells in a particular area is used below to calculate the Casing Safety Factors. If for any reason the casing design for a particular well requires setting casing deeper than the following "worst case" design, then the Casing Safety Factors will be recalculated & sent to the BLM prior to drilling.**

d. **Chevron will fill casing at a minimum of every 20 jts (~840') while running for intermediate and production casing in order to maintain collapse SF.**

**SF Calculations based on the following "Worst Case" casing design:**

| | | |
|---|---|---|
| **Surface Casing:** | 850' | ftTVD |
| **Intermediate Casing:** | 5,000' | ftTVD |
| **Production Casing:** | 22,000' | ftMD |

| Casing String | Min SF Burst | Min SF Collapse | Min SF Tension | Min SF Tri-Axial |
|---|---|---|---|---|
| Surface | 1.80 | 2.94 | 3.70 | 2.24 |
| Intermediate | 1.33 | 3.02 | 2.15 | 1.48 |
| Production | 1.11 | 2.51 | 2.47 | 1.33 |

**The following worst case load cases were considered for calculation of the above Min. Safety Factors:**

| **Burst Design** | Surf | Int | Prod |
|---|---|---|---|
| Pressure Test- Surface, Int, Prod Csg<br>P external: Mud weight above TOC, PP below<br>P internal: Test psi + next section heaviest mud in csg | X | X | X |
| Displace to Gas- Surf Csg<br>P external: Mud weight above TOC, PP below<br>P internal: Dry Gas from Next Csg Point | X | | |
| Gas over mud (60/40) - Int Csg<br>P external: Mud weight above TOC, PP below<br>P internal: 60% gas over 40% mud from hole TD PP | | X | |
| Stimulation (Frac) Pressures- Prod Csg<br>P external: Mud weight above TOC, PP below<br>P internal: Max inj pressure w/ heaviest injected fluid | | | X |
| Tubing leak- Prod Csg (packer at KOP)<br>P external: Mud weight above TOC, PP below<br>P internal: Leak just below surf, 8.45 ppg packer fluid | | | X |
| **Collapse Design** | Surf | Int | Prod |
| Full Evacuation<br>P external: Mud weight gradient<br>P internal: none | X | X | X |
| Cementing- Surf, Int, Prod Csg<br>P external: Wet cement<br>P internal: displacement fluid - water | X | X | X |
| **Tension Design** | Surf | Int | Prod |
| 100k lb overpull | X | X | X |

5. **CEMENTING PROGRAM**

| Slurry | Type | Top | Bottom | Sacks | Yield | Density | %Excess | Water | Volume | Additives |
|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | | | | (cu ft/sk) | (ppg) | Open Hole | gal/sk | cuft | |
| Tail | Class C | 0' | 800' | 1204 | 1.34 | 14.8 | 125 | 6.40 | 1613 | Extender, Antifoam, Retarder |
| Intermediate Csg | | | | | | | | | | |
| Lead | Class C | 0' | 3,914' | 958 | 2.56 | 11.9 | 100 | 14.66 | 2452 | Extender, Antifoam, Retarder, Viscosifier |
| Tail | Class C | 3,914' | 4,914' | 382 | 1.33 | 14.8 | 50 | 6.38 | 507 | Extender, Antifoam, Retarder, Viscosifier |
| Production | | | | | | | | | | |
| Lead 1 | Class C | 0' | 8,500' | 1006 | 2.46 | 11.9 | 50 | 14.05 | 2476 | Extender, Antifoam, Retarder, Viscosifier |
| Lead 2 | Class C | 8,500' | 18,814' | 1724 | 1.85 | 13.2 | 35 | 9.87 | 3190 | Extender, Antifoam, Retarder, Viscosifier |
| Tail | Acid Sol Class H | 18,814' | 19,814' | 115 | 2.19 | 15 | 10 | 9.54 | 252 | Extender, Antifoam, Retarder, Viscosifier |

1. Final cement volumes will be determined by caliper.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.
3. Production casing will have one solid body type centralizer on every joint in the lateral, then every other joint to KOP. Bowspring type centralizers will be run from KOP to intermediate casing and surface.

## 6. MUD PROGRAM

| From | To | Type | Weight | Viscosity | Filtrate | Notes |
|---|---|---|---|---|---|---|
| 0' | 800' | Fresh water mud | 8.3 - 9.0 | 28-30 | N/C | |
| 800' | 4,914' | Brine/OBM | 8.3 - 10 | 28-31 | 15-25 | |
| 4,914' | 19,814' | OBM | 8.3 - 10 | 10-15 | 15-25 | Due to wellbore stability, the mud program may exceed the MW windo w needed to maintain overbalance to pore pressure |

A closed system will be used consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill. Sanitary wastes will be contained in a chemical porta-toilet and then hauled to an approved sanitary landfill.

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations. And transportating of E&P waste will follow EPA regulations and accompanying manifests.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume. When abnormal pressures are anticipated -- a pit volume totalizer (PVT), stroke counter, and flow sensor will be used to detect volume changes indicating loss or gain of circulating fluid volume.

A weighting agent and lost circulating material (LCM) will be onsite to mitigate pressure or lost circulation as hole conditions dictate.

## 7. TESTING, LOGGING, AND CORING

The anticipated type and amount of testing, logging, and coring are as follows:

a. Drill stem tests are not planned.
b. The logging program will be as follows:

| TYPE | Logs | Interval | Timing |
|---|---|---|---|
| Mudlogs | 2 man mudlog | Surface casing shoe through prod hole TD | While drilling or circulating |
| LWD | MWD Gamma | Int. and Prod. Hole | While Drilling |

c. Conventional whole core samples are not planned.
d. A directional survey will be run.

## 8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. No abnormal pressure or temperatures are expected. Estimated BHP is: 4,429 psi
b. Hydrogen sulfide gas is not anticipated. An H2S Contingency plan is attached with this APD in the event that H2S is encountered

# $H_2S$ Preparedness and Contingency Plan Summary

Chevron

## Training

MCBU Drilling and Completions $H_2S$ training requirements are intended to define the minimum level of training required for employees, contractors and visitors to enter or perform work at MCBU Drilling and Completions locations that have known concentrations of $H_2S$.

### Awareness Level

Employees and visitors to MCBU Drilling and Completions locations that have known concentrations of $H_2S$, who are not required to perform work in $H_2S$ areas, will be provided with an awareness level of $H_2S$ training prior to entering any $H_2S$ areas. At a minimum, awareness level training will include:

1. Physical and chemical properties of $H_2S$
2. Health hazards of $H_2S$
3. Personal protective equipment
4. Information regarding potential sources of $H_2S$
5. Alarms and emergency evacuation procedures

Awareness level training will be developed and conducted by personnel who are qualified either by specific training, educational experience and/or work-related background.

### Advanced Level $H_2S$ Training

Employees and contractors required to work in areas that may contain $H_2S$ will be provided with Advanced Level $H_2S$ training prior to initial assignment. In addition to the Awareness Level requirements, Advanced Level $H_2S$ training will include:

1. $H_2S$ safe work practice procedures;
2. Emergency contingency plan procedures;
3. Methods to detect the presence or release of $H_2S$ (e.g., alarms, monitoring equipment), including hands-on training with direct reading and personal monitoring $H_2S$ equipment.
4. Basic overview of respiratory protective equipment suitable for use in $H_2S$ environments. Note: Employees who work at sites that participate in the Chevron Respirator User program will require separate respirator training as required by the MCBU Respiratory Protection Program;
5. Basic overview of emergency rescue techniques, first aid, CPR and medical evaluation procedures. Employees who may be required to perform "standby" duties are required to receive additional first aid and CPR training, which is not covered in the Advanced Level $H_2S$ training;
6. Proficiency examination covering all course material.

Advanced $H_2S$ training courses will be instructed by personnel who have successfully completed an appropriate $H_2S$ train-the-trainer development course (ANSI/ASSE Z390.1-2006) or who possess significant past experience through educational or work-related background.

# $H_2S$ Preparedness and Contingency Plan Summary

## $H_2S$ Training Certification

All employees and visitors will be issued an $H_2S$ training certification card (or certificate) upon successful completion of the appropriate $H_2S$ training course. Personnel working in an $H_2S$ environment will carry a current $H_2S$ training certification card as proof of having received the proper training on their person at all times.

## Briefing Area

A minimum of two briefing areas will be established in locations 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 upwind briefing areas for instructions.

## $H_2S$ Equipment

### Respiratory Protection

a) Six 30 minute SCBAs – 2 at each briefing area and 2 in the Safety Trailer.

b) Eight 5 minute EBAs – 5 in the dog house at the rig floor, 1 at the accumulator, 1 at the shale shakers and 1 at the mud pits.

### Visual Warning System

a) One color code sign, displaying all possible conditions, will be placed at the entrance to the location with a flag displaying the current condition.

b) Two windsocks will be on location, one on the dog house and one on the Drill Site Manager's Trailer.

## $H_2S$ Detection and Monitoring System

a) $H_2S$ monitoring system (sensor head, warning light and siren) placed throughout rig.

- Drilling Rig Locations: at a minimum, in the area of the Shale shaker, rig floor, and bell nipple.
- Workover Rig Locations: at a minimum, in the area of the Cellar, rig floor and circulating tanks or shale shaker.

## Well Control Equipment

a) Flare Line 150' from wellhead with igniter.

b) Choke manifold with a remotely operated choke.

c) Mud / gas separator

## Mud Program

In the event of drilling, completions, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater the following shall be considered:

1. Use of a degasser
2. Use of a zinc based mud treatment
3. Increasing mud weight

# Public Safety - Emergency Assistance

| Agency | Telephone Number |
|---|---|
| Eddy County Sheriff's Department | 575-887-7551 |
| Carlsbad Fire Department | 575-885-3125 |
| Carlsbad Medical Center | 575-887-4100 |
| Eddy County Emergency Management | 575-885-3581 |
| Poison Control Center | 800-222-1222 |

Schlumberger

Chevron

# Chevron DL 4 33 Loch Ness Fed Com P1 6H Rev1 kFc 25Apr19 Proposal
## Geodetic Report
(Def Plan)

| | | | |
|---|---|---|---|
| **Report Date:** | April 24, 2019 - 02:14 PM | **Survey / DLS Computation:** | Minimum Curvature / Lubinski |
| **Client:** | Chevron | **Vertical Section Azimuth:** | 359.510 ° (Grid North) |
| **Field:** | NM Lea County (NAD 27) | **Vertical Section Origin:** | 0.000 ft, 0.000 ft |
| **Structure / Slot:** | Chevron DL Loch Ness Fed Com P1 / 6H | **TVD Reference Datum:** | RKB = 26ft |
| **Well:** | DL 4 33 Loch Ness Fed Com P1 6H | **TVD Reference Elevation:** | 3660.000 ft above |
| **Borehole:** | DL 4 33 Loch Ness Fed Com P1 6H | **Seabed / Ground Elevation:** | 3632.000 ft above |
| **UWI / API#:** | Unknown / Unknown | **Magnetic Declination:** | 6.685 ° |
| **Survey Name:** | Chevron DL 4 33 Loch Ness Fed Com P1 6H Rev1 kFc 25Apr19 | **Total Gravity Field Strength:** | 998.4865mgn (9.80665 Based) |
| **Survey Date:** | March 30, 2019 | **Gravity Model:** | GARM |
| **Tort / AHD / DDI / ERD Ratio:** | 118.720 ° / 11078.283 ft / 6.437 / 1.164 | **Total Magnetic Field Strength:** | 48078.238 nT |
| **Coordinate Reference System:** | NAD27 New Mexico State Plane, Eastern Zone, US Feet | **Magnetic Dip Angle:** | 60.210 ° |
| **Location Lat / Long:** | N 32° 24' 50.98147", W 103° 34' 20.75457" | **Declination Date:** | March 30, 2019 |
| **Location Grid N/E Y/X:** | N 515222.000 ftUS, E 734812.000 ftUS | **Magnetic Declination Model:** | HDGM 2019 |
| **CRS Grid Convergence Angle:** | 0.4078 ° | **North Reference:** | Grid North |
| **Grid Scale Factor:** | 0.99997224 | **Grid Convergence Used:** | 0.4079 ° |
| **Version / Patch:** | 2.10.753.0 | **Total Corr Mag North->Grid North:** | 6.2770 ° |
| | | **Local Coord Referenced To:** | Well Head |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 100.00 | 0.00 | 110.74 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 200.00 | 0.00 | 110.74 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 300.00 | 0.00 | 110.74 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 400.00 | 0.00 | 110.74 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 500.00 | 0.00 | 110.74 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 600.00 | 0.00 | 110.74 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 700.00 | 0.00 | 110.74 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| 13 3/8" Casing | 800.00 | 0.00 | 110.74 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| Build 1.5°/100ft | 900.00 | 0.00 | 110.74 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 515222.00 | 734812.00 | N 32 24 50.98 | W 103 34 20.75 |
| | 1000.00 | 1.50 | 110.74 | 999.99 | -0.47 | -0.46 | 1.22 | 1.50 | 515221.54 | 734813.22 | N 32 24 50.98 | W 103 34 20.74 |
| | 1100.00 | 3.00 | 110.74 | 1099.91 | -1.90 | -1.85 | 4.90 | 1.50 | 515220.15 | 734816.90 | N 32 24 50.96 | W 103 34 20.70 |
| | 1200.00 | 4.50 | 110.74 | 1199.69 | -4.26 | -4.17 | 11.01 | 1.50 | 515217.83 | 734823.01 | N 32 24 50.94 | W 103 34 20.63 |
| *Rustler (RSLR)* | *1250.54* | *5.41* | *110.74* | *1250.00* | *-6.16* | *-6.02* | *15.90* | *1.50* | *515215.98* | *734827.90* | *N 32 24 50.92* | *W 103 34 20.57* |
| | 1300.00 | 6.00 | 110.74 | 1299.27 | -7.58 | -7.41 | 19.57 | 1.50 | 515214.59 | 734831.57 | N 32 24 50.91 | W 103 34 20.53 |
| | 1400.00 | 7.50 | 110.74 | 1398.57 | -11.63 | -11.37 | 30.56 | 1.50 | 515210.43 | 734842.56 | N 32 24 50.88 | W 103 34 20.40 |
| | 1500.00 | 9.00 | 110.74 | 1497.54 | -17.03 | -16.65 | 43.98 | 1.50 | 515205.35 | 734855.98 | N 32 24 50.81 | W 103 34 20.24 |
| Hold | 1583.34 | 10.25 | 110.74 | 1579.70 | -22.07 | -21.58 | 57.01 | 1.50 | 515200.42 | 734869.01 | N 32 24 50.78 | W 103 34 20.09 |
| | 1600.00 | 10.25 | 110.74 | 1596.09 | -23.14 | -22.63 | 59.79 | 0.00 | 515199.37 | 734871.78 | N 32 24 50.75 | W 103 34 20.06 |
| | 1700.00 | 10.25 | 110.74 | 1694.50 | -29.59 | -28.93 | 76.43 | 0.00 | 515193.07 | 734888.42 | N 32 24 50.69 | W 103 34 19.87 |
| | 1800.00 | 10.25 | 110.74 | 1792.90 | -36.03 | -35.23 | 93.07 | 0.00 | 515186.77 | 734905.07 | N 32 24 50.63 | W 103 34 19.67 |
| | 1900.00 | 10.25 | 110.74 | 1891.31 | -42.47 | -41.53 | 109.71 | 0.00 | 515180.47 | 734921.71 | N 32 24 50.56 | W 103 34 19.48 |
| | 2000.00 | 10.25 | 110.74 | 1989.71 | -48.91 | -47.83 | 126.35 | 0.00 | 515174.17 | 734938.35 | N 32 24 50.50 | W 103 34 19.28 |
| | 2100.00 | 10.25 | 110.74 | 2088.12 | -55.35 | -54.13 | 142.99 | 0.00 | 515167.87 | 734954.99 | N 32 24 50.44 | W 103 34 19.09 |
| | 2200.00 | 10.25 | 110.74 | 2186.52 | -61.80 | -60.43 | 159.64 | 0.00 | 515161.57 | 734971.63 | N 32 24 50.37 | W 103 34 18.90 |
| | 2300.00 | 10.25 | 110.74 | 2284.92 | -68.24 | -66.73 | 176.28 | 0.00 | 515155.27 | 734988.27 | N 32 24 50.31 | W 103 34 18.70 |
| | 2400.00 | 10.25 | 110.74 | 2383.33 | -74.68 | -73.03 | 192.92 | 0.00 | 515148.97 | 735004.91 | N 32 24 50.25 | W 103 34 18.51 |
| | 2500.00 | 10.25 | 110.74 | 2481.73 | -81.12 | -79.33 | 209.56 | 0.00 | 515142.67 | 735021.56 | N 32 24 50.18 | W 103 34 18.32 |
| | 2600.00 | 10.25 | 110.74 | 2580.14 | -87.57 | -85.64 | 226.20 | 0.00 | 515136.37 | 735038.20 | N 32 24 50.12 | W 103 34 18.12 |
| | 2700.00 | 10.25 | 110.74 | 2678.54 | -94.01 | -91.94 | 242.85 | 0.00 | 515130.07 | 735054.84 | N 32 24 50.05 | W 103 34 17.93 |
| | 2800.00 | 10.25 | 110.74 | 2776.94 | -100.45 | -98.24 | 259.49 | 0.00 | 515123.77 | 735071.48 | N 32 24 49.99 | W 103 34 17.74 |
| | 2900.00 | 10.25 | 110.74 | 2875.35 | -106.89 | -104.54 | 276.13 | 0.00 | 515117.47 | 735088.12 | N 32 24 49.93 | W 103 34 17.54 |
| | 3000.00 | 10.25 | 110.74 | 2973.75 | -113.34 | -110.84 | 292.77 | 0.00 | 515111.17 | 735104.76 | N 32 24 49.86 | W 103 34 17.35 |
| | 3100.00 | 10.25 | 110.74 | 3072.16 | -119.78 | -117.14 | 309.41 | 0.00 | 515104.87 | 735121.40 | N 32 24 49.80 | W 103 34 17.16 |
| | 3200.00 | 10.25 | 110.74 | 3170.56 | -126.22 | -123.44 | 326.05 | 0.00 | 515098.57 | 735138.04 | N 32 24 49.74 | W 103 34 16.96 |
| | 3300.00 | 10.25 | 110.74 | 3268.96 | -132.66 | -129.74 | 342.70 | 0.00 | 515092.27 | 735154.69 | N 32 24 49.67 | W 103 34 16.77 |
| | 3400.00 | 10.25 | 110.74 | 3367.37 | -139.10 | -136.04 | 359.34 | 0.00 | 515085.97 | 735171.33 | N 32 24 49.61 | W 103 34 16.57 |
| | 3500.00 | 10.25 | 110.74 | 3465.77 | -145.55 | -142.34 | 375.98 | 0.00 | 515079.67 | 735187.97 | N 32 24 49.55 | W 103 34 16.38 |
| *Castile (CSTL)* | *3575.43* | *10.25* | *110.74* | *3540.00* | *-150.41* | *-147.09* | *388.53* | *0.00* | *515074.92* | *735200.52* | *N 32 24 49.50* | *W 103 34 16.23* |
| | 3600.00 | 10.25 | 110.74 | 3564.18 | -151.99 | -148.64 | 392.62 | 0.00 | 515073.37 | 735204.61 | N 32 24 49.48 | W 103 34 16.19 |
| | 3700.00 | 10.25 | 110.74 | 3662.58 | -158.43 | -154.94 | 409.26 | 0.00 | 515067.07 | 735221.25 | N 32 24 49.42 | W 103 34 15.99 |
| | 3800.00 | 10.25 | 110.74 | 3760.99 | -164.87 | -161.24 | 425.91 | 0.00 | 515060.77 | 735237.89 | N 32 24 49.36 | W 103 34 15.80 |
| | 3900.00 | 10.25 | 110.74 | 3859.39 | -171.32 | -167.54 | 442.55 | 0.00 | 515054.47 | 735254.53 | N 32 24 49.29 | W 103 34 15.61 |
| | 4000.00 | 10.25 | 110.74 | 3957.79 | -177.76 | -173.84 | 459.19 | 0.00 | 515048.17 | 735271.18 | N 32 24 49.23 | W 103 34 15.41 |
| | 4100.00 | 10.25 | 110.74 | 4056.20 | -184.20 | -180.14 | 475.83 | 0.00 | 515041.87 | 735287.82 | N 32 24 49.17 | W 103 34 15.22 |
| Drop 1.5°/100ft | 4198.48 | 10.25 | 110.74 | 4153.14 | -190.42 | -186.22 | 491.89 | 0.00 | 515035.79 | 735303.87 | N 32 24 49.10 | W 103 34 15.03 |
| | 4200.00 | 10.20 | 110.74 | 4154.60 | -190.64 | -186.44 | 492.47 | 1.50 | 515035.57 | 735304.46 | N 32 24 49.10 | W 103 34 15.03 |
| | 4300.00 | 8.70 | 110.74 | 4253.24 | -198.58 | -192.25 | 507.82 | 1.50 | 515029.76 | 735319.81 | N 32 24 49.04 | W 103 34 14.85 |
| | 4400.00 | 7.20 | 110.74 | 4352.28 | -201.59 | -197.14 | 520.75 | 1.50 | 515024.88 | 735332.74 | N 32 24 48.99 | W 103 34 14.70 |
| | 4500.00 | 5.70 | 110.74 | 4451.64 | -205.68 | -201.12 | 531.25 | 1.50 | 515020.89 | 735343.24 | N 32 24 48.95 | W 103 34 14.57 |
| | 4600.00 | 4.20 | 110.74 | 4551.27 | -208.78 | -204.17 | 539.32 | 1.50 | 515017.83 | 735351.30 | N 32 24 48.92 | W 103 34 14.48 |
| | 4700.00 | 2.70 | 110.74 | 4651.08 | -210.95 | -206.30 | 544.94 | 1.50 | 515015.70 | 735356.93 | N 32 24 48.90 | W 103 34 14.42 |
| | 4800.00 | 1.20 | 110.74 | 4751.02 | -212.18 | -207.50 | 548.12 | 1.50 | 515014.50 | 735360.10 | N 32 24 48.89 | W 103 34 14.38 |
| Hold Vertical | 4879.82 | 0.00 | 110.74 | 4830.84 | -212.49 | -207.80 | 548.90 | 1.50 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 4900.00 | 0.00 | 110.74 | 4851.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| *9 5/8" Casing* | *4913.98* | *0.00* | *110.74* | *4865.00* | *-212.49* | *-207.80* | *548.90* | *0.00* | *515014.21* | *735360.88* | *N 32 24 48.89* | *W 103 34 14.37* |
| | 5000.00 | 0.00 | 110.74 | 4951.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| *Bell Canyon (BLCN)* | *5038.98* | *0.00* | *110.74* | *4990.00* | *-212.49* | *-207.80* | *548.90* | *0.00* | *515014.21* | *735360.88* | *N 32 24 48.89* | *W 103 34 14.37* |
| | 5100.00 | 0.00 | 110.74 | 5051.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5200.00 | 0.00 | 110.74 | 5151.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5300.00 | 0.00 | 110.74 | 5251.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5400.00 | 0.00 | 110.74 | 5351.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5500.00 | 0.00 | 110.74 | 5451.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5600.00 | 0.00 | 110.74 | 5551.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5700.00 | 0.00 | 110.74 | 5651.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 5800.00 | 0.00 | 110.74 | 5751.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| *Cherry Canyon (CRCN)* | *5838.98* | *0.00* | *110.74* | *5790.00* | *-212.49* | *-207.80* | *548.90* | *0.00* | *515014.21* | *735360.88* | *N 32 24 48.89* | *W 103 34 14.37* |
| | 5900.00 | 0.00 | 110.74 | 5851.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6000.00 | 0.00 | 110.74 | 5951.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6100.00 | 0.00 | 110.74 | 6051.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6200.00 | 0.00 | 110.74 | 6151.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6300.00 | 0.00 | 110.74 | 6251.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6400.00 | 0.00 | 110.74 | 6351.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6500.00 | 0.00 | 110.74 | 6451.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6600.00 | 0.00 | 110.74 | 6551.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6700.00 | 0.00 | 110.74 | 6651.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6800.00 | 0.00 | 110.74 | 6751.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 6900.00 | 0.00 | 110.74 | 6851.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7000.00 | 0.00 | 110.74 | 6951.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| *Brushy Canyon (BCN)* | *7073.98* | *0.00* | *110.74* | *7025.00* | *-212.49* | *-207.80* | *548.90* | *0.00* | *515014.21* | *735360.88* | *N 32 24 48.89* | *W 103 34 14.37* |
| | 7100.00 | 0.00 | 110.74 | 7051.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7200.00 | 0.00 | 110.74 | 7151.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7300.00 | 0.00 | 110.74 | 7251.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7400.00 | 0.00 | 110.74 | 7351.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7500.00 | 0.00 | 110.74 | 7451.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7600.00 | 0.00 | 110.74 | 7551.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7700.00 | 0.00 | 110.74 | 7651.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7800.00 | 0.00 | 110.74 | 7751.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 7900.00 | 0.00 | 110.74 | 7851.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 8000.00 | 0.00 | 110.74 | 7951.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 8100.00 | 0.00 | 110.74 | 8051.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 8200.00 | 0.00 | 110.74 | 8151.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 8300.00 | 0.00 | 110.74 | 8251.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |
| | 8400.00 | 0.00 | 110.74 | 8351.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.89 | W 103 34 14.37 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8500.00 | 0.00 | 110.74 | 8451.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| | 8600.00 | 0.00 | 110.74 | 8551.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| | 8700.00 | 0.00 | 110.74 | 8651.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| | 8800.00 | 0.00 | 110.74 | 8751.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| *Bone Spring (BSGL)* | *8888.98* | *0.00* | *110.74* | *8820.00* | *-212.49* | *-207.80* | *548.90* | *0.00* | *515014.21* | *735360.88* | *N 32 24 48.69* | *W 103 34 14.37* |
| | 8900.00 | 0.00 | 110.74 | 8851.02 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| KOP, Build 10°/100ft | 8996.02 | 0.00 | 110.74 | 8947.04 | -212.49 | -207.80 | 548.90 | 0.00 | 515014.21 | 735360.88 | N 32 24 48.69 | W 103 34 14.37 |
| | 9000.00 | 0.40 | 7.62 | 8951.02 | -212.47 | -207.79 | 548.90 | 10.00 | 515014.22 | 735360.89 | N 32 24 48.69 | W 103 34 14.37 |
| *Upper Avalon (AVN)* | *9013.99* | *1.80* | *7.62* | *8965.00* | *-212.21* | *-207.52* | *548.94* | *10.00* | *515014.49* | *735360.92* | *N 32 24 48.69* | *W 103 34 14.37* |
| | 9100.00 | 10.40 | 7.62 | 9050.45 | -203.17 | -198.47 | 550.15 | 10.00 | 515023.53 | 735362.13 | N 32 24 48.98 | W 103 34 14.35 |
| | 9200.00 | 20.40 | 7.62 | 9148.74 | -176.92 | -172.19 | 553.68 | 10.00 | 515049.81 | 735385.65 | N 32 24 49.24 | W 103 34 14.31 |
| *FTP Cross* | *9233.00* | *23.70* | *7.62* | *9177.32* | *-164.66* | *-159.91* | *555.31* | *10.00* | *515062.09* | *735397.29* | *N 32 24 49.36* | *W 103 34 14.29* |
| | 9300.00 | 30.40 | 7.62 | 9236.96 | -134.51 | -129.73 | 559.34 | 10.00 | 515092.27 | 735371.33 | N 32 24 49.66 | W 103 34 14.24 |
| | 9400.00 | 40.40 | 7.62 | 9318.37 | -77.24 | -72.39 | 567.02 | 10.00 | 515149.61 | 735379.00 | N 32 24 50.23 | W 103 34 14.15 |
| | 9500.00 | 50.40 | 7.62 | 9388.50 | -6.84 | -1.91 | 576.45 | 10.00 | 515220.09 | 735388.43 | N 32 24 50.92 | W 103 34 14.03 |
| | 9600.00 | 60.40 | 7.62 | 9445.21 | 74.54 | 79.57 | 587.35 | 10.00 | 515301.57 | 735399.33 | N 32 24 51.73 | W 103 34 13.90 |
| | 9700.00 | 70.40 | 7.62 | 9486.79 | 164.44 | 169.57 | 599.39 | 10.00 | 515391.57 | 735411.37 | N 32 24 52.62 | W 103 34 13.75 |
| | 9800.00 | 80.40 | 7.62 | 9511.97 | 260.12 | 265.37 | 612.21 | 10.00 | 515487.38 | 735424.19 | N 32 24 53.56 | W 103 34 13.59 |
| Landing Point | 9896.02 | 90.00 | 7.62 | 9520.00 | 354.74 | 360.10 | 624.88 | 10.00 | 515582.08 | 735436.86 | N 32 24 54.50 | W 103 34 13.44 |
| | 9900.00 | 90.00 | 7.62 | 9520.00 | 358.68 | 364.04 | 625.41 | 0.00 | 515586.03 | 735437.39 | N 32 24 54.54 | W 103 34 13.43 |
| | 10000.00 | 90.00 | 7.62 | 9520.00 | 457.68 | 463.16 | 638.67 | 0.00 | 515685.14 | 735450.65 | N 32 24 55.52 | W 103 34 13.27 |
| | 10100.00 | 90.00 | 7.62 | 9520.00 | 556.68 | 562.27 | 651.93 | 0.00 | 515784.26 | 735463.91 | N 32 24 56.50 | W 103 34 13.10 |
| Turn 2°/100ft | 10189.24 | 90.00 | 7.62 | 9520.00 | 654.92 | 660.64 | 665.09 | 0.00 | 515882.62 | 735477.07 | N 32 24 57.47 | W 103 34 12.94 |
| | 10200.00 | 90.00 | 7.61 | 9520.00 | 655.68 | 661.39 | 665.19 | 2.00 | 515883.37 | 735477.17 | N 32 24 57.48 | W 103 34 12.94 |
| | 10300.00 | 90.00 | 5.61 | 9520.00 | 754.91 | 760.72 | 676.69 | 2.00 | 515982.70 | 735488.67 | N 32 24 58.46 | W 103 34 12.80 |
| | 10400.00 | 90.00 | 3.61 | 9520.00 | 854.51 | 860.39 | 684.72 | 2.00 | 516082.37 | 735496.70 | N 32 24 59.45 | W 103 34 12.70 |
| | 10500.00 | 90.00 | 1.61 | 9520.00 | 954.36 | 960.28 | 689.27 | 2.00 | 516182.26 | 735501.25 | N 32 25 0.43 | W 103 34 12.63 |
| Upper Avalon Target 1 | 10589.26 | 90.00 | 359.62 | 9520.00 | 1053.59 | 1059.54 | 690.33 | 2.00 | 516281.51 | 735502.31 | N 32 25 1.42 | W 103 34 12.61 |
| | 10600.00 | 90.00 | 359.62 | 9520.00 | 1054.33 | 1060.27 | 690.32 | 0.00 | 516282.24 | 735502.30 | N 32 25 1.42 | W 103 34 12.61 |
| | 10700.00 | 90.00 | 359.62 | 9520.00 | 1154.33 | 1160.27 | 689.66 | 0.00 | 516382.24 | 735501.64 | N 32 25 2.41 | W 103 34 12.61 |
| | 10800.00 | 90.00 | 359.62 | 9520.00 | 1254.33 | 1260.27 | 689.00 | 0.00 | 516482.23 | 735500.98 | N 32 25 3.40 | W 103 34 12.61 |
| | 10900.00 | 90.00 | 359.62 | 9520.00 | 1354.33 | 1360.27 | 688.33 | 0.00 | 516582.23 | 735500.31 | N 32 25 4.39 | W 103 34 12.61 |
| | 11000.00 | 90.00 | 359.62 | 9520.00 | 1454.33 | 1460.27 | 687.67 | 0.00 | 516682.22 | 735499.65 | N 32 25 5.38 | W 103 34 12.61 |
| | 11100.00 | 90.00 | 359.62 | 9520.00 | 1554.33 | 1560.26 | 687.01 | 0.00 | 516782.22 | 735498.99 | N 32 25 6.37 | W 103 34 12.61 |
| | 11200.00 | 90.00 | 359.62 | 9520.00 | 1654.33 | 1660.26 | 686.34 | 0.00 | 516882.21 | 735498.32 | N 32 25 7.36 | W 103 34 12.61 |
| | 11300.00 | 90.00 | 359.62 | 9520.00 | 1754.33 | 1760.26 | 685.68 | 0.00 | 516982.21 | 735497.66 | N 32 25 8.35 | W 103 34 12.61 |
| | 11400.00 | 90.00 | 359.62 | 9520.00 | 1854.33 | 1860.26 | 685.02 | 0.00 | 517082.20 | 735497.00 | N 32 25 9.34 | W 103 34 12.61 |
| | 11500.00 | 90.00 | 359.62 | 9520.00 | 1954.33 | 1960.25 | 684.35 | 0.00 | 517182.20 | 735496.33 | N 32 25 10.33 | W 103 34 12.61 |
| | 11600.00 | 90.00 | 359.62 | 9520.00 | 2054.33 | 2060.25 | 683.69 | 0.00 | 517282.19 | 735495.67 | N 32 25 11.32 | W 103 34 12.61 |
| | 11700.00 | 90.00 | 359.62 | 9520.00 | 2154.33 | 2160.25 | 683.03 | 0.00 | 517382.19 | 735495.01 | N 32 25 12.31 | W 103 34 12.61 |
| | 11800.00 | 90.00 | 359.62 | 9520.00 | 2254.33 | 2260.25 | 682.36 | 0.00 | 517482.18 | 735494.34 | N 32 25 13.30 | W 103 34 12.61 |
| | 11900.00 | 90.00 | 359.62 | 9520.00 | 2354.33 | 2360.25 | 681.70 | 0.00 | 517582.18 | 735493.68 | N 32 25 14.29 | W 103 34 12.61 |
| | 12000.00 | 90.00 | 359.62 | 9520.00 | 2454.33 | 2460.24 | 681.04 | 0.00 | 517682.17 | 735493.02 | N 32 25 15.28 | W 103 34 12.61 |
| | 12100.00 | 90.00 | 359.62 | 9520.00 | 2554.33 | 2560.24 | 680.37 | 0.00 | 517782.17 | 735492.35 | N 32 25 16.27 | W 103 34 12.61 |
| | 12200.00 | 90.00 | 359.62 | 9520.00 | 2654.33 | 2660.24 | 679.71 | 0.00 | 517882.16 | 735491.69 | N 32 25 17.26 | W 103 34 12.60 |
| | 12300.00 | 90.00 | 359.62 | 9520.00 | 2754.33 | 2760.24 | 679.05 | 0.00 | 517982.15 | 735491.03 | N 32 25 18.25 | W 103 34 12.60 |
| | 12400.00 | 90.00 | 359.62 | 9520.00 | 2854.33 | 2860.23 | 678.38 | 0.00 | 518082.15 | 735490.36 | N 32 25 19.24 | W 103 34 12.60 |
| | 12500.00 | 90.00 | 359.62 | 9520.00 | 2954.33 | 2960.23 | 677.72 | 0.00 | 518182.14 | 735489.70 | N 32 25 20.22 | W 103 34 12.60 |
| | 12600.00 | 90.00 | 359.62 | 9520.00 | 3054.33 | 3060.23 | 677.06 | 0.00 | 518282.14 | 735489.04 | N 32 25 21.21 | W 103 34 12.60 |
| | 12700.00 | 90.00 | 359.62 | 9520.00 | 3154.33 | 3160.23 | 676.40 | 0.00 | 518382.13 | 735488.38 | N 32 25 22.20 | W 103 34 12.60 |
| | 12800.00 | 90.00 | 359.62 | 9520.00 | 3254.33 | 3260.23 | 675.73 | 0.00 | 518482.13 | 735487.71 | N 32 25 23.19 | W 103 34 12.60 |
| | 12900.00 | 90.00 | 359.62 | 9520.00 | 3354.33 | 3360.22 | 675.07 | 0.00 | 518582.12 | 735487.05 | N 32 25 24.18 | W 103 34 12.60 |
| | 13000.00 | 90.00 | 359.62 | 9520.00 | 3454.33 | 3460.22 | 674.41 | 0.00 | 518682.12 | 735486.39 | N 32 25 25.17 | W 103 34 12.60 |
| | 13100.00 | 90.00 | 359.62 | 9520.00 | 3554.33 | 3560.22 | 673.74 | 0.00 | 518782.11 | 735485.72 | N 32 25 26.16 | W 103 34 12.60 |
| | 13200.00 | 90.00 | 359.62 | 9520.00 | 3654.33 | 3660.22 | 673.08 | 0.00 | 518882.11 | 735485.06 | N 32 25 27.15 | W 103 34 12.60 |
| | 13300.00 | 90.00 | 359.62 | 9520.00 | 3754.33 | 3760.21 | 672.42 | 0.00 | 518982.10 | 735484.40 | N 32 25 28.14 | W 103 34 12.60 |
| | 13400.00 | 90.00 | 359.62 | 9520.00 | 3854.33 | 3860.21 | 671.75 | 0.00 | 519082.10 | 735483.73 | N 32 25 29.13 | W 103 34 12.60 |
| | 13500.00 | 90.00 | 359.62 | 9520.00 | 3954.33 | 3960.21 | 671.09 | 0.00 | 519182.09 | 735483.07 | N 32 25 30.12 | W 103 34 12.60 |
| | 13600.00 | 90.00 | 359.62 | 9520.00 | 4054.33 | 4060.21 | 670.43 | 0.00 | 519282.09 | 735482.41 | N 32 25 31.11 | W 103 34 12.60 |
| | 13700.00 | 90.00 | 359.62 | 9520.00 | 4154.33 | 4160.21 | 669.76 | 0.00 | 519382.08 | 735481.74 | N 32 25 32.10 | W 103 34 12.60 |
| | 13800.00 | 90.00 | 359.62 | 9520.00 | 4254.33 | 4260.20 | 669.10 | 0.00 | 519482.08 | 735481.08 | N 32 25 33.09 | W 103 34 12.60 |
| | 13900.00 | 90.00 | 359.62 | 9520.00 | 4354.33 | 4360.20 | 668.44 | 0.00 | 519582.07 | 735480.42 | N 32 25 34.08 | W 103 34 12.59 |
| | 14000.00 | 90.00 | 359.62 | 9520.00 | 4454.33 | 4460.20 | 667.77 | 0.00 | 519682.07 | 735479.75 | N 32 25 35.07 | W 103 34 12.59 |
| | 14100.00 | 90.00 | 359.62 | 9520.00 | 4554.33 | 4560.20 | 667.11 | 0.00 | 519782.06 | 735479.09 | N 32 25 36.06 | W 103 34 12.59 |
| | 14200.00 | 90.00 | 359.62 | 9520.00 | 4654.33 | 4660.20 | 666.45 | 0.00 | 519882.06 | 735478.43 | N 32 25 37.05 | W 103 34 12.59 |
| | 14300.00 | 90.00 | 359.62 | 9520.00 | 4754.33 | 4760.19 | 665.78 | 0.00 | 519982.05 | 735477.76 | N 32 25 38.04 | W 103 34 12.59 |
| | 14400.00 | 90.00 | 359.62 | 9520.00 | 4854.32 | 4860.19 | 665.12 | 0.00 | 520082.05 | 735477.10 | N 32 25 39.03 | W 103 34 12.59 |
| | 14500.00 | 90.00 | 359.62 | 9520.00 | 4954.32 | 4960.19 | 664.46 | 0.00 | 520182.04 | 735476.44 | N 32 25 40.02 | W 103 34 12.59 |
| Upper Avalon Target 1 | 14565.96 | 90.00 | 359.62 | 9520.00 | 5020.29 | 5026.15 | 664.02 | 0.00 | 520248.00 | 735476.00 | N 32 25 40.67 | W 103 34 12.59 |
| Upper Avalon Target 1 | 14576.95 | 90.00 | 359.40 | 9520.00 | 5031.28 | 5037.14 | 663.83 | 2.00 | 520258.99 | 735475.91 | N 32 25 40.78 | W 103 34 12.59 |
| | 14600.00 | 90.00 | 359.40 | 9520.00 | 5054.32 | 5060.19 | 663.68 | 0.00 | 520282.03 | 735475.68 | N 32 25 41.00 | W 103 34 12.59 |
| | 14700.00 | 90.00 | 359.40 | 9520.00 | 5154.32 | 5160.18 | 662.84 | 0.00 | 520382.03 | 735474.82 | N 32 25 41.99 | W 103 34 12.60 |
| | 14800.00 | 90.00 | 359.40 | 9520.00 | 5254.32 | 5260.17 | 661.59 | 0.00 | 520482.02 | 735473.57 | N 32 25 42.98 | W 103 34 12.60 |
| | 14900.00 | 90.00 | 359.40 | 9520.00 | 5354.32 | 5360.17 | 660.54 | 0.00 | 520582.01 | 735472.52 | N 32 25 43.97 | W 103 34 12.60 |
| | 15000.00 | 90.00 | 359.40 | 9520.00 | 5454.32 | 5460.16 | 659.50 | 0.00 | 520682.00 | 735471.48 | N 32 25 44.96 | W 103 34 12.61 |
| | 15100.00 | 90.00 | 359.40 | 9520.00 | 5554.32 | 5560.16 | 658.45 | 0.00 | 520781.99 | 735470.43 | N 32 25 45.95 | W 103 34 12.61 |
| | 15200.00 | 90.00 | 359.40 | 9520.00 | 5654.32 | 5660.15 | 657.40 | 0.00 | 520881.98 | 735469.38 | N 32 25 46.94 | W 103 34 12.61 |
| | 15300.00 | 90.00 | 359.40 | 9520.00 | 5754.32 | 5760.15 | 656.36 | 0.00 | 520981.98 | 735468.34 | N 32 25 47.93 | W 103 34 12.62 |
| | 15400.00 | 90.00 | 359.40 | 9520.00 | 5854.32 | 5860.14 | 655.31 | 0.00 | 521081.97 | 735467.29 | N 32 25 48.92 | W 103 34 12.62 |
| | 15500.00 | 90.00 | 359.40 | 9520.00 | 5954.32 | 5960.14 | 654.26 | 0.00 | 521181.96 | 735466.24 | N 32 25 49.91 | W 103 34 12.63 |
| | 15600.00 | 90.00 | 359.40 | 9520.00 | 6054.32 | 6060.13 | 653.22 | 0.00 | 521281.95 | 735465.20 | N 32 25 50.90 | W 103 34 12.63 |
| | 15700.00 | 90.00 | 359.40 | 9520.00 | 6154.32 | 6160.13 | 652.17 | 0.00 | 521381.94 | 735464.15 | N 32 25 51.89 | W 103 34 12.63 |
| | 15800.00 | 90.00 | 359.40 | 9520.00 | 6254.32 | 6260.12 | 651.12 | 0.00 | 521481.93 | 735463.10 | N 32 25 52.88 | W 103 34 12.64 |
| | 15900.00 | 90.00 | 359.40 | 9520.00 | 6354.32 | 6360.11 | 650.08 | 0.00 | 521581.92 | 735462.06 | N 32 25 53.87 | W 103 34 12.64 |
| | 16000.00 | 90.00 | 359.40 | 9520.00 | 6454.32 | 6460.11 | 649.03 | 0.00 | 521681.92 | 735461.01 | N 32 25 54.86 | W 103 34 12.65 |
| | 16100.00 | 90.00 | 359.40 | 9520.00 | 6554.32 | 6560.10 | 647.98 | 0.00 | 521781.91 | 735459.96 | N 32 25 55.85 | W 103 34 12.65 |
| | 16200.00 | 90.00 | 359.40 | 9520.00 | 6654.32 | 6660.10 | 646.94 | 0.00 | 521881.90 | 735458.92 | N 32 25 56.84 | W 103 34 12.65 |
| | 16300.00 | 90.00 | 359.40 | 9520.00 | 6754.32 | 6760.09 | 645.89 | 0.00 | 521981.89 | 735457.87 | N 32 25 57.83 | W 103 34 12.66 |
| | 16400.00 | 90.00 | 359.40 | 9520.00 | 6854.32 | 6860.09 | 644.84 | 0.00 | 522081.88 | 735456.82 | N 32 25 58.82 | W 103 34 12.66 |
| | 16500.00 | 90.00 | 359.40 | 9520.00 | 6954.32 | 6960.08 | 643.80 | 0.00 | 522181.87 | 735455.78 | N 32 25 59.81 | W 103 34 12.67 |
| | 16600.00 | 90.00 | 359.40 | 9520.00 | 7054.32 | 7060.08 | 642.75 | 0.00 | 522281.87 | 735454.73 | N 32 26 0.79 | W 103 34 12.67 |
| | 16700.00 | 90.00 | 359.40 | 9520.00 | 7154.32 | 7160.07 | 641.70 | 0.00 | 522381.86 | 735453.68 | N 32 26 1.78 | W 103 34 12.67 |
| | 16800.00 | 90.00 | 359.40 | 9520.00 | 7254.32 | 7260.06 | 640.65 | 0.00 | 522481.85 | 735452.64 | N 32 26 2.77 | W 103 34 12.68 |
| | 16900.00 | 90.00 | 359.40 | 9520.00 | 7354.32 | 7360.06 | 639.61 | 0.00 | 522581.84 | 735451.59 | N 32 26 3.76 | W 103 34 12.68 |
| | 17000.00 | 90.00 | 359.40 | 9520.00 | 7454.32 | 7460.05 | 638.56 | 0.00 | 522681.83 | 735450.54 | N 32 26 4.75 | W 103 34 12.68 |
| | 17100.00 | 90.00 | 359.40 | 9520.00 | 7554.32 | 7560.05 | 637.51 | 0.00 | 522781.82 | 735449.50 | N 32 26 5.74 | W 103 34 12.69 |
| | 17200.00 | 90.00 | 359.40 | 9520.00 | 7654.32 | 7660.04 | 636.47 | 0.00 | 522881.81 | 735448.45 | N 32 26 6.73 | W 103 34 12.69 |
| | 17300.00 | 90.00 | 359.40 | 9520.00 | 7754.32 | 7760.04 | 635.42 | 0.00 | 522981.81 | 735447.40 | N 32 26 7.72 | W 103 34 12.70 |
| | 17400.00 | 90.00 | 359.40 | 9520.00 | 7854.32 | 7860.03 | 634.37 | 0.00 | 523081.80 | 735446.36 | N 32 26 8.71 | W 103 34 12.70 |
| | 17500.00 | 90.00 | 359.40 | 9520.00 | 7954.32 | 7960.03 | 633.33 | 0.00 | 523181.79 | 735445.31 | N 32 26 9.70 | W 103 34 12.70 |
| | 17600.00 | 90.00 | 359.40 | 9520.00 | 8054.32 | 8060.02 | 632.28 | 0.00 | 523281.78 | 735444.26 | N 32 26 10.69 | W 103 34 12.71 |
| | 17700.00 | 90.00 | 359.40 | 9520.00 | 8154.32 | 8160.02 | 631.23 | 0.00 | 523381.77 | 735443.21 | N 32 26 11.68 | W 103 34 12.71 |
| | 17800.00 | 90.00 | 359.40 | 9520.00 | 8254.32 | 8260.01 | 630.19 | 0.00 | 523481.76 | 735442.17 | N 32 26 12.67 | W 103 34 12.72 |
| | 17900.00 | 90.00 | 359.40 | 9520.00 | 8354.32 | 8360.00 | 629.14 | 0.00 | 523581.76 | 735441.12 | N 32 26 13.66 | W 103 34 12.72 |
| | 18000.00 | 90.00 | 359.40 | 9520.00 | 8454.32 | 8460.00 | 628.09 | 0.00 | 523681.75 | 735440.07 | N 32 26 14.65 | W 103 34 12.72 |
| | 18100.00 | 90.00 | 359.40 | 9520.00 | 8554.32 | 8559.99 | 627.05 | 0.00 | 523781.74 | 735439.03 | N 32 26 15.64 | W 103 34 12.73 |
| | 18200.00 | 90.00 | 359.40 | 9520.00 | 8654.32 | 8659.99 | 626.00 | 0.00 | 523881.73 | 735437.98 | N 32 26 16.63 | W 103 34 12.73 |
| | 18300.00 | 90.00 | 359.40 | 9520.00 | 8754.32 | 8759.98 | 624.95 | 0.00 | 523981.72 | 735436.93 | N 32 26 17.62 | W 103 34 12.74 |
| | 18400.00 | 90.00 | 359.40 | 9520.00 | 8854.32 | 8859.98 | 623.91 | 0.00 | 524081.71 | 735435.89 | N 32 26 18.61 | W 103 34 12.74 |
| | 18500.00 | 90.00 | 359.40 | 9520.00 | 8954.32 | 8959.97 | 622.86 | 0.00 | 524181.71 | 735434.84 | N 32 26 19.60 | W 103 34 12.74 |
| | 18600.00 | 90.00 | 359.40 | 9520.00 | 9054.32 | 9059.97 | 621.81 | 0.00 | 524281.70 | 735433.79 | N 32 26 20.58 | W 103 34 12.75 |
| | 18700.00 | 90.00 | 359.40 | 9520.00 | 9154.32 | 9159.96 | 620.77 | 0.00 | 524381.69 | 735432.75 | N 32 26 21.57 | W 103 34 12.75 |
| | 18800.00 | 90.00 | 359.40 | 9520.00 | 9254.32 | 9259.96 | 619.72 | 0.00 | 524481.68 | 735431.70 | N 32 26 22.56 | W 103 34 12.75 |
| | 18900.00 | 90.00 | 359.40 | 9520.00 | 9354.32 | 9359.95 | 618.67 | 0.00 | 524581.67 | 735430.65 | N 32 26 23.55 | W 103 34 12.76 |
| | 19000.00 | 90.00 | 359.40 | 9520.00 | 9454.32 | 9459.94 | 617.63 | 0.00 | 524681.66 | 735429.61 | N 32 26 24.54 | W 103 34 12.76 |
| | 19100.00 | 90.00 | 359.40 | 9520.00 | 9554.32 | 9559.94 | 616.58 | 0.00 | 524781.65 | 735428.56 | N 32 26 25.53 | W 103 34 12.77 |
| | 19200.00 | 90.00 | 359.40 | 9520.00 | 9654.32 | 9659.93 | 615.53 | 0.00 | 524881.65 | 735427.51 | N 32 26 26.52 | W 103 34 12.77 |
| | 19300.00 | 90.00 | 359.40 | 9520.00 | 9754.32 | 9759.93 | 614.48 | 0.00 | 524981.64 | 735426.47 | N 32 26 27.51 | W 103 34 12.77 |
| | 19400.00 | 90.00 | 359.40 | 9520.00 | 9854.32 | 9859.92 | 613.44 | 0.00 | 525081.63 | 735425.42 | N 32 26 28.50 | W 103 34 12.78 |
| | 19500.00 | 90.00 | 359.40 | 9520.00 | 9954.32 | 9959.92 | 612.39 | 0.00 | 525181.62 | 735424.37 | N 32 26 29.49 | W 103 34 12.78 |
| | 19600.00 | 90.00 | 359.40 | 9520.00 | 10054.32 | 10059.91 | 611.34 | 0.00 | 525281.61 | 735423.33 | N 32 26 30.48 | W 103 34 12.79 |
| | 19700.00 | 90.00 | 359.40 | 9520.00 | 10154.32 | 10159.91 | 610.30 | 0.00 | 525381.60 | 735422.28 | N 32 26 31.47 | W 103 34 12.79 |
| *LTP Cross* | *19739.00* | *90.00* | *359.40* | *9520.00* | *10193.31* | *10198.90* | *609.89* | *0.00* | *525420.60* | *735421.87* | *N 32 26 31.86* | *W 103 34 12.79* |
| | 19800.00 | 90.00 | 359.40 | 9520.00 | 10254.32 | 10259.90 | 609.25 | 0.00 | 525481.60 | 735421.23 | N 32 26 32.46 | W 103 34 12.79 |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (ft) | EW (ft) | DLS (°/100ft) | Northing (ftUS) | Easting (ftUS) | Latitude (N/S ° ' ") | Longitude (E/W ° ' ") |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DL 4 33 Loch Ness Fed Com P1 6H - PBHL | 19814.41 | 90.00 | 359.40 | 9520.00 | 10268.73 | 10274.31 | 609.10 | 0.00 | 525498.00 | 735421.08 | N 32 26 32.60 | W 103 34 12.79 |

**Survey Type:** Def Plan

**Survey Error Model:** ISCWSA Rev 3 *** 3-D 97.071% Confidence 3.0000 sigma

**Survey Program:**

| Description | Part | MD From (ft) | MD To (ft) | EOU Freq (ft) | Hole Size (in) | Casing Diameter (in) | Expected Max Inclination (deg) | Survey Tool Type | Borehole / Survey |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0.000 | 28.000 | 1/100.000 | 30.000 | 30.000 | | B001Ma_MWD+HDGM-Depth Only | DL 4 33 Loch Ness Fed Com P1 6H / Chevron DL 4 33 Loch Ness Fed Com P1 6H Rev1 kFc |
| | 1 | 28.000 | 19814.410 | 1/100.000 | 30.000 | 30.000 | | B001Ma_MWD+HDGM | DL 4 33 Loch Ness Fed Com P1 6H / Chevron DL 4 33 Loch Ness |

# Chevron U.S.A. Inc. (CUSA)
## SUNDRY ATTACHMENT: SPUDDER RIG

**DATA OPERATOR NAME:** Chevron U.S.A. Inc.

**1. SUMMARY OF REQUEST:**

CUSA respectfully requests approval for the following operations for the surface hole in the drill plan:

1. Utilize a spudder rig to pre-set surface casing for time and cost savings.

**2. Description of Operations**

1. Spudder rig will move in to drill the surface hole and pre-set surface casing on the well.
    a. After drilling the surface hole section, the spudder rig will run casing and cement following all the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
    b. The spudder rig will utilize fresh water-based mud to drill the surface hole to TD. Solids control will be handled entirely on a closed loop basis. No earth pits will be used.
2. The wellhead will be installed and then tested offline after the WOC time has been reached.
3. An abandonment cap at the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on one wing-valve.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations are expected to take 2-3 days per well on the pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling operations will begin with a larger rig and a BOP stack equal to or greater than the pressure rating that was permitted will be nippled up and tested on the wellhead before drilling operations resume on each well.
    a. The larger rig will move back onto the location within 90 days from the point at which the wells are secured and the spudder rig is moved off location.
    b. The BLM will be contacted / notified 24 hours before the larger rig moves back on the pre-set locations.
7. CUSA will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
8. Once the rig is removed, CUSA will secure the wellhead area by placing a guard rail around the cellar area.

# Surface Rig Layout