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AUG 13 2019

DISTRICT II-ARTESIA O.C.D.

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

5. Lease Serial No.
NMNM138607

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.
MONEY GRAHAM FED COM
218H 326031

2. Name of Operator
TAP ROCK OPERATING LLC

9. API Well No.
30-015-46220

| 3a. Address | 3b. Phone No. *(include area code)* | 10. Field and Pool, or Exploratory |
|---|---|---|
| 602 Park Point Drive Suite 200 Golden CO 80401 | (720)460-3316 | PURPLE SAGE WOLFCAMP |

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface LOT 4 / 250 FSL / 854 FEL / LAT 32.0007997 / LONG -104.0009524

At proposed prod. zone NENE / 200 FNL / 638 FEL / LAT 32.0205469 / LONG -103.9999725

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 32 / T26S / R29E / NMP

| 14. Distance in miles and direction from nearest town or post office* | 12. County or Parish | 13. State |
|---|---|---|
| 16 miles | EDDY | NM |

| 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 |
|---|---|---|
| 854 feet | 874.57 | 445.6 |

| 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 |
|---|---|---|
| 25 feet | 9950 feet / 17350 feet | FED: NMB001443 |

| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date work will start* | 23. Estimated duration |
|---|---|---|
| 2866 feet | 04/01/2019 | 60 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) | Brian Wood / Ph: (505)466-8120 | 01/24/2019 |

Title
President

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Cody Layton / Ph: (575)234-5959 | 08/09/2019 |

| 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.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

**Approval Date: 08/09/2019**

RMP 8-13-19

## 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.



(Continued on page 3)

## Additional Operator Remarks

### Location of Well

1. SHL: LOT 4 / 250 FSL / 854 FEL / TWSP: 26S / RANGE: 29E / SECTION: 32 / LAT: 32.0007997 / LONG: -104.0009524 ( TVD: 0 feet, MD: 0 feet )
   PPP: LOT 4 / 238 FSL / 562 FEL / TWSP: 26S / RANGE: 29E / SECTION: 32 / LAT: 32.0007668 / LONG: -104.0000105 ( TVD: 9762 feet, MD: 9830 feet )
   BHL: NENE / 200 FNL / 638 FEL / TWSP: 26S / RANGE: 29E / SECTION: 29 / LAT: 32.0205469 / LONG: -103.9999725 ( TVD: 9950 feet, MD: 17350 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:** | **TAP ROCK OPERATING LLC** |
| **LEASE NO.:** | **NMNM38636** |
| **WELL NAME & NO.:** | **218H – MONEY GRAHAM FED COM** |
| **SURFACE HOLE FOOTAGE:** | **250'/S & 854'/E** |
| **BOTTOM HOLE FOOTAGE** | **200'/N & 638'/E** |
| **LOCATION:** | **SECTION 32, T26S, R29E, NMPM** |
| **COUNTY:** | **EDDY** |

COA

| | | | |
|---|---|---|---|
| H2S | ○ Yes | ◉ No | |
| Potash | ◉ None | ○ Secretary | ○ R-111-P |
| Cave/Karst Potential | ○ Low | ◉ Medium | ○ High |
| 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

1. The **13-3/8** inch surface casing shall be set at approximately **580** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to

include the lead cement)

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

2. The minimum required fill of cement behind the **9-5/8** inch 1st 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 Medium Cave/Karst 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.

**Variance is approved for annular spacing between 9 5/8" x 7 5/8".**

3. The minimum required fill of cement behind the **7-5/8** inch 2nd intermediate casing is:
   - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Variance is approved for annular spacing between 7 5/8" x 5 1/2". Operator shall set 5 ½" casing at 8655 ft.**

4. The minimum required fill of cement behind the **5-1/2 x 5** inch production liner is:
   - Cement should tie-back **200 feet** into the previous casing. 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 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)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ 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.

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.

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: 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.

    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.

**ZS 062119**

AFMSS

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

# Operator Certification Data Report

08/12/2019

## Operator Certification

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

**NAME:** Brian Wood **Signed on:** 01/24/2019

**Title:** President

**Street Address:** 37 Verano Loop

**City:** Santa Fe **State:** NM **Zip:** 87508

**Phone:** (505)466-8120

**Email address:** afmss@permitswest.com

## Field Representative

**Representative Name:**

**Street Address:**

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

**Phone:**

**Email address:**

AFMSS

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

# Application Data Report

08/12/2019

**APD ID:** 10400038197 **Submission Date:** 01/24/2019

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Well Type:** CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - General

**APD ID:** 10400038197 **Tie to previous NOS?** N **Submission Date:** 01/24/2019

**BLM Office:** CARLSBAD **User:** Brian Wood **Title:** President

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

**Lease number:** NMNM138607 **Lease Acres:** 874.57

**Surface access agreement in place?** **Allotted?** **Reservation:**

**Agreement in place?** NO **Federal or Indian agreement:**

**Agreement number:**

**Agreement name:**

**Keep application confidential?** NO

**Permitting Agent?** YES **APD Operator:** TAP ROCK OPERATING LLC

**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** TAP ROCK OPERATING LLC

**Operator Address:** 602 Park Point Drive Suite 200 **Zip:** 80401

**Operator PO Box:**

**Operator City:** Golden **State:** CO

**Operator Phone:** (720)460-3316

**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:** MONEY GRAHAM FED COM **Well Number:** 218H **Well API Number:**

**Field/Pool or Exploratory?** Field and Pool **Field Name:** PURPLE SAGE WOLFCAMP **Pool Name:**

**Is the proposed well in an area containing other mineral resources?** USEABLE WATER

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Describe other minerals:**

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

**Type of Well Pad:** MULTIPLE WELL **Multiple Well Pad Name:** MONEY GRAHAM EAST PAD **Number:** 1

**Well Class:** HORIZONTAL **Number of Legs:** 1

**Well Work Type:** Drill

**Well Type:** CONVENTIONAL GAS WELL

**Describe Well Type:**

**Well sub-Type:** INFILL

**Describe sub-type:**

**Distance to town:** 16 Miles **Distance to nearest well:** 25 FT **Distance to lease line:** 854 FT

**Reservoir well spacing assigned acres Measurement:** 445.6 Acres

**Well plat:** Money_218H_C102_ETAL_011519_20190117151759.pdf

**Well work start Date:** 04/01/2019 **Duration:** 60 DAYS

## Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

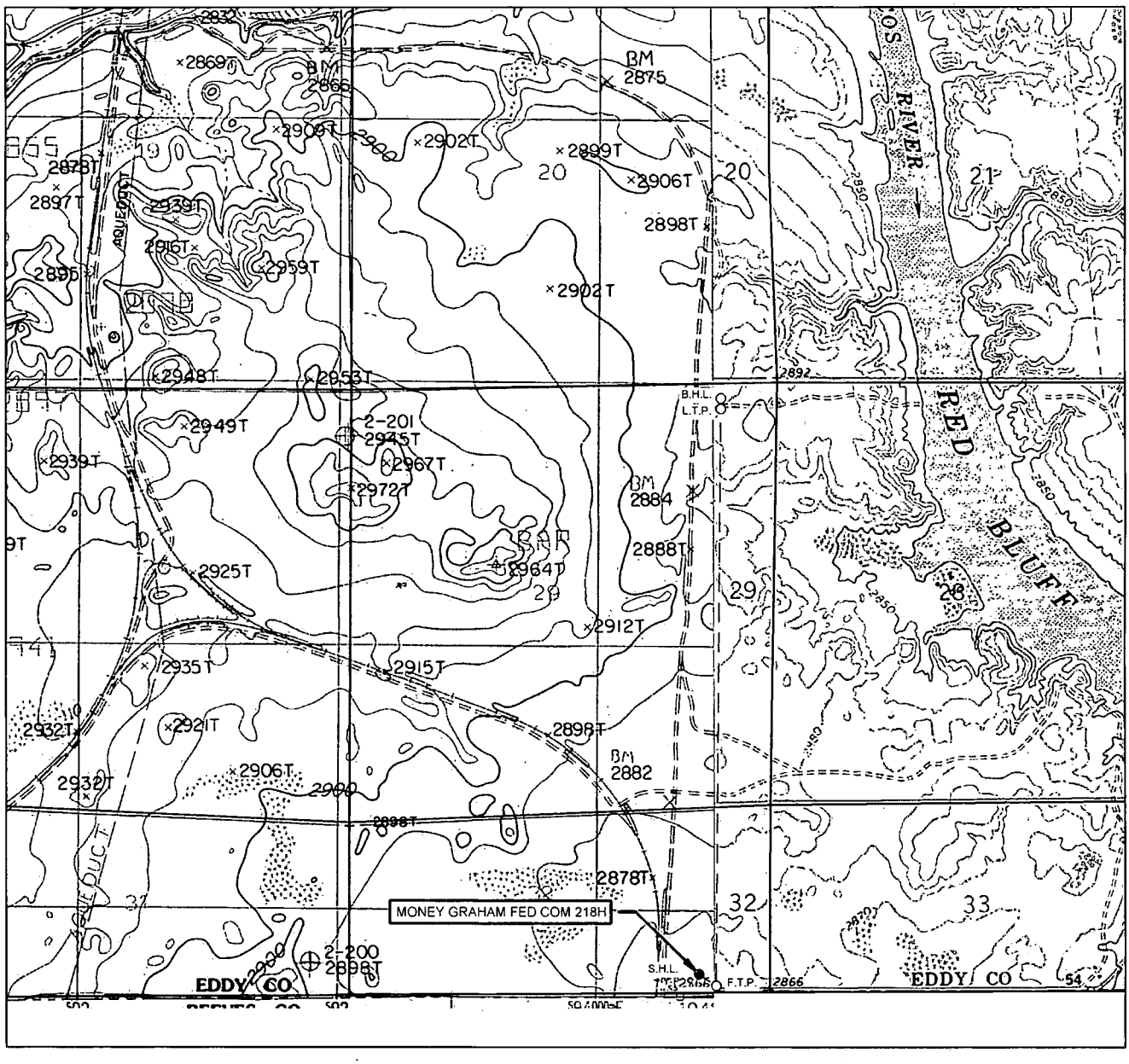
**Describe Survey Type:**

**Datum:** NAD83 **Vertical Datum:** NAVD88

**Survey number:** 18329 **Reference Datum:**

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL Leg #1 | 250 | FSL | 854 | FEL | 26S | 29E | 32 | Lot 4 | 32.0007997 | -104.0009524 | EDDY | NEW MEXICO | NEW MEXICO | F | FEE | 2866 | 0 | 0 |
| KOP Leg #1 | 51 | FSL | 538 | FEL | 26S | 29E | 32 | Lot 4 | 32.0002548 | -103.9999331 | EDDY | NEW MEXICO | NEW MEXICO | F | FEE | -6471 | 9351 | 9337 |
| PPP Leg #1 | 238 | FSL | 562 | FEL | 26S | 29E | 32 | Lot 4 | 32.0007668 | -104.0000105 | EDDY | NEW MEXICO | NEW MEXICO | F | FEE | -6896 | 9830 | 9762 |

# LOCATION & ELEVATION VERIFICATION MAP




TAP ROCK

LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 218H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM ELEVATION 2866'
DESCRIPTION 250' FSL & 854' FEL

LATITUDE N 32.0007997 LONGITUDE W 104.0009524

-N-

SCALE: 1" = 2000'
0' 1000' 2000'

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

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2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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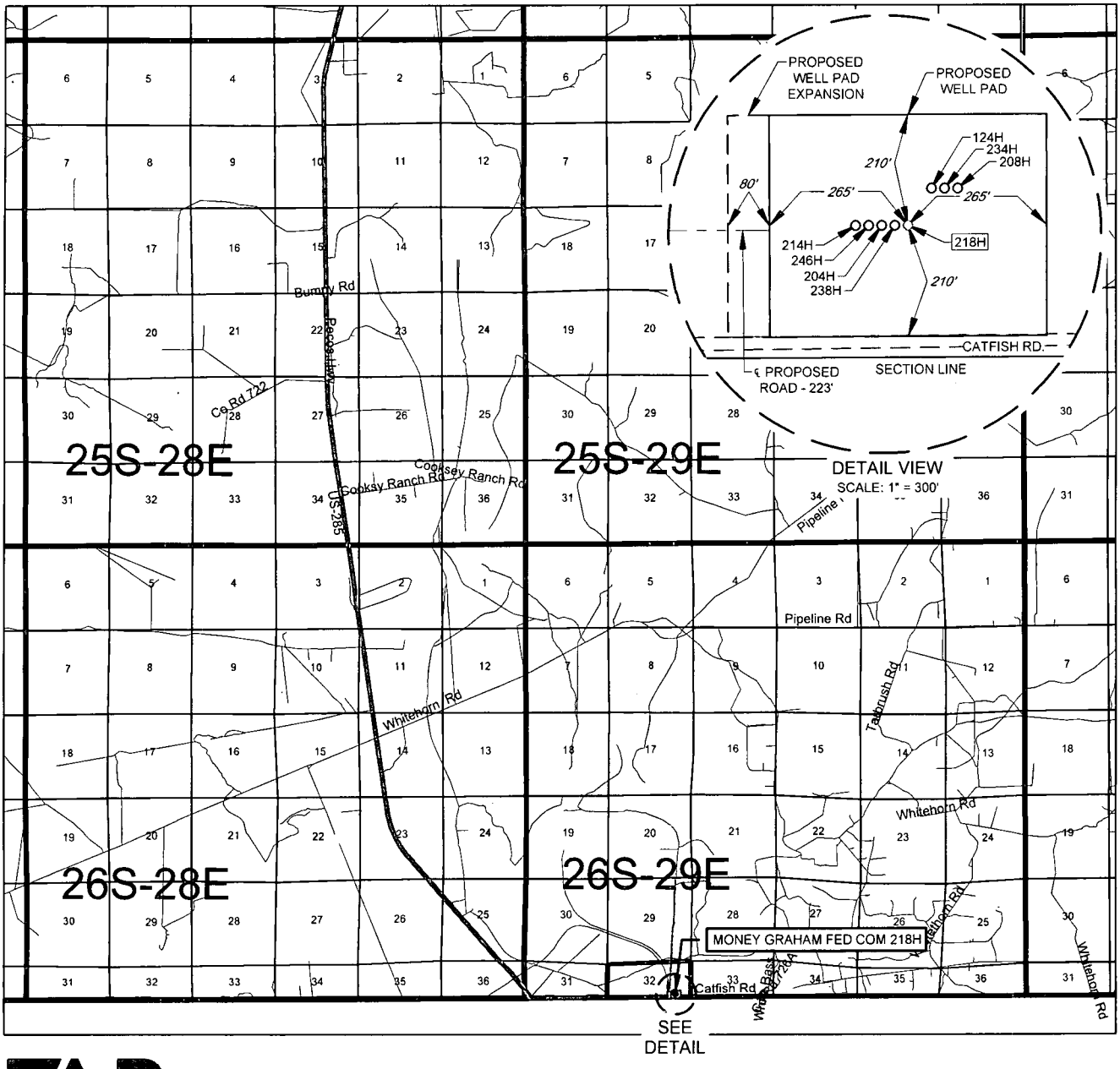
S:\SURVEY\TAPROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\LO_MONEY_GRAHAM_FED COM_218H_REV2.DWG 12/12/2018 7:36:29 AM kmatheny

EXHIBIT 2

# VICINITY MAP

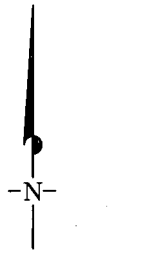



TAP ROCK

LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 218H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 250' FSL & 854' FEL

DISTANCE & DIRECTION
FROM INT. OF US-285 & BLACK RIVER VILLAGE RD., GO SOUTH ON US-285 ±16.4 MILES, THENCE EAST (LEFT) ON CATFISH RD. ±1.7 MILES, THENCE NORTH (LEFT) ON LEASE RD. ±210 FEET, THENCE EAST (RIGHT) ON PROPOSED RD. ±223 FEET TO A POINT ±265 FEET WEST OF THE LOCATION.




SCALE: 1" = 10000'

0' 5000' 10000'

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.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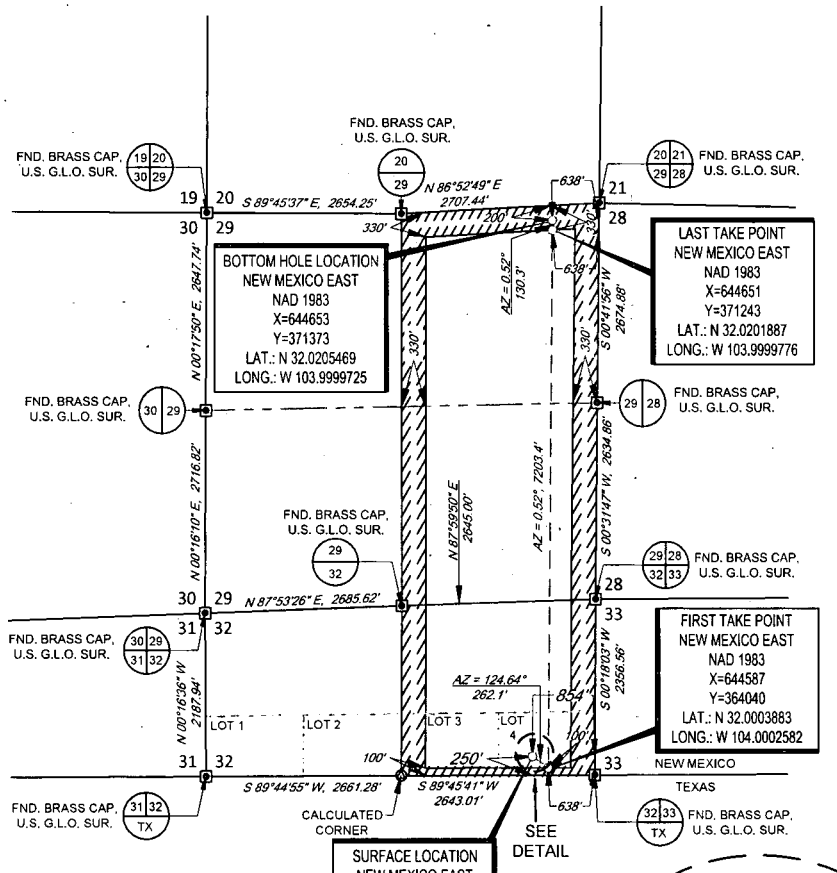
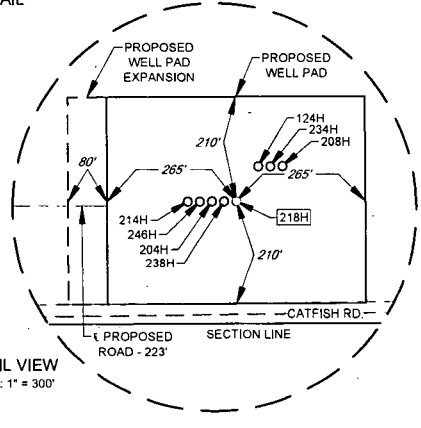
TAP ROCK

# EXHIBIT 2A

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO




DETAIL VIEW
SCALE: 1" = 300'

-N-

SCALE: 1" = 2000'
0' 1000' 2000'

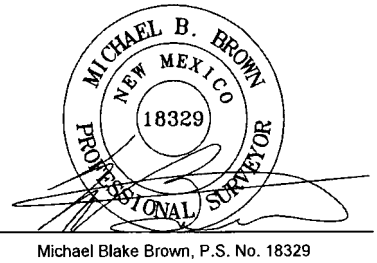
LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 218H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 250' FSL & 854' FEL

DISTANCE & DIRECTION
FROM INT. OF US-285 & BLACK RIVER VILLAGE RD., GO SOUTH ON US-285 ±16.4 MILES, THENCE EAST (LEFT) ON CATFISH RD. ±1.7 MILES, THENCE NORTH (LEFT) ON LEASE RD. ±210 FEET, THENCE EAST (RIGHT) ON PROPOSED RD. ±223 FEET TO A POINT ±265 FEET WEST OF THE LOCATION.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.




Michael Blake Brown, P.S. No. 18329
DECEMBER 12, 2018

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 - FT. WORTH, TEXAS 76140
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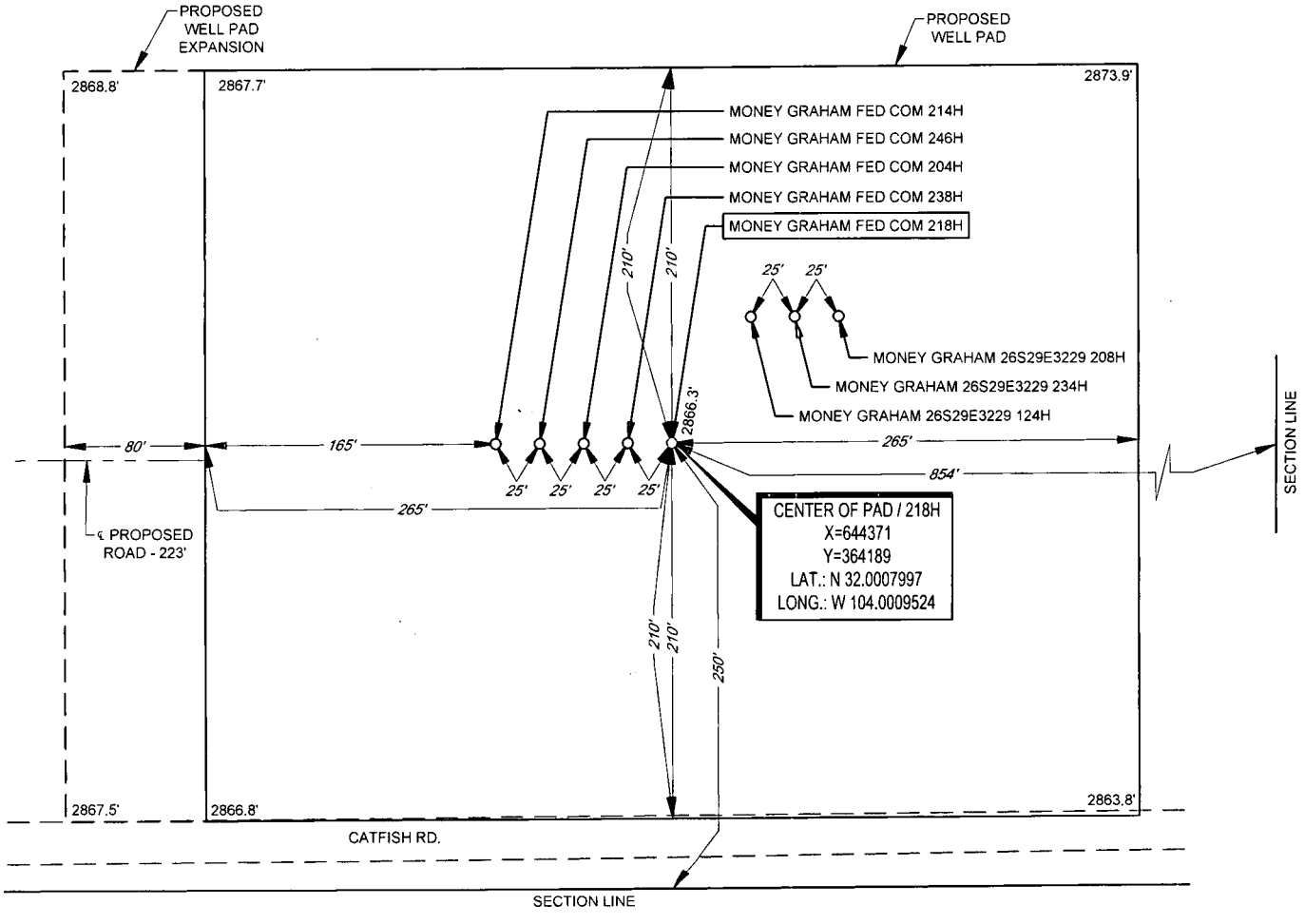
# EXHIBIT 2B

TAP ROCK

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'




LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 218H

218H LATITUDE N 32.0007997 218H LONGITUDE W 104.0009524

CENTER OF PAD IS 250' FSL & 854' FEL

-N-

SCALE: 1" = 100'

0' 50' 100'

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.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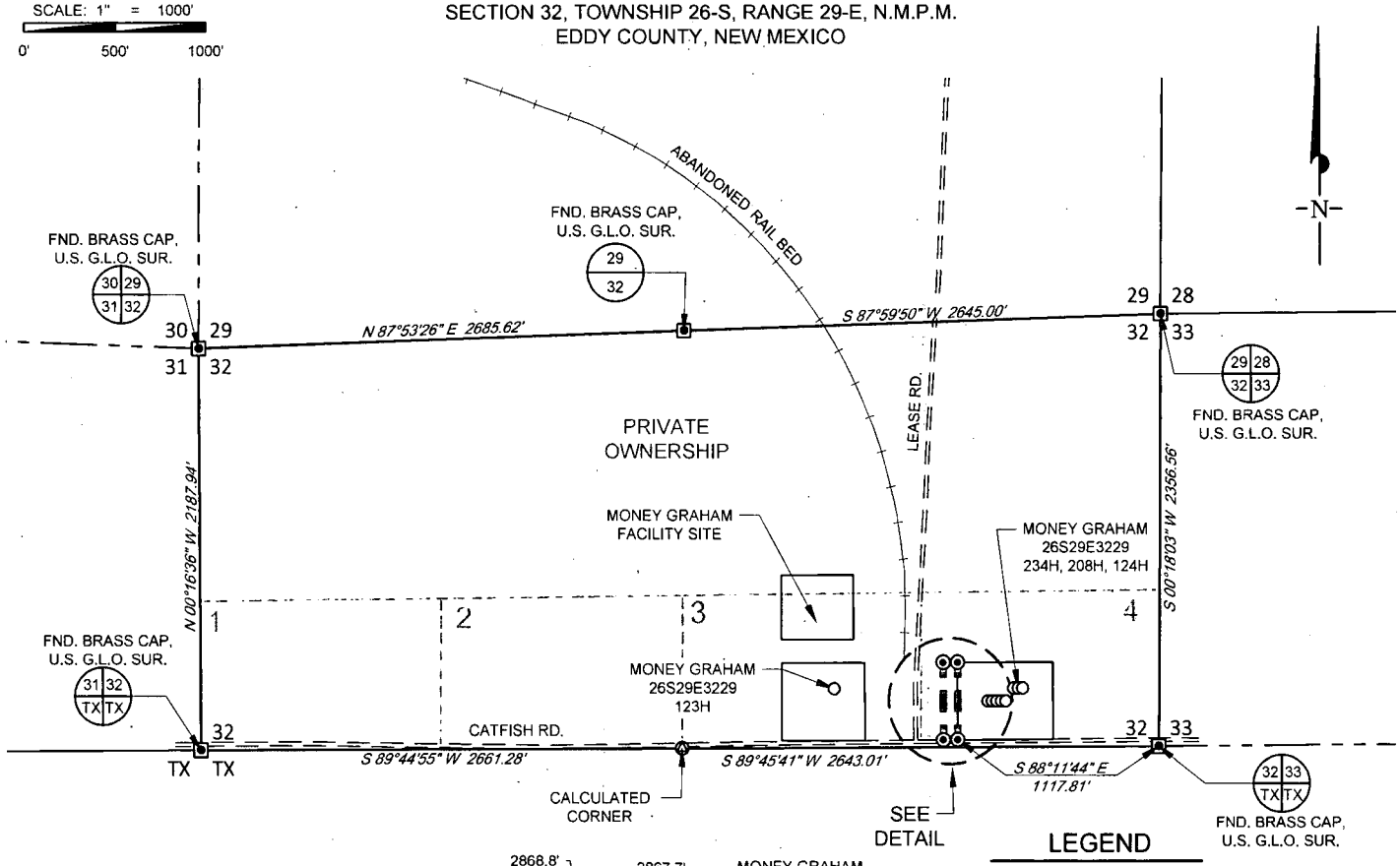
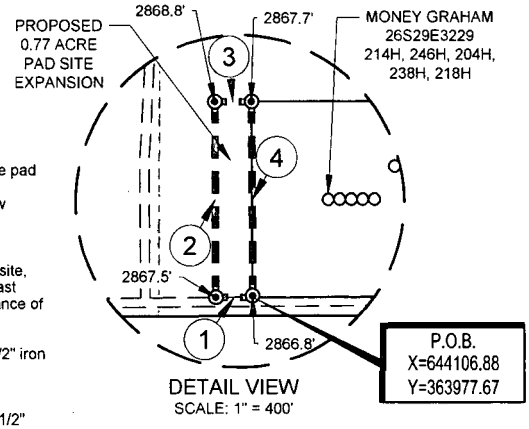
ORIGINAL DOCUMENT SIZE: 8.5" X 11"

SCALE: 1" = 1000'

0' 500' 1000'

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO




DETAIL VIEW
SCALE: 1" = 400'

## LEGEND

- SURVEY/SECTION LINE
- PROPOSED SITE
- TRACT BORDER
- ROAD WAY
- RAILROAD
- MONUMENT
- CALCULATED CORNER
- IRON ROD SET

## LINE TABLE

| LINE | BEARING | DISTANCE |
|---|---|---|
| 1 | S 89°45'18" W | 80.00' |
| 2 | N 00°14'42" W | 420.00' |
| 3 | N 89°45'18" E | 80.00' |
| 4 | S 00°14'42" E | 420.00' |

## MONEY GRAHAM FED COM PAD SITE EXPANSION

Metes and Bounds Description of a proposed 0.77 acre pad site expansion located within Section 32, Township 26 South, Range 29 East, N.M.P.M., in Eddy County, New Mexico.

BEGINNING at a 1/2" iron rod with cap marked "TOPOGRAPHIC" set for the Southeast corner of this site, whence a U.S. G.L.O. brass cap found for the Southeast corner of said Section 32, bears S 88°11'44" E, a distance of 1,117.81 feet;

Thence S 89°45'18" W, a distance of 80.00 feet to a 1/2" iron rod with cap marked "TOPOGRAPHIC" set for the Southwest corner of this site;

Thence N 00°14'42" W, a distance of 420.00 feet to a 1/2" iron rod with cap marked "TOPOGRAPHIC" set for the Northwest corner of this site;

Thence N 89°45'18" E, a distance of 80.00 feet to a 1/2" iron rod with cap marked "TOPOGRAPHIC" set for the Northeast corner of this site;

Thence S 00°14'42" E, a distance of 420.00 feet to the POINT OF BEGINNING.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MICHAEL B. BROWN NEW MEXICO 18329 PROFESSIONAL SURVEYOR

Michael Blake Brown, P.S. No. 18329
DECEMBER 12, 2018

TAP ROCK

| MONEY GRAHAM FED COM PAD SITE EXPANSION | REVISION: INT | DATE |
|---|---|---|
| DATE: 12/07/18 | | |
| FILE: 30_MONEY_GRAHAM_FED COM_PAD_SITE_EXPANSION | | |
| DRAWN BY: MML | | |
| SHEET: 1 OF 1 | | |

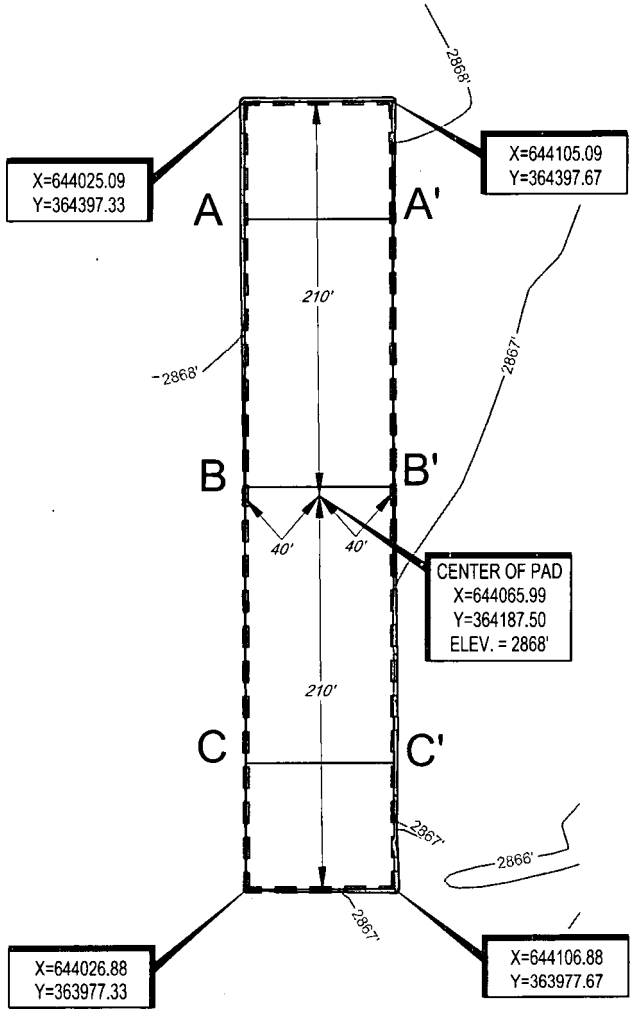
NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND, UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY TAP ROCK OPERATING, LLC. ONLY UTILITIES/EASEMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN/ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY.
4. P.O.B. = POINT OF BEGINNING

S:\SURVEY\TAPROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\BO_MONEY_GRAHAM_FED COM_PAD_SITE_EXPANSION.DWG 12/12/2018 7:46:15 AM kmatheny

# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'




TOP OF PAD ELEVATION: 2867.5
CUT SLOPE: 33.33% 3.000:1 18.43°
FILL SLOPE: 33.33% 3.000:1 18.43°
BALANCE TOLERANCE (C.Y.): 0.00
CUT SWELL FACTOR: 1.00
FILL SHRINK FACTOR: 1.00

PAD EARTHWORK VOLUMES
CUT : 5,574.1 C.F., 206.45 C.Y.
FILL: 5,574.1 C.F., 206.45 C.Y.
AREA: 34759.6 SQ.FT., 0.798 ACRES

NOTE: 1' CONTOUR INTERVALS

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LOYALTY INNOVATION LEGACY


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TAP ROCK

| MONEY GRAHAM 26S29E3229 EXPANSION PAD SITE | REVISION: INT | DATE |
|---|---|---|
| | | |
| DATE: 12/10/18 | | |
| FILE: CD_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION | | |
| DRAWN BY: EAH | | |
| SHEET: 1 OF 3 | | |

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

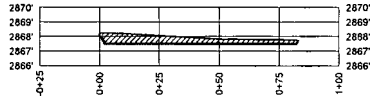
# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

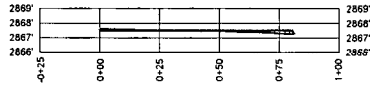
Horizontal Scale = 1:60
Vertical Scale = 1:10

TAP

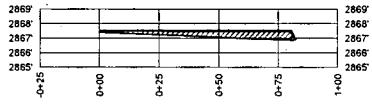
A-A'




B-B'




C-C'

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| MONEY GRAHAM 26S29E3229 EXPANSION PAD SITE | REVISION: INT | DATE |
|---|---|---|
| | | |
| | | |
| DATE: 12/10/18 | | |
| FILE: C3 MONEY GRAHAM 26S29E3229 PAD SITE EXPANSION | | |
| DRAWN BY: EAH | | |
| SHEET : 2 OF 3 | | |

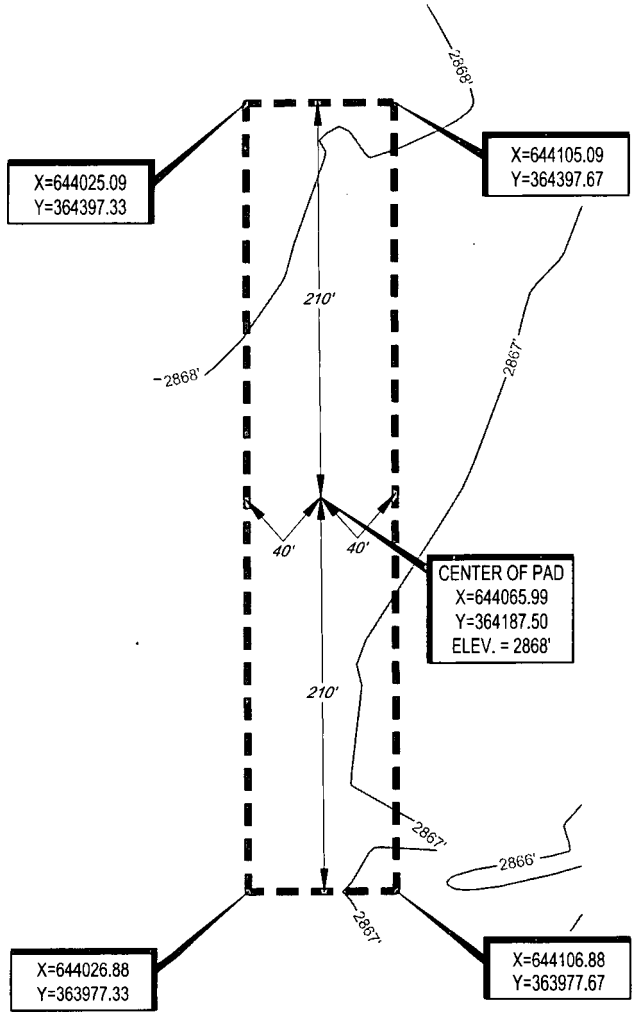
NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

S:\SURVEY\TAP\ROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\C3D_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION.DWG 12/11/2018 1:42:21 PM kmatheny

# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'




TOP OF PAD ELEVATION: 2867.5
CUT SLOPE: 33.33% 3.000:1 18.43°
FILL SLOPE: 33.33% 3.000:1 18.43°
BALANCE TOLERANCE (C.Y.): 0.00
CUT SWELL FACTOR: 1.00
FILL SHRINK FACTOR: 1.00

PAD EARTHWORK VOLUMES
CUT : 5,574.1 C.F., 206.45 C.Y.
FILL: 5,574.1 C.F., 206.45 C.Y.
AREA: 34759.6 SQ.FT., 0.798 ACRES

NOTE: 1' CONTOUR INTERVALS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TAP ROCK

| MONEY GRAHAM 26S29E3229 EXPANSION PAD SITE | REVISION: INT | DATE |
|---|---|---|
| | | |
| DATE: 12/10/18 | | |
| FILE: CD_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION | | |
| DRAWN BY: EAH | | |
| SHEET : 3 OF 3 | | |

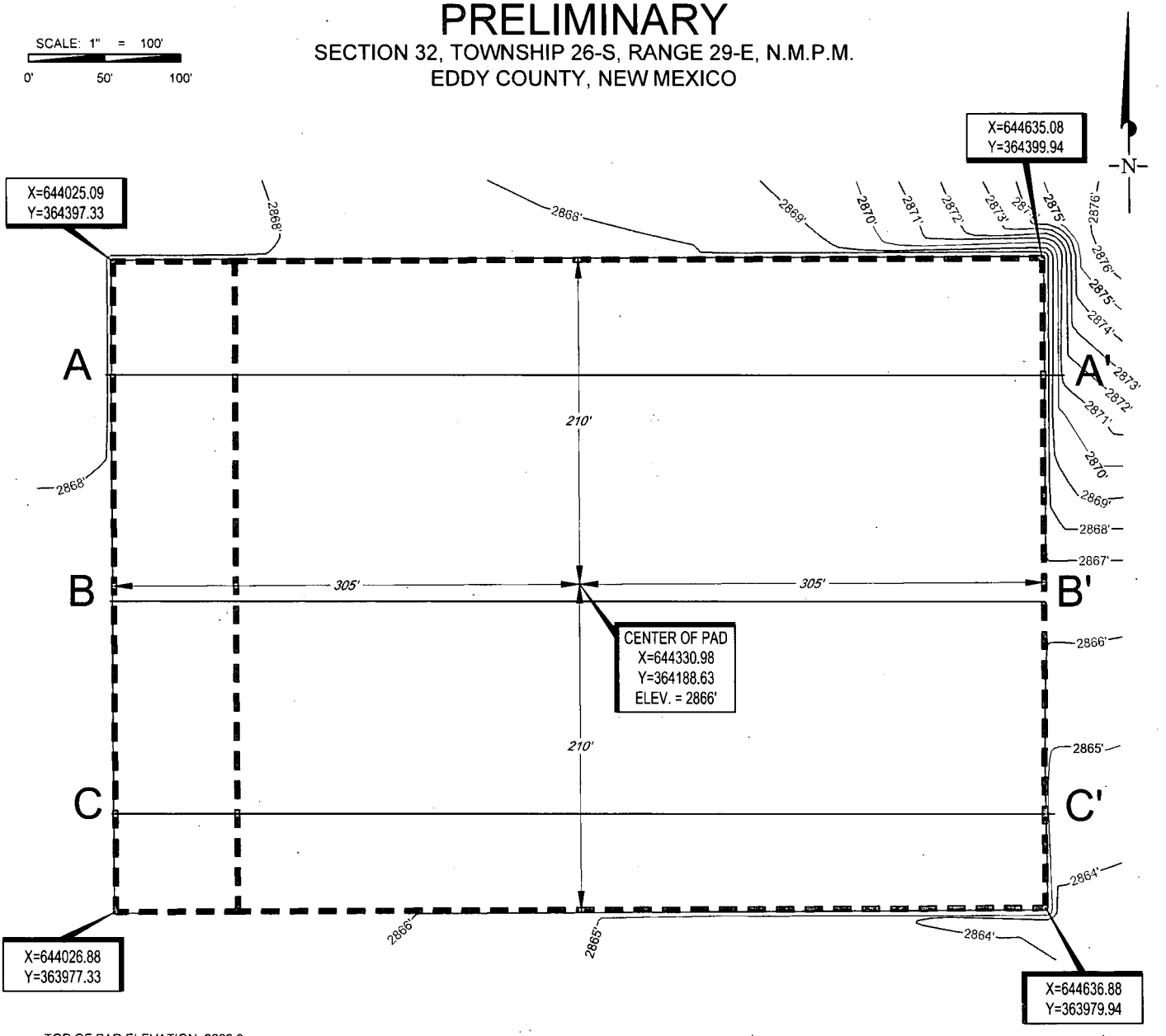
NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

S:\SURVEY\TAPROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\CD_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION.DWG 12/11/2018 1:42:21 PM kmatheny

# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'




TOP OF PAD ELEVATION: 2866.6
CUT SLOPE: 33.33% 3.000:1 18.43°
FILL SLOPE: 33.33% 3.000:1 18.43°
BALANCE TOLERANCE (C.Y.): 0.00
CUT SWELL FACTOR: 1.00
FILL SHRINK FACTOR: 1.00

PAD EARTHWORK VOLUMES
CUT : 136,378.3 C.F., 5,051.05 C.Y.
FILL: 136,376.7 C.F., 5,050.99 C.Y.
BALANCE EXPORT: 1.6 C.F., 0.06 C.Y.
AREA: 267759.1 SQ.FT., 6.147 ACRES

NOTE: 1' CONTOUR INTERVALS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TAP ROCK

| MONEY GRAHAM FED COM EXPANSION PAD SITE | REVISION: | |
|---|---|---|
| | MML | 12/12/18 |
| DATE: 12/10/18 | | |
| FILE: CD_MONEY_GRAHAM_FED COM_SITE_EXPANSION_REV1 | | |
| DRAWN BY: EAH | | |
| SHEET : 1 OF 3 | | |

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

S:\SURVEY\TAPROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\CD_MONEY_GRAHAM_FED COM_SITE_EXPANSION_REV1.DWG 12/12/2018 8:11:17 AM kmatheny

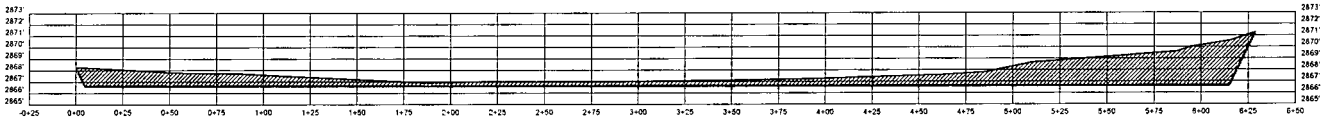
# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

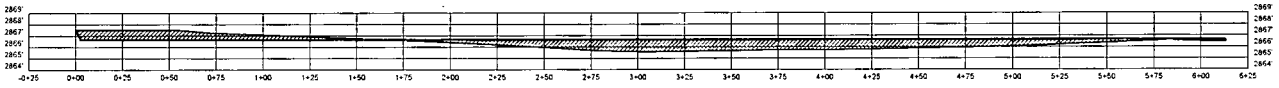
Horizontal Scale = 1:60
Vertical Scale = 1:10

TAP ROCK

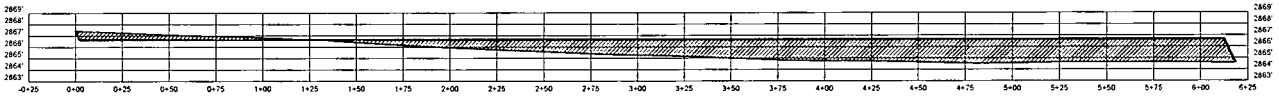
A-A'




B-B'




C-C'





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TELEPHONE (432) 682-1653 OR (800) 767-1653 · FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM


| MONEY GRAHAM FED COM EXPANSION PAD SITE | REVISION: | |
|---|---|---|
| | MML | 12/12/18 |
| | | |
| DATE: 12/10/18 | | |
| FILE: CD MONEY GRAHAM FED COM SITE EXPANSION REV1 | | |
| DRAWN BY: EAH | | |
| SHEET: 2 OF 3 | | |

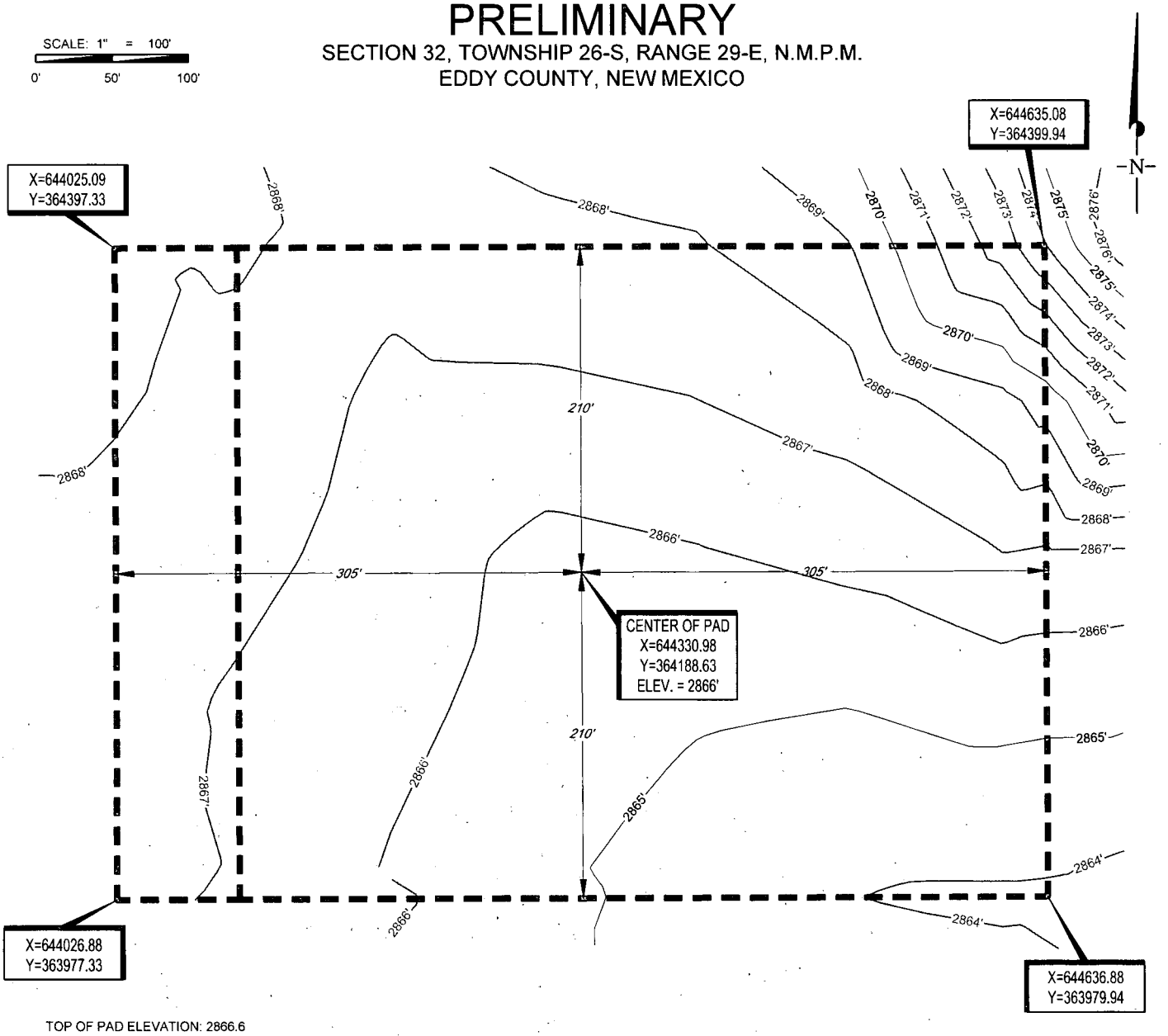
NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 14"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

S:\SURVEY\TAPROCK\MONEY_GRAHAM_UNIT\FINAL_PRODUCTS\CD_MONEY_GRAHAM_FED COM_SITE_EXPANSION_REV1.DWG 12/12/2018 8:11:17 AM kmalberry

# PRELIMINARY

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

SCALE: 1" = 100'
0' 50' 100'




TOP OF PAD ELEVATION: 2866.6
CUT SLOPE: 33.33% 3.000:1 18.43°
FILL SLOPE: 33.33% 3.000:1 18.43°
BALANCE TOLERANCE (C.Y.): 0.00
CUT SWELL FACTOR: 1.00
FILL SHRINK FACTOR: 1.00

PAD EARTHWORK VOLUMES
CUT : 136,378.3 C.F., 5,051.05 C.Y.
FILL: 136,376.7 C.F., 5,050.99 C.Y.
BALANCE EXPORT: 1.6 C.F., 0.06 C.Y.
AREA: 267759.1 SQ.FT., 6.147 ACRES

NOTE: 1' CONTOUR INTERVALS


TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM


TAP ROCK

| MONEY GRAHAM FED COM EXPANSION PAD SITE | REVISION: | |
|---|---|---|
| | MML | 12/12/18 |
| DATE: 12/10/18 | | |
| FILE: CD_MONEY_GRAHAM_FED COM_SITE_EXPANSION_REV1 | | |
| DRAWN BY: EAH | | |
| SHEET : 3 OF 3 | | |

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

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# Tap Rock Operating LLC

**Proposed Money Graham Fed Com**
**East Well Pad**
**Well Vicinity & Lease Map**

Section 32, Township 26S, Range 29E
Eddy County, New Mexico

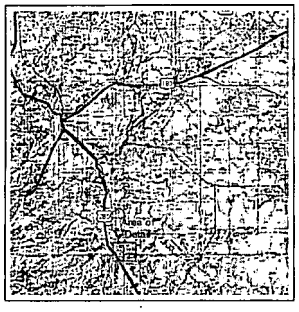
- Oil - Active
- Oil - New
- Oil - TA
- Oil - P&A
- Gas - Active
- Gas - New
- Gas - P&A
- SWD - Active
- Proposed SHL
- Proposed BHL
- Proposed Wellbore
- BLM
- STATE
- PRIVATE

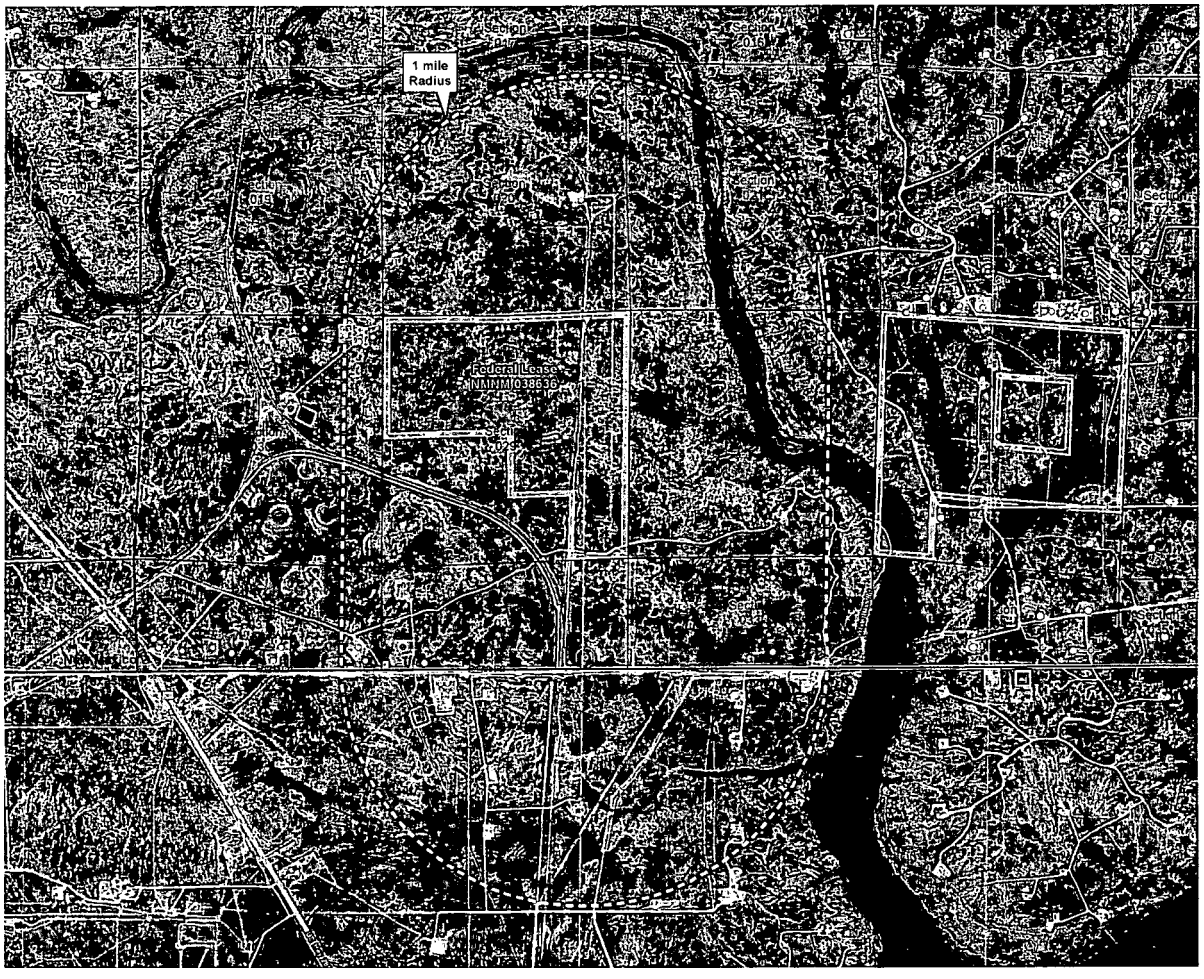
1:24,000
0 625 1,250 2,500
Feet

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., January 9, 2019
for Tap Rock Operating





AFMSS

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

# Drilling Plan Data Report

08/12/2019

**APD ID:** 10400038197 **Submission Date:** 01/24/2019

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Well Type:** CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Geologic Formations

| Formation ID | Formation Name | Elevation | True Vertical Depth | Measured Depth | Lithologies | Mineral Resources | Producing Formation |
|---|---|---|---|---|---|---|---|
| 1 | QUATERNARY | 2866 | 0 | 0 | OTHER : Caliche | USEABLE WATER,OTHER : Salt | N |
| 2 | RUSTLER ANHYDRITE | 2359 | 507 | 507 | | OTHER : Salt | N |
| 3 | TOP SALT | 2184 | 682 | 682 | | OTHER : Salt | N |
| 4 | BASE OF SALT | 474 | 2392 | 2395 | | NATURAL GAS,OIL | N |
| 5 | BELL CANYON | 19 | 2847 | 2851 | | NATURAL GAS,OIL | N |
| 6 | BRUSHY CANYON | -1970 | 4836 | 4839 | | NATURAL GAS,OIL | N |
| 7 | BRUSHY CANYON | -1971 | 4837 | 4846 | | NATURAL GAS,OIL | N |
| 8 | BONE SPRING | -3561 | 6427 | 6440 | LIMESTONE | NATURAL GAS,OIL | N |
| 9 | BONE SPRING 1ST | -4486 | 7352 | 7365 | SANDSTONE | NATURAL GAS,OIL | N |
| 10 | BONE SPRING 2ND | -5066 | 7932 | 7945 | SANDSTONE | NATURAL GAS,OIL | N |
| 11 | BONE SPRING 3RD | -6318 | 9184 | 9197 | SANDSTONE | NATURAL GAS,OIL | N |
| 12 | BONE SPRING 3RD | -6575 | 9441 | 9455 | OTHER,SANDSTONE : W | NATURAL GAS,OIL | N |
| 13 | WOLFCAMP | -6665 | 9531 | 9549 | OTHER : A | NATURAL GAS,OIL | N |
| 14 | WOLFCAMP | -6775 | 9641 | 9672 | OTHER,SANDSTONE : A Y | NATURAL GAS,OIL | N |
| 15 | WOLFCAMP | -6896 | 9762 | 9830 | OTHER : A Fat | NATURAL GAS,OIL | Y |

## Section 2 - Blowout Prevention

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Pressure Rating (PSI):** 5M **Rating Depth:** 13000

**Equipment:** A 13,000' 10,000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. The BOP will be utilized below surface casing to TD. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

**Requesting Variance?** YES

**Variance request:** Tap Rock requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used.

**Testing Procedure:** BOP Test procedure will be as follows: After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 3,500 psi. The BOP will be tested in this manner after any breaks, nipple ups, or passage of allotted time. Casing Test procedure: Casing will be tested to .22 psi per foot of casing length or 1500 psi, whichever is greater, but not to exceed 70% of minimum internal yield.

**Choke Diagram Attachment:**

Money_218H_10M_Choke_032918_20190117153746.pdf

**BOP Diagram Attachment:**

Money_218H_10M_BOP_5M_Annular_REVISED_20190430142847.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 | SURFACE | 17.5 | 13.375 | NEW | API | N | 0 | 580 | 0 | 580 | 2866 | | 580 | J-55 | 54.5 | BUTT | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |
| 2 | INTERMEDIATE | 8.75 | 7.625 | NEW | API | N | 0 | 2700 | 0 | 2696 | 2866 | | 2700 | P-110 | 29.7 | BUTT | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |
| 3 | INTERMEDIATE | 12.25 | 9.625 | NEW | API | N | 0 | 2900 | 0 | 2896 | 2866 | | 2900 | J-55 | 40 | BUTT | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |
| 4 | PRODUCTION | 6.75 | 5.5 | NEW | API | Y | 0 | 9010 | 0 | 8996 | 2866 | | 9010 | P-110 | 20 | BUTT | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |
| 5 | INTERMEDIATE | 8.75 | 7.625 | NEW | API | N | 2700 | 9210 | 2696 | 9196 | | | 6510 | P-110 | 29.7 | OTHER - Flush | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |
| 6 | PRODUCTION | 6.75 | 5.0 | NEW | API | Y | 9010 | 17350 | 8996 | 9950 | | | 8340 | P-110 | 18 | OTHER - Flush | 1.13 | 1.15 | DRY | 1.51 | DRY | 1.51 |

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Casing Attachments**

**Casing ID:** 1 **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Money_218H_Casing_Design_Assumptions_20190117154823.pdf

**Casing ID:** 2 **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Money_218H_Casing_Design_Assumptions_20190117153955.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Money_218H_Casing_Design_Assumptions_20190117154022.pdf

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

Money_218H_5.5in_Casing_Spec_20190117154233.PDF

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

Money_218H_Casing_Design_Assumptions_20190117154806.pdf

**Casing ID:** 5 **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

Money_218H_Casing_Design_Assumptions_20190117154142.pdf

**Casing ID:** 6 **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

Money_218H_5in_Casing_Spec_20190117154308.pdf

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

Money_218H_Casing_Design_Assumptions_20190117154321.pdf

## Section 4 - Cement

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INTERMEDIATE | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| INTERMEDIATE | Tail | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| PRODUCTION | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| PRODUCTION | Tail | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| PRODUCTION | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| PRODUCTION | Tail | | 8210 | 17350 | 950 | 1.17 | 15.8 | 1112 | 10 | None | None |
| SURFACE | Lead | | 0 | 580 | 554 | 1.38 | 14.8 | 765 | 100 | Class C | 5% NaCl + LCM |
| INTERMEDIATE | Lead | | 0 | 2900 | 803 | 1.81 | 13.5 | 1453 | 100 | Class C | Bentonite + 1% CaCl2 + 8% NaCl + LCM |
| INTERMEDIATE | Tail | | 0 | 2900 | 263 | 1.38 | 14.8 | 363 | 100 | Class C | 5% NaCl + LCM |
| INTERMEDIATE | Lead | | 1900 | 9210 | 316 | 2.35 | 11.5 | 743 | 35 | TXI | Fluid loss + dispersant + retarder + LCM |
| INTERMEDIATE | Tail | | 1900 | 9210 | 180 | 1.39 | 13.2 | 250 | 35 | TXI | Fluid Loss + Dispersant + Retarder + LCM |

## 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:** All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions.

**Describe the mud monitoring system utilized:** Electronic Pason mud monitor system complying with Onshore Order 1 will be used.

## Circulating Medium Table

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

| 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 | 580 | OTHER : Fresh water spud mud | 8.3 | 8.3 | | | | | | | |
| 580 | 2900 | OTHER : Brine water | 10 | 10 | | | | | | | |
| 2900 | 9210 | OTHER : Fresh water/cut brine | 9 | 9 | | | | | | | |
| 9210 | 17350 | OIL-BASED MUD | 12.5 | 12.5 | | | | | | | |

## Section 6 - Test, Logging, Coring

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

Electric Logging Program: No open-hole logs are planned at this time for the pilot hole. GR will be collected while drilling through the MWD tools from intermediate casing to TD.

CBL w/ CCL from as far as gravity will let it fall to TOC.

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

CBL,GR

**Coring operation description for the well:**

No DSTs or cores are planned at this time.

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 6000 **Anticipated Surface Pressure:** 3811

**Anticipated Bottom Hole Temperature(F):** 140

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

**Describe:**

**Contingency Plans geoharzards description:**

**Contingency Plans geohazards attachment:**

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

**Hydrogen sulfide drilling operations plan:**

Money_East_Pad_H2S_Plan_20190117154944.pdf

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

## Section 8 - Other Information

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

Money_218H_Horizontal_Plan_011519_20190117154958.pdf

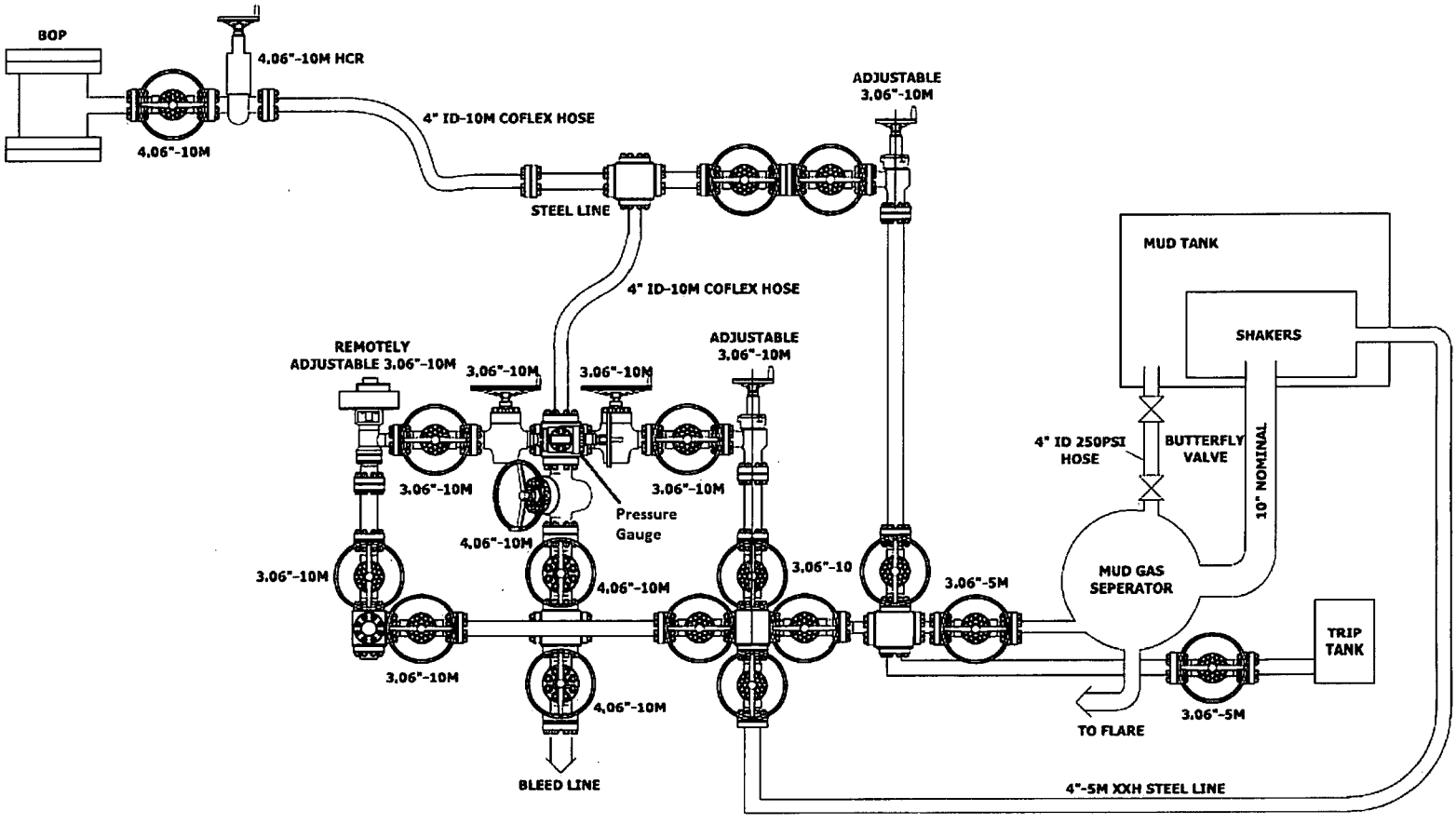
**Other proposed operations facets description:**

**Other proposed operations facets attachment:**

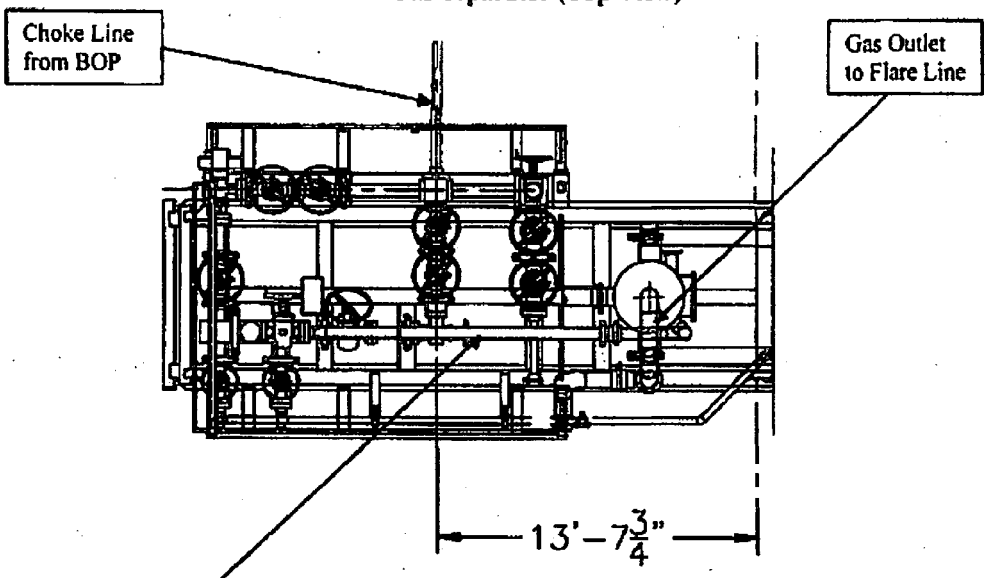
Money_218H_Speedhead_Specs_033018_20190117155020.pdf
Money_218H_Drill_Plan_v3_061219_REVISED_20190617144036.pdf
Money_218H_7.625_W513_Casing_Spec_20190617144408.pdf

**Other Variance attachment:**

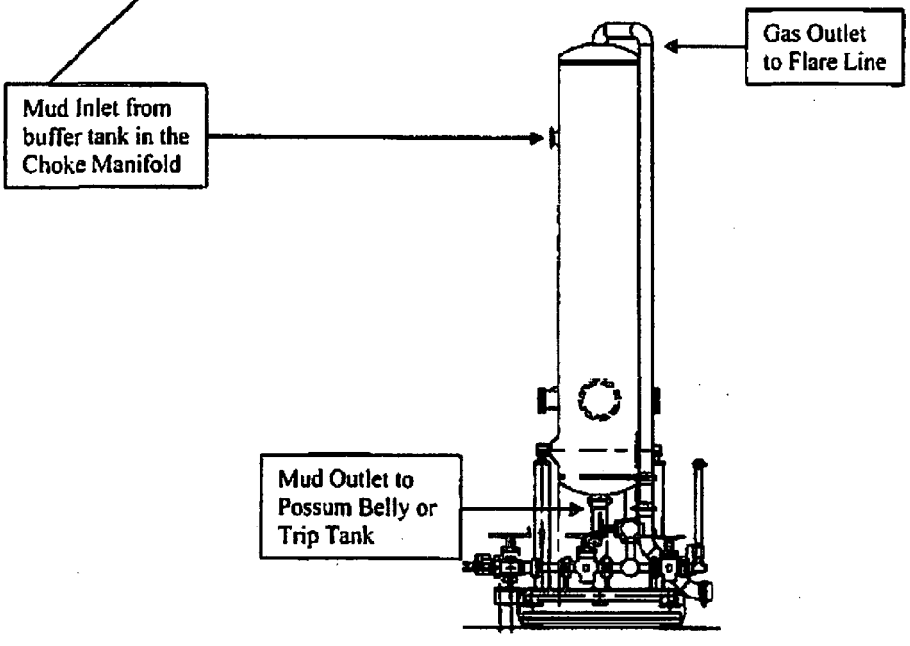
Money_218H_Casing_Variance_Request_20190117155027.pdf


BOP
4.06"-10M HCR
4.06"-10M
4" ID-10M COFLEX HOSE
ADJUSTABLE
3.06"-10M
STEEL LINE
4" ID-10M COFLEX HOSE
MUD TANK
SHAKERS
REMOTELY
ADJUSTABLE 3.06"-10M
3.06"-10M
3.06"-10M
ADJUSTABLE
3.06"-10M
4" ID 250PSI
HOSE
BUTTERFLY
VALVE
10" NOMINAL
3.06"-10M
3.06"-10M
Pressure
Gauge
4.06"-10M
3.06"-10M
4.06"-10M
3.06"-10
3.06"-5M
MUD GAS
SEPERATOR
TRIP
TANK
3.06"-10M
4.06"-10M
3.06"-5M
TO FLARE
BLEED LINE
4"-5M XXH STEEL LINE

**Choke Manifold – Gas Separator (Top View)**




**Choke Manifold – Gas Separator (Side View)**

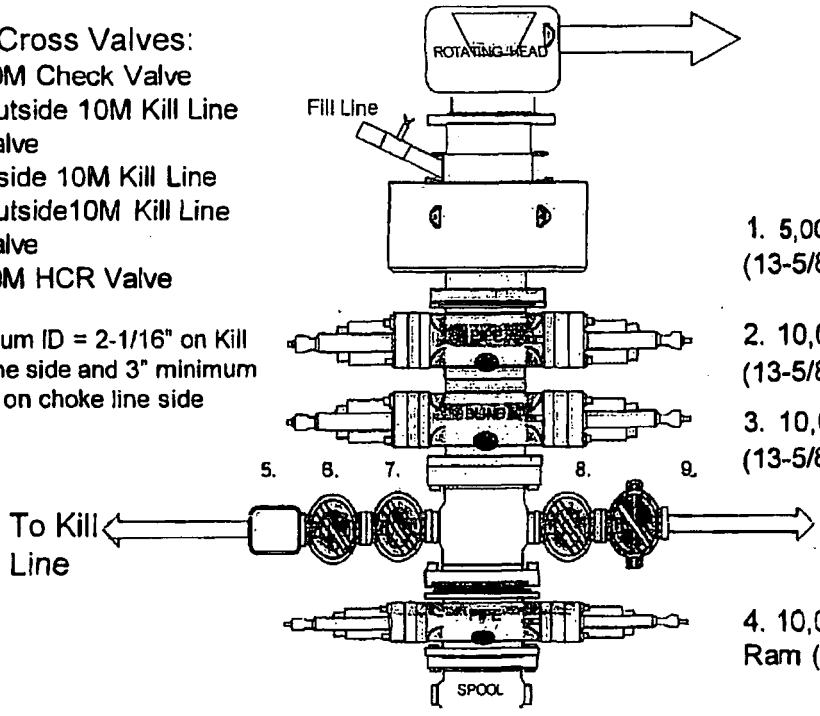


10,000 psi BOP Stack

Mud Cross Valves:

5. 10M Check Valve
6. Outside 10M Kill Line Valve
7. Inside 10M Kill Line
8. Outside10M Kill Line Valve
9. 10M HCR Valve

*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side




1. 5,000 psi Annular (13-5/8" ID)
2. 10,000 psi Upper Pipe Ram (13-5/8" ID)
3. 10,000 psi Blind Ram (13-5/8" ID)
4. 10,000 psi Lower Pipe Ram (13-5/8" ID)

# Wedge 521®

Printed on: 05/22/2018

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | 5.000 in. | Min. Wall Thickness | 87.5% | (*) Grade P110-IC | |
| Wall Thickness | 0.362 in. | Connection OD Option | REGULAR | COUPLING | PIPE BODY |
| Grade | P110-IC* | Drift | API Standard | Body: White<br>1st Band: -<br>2nd Band: -<br>3rd Band: - | 1st Band: White<br>2nd Band: Pale Green<br>3rd Band: -<br>4th Band: - |
| | | Type | Casing | | |

| GEOMETRY | | | | | |
|---|---|---|---|---|---|
| Nominal OD | 5.000 in. | Nominal Weight | 18.00 lbs/ft | Drift | 4.151 in. |
| Nominal ID | 4.276 in. | Wall Thickness | 0.362 in. | Plain End Weight | 17.95 lbs/ft |
| OD Tolerance | API | | | | |
| **PERFORMANCE** | | | | | |
| Body Yield Strength | 580 x1000 lbs | Internal Yield | 13940 psi | SMYS | 110000 psi |
| Collapse | 14840 psi | | | | |
| **GEOMETRY** | | | | | |
| Connection OD | 5.359 in. | Connection ID | 4.226 in. | Make-up Loss | 3.620 in. |
| Threads per in | 3.36 | Connection OD Option | REGULAR | | |
| **PERFORMANCE** | | | | | |
| Tension Efficiency | 73.8 % | Joint Yield Strength | 428.040 x1000 lbs | Internal Pressure Capacity | 13940.000 psi |
| Compression Efficiency | 88.7 % | Compression Strength | 514.460 x1000 lbs | Max. Allowable Bending | 74.5 °/100 ft |
| External Pressure Capacity | 14840.000 psi | | | | |
| **MAKE-UP TORQUES** | | | | | |
| Minimum | 6100 ft-lbs | Optimum | 7300 ft-lbs | Maximum | 10700 ft-lbs |
| **OPERATION LIMIT TORQUES** | | | | | |
| Operating Torque | 17300 ft-lbs | Yield Torque | 26000 ft-lbs | | |

**Notes**

This connection is fully interchangeable with:

Wedge 521® - 5 in. - 13 / 15 lbs/ft

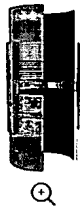
Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

5.5", 20#, P-110, TXP connection (modified buttress connection that provides a torque rating of nearly 24000ft-lbs)

TXP® BTC

SHARE | EXPORT DATA | PRINT



| | | | |
|---|---|---|---|
| Outside Diameter | 5.500 in. | Min. Wall Thickness | 87.5% |
| Wall Thickness | 0.361 in. | Drift | API Standard |
| Grade | P110 | Type | Casing |
| | | Connection OD Option | REGULAR |

Clear Filters
Compare
Request Info

CONNECTION INFORMATION
- Blanking Dimensions
- Connection's Page
- Brochure
- Datasheet Manual

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Nominal OD | 5.500 in. | Nominal Weight | 20 lbs/ft | Drift | 4.653 in. |
| Nominal ID | 4.778 in. | Wall Thickness | 0.361 in. | Plain End Weight | 19.83 lbs/ft |
| OD Tolerance | API | | | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Body Yield Strength | 641 x1000 lbs | Internal Yield | 12640 psi | SMYS | 110000 psi |
| Collapse | 11100 psi | | | | |

## CONNECTION DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Connection OD | 6.100 in. | Coupling Length | 9.450 in. | Connection ID | 4.766 in. |
| Make-up Loss | 4.204 in. | Threads per in | 5 | Connection OD Option | REGULAR |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Tension Efficiency | 100.0 % | Joint Yield Strength | 641.000 x1000 lbs | Internal Pressure Capacity [1] | 12640.000 psi |
| Compression Efficiency | 100 % | Compression Strength | 641.000 x1000 lbs | Max. Allowable Bending | 92 °/100 ft |
| External Pressure Capacity | 11100.000 psi | | | | |

### MAKE-UP TORQUES

| | | | | | |
|---|---|---|---|---|---|
| Minimum | 11270 ft-lbs | Optimum | 12520 ft-lbs | Maximum | 13770 ft-lbs |

### OPERATION LIMIT TORQUES

| | | | | | |
|---|---|---|---|---|---|
| Operating Torque | 21500 ft-lbs | Yield Torque | 23900 ft-lbs | | |

**Casing Design Assumptions**

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

**Casing Design Assumptions**

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

**Casing Design Assumptions**

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
- Cementing loads based on slurries listed in Cement table, and post cement static loading
- Strings landed at neutral weight
- Gas kicks assumed at each casing shoe
- External pressure calculated with fluid gradients and pore pressure
- Production string load tested with completion fluid density and rate
- Tubing leak tested in production scenario

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- Production string load tested with completion fluid density and rate
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Hydrogen Sulfide Drilling

Operations Plan

Tap Rock Resources

1 H2S safety instructions to the following:

- Characteristics of H2S
- Physical effects and hazards
- Principal and operation of H2S detectors, warning system and briefing areas
- Evacuation procedures, routes and first aid
- Proper use of safety equipment & life support systems
- Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30min pressure demand air packs

2 H2S Detection and Alarm Systems:

- H2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure / cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary
- An audio alarm system will be installed on the derrick floor and in the doghouse

3 Windsocks and / Wind Streamers:

- Windsocks at mud pit area should be high enough to be visible
- Windsock on the rig floor and / top of doghouse should be high enough to be visible

4 Condition Flags and Signs:

- Warning sign on access road to location
- Flags to be displayed on sign at entrance to location
    - Green Flag – Normal Safe Operation Condition
    - Yellow Flag – Potential Pressure and Danger
    - Red Flag – Danger (H2S present in dangerous concentrations) Only H2S trained personnel admitted on location

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

6 Communication:

- While working under masks chalkboards will be used for communications
- Hand signals will be used where chalk board is inappropriate
- Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drilling Stem Testing:

- No DST cores are planned at this time

8 Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubulars good and other mechanical equipment

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary

11 Emergency Contacts

| Emergency Contacts | | |
|---|---|---|
| Carlsbad Police Department | 575.887.7551 | 911 |
| Carlsbad Medical Center | 575.887.4100 | 911 |
| Eddy County Fire Service | 575.628.5450 | 911 |
| Eddy County Sherriff | 575.887.7551 | 911 |
| Lea County Fire Service | 575.391.2983 | 911 |
| Lea County Sherriff | 575.396.3611 | 911 |
| Jal Police Department | 575.395.2121 | 911 |
| Jal Fire Department | 575.395.2221 | 911 |
| Tap Rock - Doug Sproul - Drilling | 303-653-3518 | |

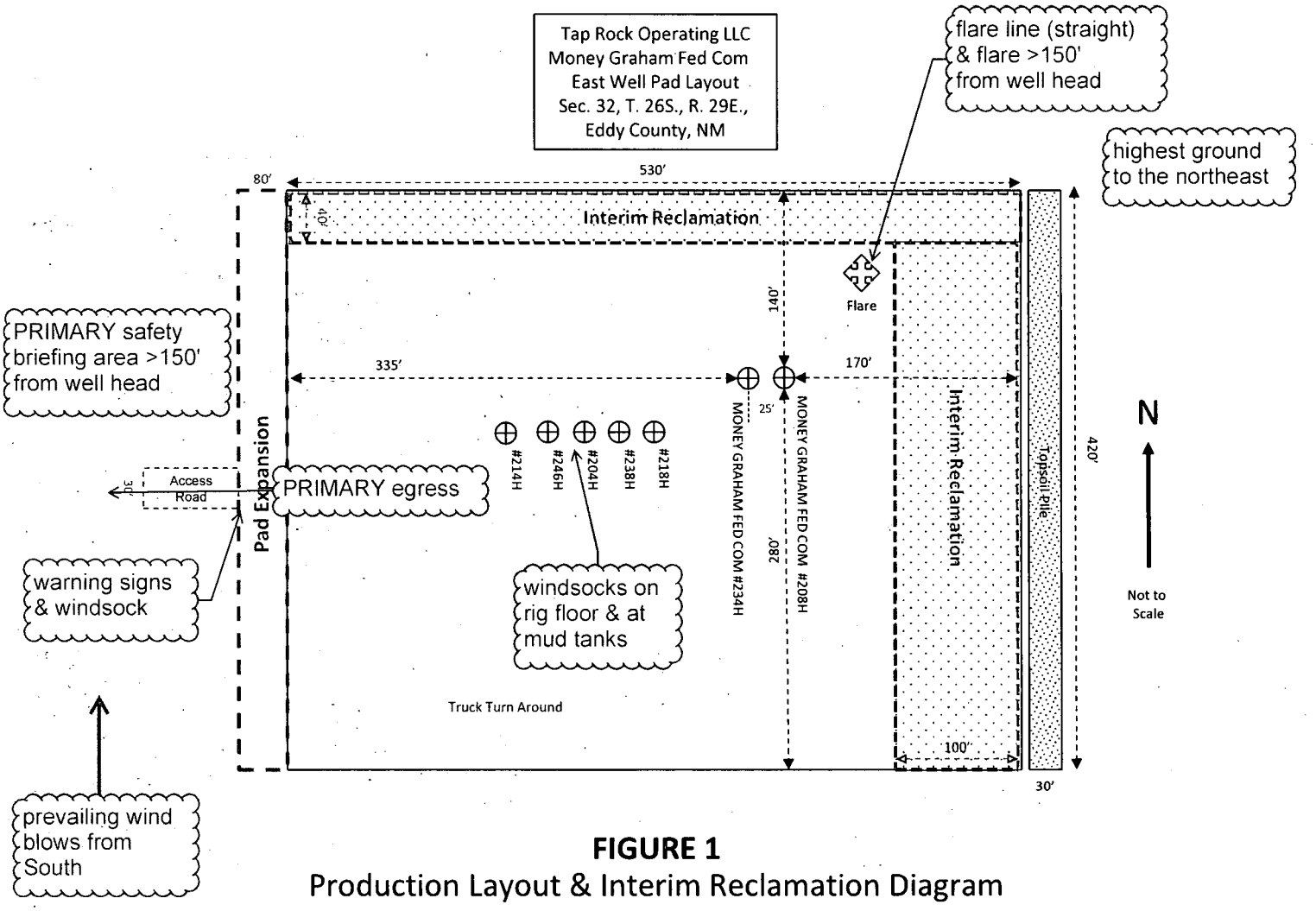



**FIGURE 1**
Production Layout & Interim Reclamation Diagram

# Tap Rock Operating, LLC

**Money Grahm East Pad**
**H2S Contingency Plan:**
**Radius Map**

Section 32, Township 26S, Range 29E
Eddy County, New Mexico

Surface Hole Location

1:27,000

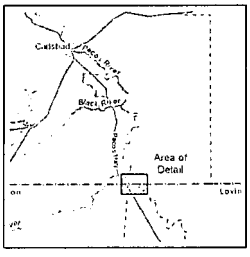
0 0.25 0.5 1

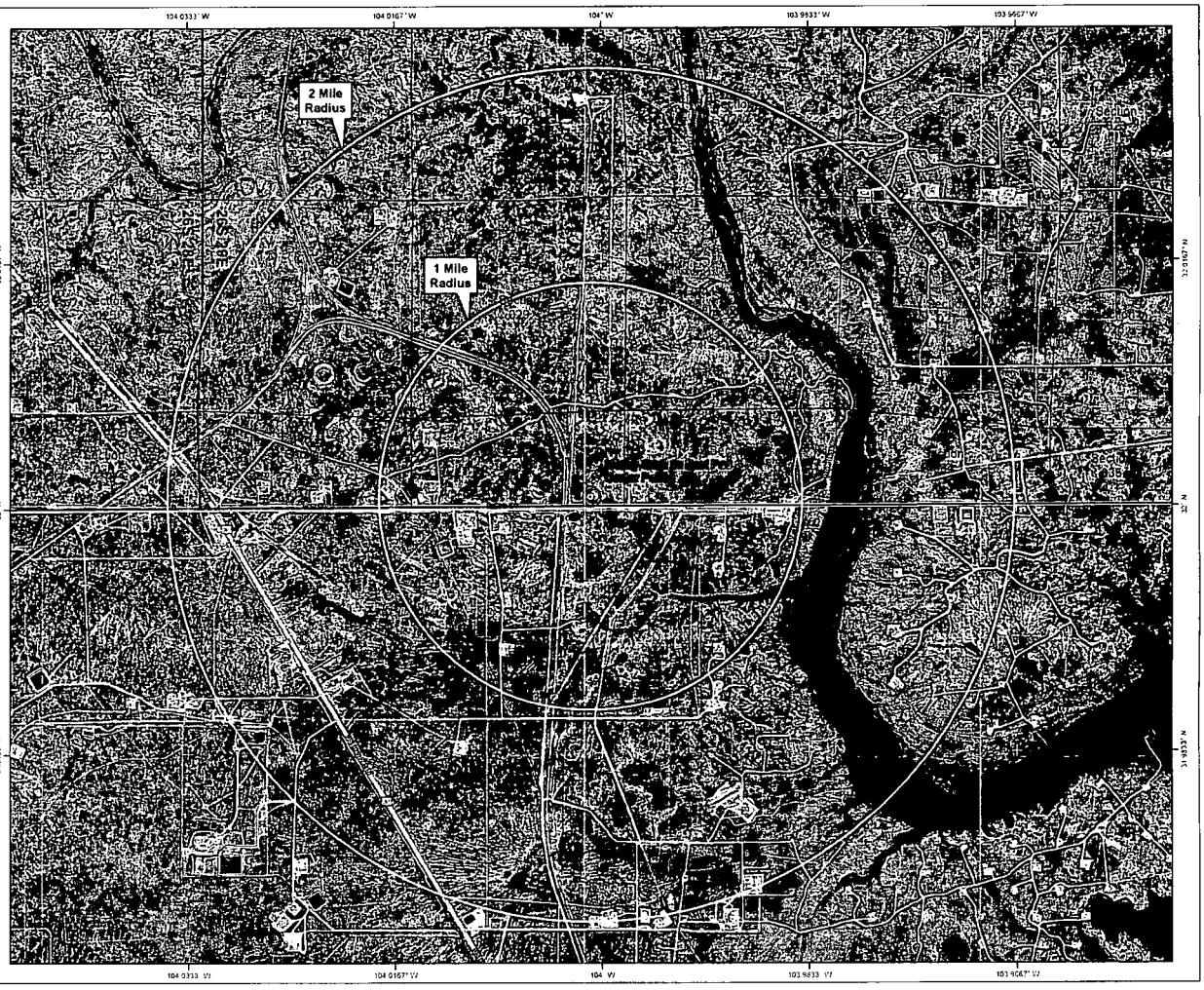
Miles

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., July 26, 2018
for Tap Rock Operating, LLC



# Well: Money Graham Fed Com Well No. 218 H
# Site: Section 32-T26S-R29E
# Project: Eddy County, New Mexico NAD83 NM east
# Design: rev0
# Rig:

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | VSect | Annotation |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 1200.00 | 0.00 | 0.00 | 1200.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP Begin 1.5°/100' build |
| 3 | 1489.54 | 4.34 | 122.20 | 1489.27 | -5.85 | 9.28 | 1.50 | -5.76 | Begin 4.34° tangent |
| 4 | 6124.32 | 4.34 | 122.20 | 6110.73 | -192.89 | 306.28 | 0.00 | -190.11 | Begin 1.5°/100' drop |
| 5 | 6413.86 | 0.00 | 0.00 | 6400.00 | -198.74 | 315.56 | 1.50 | -195.87 | Begin vertical hold |
| 6 | 9350.91 | 0.00 | 0.00 | 9337.05 | -198.74 | 315.56 | 0.00 | -195.87 | Begin 10°/100' build |
| 7 | 9400.91 | 5.00 | 352.90 | 9386.99 | -196.58 | 315.29 | 10.00 | -193.71 | |
| 8 | 10247.51 | 89.66 | 352.90 | 9910.00 | 366.45 | 245.16 | 10.00 | 368.66 | Begin 2°/100' turn |
| 9 | 10628.62 | 89.66 | 0.52 | 9912.25 | 746.64 | 223.31 | 2.00 | 748.64 | Begin 89.66° lateral |
| 10 | 17066.37 | 89.66 | 0.52 | 9950.00 | 7184.01 | 282.00 | 0.00 | 7186.28 | PBHL/TD 17066.37 MD/9950.00 TVD |

DESIGN TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting |
|---|---|---|---|---|---|
| Money Graham 218H VT 100 FSL 638 FEL | 6400.00 | -149.00 | 216.00 | 364040.00 | 644587.00 |
| Money Graham 218H VT 50 FSL 538 FEL | 6400.00 | -198.74 | 315.56 | 363990.26 | 644686.56 |
| Money Graham 218H PBHL 200 FNL 638 FEL | 9950.00 | 7184.01 | 282.00 | 371373.00 | 644653.00 |

Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.79°

Magnetic Field
Strength: 47607.6snT
Dip Angle: 59.77°
Date: 12/26/2018
Model: IGRF2015

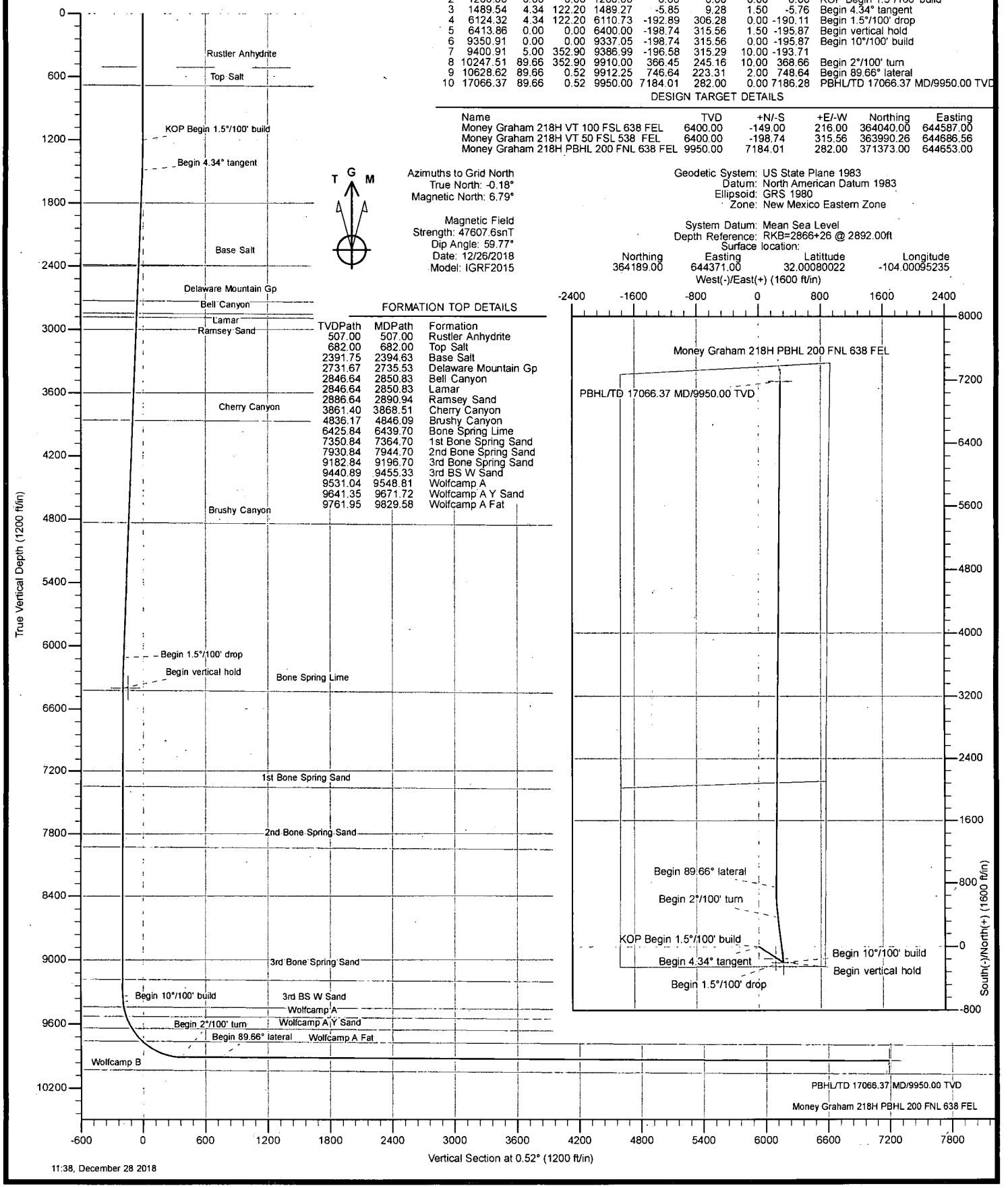
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level
Depth Reference: RKB=2866+26 @ 2892.00ft
Surface location:

| Northing | Easting | Latitude | Longitude |
|---|---|---|---|
| 364189.00 | 644371.00 | 32.00080022 | -104.00095235 |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---|---|---|
| 507.00 | 507.00 | Rustler Anhydrite |
| 682.00 | 682.00 | Top Salt |
| 2391.75 | 2394.63 | Base Salt |
| 2731.67 | 2735.53 | Delaware Mountain Gp |
| 2846.64 | 2850.83 | Bell Canyon |
| 2846.64 | 2850.83 | Lamar |
| 2886.64 | 2890.94 | Ramsey Sand |
| 3861.40 | 3868.51 | Cherry Canyon |
| 4836.17 | 4846.09 | Brushy Canyon |
| 6425.84 | 6439.70 | Bone Spring Lime |
| 7350.84 | 7364.70 | 1st Bone Spring Sand |
| 7930.84 | 7944.70 | 2nd Bone Spring Sand |
| 9182.84 | 9196.70 | 3rd Bone Spring Sand |
| 9440.89 | 9455.33 | 3rd BS W Sand |
| 9531.04 | 9548.81 | Wolfcamp A |
| 9641.35 | 9671.72 | Wolfcamp A Y Sand |
| 9761.95 | 9829.58 | Wolfcamp A Fat |







11:38, December 28 2018

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

| **Project** | Eddy County, New Mexico NAD83 NM east | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | New Mexico Eastern Zone | | |

| **Site** | Section 32-T26S-R29E | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 364,189.00 usft | **Latitude:** | 32.00080022 |
| **From:** | Map | **Easting:** | 644,371.00 usft | **Longitude:** | -104.00095235 |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.18 ° |

| **Well** | Money Graham Fed Com Well No. 218 H, Surf loc: 250 FSL 854 FEL Section32-T26S-R29E | | | | |
|---|---|---|---|---|---|
| **Well Position** | **+N/-S** 0.00 ft | **Northing:** | 364,189.00 usft | **Latitude:** | 32.00080022 |
| | **+E/-W** 0.00 ft | **Easting:** | 644,371.00 usft | **Longitude:** | -104.00095235 |
| **Position Uncertainty** | 0.00 ft | **Wellhead Elevation:** | | **Ground Level:** | 2,866.00 ft |

| **Wellbore** | Original Hole | | | |
|---|---|---|---|---|
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | IGRF2015 | 12/26/2018 | 6.97 | 59.77 | 47,607.60448987 |

| **Design** | rev0 | | | |
|---|---|---|---|---|
| **Audit Notes:** | | | | |
| **Version:** | **Phase:** | PLAN | **Tie On Depth:** | 0.00 |

| **Vertical Section:** | **Depth From (TVD) (ft)** | **+N/-S (ft)** | **+E/-W (ft)** | **Direction (°)** |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 0.52 |

| **Plan Survey Tool Program** | **Date** 12/28/2018 | | | |
|---|---|---|---|---|
| | **Depth From (ft)** | **Depth To (ft)** | **Survey (Wellbore)** | **Tool Name** | **Remarks** |
| 1 | 0.00 | 17,066.37 | rev0 (Original Hole) | MWD<br>OWSG MWD - Standard | |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,489.54 | 4.34 | 122.20 | 1,489.27 | -5.85 | 9.28 | 1.50 | 1.50 | 0.00 | 122.20 | |
| 6,124.32 | 4.34 | 122.20 | 6,110.73 | -192.89 | 306.28 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,413.86 | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | 1.50 | -1.50 | 0.00 | 180.00 | Money Graham 218H |
| 9,350.91 | 0.00 | 0.01 | 9,337.05 | -198.74 | 315.56 | 0.00 | 0.00 | 0.00 | 0.01 | |
| 9,400.91 | 5.00 | 352.90 | 9,386.99 | -196.58 | 315.29 | 10.00 | 10.00 | 0.00 | 352.90 | |
| 10,247.51 | 89.66 | 352.90 | 9,910.00 | 366.45 | 245.16 | 10.00 | 10.00 | 0.00 | 0.00 | |
| 10,628.62 | 89.66 | 0.52 | 9,912.25 | 746.64 | 223.31 | 2.00 | 0.00 | 2.00 | 89.99 | |
| 17,066.37 | 89.66 | 0.52 | 9,950.00 | 7,184.01 | 282.00 | 0.00 | 0.00 | 0.00 | 0.00 | Money Graham 218H |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 507.00 | 0.00 | 0.00 | 507.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Rustler Anhydrite** | | | | | | | | | |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 682.00 | 0.00 | 0.00 | 682.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Top Salt** | | | | | | | | | |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **KOP Begin 1.5°/100' build** | | | | | | | | | |
| 1,300.00 | 1.50 | 122.20 | 1,299.99 | -0.70 | 1.11 | -0.69 | 1.50 | 1.50 | 0.00 |
| 1,400.00 | 3.00 | 122.20 | 1,399.91 | -2.79 | 4.43 | -2.75 | 1.50 | 1.50 | 0.00 |
| 1,489.54 | 4.34 | 122.20 | 1,489.27 | -5.85 | 9.28 | -5.76 | 1.50 | 1.50 | 0.00 |
| **Begin 4.34° tangent** | | | | | | | | | |
| 1,500.00 | 4.34 | 122.20 | 1,499.69 | -6.27 | 9.95 | -6.18 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 4.34 | 122.20 | 1,599.41 | -10.30 | 16.36 | -10.15 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 4.34 | 122.20 | 1,699.12 | -14.34 | 22.77 | -14.13 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 4.34 | 122.20 | 1,798.83 | -18.37 | 29.18 | -18.11 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 4.34 | 122.20 | 1,898.54 | -22.41 | 35.58 | -22.09 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 4.34 | 122.20 | 1,998.26 | -26.45 | 41.99 | -26.06 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 4.34 | 122.20 | 2,097.97 | -30.48 | 48.40 | -30.04 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 4.34 | 122.20 | 2,197.68 | -34.52 | 54.81 | -34.02 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 4.34 | 122.20 | 2,297.40 | -38.55 | 61.22 | -38.00 | 0.00 | 0.00 | 0.00 |
| 2,394.63 | 4.34 | 122.20 | 2,391.75 | -42.37 | 67.28 | -41.76 | 0.00 | 0.00 | 0.00 |
| **Base Salt** | | | | | | | | | |
| 2,400.00 | 4.34 | 122.20 | 2,397.11 | -42.59 | 67.62 | -41.97 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 4.34 | 122.20 | 2,496.82 | -46.63 | 74.03 | -45.95 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 4.34 | 122.20 | 2,596.53 | -50.66 | 80.44 | -49.93 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 4.34 | 122.20 | 2,696.25 | -54.70 | 86.85 | -53.91 | 0.00 | 0.00 | 0.00 |
| 2,735.53 | 4.34 | 122.20 | 2,731.67 | -56.13 | 89.12 | -55.32 | 0.00 | 0.00 | 0.00 |
| **Delaware Mountain Gp** | | | | | | | | | |
| 2,800.00 | 4.34 | 122.20 | 2,795.96 | -58.73 | 93.26 | -57.88 | 0.00 | 0.00 | 0.00 |
| 2,850.83 | 4.34 | 122.20 | 2,846.64 | -60.78 | 96.51 | -59.91 | 0.00 | 0.00 | 0.00 |
| **Bell Canyon - Lamar** | | | | | | | | | |
| 2,890.94 | 4.34 | 122.20 | 2,886.64 | -62.40 | 99.08 | -61.50 | 0.00 | 0.00 | 0.00 |
| **Ramsey Sand** | | | | | | | | | |
| 2,900.00 | 4.34 | 122.20 | 2,895.67 | -62.77 | 99.66 | -61.86 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 4.34 | 122.20 | 2,995.39 | -66.80 | 106.07 | -65.84 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 4.34 | 122.20 | 3,095.10 | -70.84 | 112.48 | -69.82 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 4.34 | 122.20 | 3,194.81 | -74.88 | 118.89 | -73.79 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 4.34 | 122.20 | 3,294.52 | -78.91 | 125.30 | -77.77 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 4.34 | 122.20 | 3,394.24 | -82.95 | 131.70 | -81.75 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 4.34 | 122.20 | 3,493.95 | -86.98 | 138.11 | -85.73 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 4.34 | 122.20 | 3,593.66 | -91.02 | 144.52 | -89.70 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 4.34 | 122.20 | 3,693.38 | -95.05 | 150.93 | -93.68 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 3,800.00 | 4.34 | 122.20 | 3,793.09 | -99.09 | 157.34 | -97.66 | 0.00 | 0.00 | 0.00 |
| 3,868.51 | 4.34 | 122.20 | 3,861.40 | -101.86 | 161.73 | -100.38 | 0.00 | 0.00 | 0.00 |
| **Cherry Canyon** | | | | | | | | | |
| 3,900.00 | 4.34 | 122.20 | 3,892.80 | -103.13 | 163.74 | -101.64 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 4.34 | 122.20 | 3,992.51 | -107.16 | 170.15 | -105.61 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 4.34 | 122.20 | 4,092.23 | -111.20 | 176.56 | -109.59 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 4.34 | 122.20 | 4,191.94 | -115.23 | 182.97 | -113.57 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 4.34 | 122.20 | 4,291.65 | -119.27 | 189.38 | -117.55 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 4.34 | 122.20 | 4,391.37 | -123.31 | 195.78 | -121.52 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 4.34 | 122.20 | 4,491.08 | -127.34 | 202.19 | -125.50 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 4.34 | 122.20 | 4,590.79 | -131.38 | 208.60 | -129.48 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 4.34 | 122.20 | 4,690.50 | -135.41 | 215.01 | -133.46 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 4.34 | 122.20 | 4,790.22 | -139.45 | 221.42 | -137.43 | 0.00 | 0.00 | 0.00 |
| 4,846.09 | 4.34 | 122.20 | 4,836.17 | -141.31 | 224.37 | -139.27 | 0.00 | 0.00 | 0.00 |
| **Brushy Canyon** | | | | | | | | | |
| 4,900.00 | 4.34 | 122.20 | 4,889.93 | -143.48 | 227.82 | -141.41 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 4.34 | 122.20 | 4,989.64 | -147.52 | 234.23 | -145.39 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 4.34 | 122.20 | 5,089.35 | -151.56 | 240.64 | -149.37 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 4.34 | 122.20 | 5,189.07 | -155.59 | 247.05 | -153.34 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 4.34 | 122.20 | 5,288.78 | -159.63 | 253.46 | -157.32 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 4.34 | 122.20 | 5,388.49 | -163.66 | 259.86 | -161.30 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 4.34 | 122.20 | 5,488.21 | -167.70 | 266.27 | -165.28 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 4.34 | 122.20 | 5,587.92 | -171.73 | 272.68 | -169.25 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 4.34 | 122.20 | 5,687.63 | -175.77 | 279.09 | -173.23 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 4.34 | 122.20 | 5,787.34 | -179.81 | 285.50 | -177.21 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 4.34 | 122.20 | 5,887.06 | -183.84 | 291.90 | -181.19 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 4.34 | 122.20 | 5,986.77 | -187.88 | 298.31 | -185.16 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 4.34 | 122.20 | 6,086.48 | -191.91 | 304.72 | -189.14 | 0.00 | 0.00 | 0.00 |
| 6,124.32 | 4.34 | 122.20 | 6,110.73 | -192.89 | 306.28 | -190.11 | 0.00 | 0.00 | 0.00 |
| **Begin 1.5°/100' drop** | | | | | | | | | |
| 6,200.00 | 3.21 | 122.20 | 6,186.25 | -195.55 | 310.50 | -192.72 | 1.50 | -1.50 | 0.00 |
| 6,300.00 | 1.71 | 122.20 | 6,286.15 | -197.84 | 314.12 | -194.98 | 1.50 | -1.50 | 0.00 |
| 6,400.00 | 0.21 | 122.20 | 6,386.14 | -198.73 | 315.54 | -195.86 | 1.50 | -1.50 | 0.00 |
| 6,413.86 | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | -195.87 | 1.50 | -1.50 | 0.00 |
| **Begin vertical hold** | | | | | | | | | |
| 6,439.70 | 0.00 | 0.00 | 6,425.84 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| **Bone Spring Lime** | | | | | | | | | |
| 6,500.00 | 0.00 | 0.00 | 6,486.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,586.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,686.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,786.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,886.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 6,986.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 7,086.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 7,186.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 0.00 | 0.00 | 7,286.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,364.70 | 0.00 | 0.00 | 7,350.84 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| **1st Bone Spring Sand** | | | | | | | | | |
| 7,400.00 | 0.00 | 0.00 | 7,386.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 0.00 | 0.00 | 7,486.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 0.00 | 0.00 | 7,586.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 0.00 | 0.00 | 7,686.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 0.00 | 0.00 | 7,786.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 7,900.00 | 0.00 | 0.00 | 7,886.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 7,944.70 | 0.00 | 0.00 | 7,930.84 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| **2nd Bone Spring Sand** | | | | | | | | | |
| 8,000.00 | 0.00 | 0.00 | 7,986.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 0.00 | 0.00 | 8,086.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 0.00 | 0.00 | 8,186.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 0.00 | 0.00 | 8,286.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 0.00 | 0.00 | 8,386.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 0.00 | 0.00 | 8,486.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 0.00 | 0.00 | 8,586.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 0.00 | 0.00 | 8,686.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 0.00 | 0.00 | 8,786.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 0.00 | 0.00 | 8,886.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 0.00 | 0.00 | 8,986.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 0.00 | 0.00 | 9,086.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 9,196.70 | 0.00 | 0.00 | 9,182.84 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| **3rd Bone Spring Sand** | | | | | | | | | |
| 9,200.00 | 0.00 | 0.00 | 9,186.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 0.00 | 0.00 | 9,286.14 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| 9,350.91 | 0.00 | 0.00 | 9,337.05 | -198.74 | 315.56 | -195.87 | 0.00 | 0.00 | 0.00 |
| **Begin 10°/100' build** | | | | | | | | | |
| 9,400.00 | 4.91 | 352.90 | 9,386.08 | -196.66 | 315.30 | -193.79 | 10.00 | 10.00 | 0.00 |
| 9,400.91 | 5.00 | 352.90 | 9,386.99 | -196.58 | 315.29 | -193.71 | 10.00 | 10.00 | 0.00 |
| 9,455.33 | 10.44 | 352.90 | 9,440.89 | -189.32 | 314.39 | -186.46 | 10.00 | 10.00 | 0.00 |
| **3rd BS W Sand** | | | | | | | | | |
| 9,500.00 | 14.91 | 352.90 | 9,484.46 | -179.60 | 313.18 | -176.75 | 10.00 | 10.00 | 0.00 |
| 9,548.81 | 19.79 | 352.90 | 9,531.04 | -165.16 | 311.38 | -162.33 | 10.00 | 10.00 | 0.00 |
| **Wolfcamp A** | | | | | | | | | |
| 9,600.00 | 24.91 | 352.90 | 9,578.36 | -145.85 | 308.97 | -143.04 | 10.00 | 10.00 | 0.00 |
| 9,671.72 | 32.08 | 352.90 | 9,641.35 | -111.92 | 304.75 | -109.15 | 10.00 | 10.00 | 0.00 |
| **Wolfcamp A Y Sand** | | | | | | | | | |
| 9,700.00 | 34.91 | 352.90 | 9,664.94 | -96.44 | 302.82 | -93.68 | 10.00 | 10.00 | 0.00 |
| 9,800.00 | 44.91 | 352.90 | 9,741.55 | -32.85 | 294.90 | -30.17 | 10.00 | 10.00 | 0.00 |
| 9,829.58 | 47.87 | 352.90 | 9,761.95 | -11.60 | 292.25 | -8.95 | 10.00 | 10.00 | 0.00 |
| **Wolfcamp A Fat** | | | | | | | | | |
| 9,900.00 | 54.91 | 352.90 | 9,805.87 | 42.97 | 285.45 | 45.56 | 10.00 | 10.00 | 0.00 |
| 10,000.00 | 64.91 | 352.90 | 9,855.94 | 128.72 | 274.77 | 131.21 | 10.00 | 10.00 | 0.00 |
| 10,100.00 | 74.91 | 352.90 | 9,890.25 | 221.79 | 263.18 | 224.17 | 10.00 | 10.00 | 0.00 |
| 10,200.00 | 84.91 | 352.90 | 9,907.75 | 319.37 | 251.03 | 321.63 | 10.00 | 10.00 | 0.00 |
| 10,247.51 | 89.66 | 352.90 | 9,910.00 | 366.45 | 245.16 | 368.66 | 10.00 | 10.00 | 0.00 |
| **Begin 2°/100' turn** | | | | | | | | | |
| 10,300.00 | 89.66 | 353.95 | 9,910.31 | 418.59 | 239.15 | 420.74 | 2.00 | 0.00 | 2.00 |
| 10,400.00 | 89.66 | 355.95 | 9,910.90 | 518.19 | 230.35 | 520.26 | 2.00 | 0.00 | 2.00 |
| 10,500.00 | 89.66 | 357.95 | 9,911.49 | 618.05 | 225.03 | 620.06 | 2.00 | 0.00 | 2.00 |
| 10,600.00 | 89.66 | 359.95 | 9,912.08 | 718.02 | 223.20 | 720.02 | 2.00 | 0.00 | 2.00 |
| 10,628.62 | 89.66 | 0.52 | 9,912.25 | 746.64 | 223.31 | 748.64 | 2.00 | 0.00 | 2.00 |
| **Begin 89.66° lateral** | | | | | | | | | |
| 10,700.00 | 89.66 | 0.52 | 9,912.67 | 818.02 | 223.97 | 820.02 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 89.66 | 0.52 | 9,913.25 | 918.01 | 224.88 | 920.01 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 89.66 | 0.52 | 9,913.84 | 1,018.01 | 225.79 | 1,020.01 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 89.66 | 0.52 | 9,914.43 | 1,118.00 | 226.70 | 1,120.01 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 89.66 | 0.52 | 9,915.01 | 1,217.99 | 227.61 | 1,220.01 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 89.66 | 0.52 | 9,915.60 | 1,317.99 | 228.52 | 1,320.01 | 0.00 | 0.00 | 0.00 |

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|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 11,300.00 | 89.66 | 0.52 | 9,916.19 | 1,417.98 | 229.44 | 1,420.01 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 89.66 | 0.52 | 9,916.77 | 1,517.98 | 230.35 | 1,520.00 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 89.66 | 0.52 | 9,917.36 | 1,617.97 | 231.26 | 1,620.00 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 89.66 | 0.52 | 9,917.95 | 1,717.96 | 232.17 | 1,720.00 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 89.66 | 0.52 | 9,918.53 | 1,817.96 | 233.08 | 1,820.00 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 89.66 | 0.52 | 9,919.12 | 1,917.95 | 233.99 | 1,920.00 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 89.66 | 0.52 | 9,919.70 | 2,017.95 | 234.90 | 2,020.00 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 89.66 | 0.52 | 9,920.29 | 2,117.94 | 235.82 | 2,119.99 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 89.66 | 0.52 | 9,920.88 | 2,217.93 | 236.73 | 2,219.99 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 89.66 | 0.52 | 9,921.46 | 2,317.93 | 237.64 | 2,319.99 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 89.66 | 0.52 | 9,922.05 | 2,417.92 | 238.55 | 2,419.99 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 89.66 | 0.52 | 9,922.64 | 2,517.92 | 239.46 | 2,519.99 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 89.66 | 0.52 | 9,923.22 | 2,617.91 | 240.37 | 2,619.99 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 89.66 | 0.52 | 9,923.81 | 2,717.91 | 241.29 | 2,719.98 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 89.66 | 0.52 | 9,924.40 | 2,817.90 | 242.20 | 2,819.98 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 89.66 | 0.52 | 9,924.98 | 2,917.89 | 243.11 | 2,919.98 | 0.00 | 0.00 | 0.00 |
| 12,900.00 | 89.66 | 0.52 | 9,925.57 | 3,017.89 | 244.02 | 3,019.98 | 0.00 | 0.00 | 0.00 |
| 13,000.00 | 89.66 | 0.52 | 9,926.16 | 3,117.88 | 244.93 | 3,119.98 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 89.66 | 0.52 | 9,926.74 | 3,217.88 | 245.84 | 3,219.97 | 0.00 | 0.00 | 0.00 |
| 13,200.00 | 89.66 | 0.52 | 9,927.33 | 3,317.87 | 246.76 | 3,319.97 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 89.66 | 0.52 | 9,927.91 | 3,417.86 | 247.67 | 3,419.97 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 89.66 | 0.52 | 9,928.50 | 3,517.86 | 248.58 | 3,519.97 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 89.66 | 0.52 | 9,929.09 | 3,617.85 | 249.49 | 3,619.97 | 0.00 | 0.00 | 0.00 |
| 13,600.00 | 89.66 | 0.52 | 9,929.67 | 3,717.85 | 250.40 | 3,719.97 | 0.00 | 0.00 | 0.00 |
| 13,700.00 | 89.66 | 0.52 | 9,930.26 | 3,817.84 | 251.31 | 3,819.96 | 0.00 | 0.00 | 0.00 |
| 13,800.00 | 89.66 | 0.52 | 9,930.85 | 3,917.84 | 252.22 | 3,919.96 | 0.00 | 0.00 | 0.00 |
| 13,900.00 | 89.66 | 0.52 | 9,931.43 | 4,017.83 | 253.14 | 4,019.96 | 0.00 | 0.00 | 0.00 |
| 14,000.00 | 89.66 | 0.52 | 9,932.02 | 4,117.82 | 254.05 | 4,119.96 | 0.00 | 0.00 | 0.00 |
| 14,100.00 | 89.66 | 0.52 | 9,932.61 | 4,217.82 | 254.96 | 4,219.96 | 0.00 | 0.00 | 0.00 |
| 14,200.00 | 89.66 | 0.52 | 9,933.19 | 4,317.81 | 255.87 | 4,319.96 | 0.00 | 0.00 | 0.00 |
| 14,300.00 | 89.66 | 0.52 | 9,933.78 | 4,417.81 | 256.78 | 4,419.95 | 0.00 | 0.00 | 0.00 |
| 14,400.00 | 89.66 | 0.52 | 9,934.36 | 4,517.80 | 257.69 | 4,519.95 | 0.00 | 0.00 | 0.00 |
| 14,500.00 | 89.66 | 0.52 | 9,934.95 | 4,617.79 | 258.61 | 4,619.95 | 0.00 | 0.00 | 0.00 |
| 14,600.00 | 89.66 | 0.52 | 9,935.54 | 4,717.79 | 259.52 | 4,719.95 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 89.66 | 0.52 | 9,936.12 | 4,817.78 | 260.43 | 4,819.95 | 0.00 | 0.00 | 0.00 |
| 14,800.00 | 89.66 | 0.52 | 9,936.71 | 4,917.78 | 261.34 | 4,919.95 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 89.66 | 0.52 | 9,937.30 | 5,017.77 | 262.25 | 5,019.94 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 89.66 | 0.52 | 9,937.88 | 5,117.76 | 263.16 | 5,119.94 | 0.00 | 0.00 | 0.00 |
| 15,100.00 | 89.66 | 0.52 | 9,938.47 | 5,217.76 | 264.08 | 5,219.94 | 0.00 | 0.00 | 0.00 |
| 15,200.00 | 89.66 | 0.52 | 9,939.06 | 5,317.75 | 264.99 | 5,319.94 | 0.00 | 0.00 | 0.00 |
| 15,300.00 | 89.66 | 0.52 | 9,939.64 | 5,417.75 | 265.90 | 5,419.94 | 0.00 | 0.00 | 0.00 |
| 15,400.00 | 89.66 | 0.52 | 9,940.23 | 5,517.74 | 266.81 | 5,519.94 | 0.00 | 0.00 | 0.00 |
| 15,500.00 | 89.66 | 0.52 | 9,940.82 | 5,617.74 | 267.72 | 5,619.93 | 0.00 | 0.00 | 0.00 |
| 15,600.00 | 89.66 | 0.52 | 9,941.40 | 5,717.73 | 268.63 | 5,719.93 | 0.00 | 0.00 | 0.00 |
| 15,700.00 | 89.66 | 0.52 | 9,941.99 | 5,817.72 | 269.54 | 5,819.93 | 0.00 | 0.00 | 0.00 |
| 15,800.00 | 89.66 | 0.52 | 9,942.57 | 5,917.72 | 270.46 | 5,919.93 | 0.00 | 0.00 | 0.00 |
| 15,900.00 | 89.66 | 0.52 | 9,943.16 | 6,017.71 | 271.37 | 6,019.93 | 0.00 | 0.00 | 0.00 |
| 16,000.00 | 89.66 | 0.52 | 9,943.75 | 6,117.71 | 272.28 | 6,119.93 | 0.00 | 0.00 | 0.00 |
| 16,100.00 | 89.66 | 0.52 | 9,944.33 | 6,217.70 | 273.19 | 6,219.92 | 0.00 | 0.00 | 0.00 |
| 16,200.00 | 89.66 | 0.52 | 9,944.92 | 6,317.69 | 274.10 | 6,319.92 | 0.00 | 0.00 | 0.00 |
| 16,300.00 | 89.66 | 0.52 | 9,945.51 | 6,417.69 | 275.01 | 6,419.92 | 0.00 | 0.00 | 0.00 |
| 16,400.00 | 89.66 | 0.52 | 9,946.09 | 6,517.68 | 275.93 | 6,519.92 | 0.00 | 0.00 | 0.00 |
| 16,500.00 | 89.66 | 0.52 | 9,946.68 | 6,617.68 | 276.84 | 6,619.92 | 0.00 | 0.00 | 0.00 |
| 16,600.00 | 89.66 | 0.52 | 9,947.27 | 6,717.67 | 277.75 | 6,719.91 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 16,700.00 | 89.66 | 0.52 | 9,947.85 | 6,817.66 | 278.66 | 6,819.91 | 0.00 | 0.00 | 0.00 |
| 16,800.00 | 89.66 | 0.52 | 9,948.44 | 6,917.66 | 279.57 | 6,919.91 | 0.00 | 0.00 | 0.00 |
| 16,900.00 | 89.66 | 0.52 | 9,949.02 | 7,017.65 | 280.48 | 7,019.91 | 0.00 | 0.00 | 0.00 |
| 17,000.00 | 89.66 | 0.52 | 9,949.61 | 7,117.65 | 281.40 | 7,119.91 | 0.00 | 0.00 | 0.00 |
| 17,066.37 | 89.66 | 0.52 | 9,950.00 | 7,184.01 | 282.00 | 7,186.28 | 0.00 | 0.00 | 0.00 |
| **PBHL/TD 17066.37 MD/9950.00 TVD** | | | | | | | | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Money Graham 218H V1<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| Money Graham 218H V1<br>- plan misses target center by 111.29ft at 6413.66ft MD (6399.80 TVD, -198.74 N, 315.56 E)<br>- Point | 0.00 | 0.01 | 6,400.00 | -149.00 | 216.00 | 364,040.00 | 644,587.00 | 32.00038880 | -104.00025703 |
| Money Graham 218H PE<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 9,950.00 | 7,184.01 | 282.00 | 371,373.00 | 644,653.00 | 32.02054632 | -103.99997117 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 507.00 | 507.00 | Rustler Anhydrite | | 0.34 | 0.52 |
| 682.00 | 682.00 | Top Salt | | 0.34 | 0.52 |
| 2,394.63 | 2,391.75 | Base Salt | | 0.34 | 0.52 |
| 2,735.53 | 2,731.67 | Delaware Mountain Gp | | 0.34 | 0.52 |
| 2,850.83 | 2,846.64 | Bell Canyon | | 0.34 | 0.52 |
| 2,850.83 | 2,846.64 | Lamar | | 0.34 | 0.52 |
| 2,890.94 | 2,886.64 | Ramsey Sand | | 0.34 | 0.52 |
| 3,868.51 | 3,861.40 | Cherry Canyon | | 0.34 | 0.52 |
| 4,846.09 | 4,836.17 | Brushy Canyon | | 0.34 | 0.52 |
| 6,439.70 | 6,425.84 | Bone Spring Lime | | 0.34 | 0.52 |
| 7,364.70 | 7,350.84 | 1st Bone Spring Sand | | 0.34 | 0.52 |
| 7,944.70 | 7,930.84 | 2nd Bone Spring Sand | | 0.34 | 0.52 |
| 9,196.70 | 9,182.84 | 3rd Bone Spring Sand | | 0.34 | 0.52 |
| 9,455.33 | 9,440.89 | 3rd BS W Sand | | 0.34 | 0.52 |
| 9,548.81 | 9,531.04 | Wolfcamp A | | 0.34 | 0.52 |
| 9,671.72 | 9,641.35 | Wolfcamp A Y Sand | | 0.34 | 0.52 |
| 9,829.58 | 9,761.95 | Wolfcamp A Fat | | 0.34 | 0.52 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | +E/-W (ft) | Comment |
|---|---|---|---|---|
| 1,200.00 | 1,200.00 | 0.00 | 0.00 | KOP Begin 1.5°/100' build |
| 1,489.54 | 1,489.27 | -5.85 | 9.28 | Begin 4.34° tangent |
| 6,124.32 | 6,110.73 | -192.89 | 306.28 | Begin 1.5°/100' drop |
| 6,413.86 | 6,400.00 | -198.74 | 315.56 | Begin vertical hold |
| 9,350.91 | 9,337.05 | -198.74 | 315.56 | Begin 10°/100' build |
| 9,400.91 | 9,386.99 | -196.58 | 315.29 | |
| 10,247.51 | 9,910.00 | 366.45 | 245.16 | Begin 2°/100' turn |
| 10,628.62 | 9,912.25 | 746.64 | 223.31 | Begin 89.66° lateral |
| 17,066.37 | 9,950.00 | 7,184.01 | 282.00 | PBHL/TD 17066.37 MD/9950.00 TVD |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

| **Project** | Eddy County, New Mexico NAD83 NM east | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | New Mexico Eastern Zone | | |

| **Site** | Section 32-T26S-R29E | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 364,189.00 usft | **Latitude:** | 32.00080022 |
| **From:** | Map | **Easting:** | 644,371.00 usft | **Longitude:** | -104.00095235 |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.18 ° |

| **Well** | Money Graham Fed Com Well No. 218 H, Surf loc: 250 FSL 854 FEL Section32-T26S-R29E | | | | |
|---|---|---|---|---|---|
| **Well Position** | **+N/-S** 0.00 ft | **Northing:** | 364,189.00 usft | **Latitude:** | 32.00080022 |
| | **+E/-W** 0.00 ft | **Easting:** | 644,371.00 usft | **Longitude:** | -104.00095235 |
| **Position Uncertainty** | 0.00 ft | **Wellhead Elevation:** | | **Ground Level:** | 2,866.00 ft |

| **Wellbore** | Original Hole | | | |
|---|---|---|---|---|
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | IGRF2015 | 12/26/2018 | 6.97 | 59.77 | 47,607.60448987 |

| **Design** | rev0 | | | |
|---|---|---|---|---|
| **Audit Notes:** | | | | |
| **Version:** | **Phase:** | PLAN | **Tie On Depth:** | 0.00 |

| **Vertical Section:** | **Depth From (TVD) (ft)** | **+N/-S (ft)** | **+E/-W (ft)** | **Direction (°)** |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 0.52 |

**Plan Survey Tool Program** **Date** 12/28/2018

| | Depth From (ft) | Depth To (ft) | Survey (Wellbore) | Tool Name | Remarks |
|---|---|---|---|---|---|
| 1 | 0.00 | 17,066.37 | rev0 (Original Hole) | MWD<br>OWSG MWD - Standard | |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,489.54 | 4.34 | 122.20 | 1,489.27 | -5.85 | 9.28 | 1.50 | 1.50 | 0.00 | 122.20 | |
| 6,124.32 | 4.34 | 122.20 | 6,110.73 | -192.89 | 306.28 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,413.86 | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | 1.50 | -1.50 | 0.00 | 180.00 | Money Graham 218H |
| 9,350.91 | 0.00 | 0.01 | 9,337.05 | -198.74 | 315.56 | 0.00 | 0.00 | 0.00 | 0.01 | |
| 9,400.91 | 5.00 | 352.90 | 9,386.99 | -196.58 | 315.29 | 10.00 | 10.00 | 0.00 | 352.90 | |
| 10,247.51 | 89.66 | 352.90 | 9,910.00 | 366.45 | 245.16 | 10.00 | 10.00 | 0.00 | 0.00 | |
| 10,628.62 | 89.66 | 0.52 | 9,912.25 | 746.64 | 223.31 | 2.00 | 0.00 | 2.00 | 89.99 | |
| 17,066.37 | 89.66 | 0.52 | 9,950.00 | 7,184.01 | 282.00 | 0.00 | 0.00 | 0.00 | 0.00 | Money Graham 218H |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 507.00 | 0.00 | 0.00 | 507.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| **Rustler Anhydrite** | | | | | | | | | |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 682.00 | 0.00 | 0.00 | 682.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| **Top Salt** | | | | | | | | | |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 364,189.00 | 644,371.00 | 32.00080022 | -104.00095235 |
| **KOP Begin 1.5°/100' build** | | | | | | | | | |
| 1,300.00 | 1.50 | 122.20 | 1,299.99 | -0.70 | 1.11 | 364,188.30 | 644,372.11 | 32.00079830 | -104.00094878 |
| 1,400.00 | 3.00 | 122.20 | 1,399.91 | -2.79 | 4.43 | 364,186.21 | 644,375.43 | 32.00079252 | -104.00093809 |
| 1,489.54 | 4.34 | 122.20 | 1,489.27 | -5.85 | 9.28 | 364,183.15 | 644,380.29 | 32.00078408 | -104.00092246 |
| **Begin 4.34° tangent** | | | | | | | | | |
| 1,500.00 | 4.34 | 122.20 | 1,499.69 | -6.27 | 9.95 | 364,182.73 | 644,380.96 | 32.00078291 | -104.00092031 |
| 1,600.00 | 4.34 | 122.20 | 1,599.41 | -10.30 | 16.36 | 364,178.69 | 644,387.36 | 32.00077176 | -104.00089968 |
| 1,700.00 | 4.34 | 122.20 | 1,699.12 | -14.34 | 22.77 | 364,174.66 | 644,393.77 | 32.00076061 | -104.00087904 |
| 1,800.00 | 4.34 | 122.20 | 1,798.83 | -18.37 | 29.18 | 364,170.62 | 644,400.18 | 32.00074947 | -104.00085841 |
| 1,900.00 | 4.34 | 122.20 | 1,898.54 | -22.41 | 35.58 | 364,166.59 | 644,406.59 | 32.00073832 | -104.00083778 |
| 2,000.00 | 4.34 | 122.20 | 1,998.26 | -26.45 | 41.99 | 364,162.55 | 644,413.00 | 32.00072717 | -104.00081715 |
| 2,100.00 | 4.34 | 122.20 | 2,097.97 | -30.48 | 48.40 | 364,158.52 | 644,419.40 | 32.00071602 | -104.00079652 |
| 2,200.00 | 4.34 | 122.20 | 2,197.68 | -34.52 | 54.81 | 364,154.48 | 644,425.81 | 32.00070487 | -104.00077589 |
| 2,300.00 | 4.34 | 122.20 | 2,297.40 | -38.55 | 61.22 | 364,150.44 | 644,432.22 | 32.00069372 | -104.00075525 |
| 2,394.63 | 4.34 | 122.20 | 2,391.75 | -42.37 | 67.28 | 364,146.63 | 644,438.28 | 32.00068317 | -104.00073573 |
| **Base Salt** | | | | | | | | | |
| 2,400.00 | 4.34 | 122.20 | 2,397.11 | -42.59 | 67.62 | 364,146.41 | 644,438.63 | 32.00068258 | -104.00073462 |
| 2,500.00 | 4.34 | 122.20 | 2,496.82 | -46.63 | 74.03 | 364,142.37 | 644,445.04 | 32.00067143 | -104.00071399 |
| 2,600.00 | 4.34 | 122.20 | 2,596.53 | -50.66 | 80.44 | 364,138.34 | 644,451.44 | 32.00066028 | -104.00069336 |
| 2,700.00 | 4.34 | 122.20 | 2,696.25 | -54.70 | 86.85 | 364,134.30 | 644,457.85 | 32.00064913 | -104.00067273 |
| 2,735.53 | 4.34 | 122.20 | 2,731.67 | -56.13 | 89.12 | 364,132.87 | 644,460.13 | 32.00064517 | -104.00066540 |
| **Delaware Mountain Gp** | | | | | | | | | |
| 2,800.00 | 4.34 | 122.20 | 2,795.96 | -58.73 | 93.26 | 364,130.27 | 644,464.26 | 32.00063798 | -104.00065210 |
| 2,850.83 | 4.34 | 122.20 | 2,846.64 | -60.78 | 96.51 | 364,128.21 | 644,467.52 | 32.00063232 | -104.00064161 |
| **Bell Canyon - Lamar** | | | | | | | | | |
| 2,890.94 | 4.34 | 122.20 | 2,886.64 | -62.40 | 99.08 | 364,126.60 | 644,470.09 | 32.00062784 | -104.00063334 |
| **Ramsey Sand** | | | | | | | | | |
| 2,900.00 | 4.34 | 122.20 | 2,895.67 | -62.77 | 99.66 | 364,126.23 | 644,470.67 | 32.00062683 | -104.00063147 |
| 3,000.00 | 4.34 | 122.20 | 2,995.39 | -66.80 | 106.07 | 364,122.19 | 644,477.08 | 32.00061569 | -104.00061083 |
| 3,100.00 | 4.34 | 122.20 | 3,095.10 | -70.84 | 112.48 | 364,118.16 | 644,483.48 | 32.00060454 | -104.00059020 |
| 3,200.00 | 4.34 | 122.20 | 3,194.81 | -74.88 | 118.89 | 364,114.12 | 644,489.89 | 32.00059339 | -104.00056957 |
| 3,300.00 | 4.34 | 122.20 | 3,294.52 | -78.91 | 125.30 | 364,110.09 | 644,496.30 | 32.00058224 | -104.00054894 |
| 3,400.00 | 4.34 | 122.20 | 3,394.24 | -82.95 | 131.70 | 364,106.05 | 644,502.71 | 32.00057109 | -104.00052831 |
| 3,500.00 | 4.34 | 122.20 | 3,493.95 | -86.98 | 138.11 | 364,102.02 | 644,509.12 | 32.00055994 | -104.00050768 |
| 3,600.00 | 4.34 | 122.20 | 3,593.66 | -91.02 | 144.52 | 364,097.98 | 644,515.52 | 32.00054880 | -104.00048704 |
| 3,700.00 | 4.34 | 122.20 | 3,693.38 | -95.05 | 150.93 | 364,093.94 | 644,521.93 | 32.00053765 | -104.00046641 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 3,800.00 | 4.34 | 122.20 | 3,793.09 | -99.09 | 157.34 | 364,089.91 | 644,528.34 | 32.00052650 | -104.00044578 |
| 3,868.51 | 4.34 | 122.20 | 3,861.40 | -101.86 | 161.73 | 364,087.14 | 644,532.73 | 32.00051886 | -104.00043165 |
| **Cherry Canyon** | | | | | | | | | |
| 3,900.00 | 4.34 | 122.20 | 3,892.80 | -103.13 | 163.74 | 364,085.87 | 644,534.75 | 32.00051535 | -104.00042515 |
| 4,000.00 | 4.34 | 122.20 | 3,992.51 | -107.16 | 170.15 | 364,081.84 | 644,541.16 | 32.00050420 | -104.00040452 |
| 4,100.00 | 4.34 | 122.20 | 4,092.23 | -111.20 | 176.56 | 364,077.80 | 644,547.56 | 32.00049305 | -104.00038389 |
| 4,200.00 | 4.34 | 122.20 | 4,191.94 | -115.23 | 182.97 | 364,073.76 | 644,553.97 | 32.00048190 | -104.00036326 |
| 4,300.00 | 4.34 | 122.20 | 4,291.65 | -119.27 | 189.38 | 364,069.73 | 644,560.38 | 32.00047076 | -104.00034262 |
| 4,400.00 | 4.34 | 122.20 | 4,391.37 | -123.31 | 195.78 | 364,065.69 | 644,566.79 | 32.00045961 | -104.00032199 |
| 4,500.00 | 4.34 | 122.20 | 4,491.08 | -127.34 | 202.19 | 364,061.66 | 644,573.20 | 32.00044846 | -104.00030136 |
| 4,600.00 | 4.34 | 122.20 | 4,590.79 | -131.38 | 208.60 | 364,057.62 | 644,579.60 | 32.00043731 | -104.00028073 |
| 4,700.00 | 4.34 | 122.20 | 4,690.50 | -135.41 | 215.01 | 364,053.59 | 644,586.01 | 32.00042616 | -104.00026010 |
| 4,800.00 | 4.34 | 122.20 | 4,790.22 | -139.45 | 221.42 | 364,049.55 | 644,592.42 | 32.00041501 | -104.00023947 |
| 4,846.09 | 4.34 | 122.20 | 4,836.17 | -141.31 | 224.37 | 364,047.69 | 644,595.37 | 32.00040988 | -104.00022996 |
| **Brushy Canyon** | | | | | | | | | |
| 4,900.00 | 4.34 | 122.20 | 4,889.93 | -143.48 | 227.82 | 364,045.51 | 644,598.83 | 32.00040387 | -104.00021884 |
| 5,000.00 | 4.34 | 122.20 | 4,989.64 | -147.52 | 234.23 | 364,041.48 | 644,605.24 | 32.00039272 | -104.00019820 |
| 5,100.00 | 4.34 | 122.20 | 5,089.35 | -151.56 | 240.64 | 364,037.44 | 644,611.64 | 32.00038157 | -104.00017757 |
| 5,200.00 | 4.34 | 122.20 | 5,189.07 | -155.59 | 247.05 | 364,033.41 | 644,618.05 | 32.00037042 | -104.00015694 |
| 5,300.00 | 4.34 | 122.20 | 5,288.78 | -159.63 | 253.46 | 364,029.37 | 644,624.46 | 32.00035927 | -104.00013631 |
| 5,400.00 | 4.34 | 122.20 | 5,388.49 | -163.66 | 259.86 | 364,025.34 | 644,630.87 | 32.00034812 | -104.00011568 |
| 5,500.00 | 4.34 | 122.20 | 5,488.21 | -167.70 | 266.27 | 364,021.30 | 644,637.28 | 32.00033698 | -104.00009505 |
| 5,600.00 | 4.34 | 122.20 | 5,587.92 | -171.73 | 272.68 | 364,017.26 | 644,643.68 | 32.00032583 | -104.00007442 |
| 5,700.00 | 4.34 | 122.20 | 5,687.63 | -175.77 | 279.09 | 364,013.23 | 644,650.09 | 32.00031468 | -104.00005378 |
| 5,800.00 | 4.34 | 122.20 | 5,787.34 | -179.81 | 285.50 | 364,009.19 | 644,656.50 | 32.00030353 | -104.00003315 |
| 5,900.00 | 4.34 | 122.20 | 5,887.06 | -183.84 | 291.90 | 364,005.16 | 644,662.91 | 32.00029238 | -104.00001252 |
| 6,000.00 | 4.34 | 122.20 | 5,986.77 | -187.88 | 298.31 | 364,001.12 | 644,669.32 | 32.00028123 | -103.99999189 |
| 6,100.00 | 4.34 | 122.20 | 6,086.48 | -191.91 | 304.72 | 363,997.09 | 644,675.72 | 32.00027008 | -103.99997126 |
| 6,124.32 | 4.34 | 122.20 | 6,110.73 | -192.89 | 306.28 | 363,996.10 | 644,677.28 | 32.00026737 | -103.99996624 |
| **Begin 1.5°/100' drop** | | | | | | | | | |
| 6,200.00 | 3.21 | 122.20 | 6,186.25 | -195.55 | 310.50 | 363,993.45 | 644,681.50 | 32.00026004 | -103.99995267 |
| 6,300.00 | 1.71 | 122.20 | 6,286.15 | -197.84 | 314.12 | 363,991.16 | 644,685.13 | 32.00025372 | -103.99994098 |
| 6,400.00 | 0.21 | 122.20 | 6,386.14 | -198.73 | 315.54 | 363,990.27 | 644,686.54 | 32.00025126 | -103.99993643 |
| 6,413.86 | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **Begin vertical hold** | | | | | | | | | |
| 6,439.70 | 0.00 | 0.00 | 6,425.84 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **Bone Spring Lime** | | | | | | | | | |
| 6,500.00 | 0.00 | 0.00 | 6,486.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 6,600.00 | 0.00 | 0.00 | 6,586.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 6,700.00 | 0.00 | 0.00 | 6,686.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 6,800.00 | 0.00 | 0.00 | 6,786.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 6,900.00 | 0.00 | 0.00 | 6,886.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,000.00 | 0.00 | 0.00 | 6,986.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,100.00 | 0.00 | 0.00 | 7,086.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,200.00 | 0.00 | 0.00 | 7,186.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,300.00 | 0.00 | 0.00 | 7,286.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,364.70 | 0.00 | 0.00 | 7,350.84 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **1st Bone Spring Sand** | | | | | | | | | |
| 7,400.00 | 0.00 | 0.00 | 7,386.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,500.00 | 0.00 | 0.00 | 7,486.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,600.00 | 0.00 | 0.00 | 7,586.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,700.00 | 0.00 | 0.00 | 7,686.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,800.00 | 0.00 | 0.00 | 7,786.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 7,900.00 | 0.00 | 0.00 | 7,886.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 7,944.70 | 0.00 | 0.00 | 7,930.84 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **2nd Bone Spring Sand** | | | | | | | | | |
| 8,000.00 | 0.00 | 0.00 | 7,986.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,100.00 | 0.00 | 0.00 | 8,086.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,200.00 | 0.00 | 0.00 | 8,186.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,300.00 | 0.00 | 0.00 | 8,286.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,400.00 | 0.00 | 0.00 | 8,386.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,500.00 | 0.00 | 0.00 | 8,486.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,600.00 | 0.00 | 0.00 | 8,586.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,700.00 | 0.00 | 0.00 | 8,686.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,800.00 | 0.00 | 0.00 | 8,786.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 8,900.00 | 0.00 | 0.00 | 8,886.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 9,000.00 | 0.00 | 0.00 | 8,986.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 9,100.00 | 0.00 | 0.00 | 9,086.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 9,196.70 | 0.00 | 0.00 | 9,182.84 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **3rd Bone Spring Sand** | | | | | | | | | |
| 9,200.00 | 0.00 | 0.00 | 9,186.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 9,300.00 | 0.00 | 0.00 | 9,286.14 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| 9,350.91 | 0.00 | 0.00 | 9,337.05 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| **Begin 10°/100' build** | | | | | | | | | |
| 9,400.00 | 4.91 | 352.90 | 9,386.08 | -196.66 | 315.30 | 363,992.34 | 644,686.30 | 32.00025696 | -103.99993718 |
| 9,400.91 | 5.00 | 352.90 | 9,386.99 | -196.58 | 315.29 | 363,992.42 | 644,686.29 | 32.00025718 | -103.99993721 |
| 9,455.33 | 10.44 | 352.90 | 9,440.89 | -189.32 | 314.39 | 363,999.67 | 644,685.39 | 32.00027712 | -103.99994005 |
| **3rd BS W Sand** | | | | | | | | | |
| 9,500.00 | 14.91 | 352.90 | 9,484.46 | -179.60 | 313.18 | 364,009.40 | 644,684.18 | 32.00030386 | -103.99994386 |
| 9,548.81 | 19.79 | 352.90 | 9,531.04 | -165.16 | 311.38 | 364,023.84 | 644,682.38 | 32.00034357 | -103.99994952 |
| **Wolfcamp A** | | | | | | | | | |
| 9,600.00 | 24.91 | 352.90 | 9,578.36 | -145.85 | 308.97 | 364,043.15 | 644,679.98 | 32.00039667 | -103.99995708 |
| 9,671.72 | 32.08 | 352.90 | 9,641.35 | -111.92 | 304.75 | 364,077.08 | 644,675.75 | 32.00048997 | -103.99997038 |
| **Wolfcamp A Y Sand** | | | | | | | | | |
| 9,700.00 | 34.91 | 352.90 | 9,664.94 | -96.44 | 302.82 | 364,092.56 | 644,673.82 | 32.00053256 | -103.99997645 |
| 9,800.00 | 44.91 | 352.90 | 9,741.55 | -32.85 | 294.90 | 364,156.15 | 644,665.90 | 32.00070742 | -104.00000136 |
| 9,829.58 | 47.87 | 352.90 | 9,761.95 | -11.60 | 292.25 | 364,177.40 | 644,663.26 | 32.00076586 | -104.00000969 |
| **Wolfcamp A Fat** | | | | | | | | | |
| 9,900.00 | 54.91 | 352.90 | 9,805.87 | 42.97 | 285.45 | 364,231.96 | 644,656.46 | 32.00091592 | -104.00003107 |
| 10,000.00 | 64.91 | 352.90 | 9,855.94 | 128.72 | 274.77 | 364,317.71 | 644,645.78 | 32.00115173 | -104.00006468 |
| 10,100.00 | 74.91 | 352.90 | 9,890.25 | 221.79 | 263.18 | 364,410.79 | 644,634.18 | 32.00140770 | -104.00010115 |
| 10,200.00 | 84.91 | 352.90 | 9,907.75 | 319.37 | 251.03 | 364,508.36 | 644,622.03 | 32.00167602 | -104.00013939 |
| 10,247.51 | 89.66 | 352.90 | 9,910.00 | 366.45 | 245.16 | 364,555.45 | 644,616.17 | 32.00180550 | -104.00015784 |
| **Begin 2°/100' turn** | | | | | | | | | |
| 10,300.00 | 89.66 | 353.95 | 9,910.31 | 418.59 | 239.15 | 364,607.59 | 644,610.16 | 32.00194888 | -104.00017670 |
| 10,400.00 | 89.66 | 355.95 | 9,910.90 | 518.19 | 230.35 | 364,707.19 | 644,601.35 | 32.00222277 | -104.00020411 |
| 10,500.00 | 89.66 | 357.95 | 9,911.49 | 618.05 | 225.03 | 364,807.04 | 644,596.03 | 32.00249730 | -104.00022028 |
| 10,600.00 | 89.66 | 359.95 | 9,912.08 | 718.02 | 223.20 | 364,907.02 | 644,594.20 | 32.00277214 | -104.00022520 |
| 10,628.62 | 89.66 | 0.52 | 9,912.25 | 746.64 | 223.31 | 364,935.64 | 644,594.32 | 32.00285082 | -104.00022454 |
| **Begin 89.66° lateral** | | | | | | | | | |
| 10,700.00 | 89.66 | 0.52 | 9,912.67 | 818.02 | 223.97 | 365,007.01 | 644,594.97 | 32.00304702 | -104.00022173 |
| 10,800.00 | 89.66 | 0.52 | 9,913.25 | 918.01 | 224.88 | 365,107.01 | 644,595.88 | 32.00332189 | -104.00021779 |
| 10,900.00 | 89.66 | 0.52 | 9,913.84 | 1,018.01 | 225.79 | 365,207.00 | 644,596.79 | 32.00359676 | -104.00021386 |
| 11,000.00 | 89.66 | 0.52 | 9,914.43 | 1,118.00 | 226.70 | 365,307.00 | 644,597.70 | 32.00387163 | -104.00020992 |
| 11,100.00 | 89.66 | 0.52 | 9,915.01 | 1,217.99 | 227.61 | 365,406.99 | 644,598.62 | 32.00414650 | -104.00020599 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 11,200.00 | 89.66 | 0.52 | 9,915.60 | 1,317.99 | 228.52 | 365,506.98 | 644,599.53 | 32.00442137 | -104.00020205 |
| 11,300.00 | 89.66 | 0.52 | 9,916.19 | 1,417.98 | 229.44 | 365,606.98 | 644,600.44 | 32.00469625 | -104.00019812 |
| 11,400.00 | 89.66 | 0.52 | 9,916.77 | 1,517.98 | 230.35 | 365,706.97 | 644,601.35 | 32.00497112 | -104.00019418 |
| 11,500.00 | 89.66 | 0.52 | 9,917.36 | 1,617.97 | 231.26 | 365,806.97 | 644,602.26 | 32.00524599 | -104.00019025 |
| 11,600.00 | 89.66 | 0.52 | 9,917.95 | 1,717.96 | 232.17 | 365,906.96 | 644,603.17 | 32.00552086 | -104.00018631 |
| 11,700.00 | 89.66 | 0.52 | 9,918.53 | 1,817.96 | 233.08 | 366,006.95 | 644,604.09 | 32.00579573 | -104.00018238 |
| 11,800.00 | 89.66 | 0.52 | 9,919.12 | 1,917.95 | 233.99 | 366,106.95 | 644,605.00 | 32.00607060 | -104.00017844 |
| 11,900.00 | 89.66 | 0.52 | 9,919.70 | 2,017.95 | 234.90 | 366,206.94 | 644,605.91 | 32.00634547 | -104.00017451 |
| 12,000.00 | 89.66 | 0.52 | 9,920.29 | 2,117.94 | 235.82 | 366,306.93 | 644,606.82 | 32.00662034 | -104.00017057 |
| 12,100.00 | 89.66 | 0.52 | 9,920.88 | 2,217.93 | 236.73 | 366,406.93 | 644,607.73 | 32.00689521 | -104.00016664 |
| 12,200.00 | 89.66 | 0.52 | 9,921.46 | 2,317.93 | 237.64 | 366,506.92 | 644,608.64 | 32.00717009 | -104.00016270 |
| 12,300.00 | 89.66 | 0.52 | 9,922.05 | 2,417.92 | 238.55 | 366,606.92 | 644,609.55 | 32.00744496 | -104.00015877 |
| 12,400.00 | 89.66 | 0.52 | 9,922.64 | 2,517.92 | 239.46 | 366,706.91 | 644,610.47 | 32.00771983 | -104.00015483 |
| 12,500.00 | 89.66 | 0.52 | 9,923.22 | 2,617.91 | 240.37 | 366,806.90 | 644,611.38 | 32.00799470 | -104.00015090 |
| 12,600.00 | 89.66 | 0.52 | 9,923.81 | 2,717.91 | 241.29 | 366,906.90 | 644,612.29 | 32.00826957 | -104.00014696 |
| 12,700.00 | 89.66 | 0.52 | 9,924.40 | 2,817.90 | 242.20 | 367,006.89 | 644,613.20 | 32.00854444 | -104.00014303 |
| 12,800.00 | 89.66 | 0.52 | 9,924.98 | 2,917.89 | 243.11 | 367,106.89 | 644,614.11 | 32.00881931 | -104.00013909 |
| 12,900.00 | 89.66 | 0.52 | 9,925.57 | 3,017.89 | 244.02 | 367,206.88 | 644,615.02 | 32.00909418 | -104.00013516 |
| 13,000.00 | 89.66 | 0.52 | 9,926.16 | 3,117.88 | 244.93 | 367,306.87 | 644,615.94 | 32.00936905 | -104.00013122 |
| 13,100.00 | 89.66 | 0.52 | 9,926.74 | 3,217.88 | 245.84 | 367,406.87 | 644,616.85 | 32.00964392 | -104.00012729 |
| 13,200.00 | 89.66 | 0.52 | 9,927.33 | 3,317.87 | 246.76 | 367,506.86 | 644,617.76 | 32.00991880 | -104.00012335 |
| 13,300.00 | 89.66 | 0.52 | 9,927.91 | 3,417.86 | 247.67 | 367,606.86 | 644,618.67 | 32.01019367 | -104.00011942 |
| 13,400.00 | 89.66 | 0.52 | 9,928.50 | 3,517.86 | 248.58 | 367,706.85 | 644,619.58 | 32.01046854 | -104.00011548 |
| 13,500.00 | 89.66 | 0.52 | 9,929.09 | 3,617.85 | 249.49 | 367,806.84 | 644,620.49 | 32.01074341 | -104.00011154 |
| 13,600.00 | 89.66 | 0.52 | 9,929.67 | 3,717.85 | 250.40 | 367,906.84 | 644,621.41 | 32.01101828 | -104.00010761 |
| 13,700.00 | 89.66 | 0.52 | 9,930.26 | 3,817.84 | 251.31 | 368,006.83 | 644,622.32 | 32.01129315 | -104.00010367 |
| 13,800.00 | 89.66 | 0.52 | 9,930.85 | 3,917.84 | 252.22 | 368,106.83 | 644,623.23 | 32.01156802 | -104.00009974 |
| 13,900.00 | 89.66 | 0.52 | 9,931.43 | 4,017.83 | 253.14 | 368,206.82 | 644,624.14 | 32.01184289 | -104.00009580 |
| 14,000.00 | 89.66 | 0.52 | 9,932.02 | 4,117.82 | 254.05 | 368,306.81 | 644,625.05 | 32.01211776 | -104.00009187 |
| 14,100.00 | 89.66 | 0.52 | 9,932.61 | 4,217.82 | 254.96 | 368,406.81 | 644,625.96 | 32.01239263 | -104.00008793 |
| 14,200.00 | 89.66 | 0.52 | 9,933.19 | 4,317.81 | 255.87 | 368,506.80 | 644,626.87 | 32.01266750 | -104.00008399 |
| 14,300.00 | 89.66 | 0.52 | 9,933.78 | 4,417.81 | 256.78 | 368,606.80 | 644,627.79 | 32.01294237 | -104.00008006 |
| 14,400.00 | 89.66 | 0.52 | 9,934.36 | 4,517.80 | 257.69 | 368,706.79 | 644,628.70 | 32.01321725 | -104.00007612 |
| 14,500.00 | 89.66 | 0.52 | 9,934.95 | 4,617.79 | 258.61 | 368,806.78 | 644,629.61 | 32.01349212 | -104.00007219 |
| 14,600.00 | 89.66 | 0.52 | 9,935.54 | 4,717.79 | 259.52 | 368,906.78 | 644,630.52 | 32.01376699 | -104.00006825 |
| 14,700.00 | 89.66 | 0.52 | 9,936.12 | 4,817.78 | 260.43 | 369,006.77 | 644,631.43 | 32.01404186 | -104.00006432 |
| 14,800.00 | 89.66 | 0.52 | 9,936.71 | 4,917.78 | 261.34 | 369,106.76 | 644,632.34 | 32.01431673 | -104.00006038 |
| 14,900.00 | 89.66 | 0.52 | 9,937.30 | 5,017.77 | 262.25 | 369,206.76 | 644,633.26 | 32.01459160 | -104.00005644 |
| 15,000.00 | 89.66 | 0.52 | 9,937.88 | 5,117.76 | 263.16 | 369,306.75 | 644,634.17 | 32.01486647 | -104.00005251 |
| 15,100.00 | 89.66 | 0.52 | 9,938.47 | 5,217.76 | 264.08 | 369,406.75 | 644,635.08 | 32.01514134 | -104.00004857 |
| 15,200.00 | 89.66 | 0.52 | 9,939.06 | 5,317.75 | 264.99 | 369,506.74 | 644,635.99 | 32.01541621 | -104.00004464 |
| 15,300.00 | 89.66 | 0.52 | 9,939.64 | 5,417.75 | 265.90 | 369,606.73 | 644,636.90 | 32.01569108 | -104.00004070 |
| 15,400.00 | 89.66 | 0.52 | 9,940.23 | 5,517.74 | 266.81 | 369,706.73 | 644,637.81 | 32.01596595 | -104.00003676 |
| 15,500.00 | 89.66 | 0.52 | 9,940.82 | 5,617.74 | 267.72 | 369,806.72 | 644,638.73 | 32.01624082 | -104.00003283 |
| 15,600.00 | 89.66 | 0.52 | 9,941.40 | 5,717.73 | 268.63 | 369,906.72 | 644,639.64 | 32.01651569 | -104.00002889 |
| 15,700.00 | 89.66 | 0.52 | 9,941.99 | 5,817.72 | 269.54 | 370,006.71 | 644,640.55 | 32.01679056 | -104.00002495 |
| 15,800.00 | 89.66 | 0.52 | 9,942.57 | 5,917.72 | 270.46 | 370,106.70 | 644,641.46 | 32.01706544 | -104.00002102 |
| 15,900.00 | 89.66 | 0.52 | 9,943.16 | 6,017.71 | 271.37 | 370,206.70 | 644,642.37 | 32.01734031 | -104.00001708 |
| 16,000.00 | 89.66 | 0.52 | 9,943.75 | 6,117.71 | 272.28 | 370,306.69 | 644,643.28 | 32.01761518 | -104.00001315 |
| 16,100.00 | 89.66 | 0.52 | 9,944.33 | 6,217.70 | 273.19 | 370,406.69 | 644,644.20 | 32.01789005 | -104.00000921 |
| 16,200.00 | 89.66 | 0.52 | 9,944.92 | 6,317.69 | 274.10 | 370,506.68 | 644,645.11 | 32.01816492 | -104.00000527 |
| 16,300.00 | 89.66 | 0.52 | 9,945.51 | 6,417.69 | 275.01 | 370,606.67 | 644,646.02 | 32.01843979 | -104.00000134 |
| 16,400.00 | 89.66 | 0.52 | 9,946.09 | 6,517.68 | 275.93 | 370,706.67 | 644,646.93 | 32.01871466 | -103.99999740 |
| 16,500.00 | 89.66 | 0.52 | 9,946.68 | 6,617.68 | 276.84 | 370,806.66 | 644,647.84 | 32.01898953 | -103.99999346 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 16,600.00 | 89.66 | 0.52 | 9,947.27 | 6,717.67 | 277.75 | 370,906.66 | 644,648.75 | 32.01926440 | -103.99998953 |
| 16,700.00 | 89.66 | 0.52 | 9,947.85 | 6,817.66 | 278.66 | 371,006.65 | 644,649.66 | 32.01953927 | -103.99998559 |
| 16,800.00 | 89.66 | 0.52 | 9,948.44 | 6,917.66 | 279.57 | 371,106.64 | 644,650.58 | 32.01981414 | -103.99998165 |
| 16,900.00 | 89.66 | 0.52 | 9,949.02 | 7,017.65 | 280.48 | 371,206.64 | 644,651.49 | 32.02008901 | -103.99997772 |
| 17,000.00 | 89.66 | 0.52 | 9,949.61 | 7,117.65 | 281.40 | 371,306.63 | 644,652.40 | 32.02036388 | -103.99997378 |
| 17,066.37 | 89.66 | 0.52 | 9,950.00 | 7,184.01 | 282.00 | 371,373.00 | 644,653.00 | 32.02054632 | -103.99997117 |
| **PBHL/TD 17066.37 MD/9950.00 TVD** | | | | | | | | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Money Graham 218H VT<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 6,400.00 | -198.74 | 315.56 | 363,990.26 | 644,686.56 | 32.00025123 | -103.99993636 |
| Money Graham 218H VT<br>- plan misses target center by 111.29ft at 6413.66ft MD (6399.80 TVD, -198.74 N, 315.56 E)<br>- Point | 0.00 | 0.01 | 6,400.00 | -149.00 | 216.00 | 364,040.00 | 644,587.00 | 32.00038880 | -104.00025703 |
| Money Graham 218H PE<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 9,950.00 | 7,184.01 | 282.00 | 371,373.00 | 644,653.00 | 32.02054632 | -103.99997117 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 507.00 | 507.00 | Rustler Anhydrite | | 0.34 | 0.52 |
| 682.00 | 682.00 | Top Salt | | 0.34 | 0.52 |
| 2,394.63 | 2,391.75 | Base Salt | | 0.34 | 0.52 |
| 2,735.53 | 2,731.67 | Delaware Mountain Gp | | 0.34 | 0.52 |
| 2,850.83 | 2,846.64 | Bell Canyon | | 0.34 | 0.52 |
| 2,850.83 | 2,846.64 | Lamar | | 0.34 | 0.52 |
| 2,890.94 | 2,886.64 | Ramsey Sand | | 0.34 | 0.52 |
| 3,868.51 | 3,861.40 | Cherry Canyon | | 0.34 | 0.52 |
| 4,846.09 | 4,836.17 | Brushy Canyon | | 0.34 | 0.52 |
| 6,439.70 | 6,425.84 | Bone Spring Lime | | 0.34 | 0.52 |
| 7,364.70 | 7,350.84 | 1st Bone Spring Sand | | 0.34 | 0.52 |
| 7,944.70 | 7,930.84 | 2nd Bone Spring Sand | | 0.34 | 0.52 |
| 9,196.70 | 9,182.84 | 3rd Bone Spring Sand | | 0.34 | 0.52 |
| 9,455.33 | 9,440.89 | 3rd BS W Sand | | 0.34 | 0.52 |
| 9,548.81 | 9,531.04 | Wolfcamp A | | 0.34 | 0.52 |
| 9,671.72 | 9,641.35 | Wolfcamp A Y Sand | | 0.34 | 0.52 |
| 9,829.58 | 9,761.95 | Wolfcamp A Fat | | 0.34 | 0.52 |

| | | | |
|---|---|---|---|
| **Database:** | DB_Jul2216dt_v14 | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Company:** | Tap Rock Operating LLC | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site:** | Section 32-T26S-R29E | **North Reference:** | Grid |
| **Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Hole | | |
| **Design:** | rev0 | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | +E/-W (ft) | Comment |
|---|---|---|---|---|
| 1,200.00 | 1,200.00 | 0.00 | 0.00 | KOP Begin 1.5°/100' build |
| 1,489.54 | 1,489.27 | -5.85 | 9.28 | Begin 4.34° tangent |
| 6,124.32 | 6,110.73 | -192.89 | 306.28 | Begin 1.5°/100' drop |
| 6,413.86 | 6,400.00 | -198.74 | 315.56 | Begin vertical hold |
| 9,350.91 | 9,337.05 | -198.74 | 315.56 | Begin 10°/100' build |
| 9,400.91 | 9,386.99 | -196.58 | 315.29 | |
| 10,247.51 | 9,910.00 | 366.45 | 245.16 | Begin 2°/100' turn |
| 10,628.62 | 9,912.25 | 746.64 | 223.31 | Begin 89.66° lateral |
| 17,066.37 | 9,950.00 | 7,184.01 | 282.00 | PBHL/TD 17066.37 MD/9950.00 TVD |

TAP ROCK

# Anticollision Report

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Reference** rev0

| | | | |
|---|---|---|---|
| **Filter type:** | GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference | | |
| **Interpolation Method:** | MD Interval 100.00ft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 1,906.64 ft | **Error Surface:** | Ellipsoid Separation |
| **Warning Levels Evaluated at:** | 3.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 12/28/2018

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 17,066.37 | rev0 (Original Hole) | MWD | OWSG MWD - Standard |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Section 32-T26S-R29E | | | | | | |
| Money Graham Fed Com Well No. 204 H - Original Hole | 1,200.00 | 1,200.00 | 50.00 | 37.77 | 4.089 | CC, ES |
| Money Graham Fed Com Well No. 204 H - Original Hole | 17,066.37 | 16,786.87 | 397.06 | 132.06 | 1.498 | Level 2<1.50, SF |
| Money Graham Fed Com Well No. 214 H - Original Hole | 1,200.00 | 1,200.00 | 100.01 | 87.78 | 8.179 | CC, ES |
| Money Graham Fed Com Well No. 214 H - Original Hole | 17,066.37 | 17,040.11 | 617.96 | 248.31 | 1.672 | Level 3<2.00, SF |
| Money Graham Fed Com Well No. 238 H - Original Hole | 1,200.00 | 1,200.00 | 25.00 | 12.77 | 2.045 | CC, ES |
| Money Graham Fed Com Well No. 238 H - Original Hole | 1,300.00 | 1,300.01 | 26.12 | 12.83 | 1.966 | Level 3<2.00, SF |
| Money Graham Fed Com Well No. 246 H - Original Hole | 1,200.00 | 1,200.00 | 75.01 | 62.78 | 6.134 | CC, ES |
| Money Graham Fed Com Well No. 246 H - Original Hole | 17,066.37 | 17,891.06 | 1,012.19 | 779.01 | 4.341 | SF |
| Sidewinder #1H - Original Hole - Surveys Original Hole | 6,899.77 | 10,886.86 | 276.64 | 82.29 | 1.423 | Level 2<1.50, CC, ES, SF |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 204 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -90.00 | 0.00 | -50.00 | 50.00 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.20 | 0.20 | -90.00 | 0.00 | -50.00 | 50.00 | 49.60 | 0.40 | 125.659 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.74 | 0.74 | -90.00 | 0.00 | -50.00 | 50.00 | 48.53 | 1.47 | 33.937 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 1.27 | 1.27 | -90.00 | 0.00 | -50.00 | 50.00 | 47.45 | 2.55 | 19.618 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 1.81 | 1.81 | -90.00 | 0.00 | -50.00 | 50.00 | 46.38 | 3.62 | 13.796 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 2.35 | 2.35 | -90.00 | 0.00 | -50.00 | 50.00 | 45.30 | 4.70 | 10.639 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 2.89 | 2.89 | -90.00 | 0.00 | -50.00 | 50.00 | 44.23 | 5.77 | 8.658 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 3.43 | 3.43 | -90.00 | 0.00 | -50.00 | 50.00 | 43.15 | 6.85 | 7.299 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 3.96 | 3.96 | -90.00 | 0.00 | -50.00 | 50.00 | 42.07 | 7.93 | 6.309 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 4.50 | 4.50 | -90.00 | 0.00 | -50.00 | 50.00 | 41.00 | 9.00 | 5.555 | |
| 1,000.00 | 1,000.00 | 1,000.00 | 1,000.00 | 5.04 | 5.04 | -90.00 | 0.00 | -50.00 | 50.00 | 39.92 | 10.08 | 4.962 | |
| 1,100.00 | 1,100.00 | 1,100.00 | 1,100.00 | 5.58 | 5.58 | -90.00 | 0.00 | -50.00 | 50.00 | 38.85 | 11.15 | 4.483 | |
| 1,200.00 | 1,200.00 | 1,200.00 | 1,200.00 | 6.11 | 6.11 | -90.00 | 0.00 | -50.00 | 50.00 | 37.77 | 12.23 | 4.089 | CC, ES |
| 1,300.00 | 1,299.99 | 1,300.01 | 1,299.99 | 6.63 | 6.65 | 148.57 | 0.00 | -50.00 | 51.11 | 37.83 | 13.28 | 3.848 | |
| 1,400.00 | 1,399.91 | 1,400.09 | 1,399.91 | 7.13 | 7.19 | 150.70 | 0.00 | -50.00 | 54.50 | 40.18 | 14.32 | 3.805 | |
| 1,500.00 | 1,499.69 | 1,500.31 | 1,499.69 | 7.65 | 7.73 | 153.70 | 0.00 | -50.00 | 60.28 | 44.91 | 15.37 | 3.922 | |
| 1,600.00 | 1,599.41 | 1,600.59 | 1,599.41 | 8.16 | 8.27 | 156.56 | 0.00 | -50.00 | 67.15 | 50.74 | 16.42 | 4.090 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 204 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,700.00 | 1,699.12 | 1,700.88 | 1,699.12 | 8.69 | 8.81 | 158.89 | 0.00 | -50.00 | 74.17 | 56.69 | 17.47 | 4.245 | |
| 1,800.00 | 1,798.83 | 1,801.17 | 1,798.83 | 9.22 | 9.35 | 160.81 | 0.00 | -50.00 | 81.28 | 62.75 | 18.53 | 4.387 | |
| 1,900.00 | 1,898.54 | 1,901.46 | 1,898.54 | 9.75 | 9.89 | 162.42 | 0.00 | -50.00 | 88.47 | 68.88 | 19.59 | 4.516 | |
| 2,000.00 | 1,998.26 | 1,998.26 | 1,998.26 | 10.29 | 10.41 | 163.79 | 0.00 | -50.00 | 95.72 | 75.09 | 20.63 | 4.639 | |
| 2,100.00 | 2,097.97 | 2,098.19 | 2,098.18 | 10.83 | 10.92 | 164.27 | -1.23 | -50.26 | 102.91 | 81.24 | 21.67 | 4.749 | |
| 2,200.00 | 2,197.68 | 2,201.89 | 2,198.02 | 11.38 | 11.42 | 163.33 | -5.00 | -51.06 | 109.91 | 87.21 | 22.70 | 4.842 | |
| 2,300.00 | 2,297.40 | 2,302.17 | 2,297.62 | 11.92 | 11.92 | 162.02 | -9.74 | -52.06 | 116.89 | 93.16 | 23.72 | 4.927 | |
| 2,400.00 | 2,397.11 | 2,402.45 | 2,397.23 | 12.47 | 12.41 | 160.86 | -14.48 | -53.07 | 123.92 | 99.17 | 24.75 | 5.006 | |
| 2,500.00 | 2,496.82 | 2,502.72 | 2,496.83 | 13.02 | 12.92 | 159.82 | -19.22 | -54.07 | 131.00 | 105.21 | 25.79 | 5.080 | |
| 2,600.00 | 2,596.53 | 2,603.00 | 2,596.44 | 13.57 | 13.42 | 158.89 | -23.95 | -55.07 | 138.12 | 111.29 | 26.83 | 5.148 | |
| 2,700.00 | 2,696.25 | 2,703.28 | 2,696.04 | 14.13 | 13.93 | 158.05 | -28.69 | -56.08 | 145.27 | 117.39 | 27.88 | 5.211 | |
| 2,800.00 | 2,795.96 | 2,803.56 | 2,795.65 | 14.68 | 14.45 | 157.29 | -33.43 | -57.08 | 152.45 | 123.52 | 28.93 | 5.270 | |
| 2,900.00 | 2,895.67 | 2,903.84 | 2,895.25 | 15.24 | 14.96 | 156.60 | -38.17 | -58.08 | 159.65 | 129.67 | 29.98 | 5.324 | |
| 3,000.00 | 2,995.39 | 3,004.11 | 2,994.86 | 15.79 | 15.48 | 155.96 | -42.90 | -59.09 | 166.88 | 135.84 | 31.04 | 5.376 | |
| 3,100.00 | 3,095.10 | 3,104.39 | 3,094.46 | 16.35 | 16.00 | 155.39 | -47.64 | -60.09 | 174.12 | 142.02 | 32.11 | 5.423 | |
| 3,200.00 | 3,194.81 | 3,204.67 | 3,194.07 | 16.91 | 16.53 | 154.85 | -52.38 | -61.09 | 181.38 | 148.21 | 33.17 | 5.468 | |
| 3,300.00 | 3,294.52 | 3,304.95 | 3,293.67 | 17.47 | 17.05 | 154.36 | -57.11 | -62.10 | 188.66 | 154.42 | 34.24 | 5.510 | |
| 3,400.00 | 3,394.24 | 3,405.22 | 3,393.28 | 18.02 | 17.58 | 153.90 | -61.85 | -63.10 | 195.94 | 160.64 | 35.31 | 5.550 | |
| 3,500.00 | 3,493.95 | 3,505.50 | 3,492.88 | 18.58 | 18.11 | 153.48 | -66.59 | -64.10 | 203.24 | 166.86 | 36.38 | 5.587 | |
| 3,600.00 | 3,593.66 | 3,605.78 | 3,592.49 | 19.14 | 18.64 | 153.09 | -71.33 | -65.11 | 210.55 | 173.10 | 37.45 | 5.622 | |
| 3,700.00 | 3,693.38 | 3,706.06 | 3,692.09 | 19.71 | 19.17 | 152.72 | -76.06 | -66.11 | 217.87 | 179.34 | 38.53 | 5.655 | |
| 3,800.00 | 3,793.09 | 3,806.33 | 3,791.70 | 20.27 | 19.70 | 152.38 | -80.80 | -67.11 | 225.20 | 185.59 | 39.61 | 5.686 | |
| 3,900.00 | 3,892.80 | 3,906.61 | 3,891.30 | 20.83 | 20.23 | 152.05 | -85.54 | -68.12 | 232.53 | 191.85 | 40.69 | 5.715 | |
| 4,000.00 | 3,992.51 | 4,006.89 | 3,990.91 | 21.39 | 20.77 | 151.75 | -90.28 | -69.12 | 239.87 | 198.11 | 41.77 | 5.743 | |
| 4,100.00 | 4,092.23 | 4,107.17 | 4,090.51 | 21.95 | 21.30 | 151.47 | -95.01 | -70.12 | 247.22 | 204.37 | 42.85 | 5.770 | |
| 4,200.00 | 4,191.94 | 4,207.44 | 4,190.12 | 22.51 | 21.84 | 151.20 | -99.75 | -71.13 | 254.57 | 210.64 | 43.93 | 5.795 | |
| 4,300.00 | 4,291.65 | 4,307.72 | 4,289.72 | 23.08 | 22.38 | 150.95 | -104.49 | -72.13 | 261.93 | 216.92 | 45.01 | 5.819 | |
| 4,400.00 | 4,391.37 | 4,408.00 | 4,389.33 | 23.64 | 22.92 | 150.71 | -109.22 | -73.13 | 269.29 | 223.19 | 46.10 | 5.842 | |
| 4,500.00 | 4,491.08 | 4,508.28 | 4,488.93 | 24.20 | 23.46 | 150.48 | -113.96 | -74.14 | 276.66 | 229.47 | 47.19 | 5.863 | |
| 4,600.00 | 4,590.79 | 4,608.55 | 4,588.54 | 24.77 | 24.00 | 150.27 | -118.70 | -75.14 | 284.03 | 235.76 | 48.27 | 5.884 | |
| 4,700.00 | 4,690.50 | 4,708.83 | 4,688.14 | 25.33 | 24.54 | 150.06 | -123.44 | -76.14 | 291.41 | 242.05 | 49.36 | 5.904 | |
| 4,800.00 | 4,790.22 | 4,809.11 | 4,787.75 | 25.90 | 25.08 | 149.87 | -128.17 | -77.15 | 298.78 | 248.34 | 50.45 | 5.922 | |
| 4,900.00 | 4,889.93 | 4,909.39 | 4,887.35 | 26.46 | 25.62 | 149.69 | -132.91 | -78.15 | 306.17 | 254.63 | 51.54 | 5.940 | |
| 5,000.00 | 4,989.64 | 5,009.66 | 4,986.96 | 27.02 | 26.16 | 149.51 | -137.65 | -79.15 | 313.55 | 260.92 | 52.63 | 5.958 | |
| 5,100.00 | 5,089.35 | 5,090.06 | 5,086.56 | 27.59 | 26.60 | 149.34 | -142.39 | -80.16 | 320.94 | 267.33 | 53.61 | 5.986 | |
| 5,200.00 | 5,189.07 | 5,189.78 | 5,186.16 | 28.15 | 27.13 | 149.18 | -147.12 | -81.16 | 328.33 | 273.63 | 54.70 | 6.002 | |
| 5,300.00 | 5,288.78 | 5,289.50 | 5,285.77 | 28.72 | 27.68 | 149.03 | -151.86 | -82.16 | 335.72 | 279.93 | 55.79 | 6.018 | |
| 5,400.00 | 5,388.49 | 5,389.23 | 5,385.37 | 29.28 | 28.22 | 148.88 | -156.60 | -83.16 | 343.12 | 286.24 | 56.88 | 6.032 | |
| 5,500.00 | 5,488.21 | 5,488.95 | 5,484.98 | 29.85 | 28.76 | 148.74 | -161.33 | -84.17 | 350.51 | 292.54 | 57.97 | 6.047 | |
| 5,600.00 | 5,587.92 | 5,588.67 | 5,584.58 | 30.41 | 29.30 | 148.61 | -166.07 | -85.17 | 357.91 | 298.85 | 59.06 | 6.060 | |
| 5,700.00 | 5,687.63 | 5,688.39 | 5,684.19 | 30.98 | 29.84 | 148.48 | -170.81 | -86.17 | 365.31 | 305.16 | 60.15 | 6.073 | |
| 5,800.00 | 5,787.34 | 5,788.12 | 5,783.79 | 31.55 | 30.38 | 148.36 | -175.55 | -87.18 | 372.72 | 311.47 | 61.24 | 6.086 | |
| 5,900.00 | 5,887.06 | 5,887.84 | 5,883.40 | 32.11 | 30.92 | 148.24 | -180.28 | -88.18 | 380.12 | 317.79 | 62.33 | 6.098 | |
| 6,000.00 | 5,986.77 | 5,987.56 | 5,983.00 | 32.68 | 31.47 | 148.12 | -185.02 | -89.18 | 387.53 | 324.10 | 63.43 | 6.110 | |
| 6,100.00 | 6,086.48 | 6,087.28 | 6,082.61 | 33.24 | 32.01 | 148.01 | -189.76 | -90.19 | 394.93 | 330.41 | 64.52 | 6.121 | |
| 6,200.00 | 6,186.25 | 6,187.05 | 6,182.25 | 33.80 | 32.55 | 147.89 | -194.50 | -91.19 | 401.71 | 336.10 | 65.61 | 6.123 | |
| 6,300.00 | 6,286.15 | 6,288.45 | 6,283.56 | 34.35 | 33.10 | 147.66 | -198.70 | -92.08 | 406.22 | 339.51 | 66.71 | 6.089 | |
| 6,400.00 | 6,386.14 | 6,390.72 | 6,385.82 | 34.88 | 33.64 | 147.56 | -200.41 | -92.44 | 407.99 | 340.20 | 67.79 | 6.018 | |
| 6,500.00 | 6,486.14 | 6,508.96 | 6,486.14 | 35.37 | 34.24 | -90.24 | -200.44 | -92.45 | 408.01 | 339.12 | 68.89 | 5.923 | |
| 6,600.00 | 6,586.14 | 6,608.96 | 6,586.14 | 35.87 | 34.74 | -90.24 | -200.44 | -92.45 | 408.01 | 338.12 | 69.90 | 5.837 | |
| 6,700.00 | 6,686.14 | 6,708.96 | 6,686.14 | 36.36 | 35.25 | -90.24 | -200.44 | -92.45 | 408.01 | 337.11 | 70.91 | 5.754 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 204 H - Original Hole - rev0

Survey Program: 0-MWD

Offset Site Error: 0.00 ft

Offset Well Error: 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6,800.00 | 6,786.14 | 6,808.96 | 6,786.14 | 36.86 | 35.76 | -90.24 | -200.44 | -92.45 | 408.01 | 336.10 | 71.92 | 5.673 | |
| 6,900.00 | 6,886.14 | 6,908.96 | 6,886.14 | 37.35 | 36.27 | -90.24 | -200.44 | -92.45 | 408.01 | 335.08 | 72.93 | 5.595 | |
| 7,000.00 | 6,986.14 | 7,008.96 | 6,986.14 | 37.85 | 36.77 | -90.24 | -200.44 | -92.45 | 408.01 | 334.07 | 73.94 | 5.518 | |
| 7,100.00 | 7,086.14 | 7,108.96 | 7,086.14 | 38.35 | 37.28 | -90.24 | -200.44 | -92.45 | 408.01 | 333.05 | 74.96 | 5.443 | |
| 7,200.00 | 7,186.14 | 7,208.96 | 7,186.14 | 38.85 | 37.80 | -90.24 | -200.44 | -92.45 | 408.01 | 332.04 | 75.98 | 5.370 | |
| 7,300.00 | 7,286.14 | 7,308.96 | 7,286.14 | 39.35 | 38.31 | -90.24 | -200.44 | -92.45 | 408.01 | 331.02 | 77.00 | 5.299 | |
| 7,400.00 | 7,386.14 | 7,408.96 | 7,386.14 | 39.86 | 38.82 | -90.24 | -200.44 | -92.45 | 408.01 | 330.00 | 78.02 | 5.230 | |
| 7,500.00 | 7,486.14 | 7,508.96 | 7,486.14 | 40.36 | 39.33 | -90.24 | -200.44 | -92.45 | 408.01 | 328.97 | 79.04 | 5.162 | |
| 7,600.00 | 7,586.14 | 7,608.96 | 7,586.14 | 40.86 | 39.85 | -90.24 | -200.44 | -92.45 | 408.01 | 327.95 | 80.06 | 5.096 | |
| 7,700.00 | 7,686.14 | 7,708.96 | 7,686.14 | 41.37 | 40.36 | -90.24 | -200.44 | -92.45 | 408.01 | 326.93 | 81.09 | 5.032 | |
| 7,800.00 | 7,786.14 | 7,808.96 | 7,786.14 | 41.87 | 40.88 | -90.24 | -200.44 | -92.45 | 408.01 | 325.90 | 82.11 | 4.969 | |
| 7,900.00 | 7,886.14 | 7,908.96 | 7,886.14 | 42.38 | 41.39 | -90.24 | -200.44 | -92.45 | 408.01 | 324.87 | 83.14 | 4.907 | |
| 8,000.00 | 7,986.14 | 8,008.96 | 7,986.14 | 42.89 | 41.91 | -90.24 | -200.44 | -92.45 | 408.01 | 323.84 | 84.17 | 4.847 | |
| 8,100.00 | 8,086.14 | 8,108.96 | 8,086.14 | 43.40 | 42.42 | -90.24 | -200.44 | -92.45 | 408.01 | 322.81 | 85.20 | 4.789 | |
| 8,200.00 | 8,186.14 | 8,208.96 | 8,186.14 | 43.90 | 42.94 | -90.24 | -200.44 | -92.45 | 408.01 | 321.78 | 86.23 | 4.732 | |
| 8,300.00 | 8,286.14 | 8,308.96 | 8,286.14 | 44.41 | 43.46 | -90.24 | -200.44 | -92.45 | 408.01 | 320.75 | 87.26 | 4.676 | |
| 8,400.00 | 8,386.14 | 8,408.96 | 8,386.14 | 44.92 | 43.98 | -90.24 | -200.44 | -92.45 | 408.01 | 319.72 | 88.30 | 4.621 | |
| 8,500.00 | 8,486.14 | 8,508.96 | 8,486.14 | 45.44 | 44.49 | -90.24 | -200.44 | -92.45 | 408.01 | 318.68 | 89.33 | 4.567 | |
| 8,600.00 | 8,586.14 | 8,608.96 | 8,586.14 | 45.95 | 45.01 | -90.24 | -200.44 | -92.45 | 408.01 | 317.65 | 90.37 | 4.515 | |
| 8,700.00 | 8,686.14 | 8,708.96 | 8,686.14 | 46.46 | 45.53 | -90.24 | -200.44 | -92.45 | 408.01 | 316.61 | 91.40 | 4.464 | |
| 8,800.00 | 8,786.14 | 8,808.96 | 8,786.14 | 46.97 | 46.05 | -90.24 | -200.44 | -92.45 | 408.01 | 315.58 | 92.44 | 4.414 | |
| 8,900.00 | 8,886.14 | 8,908.96 | 8,886.14 | 47.48 | 46.57 | -90.24 | -200.44 | -92.45 | 408.01 | 314.54 | 93.48 | 4.365 | |
| 9,000.00 | 8,986.14 | 9,008.96 | 8,986.14 | 48.00 | 47.09 | -90.24 | -200.44 | -92.45 | 408.01 | 313.50 | 94.51 | 4.317 | |
| 9,100.00 | 9,086.14 | 9,091.04 | 9,086.14 | 48.51 | 47.52 | -90.24 | -200.44 | -92.45 | 408.01 | 312.55 | 95.46 | 4.274 | |
| 9,179.24 | 9,165.38 | 9,170.53 | 9,165.38 | 48.92 | 47.92 | -89.48 | -195.06 | -92.40 | 407.98 | 311.71 | 96.26 | 4.238 | |
| 9,200.00 | 9,186.14 | 9,190.98 | 9,185.59 | 49.03 | 48.02 | -89.04 | -191.90 | -92.37 | 407.99 | 311.53 | 96.47 | 4.229 | |
| 9,300.00 | 9,286.14 | 9,285.25 | 9,276.70 | 49.54 | 48.46 | -85.71 | -168.15 | -92.16 | 408.97 | 311.64 | 97.33 | 4.202 | |
| 9,400.00 | 9,386.08 | 9,370.65 | 9,354.88 | 50.05 | 48.83 | -73.85 | -133.99 | -91.85 | 413.13 | 315.27 | 97.86 | 4.222 | |
| 9,500.00 | 9,484.46 | 9,451.22 | 9,423.23 | 50.52 | 49.15 | -69.17 | -91.45 | -91.47 | 418.64 | 320.80 | 97.84 | 4.279 | |
| 9,600.00 | 9,578.36 | 9,528.61 | 9,482.65 | 50.94 | 49.45 | -65.05 | -41.96 | -91.02 | 424.21 | 327.06 | 97.15 | 4.366 | |
| 9,700.00 | 9,664.94 | 9,603.50 | 9,533.29 | 51.29 | 49.74 | -61.52 | 13.13 | -90.52 | 429.02 | 333.19 | 95.83 | 4.477 | |
| 9,800.00 | 9,741.55 | 9,676.44 | 9,575.31 | 51.57 | 50.03 | -58.59 | 72.70 | -89.99 | 432.33 | 338.33 | 94.01 | 4.599 | |
| 9,900.00 | 9,805.87 | 9,750.00 | 9,609.68 | 51.79 | 50.33 | -56.20 | 137.68 | -89.40 | 433.56 | 341.54 | 92.02 | 4.712 | |
| 10,000.00 | 9,855.94 | 9,818.26 | 9,633.88 | 52.03 | 50.63 | -54.52 | 201.46 | -88.83 | 432.21 | 342.33 | 89.88 | 4.809 | |
| 10,100.00 | 9,890.25 | 9,887.87 | 9,650.58 | 52.40 | 50.95 | -53.37 | 268.99 | -88.22 | 427.96 | 339.80 | 88.16 | 4.855 | |
| 10,200.00 | 9,907.75 | 9,957.04 | 9,658.94 | 52.85 | 51.28 | -52.82 | 337.60 | -87.60 | 420.60 | 333.57 | 87.03 | 4.833 | |
| 10,300.00 | 9,910.31 | 10,042.46 | 9,660.32 | 53.35 | 51.74 | -52.30 | 423.00 | -86.83 | 410.83 | 324.11 | 86.71 | 4.738 | |
| 10,400.00 | 9,910.90 | 10,141.99 | 9,660.90 | 53.95 | 52.37 | -51.56 | 522.52 | -85.93 | 403.18 | 316.30 | 86.87 | 4.641 | |
| 10,500.00 | 9,911.49 | 10,241.79 | 9,661.49 | 54.66 | 53.09 | -51.08 | 622.31 | -85.03 | 398.32 | 310.88 | 87.44 | 4.556 | |
| 10,600.00 | 9,912.08 | 10,341.75 | 9,662.08 | 55.47 | 53.93 | -50.87 | 722.27 | -84.13 | 396.19 | 307.77 | 88.42 | 4.481 | |
| 10,696.41 | 9,912.65 | 10,438.15 | 9,662.64 | 56.33 | 54.83 | -50.83 | 818.66 | -83.26 | 395.81 | 306.12 | 89.69 | 4.413 | |
| 10,700.00 | 9,912.67 | 10,441.75 | 9,662.66 | 56.36 | 54.86 | -50.86 | 822.26 | -83.23 | 396.09 | 306.31 | 89.78 | 4.412 | |
| 10,800.00 | 9,913.25 | 10,541.75 | 9,663.25 | 57.35 | 55.89 | -50.86 | 922.25 | -82.32 | 396.10 | 304.81 | 91.28 | 4.339 | |
| 10,900.00 | 9,913.84 | 10,641.75 | 9,663.84 | 58.43 | 57.00 | -50.86 | 1,022.25 | -81.42 | 396.10 | 303.18 | 92.92 | 4.263 | |
| 11,000.00 | 9,914.43 | 10,741.75 | 9,664.43 | 59.59 | 58.20 | -50.87 | 1,122.24 | -80.52 | 396.11 | 301.42 | 94.69 | 4.183 | |
| 11,100.00 | 9,915.01 | 10,841.75 | 9,665.02 | 60.83 | 59.48 | -50.87 | 1,222.24 | -79.62 | 396.11 | 299.54 | 96.57 | 4.102 | |
| 11,200.00 | 9,915.60 | 10,941.75 | 9,665.61 | 62.14 | 60.83 | -50.87 | 1,322.23 | -78.72 | 396.12 | 297.56 | 98.56 | 4.019 | |
| 11,300.00 | 9,916.19 | 11,041.75 | 9,666.20 | 63.52 | 62.25 | -50.87 | 1,422.22 | -77.81 | 396.13 | 295.48 | 100.65 | 3.936 | |
| 11,400.00 | 9,916.77 | 11,141.75 | 9,666.78 | 64.96 | 63.74 | -50.87 | 1,522.22 | -76.91 | 396.13 | 293.31 | 102.83 | 3.852 | |
| 11,500.00 | 9,917.36 | 11,241.75 | 9,667.37 | 66.47 | 65.28 | -50.87 | 1,622.21 | -76.01 | 396.14 | 291.04 | 105.09 | 3.769 | |
| 11,600.00 | 9,917.95 | 11,341.75 | 9,667.96 | 68.03 | 66.88 | -50.87 | 1,722.21 | -75.11 | 396.15 | 288.71 | 107.44 | 3.687 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 204 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11,700.00 | 9,918.53 | 11,441.75 | 9,668.55 | 69.64 | 68.53 | -50.87 | 1,822.20 | -74.21 | 396.15 | 286.30 | 109.86 | 3.606 | |
| 11,800.00 | 9,919.12 | 11,541.75 | 9,669.14 | 71.31 | 70.23 | -50.87 | 1,922.20 | -73.31 | 396.16 | 283.82 | 112.34 | 3.526 | |
| 11,900.00 | 9,919.70 | 11,641.75 | 9,669.73 | 73.01 | 71.98 | -50.88 | 2,022.19 | -72.40 | 396.16 | 281.28 | 114.88 | 3.448 | |
| 12,000.00 | 9,920.29 | 11,741.75 | 9,670.31 | 74.77 | 73.76 | -50.88 | 2,122.18 | -71.50 | 396.17 | 278.69 | 117.48 | 3.372 | |
| 12,100.00 | 9,920.88 | 11,841.75 | 9,670.90 | 76.56 | 75.59 | -50.88 | 2,222.18 | -70.60 | 396.18 | 276.05 | 120.13 | 3.298 | |
| 12,200.00 | 9,921.46 | 11,941.75 | 9,671.49 | 78.38 | 77.45 | -50.88 | 2,322.17 | -69.70 | 396.18 | 273.36 | 122.82 | 3.226 | |
| 12,300.00 | 9,922.05 | 12,041.75 | 9,672.08 | 80.25 | 79.34 | -50.88 | 2,422.17 | -68.80 | 396.19 | 270.64 | 125.55 | 3.156 | |
| 12,400.00 | 9,922.64 | 12,141.75 | 9,672.67 | 82.14 | 81.27 | -50.88 | 2,522.16 | -67.89 | 396.20 | 267.88 | 128.32 | 3.088 | |
| 12,500.00 | 9,923.22 | 12,241.75 | 9,673.26 | 84.07 | 83.22 | -50.88 | 2,622.15 | -66.99 | 396.20 | 265.08 | 131.12 | 3.022 | |
| 12,600.00 | 9,923.81 | 12,341.75 | 9,673.84 | 86.02 | 85.20 | -50.88 | 2,722.15 | -66.09 | 396.21 | 262.26 | 133.95 | 2.958 | |
| 12,700.00 | 9,924.40 | 12,441.75 | 9,674.43 | 88.00 | 87.21 | -50.88 | 2,822.14 | -65.19 | 396.21 | 259.40 | 136.81 | 2.896 | |
| 12,800.00 | 9,924.98 | 12,541.75 | 9,675.02 | 90.00 | 89.24 | -50.89 | 2,922.14 | -64.29 | 396.22 | 256.53 | 139.69 | 2.836 | |
| 12,900.00 | 9,925.57 | 12,641.75 | 9,675.61 | 92.03 | 91.29 | -50.89 | 3,022.13 | -63.38 | 396.23 | 253.63 | 142.59 | 2.779 | |
| 13,000.00 | 9,926.16 | 12,741.75 | 9,676.20 | 94.07 | 93.36 | -50.89 | 3,122.13 | -62.48 | 396.23 | 250.72 | 145.51 | 2.723 | |
| 13,100.00 | 9,926.74 | 12,841.75 | 9,676.79 | 96.14 | 95.45 | -50.89 | 3,222.12 | -61.58 | 396.24 | 247.79 | 148.45 | 2.669 | |
| 13,200.00 | 9,927.33 | 12,941.75 | 9,677.37 | 98.23 | 97.56 | -50.89 | 3,322.11 | -60.68 | 396.25 | 244.85 | 151.40 | 2.617 | |
| 13,300.00 | 9,927.91 | 13,041.75 | 9,677.96 | 100.33 | 99.69 | -50.89 | 3,422.11 | -59.78 | 396.25 | 241.89 | 154.36 | 2.567 | |
| 13,400.00 | 9,928.50 | 13,141.75 | 9,678.55 | 102.45 | 101.83 | -50.89 | 3,522.10 | -58.88 | 396.26 | 238.93 | 157.33 | 2.519 | |
| 13,500.00 | 9,929.09 | 13,241.75 | 9,679.14 | 104.58 | 103.98 | -50.89 | 3,622.10 | -57.97 | 396.26 | 235.96 | 160.31 | 2.472 | |
| 13,600.00 | 9,929.67 | 13,341.75 | 9,679.73 | 106.73 | 106.15 | -50.89 | 3,722.09 | -57.07 | 396.27 | 232.98 | 163.29 | 2.427 | |
| 13,700.00 | 9,930.26 | 13,441.75 | 9,680.32 | 108.90 | 108.33 | -50.90 | 3,822.09 | -56.17 | 396.28 | 229.99 | 166.28 | 2.383 | |
| 13,800.00 | 9,930.85 | 13,541.75 | 9,680.91 | 111.07 | 110.53 | -50.90 | 3,922.08 | -55.27 | 396.28 | 227.00 | 169.28 | 2.341 | |
| 13,900.00 | 9,931.43 | 13,641.75 | 9,681.49 | 113.26 | 112.73 | -50.90 | 4,022.07 | -54.37 | 396.29 | 224.01 | 172.28 | 2.300 | |
| 14,000.00 | 9,932.02 | 13,741.75 | 9,682.08 | 115.46 | 114.95 | -50.90 | 4,122.07 | -53.46 | 396.30 | 221.02 | 175.28 | 2.261 | |
| 14,100.00 | 9,932.61 | 13,841.75 | 9,682.67 | 117.67 | 117.18 | -50.90 | 4,222.06 | -52.56 | 396.30 | 218.02 | 178.28 | 2.223 | |
| 14,200.00 | 9,933.19 | 13,941.75 | 9,683.26 | 119.89 | 119.41 | -50.90 | 4,322.06 | -51.66 | 396.31 | 215.03 | 181.28 | 2.186 | |
| 14,300.00 | 9,933.78 | 14,041.75 | 9,683.85 | 122.12 | 121.66 | -50.90 | 4,422.05 | -50.76 | 396.31 | 212.03 | 184.28 | 2.151 | |
| 14,400.00 | 9,934.36 | 14,141.75 | 9,684.44 | 124.36 | 123.91 | -50.90 | 4,522.04 | -49.86 | 396.32 | 209.04 | 187.28 | 2.116 | |
| 14,500.00 | 9,934.95 | 14,241.75 | 9,685.02 | 126.61 | 126.18 | -50.90 | 4,622.04 | -48.95 | 396.33 | 206.05 | 190.28 | 2.083 | |
| 14,600.00 | 9,935.54 | 14,341.75 | 9,685.61 | 128.86 | 128.45 | -50.91 | 4,722.03 | -48.05 | 396.33 | 203.06 | 193.27 | 2.051 | |
| 14,700.00 | 9,936.12 | 14,441.75 | 9,686.20 | 131.13 | 130.72 | -50.91 | 4,822.03 | -47.15 | 396.34 | 200.08 | 196.26 | 2.019 | |
| 14,800.00 | 9,936.71 | 14,541.75 | 9,686.79 | 133.40 | 133.01 | -50.91 | 4,922.02 | -46.25 | 396.35 | 197.10 | 199.25 | 1.989 | Level 3<2.00 |
| 14,900.00 | 9,937.30 | 14,641.75 | 9,687.38 | 135.68 | 135.30 | -50.91 | 5,022.02 | -45.35 | 396.35 | 194.12 | 202.23 | 1.960 | Level 3<2.00 |
| 15,000.00 | 9,937.88 | 14,741.75 | 9,687.97 | 137.96 | 137.60 | -50.91 | 5,122.01 | -44.44 | 396.36 | 191.15 | 205.21 | 1.931 | Level 3<2.00 |
| 15,100.00 | 9,938.47 | 14,841.75 | 9,688.55 | 140.25 | 139.90 | -50.91 | 5,222.00 | -43.54 | 396.36 | 188.18 | 208.18 | 1.904 | Level 3<2.00 |
| 15,200.00 | 9,939.06 | 14,941.75 | 9,689.14 | 142.55 | 142.21 | -50.91 | 5,322.00 | -42.64 | 396.37 | 185.22 | 211.15 | 1.877 | Level 3<2.00 |
| 15,300.00 | 9,939.64 | 15,041.75 | 9,689.73 | 144.85 | 144.52 | -50.91 | 5,421.99 | -41.74 | 396.38 | 182.27 | 214.11 | 1.851 | Level 3<2.00 |
| 15,400.00 | 9,940.23 | 15,141.75 | 9,690.32 | 147.16 | 146.84 | -50.91 | 5,521.99 | -40.84 | 396.38 | 179.32 | 217.06 | 1.826 | Level 3<2.00 |
| 15,500.00 | 9,940.82 | 15,241.75 | 9,690.91 | 149.48 | 149.17 | -50.92 | 5,621.98 | -39.94 | 396.39 | 176.38 | 220.01 | 1.802 | Level 3<2.00 |
| 15,600.00 | 9,941.40 | 15,341.75 | 9,691.50 | 151.79 | 151.50 | -50.92 | 5,721.97 | -39.03 | 396.40 | 173.44 | 222.96 | 1.778 | Level 3<2.00 |
| 15,700.00 | 9,941.99 | 15,441.75 | 9,692.09 | 154.12 | 153.83 | -50.92 | 5,821.97 | -38.13 | 396.40 | 170.51 | 225.89 | 1.755 | Level 3<2.00 |
| 15,800.00 | 9,942.57 | 15,541.75 | 9,692.67 | 156.45 | 156.17 | -50.92 | 5,921.96 | -37.23 | 396.41 | 167.59 | 228.82 | 1.732 | Level 3<2.00 |
| 15,900.00 | 9,943.16 | 15,641.75 | 9,693.26 | 158.78 | 158.51 | -50.92 | 6,021.96 | -36.33 | 396.41 | 164.67 | 231.74 | 1.711 | Level 3<2.00 |
| 16,000.00 | 9,943.75 | 15,741.75 | 9,693.85 | 161.11 | 160.85 | -50.92 | 6,121.95 | -35.43 | 396.42 | 161.76 | 234.66 | 1.689 | Level 3<2.00 |
| 16,100.00 | 9,944.33 | 15,841.75 | 9,694.44 | 163.46 | 163.20 | -50.92 | 6,221.95 | -34.52 | 396.43 | 158.86 | 237.57 | 1.669 | Level 3<2.00 |
| 16,200.00 | 9,944.92 | 15,941.75 | 9,695.03 | 165.80 | 165.56 | -50.92 | 6,321.94 | -33.62 | 396.43 | 155.96 | 240.47 | 1.649 | Level 3<2.00 |
| 16,300.00 | 9,945.51 | 16,041.75 | 9,695.62 | 168.15 | 167.91 | -50.92 | 6,421.93 | -32.72 | 396.44 | 153.08 | 243.36 | 1.629 | Level 3<2.00 |
| 16,400.00 | 9,946.09 | 16,141.75 | 9,696.20 | 170.50 | 170.27 | -50.93 | 6,521.93 | -31.82 | 396.45 | 150.19 | 246.25 | 1.610 | Level 3<2.00 |
| 16,500.00 | 9,946.68 | 16,241.75 | 9,696.79 | 172.85 | 172.64 | -50.93 | 6,621.92 | -30.92 | 396.45 | 147.32 | 249.13 | 1.591 | Level 3<2.00 |
| 16,600.00 | 9,947.27 | 16,341.75 | 9,697.38 | 175.21 | 175.00 | -50.93 | 6,721.92 | -30.01 | 396.46 | 144.45 | 252.00 | 1.573 | Level 3<2.00 |
| 16,700.00 | 9,947.85 | 16,441.75 | 9,697.97 | 177.57 | 177.37 | -50.93 | 6,821.91 | -29.11 | 396.46 | 141.59 | 254.87 | 1.556 | Level 3<2.00 |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 204 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16,800.00 | 9,948.44 | 16,541.75 | 9,698.56 | 179.94 | 179.74 | -50.93 | 6,921.91 | -28.21 | 396.47 | 138.74 | 257.73 | 1.538 | Level 3<2.00 |
| 16,900.00 | 9,949.02 | 16,641.75 | 9,699.15 | 182.30 | 182.12 | -50.93 | 7,021.90 | -27.31 | 396.48 | 135.90 | 260.58 | 1.522 | Level 3<2.00 |
| 17,000.00 | 9,949.61 | 16,741.75 | 9,699.73 | 184.67 | 184.49 | -50.93 | 7,121.89 | -26.41 | 396.48 | 133.06 | 263.43 | 1.505 | Level 3<2.00 |
| 17,000.20 | 9,949.61 | 16,741.94 | 9,699.74 | 184.68 | 184.50 | -50.93 | 7,122.09 | -26.41 | 396.48 | 133.05 | 263.43 | 1.505 | Level 3<2.00 |
| 17,066.37 | 9,950.00 | 16,786.87 | 9,700.00 | 186.25 | 185.57 | -50.93 | 7,167.01 | -26.00 | 397.06 | 132.06 | 264.99 | 1.498 | Level 2<1.50, SF |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 214 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -90.57 | -1.00 | -100.00 | 100.01 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.20 | 0.20 | -90.57 | -1.00 | -100.00 | 100.01 | 99.61 | 0.40 | 251.330 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.74 | 0.74 | -90.57 | -1.00 | -100.00 | 100.01 | 98.53 | 1.47 | 67.878 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 1.27 | 1.27 | -90.57 | -1.00 | -100.00 | 100.01 | 97.46 | 2.55 | 39.237 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 1.81 | 1.81 | -90.57 | -1.00 | -100.00 | 100.01 | 96.38 | 3.62 | 27.594 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 2.35 | 2.35 | -90.57 | -1.00 | -100.00 | 100.01 | 95.31 | 4.70 | 21.280 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 2.89 | 2.89 | -90.57 | -1.00 | -100.00 | 100.01 | 94.23 | 5.77 | 17.317 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 3.43 | 3.43 | -90.57 | -1.00 | -100.00 | 100.01 | 93.15 | 6.85 | 14.598 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 3.96 | 3.96 | -90.57 | -1.00 | -100.00 | 100.01 | 92.08 | 7.93 | 12.618 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 4.50 | 4.50 | -90.57 | -1.00 | -100.00 | 100.01 | 91.00 | 9.00 | 11.110 | |
| 1,000.00 | 1,000.00 | 1,000.00 | 1,000.00 | 5.04 | 5.04 | -90.57 | -1.00 | -100.00 | 100.01 | 89.93 | 10.08 | 9.924 | |
| 1,100.00 | 1,100.00 | 1,100.00 | 1,100.00 | 5.58 | 5.58 | -90.57 | -1.00 | -100.00 | 100.01 | 88.85 | 11.15 | 8.967 | |
| 1,200.00 | 1,200.00 | 1,200.00 | 1,200.00 | 6.11 | 6.11 | -90.57 | -1.00 | -100.00 | 100.01 | 87.78 | 12.23 | 8.179 | CC, ES |
| 1,300.00 | 1,299.99 | 1,297.63 | 1,297.62 | 6.63 | 6.62 | 147.30 | -1.53 | -101.13 | 102.27 | 89.02 | 13.25 | 7.719 | |
| 1,400.00 | 1,399.91 | 1,394.96 | 1,394.87 | 7.13 | 7.11 | 147.51 | -3.13 | -104.50 | 109.04 | 94.81 | 14.23 | 7.661 | |
| 1,500.00 | 1,499.69 | 1,491.69 | 1,491.41 | 7.65 | 7.61 | 147.81 | -5.76 | -110.06 | 120.30 | 105.08 | 15.22 | 7.904 | |
| 1,600.00 | 1,599.41 | 1,588.29 | 1,587.62 | 8.16 | 8.11 | 147.90 | -9.41 | -117.79 | 134.67 | 118.47 | 16.20 | 8.311 | |
| 1,700.00 | 1,699.12 | 1,687.14 | 1,686.00 | 8.69 | 8.64 | 147.84 | -13.52 | -126.46 | 149.80 | 132.58 | 17.23 | 8.696 | |
| 1,800.00 | 1,798.83 | 1,785.98 | 1,784.39 | 9.22 | 9.17 | 147.78 | -17.62 | -135.13 | 164.94 | 146.68 | 18.26 | 9.034 | |
| 1,900.00 | 1,898.54 | 1,884.83 | 1,882.77 | 9.75 | 9.71 | 147.74 | -21.72 | -143.80 | 180.07 | 160.78 | 19.30 | 9.332 | |
| 2,000.00 | 1,998.26 | 1,983.68 | 1,981.15 | 10.29 | 10.25 | 147.70 | -25.82 | -152.46 | 195.21 | 174.87 | 20.34 | 9.596 | |
| 2,100.00 | 2,097.97 | 2,082.53 | 2,079.53 | 10.83 | 10.79 | 147.67 | -29.92 | -161.13 | 210.34 | 188.95 | 21.39 | 9.833 | |
| 2,200.00 | 2,197.68 | 2,181.37 | 2,177.91 | 11.38 | 11.34 | 147.65 | -34.02 | -169.80 | 225.48 | 203.03 | 22.45 | 10.045 | |
| 2,300.00 | 2,297.40 | 2,280.22 | 2,276.29 | 11.92 | 11.90 | 147.62 | -38.12 | -178.47 | 240.61 | 217.11 | 23.50 | 10.237 | |
| 2,400.00 | 2,397.11 | 2,379.07 | 2,374.68 | 12.47 | 12.45 | 147.60 | -42.22 | -187.14 | 255.75 | 231.18 | 24.57 | 10.410 | |
| 2,500.00 | 2,496.82 | 2,477.92 | 2,473.06 | 13.02 | 13.01 | 147.58 | -46.32 | -195.81 | 270.88 | 245.25 | 25.63 | 10.568 | |
| 2,600.00 | 2,596.53 | 2,576.77 | 2,571.44 | 13.57 | 13.57 | 147.57 | -50.42 | -204.48 | 286.02 | 259.32 | 26.70 | 10.713 | |
| 2,700.00 | 2,696.25 | 2,675.61 | 2,669.82 | 14.13 | 14.13 | 147.55 | -54.52 | -213.14 | 301.15 | 273.39 | 27.77 | 10.845 | |
| 2,800.00 | 2,795.96 | 2,774.46 | 2,768.20 | 14.68 | 14.69 | 147.54 | -58.62 | -221.81 | 316.29 | 287.45 | 28.84 | 10.967 | |
| 2,900.00 | 2,895.67 | 2,873.31 | 2,866.59 | 15.24 | 15.25 | 147.53 | -62.72 | -230.48 | 331.42 | 301.51 | 29.91 | 11.079 | |
| 3,000.00 | 2,995.39 | 2,972.16 | 2,964.97 | 15.79 | 15.82 | 147.51 | -66.82 | -239.15 | 346.56 | 315.57 | 30.99 | 11.183 | |
| 3,100.00 | 3,095.10 | 3,071.01 | 3,063.35 | 16.35 | 16.38 | 147.50 | -70.92 | -247.82 | 361.69 | 329.63 | 32.07 | 11.280 | |
| 3,200.00 | 3,194.81 | 3,169.85 | 3,161.73 | 16.91 | 16.95 | 147.50 | -75.02 | -256.49 | 376.83 | 343.69 | 33.14 | 11.370 | |
| 3,300.00 | 3,294.52 | 3,268.70 | 3,260.11 | 17.47 | 17.52 | 147.49 | -79.12 | -265.16 | 391.96 | 357.74 | 34.22 | 11.453 | |
| 3,400.00 | 3,394.24 | 3,367.55 | 3,358.49 | 18.02 | 18.09 | 147.48 | -83.22 | -273.82 | 407.10 | 371.80 | 35.30 | 11.531 | |
| 3,500.00 | 3,493.95 | 3,466.40 | 3,456.88 | 18.58 | 18.66 | 147.47 | -87.32 | -282.49 | 422.24 | 385.85 | 36.38 | 11.605 | |
| 3,600.00 | 3,593.66 | 3,565.25 | 3,555.26 | 19.14 | 19.23 | 147.46 | -91.42 | -291.16 | 437.37 | 399.90 | 37.47 | 11.673 | |
| 3,700.00 | 3,693.38 | 3,664.09 | 3,653.64 | 19.71 | 19.80 | 147.46 | -95.52 | -299.83 | 452.51 | 413.96 | 38.55 | 11.738 | |
| 3,800.00 | 3,793.09 | 3,762.94 | 3,752.02 | 20.27 | 20.37 | 147.45 | -99.62 | -308.50 | 467.64 | 428.01 | 39.63 | 11.799 | |
| 3,900.00 | 3,892.80 | 3,861.79 | 3,850.40 | 20.83 | 20.94 | 147.45 | -103.72 | -317.17 | 482.78 | 442.06 | 40.72 | 11.856 | |
| 4,000.00 | 3,992.51 | 3,960.64 | 3,948.78 | 21.39 | 21.52 | 147.44 | -107.82 | -325.84 | 497.91 | 456.11 | 41.80 | 11.911 | |
| 4,100.00 | 4,092.23 | 4,059.49 | 4,047.17 | 21.95 | 22.09 | 147.44 | -111.92 | -334.50 | 513.05 | 470.16 | 42.89 | 11.962 | |
| 4,200.00 | 4,191.94 | 4,158.33 | 4,145.55 | 22.51 | 22.66 | 147.43 | -116.02 | -343.17 | 528.18 | 484.21 | 43.98 | 12.010 | |
| 4,300.00 | 4,291.65 | 4,257.18 | 4,243.93 | 23.08 | 23.24 | 147.43 | -120.12 | -351.84 | 543.32 | 498.25 | 45.06 | 12.057 | |
| 4,400.00 | 4,391.37 | 4,356.03 | 4,342.31 | 23.64 | 23.81 | 147.42 | -124.22 | -360.51 | 558.45 | 512.30 | 46.15 | 12.100 | |
| 4,500.00 | 4,491.08 | 4,454.88 | 4,440.69 | 24.20 | 24.38 | 147.42 | -128.32 | -369.18 | 573.59 | 526.35 | 47.24 | 12.142 | |
| 4,600.00 | 4,590.79 | 4,553.73 | 4,539.07 | 24.77 | 24.96 | 147.41 | -132.42 | -377.85 | 588.72 | 540.40 | 48.33 | 12.182 | |
| 4,700.00 | 4,690.50 | 4,652.57 | 4,637.46 | 25.33 | 25.53 | 147.41 | -136.52 | -386.51 | 603.86 | 554.44 | 49.42 | 12.220 | |
| 4,800.00 | 4,790.22 | 4,751.42 | 4,735.84 | 25.90 | 26.11 | 147.41 | -140.62 | -395.18 | 618.99 | 568.49 | 50.51 | 12.256 | |
| 4,900.00 | 4,889.93 | 4,850.27 | 4,834.22 | 26.46 | 26.68 | 147.40 | -144.72 | -403.85 | 634.13 | 582.53 | 51.60 | 12.290 | |
| 5,000.00 | 4,989.64 | 4,949.12 | 4,932.60 | 27.02 | 27.26 | 147.40 | -148.82 | -412.52 | 649.26 | 596.58 | 52.69 | 12.323 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 214 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.00 | 5,089.35 | 5,047.97 | 5,030.98 | 27.59 | 27.84 | 147.40 | -152.92 | -421.19 | 664.40 | 610.62 | 53.78 | 12.355 | |
| 5,200.00 | 5,189.07 | 5,146.81 | 5,129.37 | 28.15 | 28.41 | 147.39 | -157.02 | -429.86 | 679.54 | 624.67 | 54.87 | 12.385 | |
| 5,300.00 | 5,288.78 | 5,245.66 | 5,227.75 | 28.72 | 28.99 | 147.39 | -161.12 | -438.53 | 694.67 | 638.71 | 55.96 | 12.414 | |
| 5,400.00 | 5,388.49 | 5,344.51 | 5,326.13 | 29.28 | 29.56 | 147.39 | -165.22 | -447.19 | 709.81 | 652.76 | 57.05 | 12.442 | |
| 5,500.00 | 5,488.21 | 5,443.36 | 5,424.51 | 29.85 | 30.14 | 147.39 | -169.32 | -455.86 | 724.94 | 666.80 | 58.14 | 12.469 | |
| 5,600.00 | 5,587.92 | 5,542.21 | 5,522.89 | 30.41 | 30.72 | 147.38 | -173.43 | -464.53 | 740.08 | 680.84 | 59.23 | 12.494 | |
| 5,700.00 | 5,687.63 | 5,641.05 | 5,621.27 | 30.98 | 31.29 | 147.38 | -177.53 | -473.20 | 755.21 | 694.89 | 60.33 | 12.519 | |
| 5,800.00 | 5,787.34 | 5,739.90 | 5,719.66 | 31.55 | 31.87 | 147.38 | -181.63 | -481.87 | 770.35 | 708.93 | 61.42 | 12.543 | |
| 5,900.00 | 5,887.06 | 5,838.75 | 5,818.04 | 32.11 | 32.45 | 147.38 | -185.73 | -490.54 | 785.48 | 722.97 | 62.51 | 12.566 | |
| 6,000.00 | 5,986.77 | 5,937.60 | 5,916.42 | 32.68 | 33.03 | 147.38 | -189.83 | -499.21 | 800.62 | 737.01 | 63.60 | 12.588 | |
| 6,100.00 | 6,086.48 | 6,036.45 | 6,014.80 | 33.24 | 33.60 | 147.37 | -193.93 | -507.87 | 815.75 | 751.06 | 64.70 | 12.609 | |
| 6,200.00 | 6,186.25 | 6,156.01 | 6,133.93 | 33.80 | 34.29 | 147.46 | -198.27 | -517.06 | 829.22 | 763.22 | 65.99 | 12.565 | |
| 6,300.00 | 6,286.15 | 6,280.20 | 6,257.93 | 34.35 | 34.97 | 147.53 | -201.11 | -523.06 | 837.67 | 770.40 | 67.27 | 12.452 | |
| 6,400.00 | 6,386.14 | 6,404.98 | 6,382.68 | 34.88 | 35.63 | 147.56 | -202.22 | -525.42 | 840.97 | 772.49 | 68.48 | 12.280 | |
| 6,500.00 | 6,486.14 | 6,508.43 | 6,486.14 | 35.37 | 36.13 | -90.24 | -202.24 | -525.45 | 841.02 | 771.52 | 69.50 | 12.101 | |
| 6,600.00 | 6,586.14 | 6,608.43 | 6,586.14 | 35.87 | 36.62 | -90.24 | -202.24 | -525.45 | 841.02 | 770.52 | 70.50 | 11.929 | |
| 6,700.00 | 6,686.14 | 6,708.43 | 6,686.14 | 36.36 | 37.10 | -90.24 | -202.24 | -525.45 | 841.02 | 769.51 | 71.51 | 11.762 | |
| 6,800.00 | 6,786.14 | 6,808.43 | 6,786.14 | 36.86 | 37.59 | -90.24 | -202.24 | -525.45 | 841.02 | 768.51 | 72.51 | 11.599 | |
| 6,900.00 | 6,886.14 | 6,908.43 | 6,886.14 | 37.35 | 38.08 | -90.24 | -202.24 | -525.45 | 841.02 | 767.50 | 73.52 | 11.440 | |
| 7,000.00 | 6,986.14 | 7,008.43 | 6,986.14 | 37.85 | 38.57 | -90.24 | -202.24 | -525.45 | 841.02 | 766.49 | 74.53 | 11.285 | |
| 7,100.00 | 7,086.14 | 7,108.43 | 7,086.14 | 38.35 | 39.07 | -90.24 | -202.24 | -525.45 | 841.02 | 765.48 | 75.54 | 11.134 | |
| 7,200.00 | 7,186.14 | 7,208.43 | 7,186.14 | 38.85 | 39.56 | -90.24 | -202.24 | -525.45 | 841.02 | 764.47 | 76.55 | 10.987 | |
| 7,300.00 | 7,286.14 | 7,308.43 | 7,286.14 | 39.35 | 40.06 | -90.24 | -202.24 | -525.45 | 841.02 | 763.46 | 77.56 | 10.843 | |
| 7,400.00 | 7,386.14 | 7,408.43 | 7,386.14 | 39.86 | 40.55 | -90.24 | -202.24 | -525.45 | 841.02 | 762.44 | 78.58 | 10.703 | |
| 7,500.00 | 7,486.14 | 7,508.43 | 7,486.14 | 40.36 | 41.05 | -90.24 | -202.24 | -525.45 | 841.02 | 761.42 | 79.60 | 10.566 | |
| 7,600.00 | 7,586.14 | 7,608.43 | 7,586.14 | 40.86 | 41.55 | -90.24 | -202.24 | -525.45 | 841.02 | 760.40 | 80.62 | 10.432 | |
| 7,700.00 | 7,686.14 | 7,708.43 | 7,686.14 | 41.37 | 42.05 | -90.24 | -202.24 | -525.45 | 841.02 | 759.38 | 81.64 | 10.302 | |
| 7,800.00 | 7,786.14 | 7,808.43 | 7,786.14 | 41.87 | 42.55 | -90.24 | -202.24 | -525.45 | 841.02 | 758.36 | 82.66 | 10.175 | |
| 7,900.00 | 7,886.14 | 7,908.43 | 7,886.14 | 42.38 | 43.05 | -90.24 | -202.24 | -525.45 | 841.02 | 757.34 | 83.68 | 10.050 | |
| 8,000.00 | 7,986.14 | 8,008.43 | 7,986.14 | 42.89 | 43.55 | -90.24 | -202.24 | -525.45 | 841.02 | 756.31 | 84.71 | 9.929 | |
| 8,100.00 | 8,086.14 | 8,108.43 | 8,086.14 | 43.40 | 44.05 | -90.24 | -202.24 | -525.45 | 841.02 | 755.29 | 85.73 | 9.810 | |
| 8,200.00 | 8,186.14 | 8,208.43 | 8,186.14 | 43.90 | 44.55 | -90.24 | -202.24 | -525.45 | 841.02 | 754.26 | 86.76 | 9.694 | |
| 8,300.00 | 8,286.14 | 8,308.43 | 8,286.14 | 44.41 | 45.06 | -90.24 | -202.24 | -525.45 | 841.02 | 753.23 | 87.79 | 9.580 | |
| 8,400.00 | 8,386.14 | 8,408.43 | 8,386.14 | 44.92 | 45.56 | -90.24 | -202.24 | -525.45 | 841.02 | 752.20 | 88.81 | 9.469 | |
| 8,500.00 | 8,486.14 | 8,508.43 | 8,486.14 | 45.44 | 46.07 | -90.24 | -202.24 | -525.45 | 841.02 | 751.17 | 89.84 | 9.361 | |
| 8,600.00 | 8,586.14 | 8,608.43 | 8,586.14 | 45.95 | 46.58 | -90.24 | -202.24 | -525.45 | 841.02 | 750.14 | 90.88 | 9.255 | |
| 8,700.00 | 8,686.14 | 8,708.43 | 8,686.14 | 46.46 | 47.08 | -90.24 | -202.24 | -525.45 | 841.02 | 749.11 | 91.91 | 9.151 | |
| 8,800.00 | 8,786.14 | 8,808.43 | 8,786.14 | 46.97 | 47.59 | -90.24 | -202.24 | -525.45 | 841.02 | 748.08 | 92.94 | 9.049 | |
| 8,900.00 | 8,886.14 | 8,908.43 | 8,886.14 | 47.48 | 48.10 | -90.24 | -202.24 | -525.45 | 841.02 | 747.04 | 93.98 | 8.949 | |
| 9,000.00 | 8,986.14 | 9,008.43 | 8,986.14 | 48.00 | 48.61 | -90.24 | -202.24 | -525.45 | 841.02 | 746.01 | 95.01 | 8.852 | |
| 9,100.00 | 9,086.14 | 9,108.43 | 9,086.14 | 48.51 | 49.12 | -90.24 | -202.24 | -525.45 | 841.02 | 744.97 | 96.05 | 8.756 | |
| 9,200.00 | 9,186.14 | 9,208.43 | 9,186.14 | 49.03 | 49.63 | -90.24 | -202.24 | -525.45 | 841.02 | 743.94 | 97.08 | 8.663 | |
| 9,300.00 | 9,286.14 | 9,308.43 | 9,286.14 | 49.54 | 50.14 | -90.24 | -202.24 | -525.45 | 841.02 | 742.90 | 98.12 | 8.571 | |
| 9,400.00 | 9,386.08 | 9,427.88 | 9,405.33 | 50.05 | 50.73 | -83.06 | -196.94 | -524.56 | 840.08 | 740.87 | 99.21 | 8.468 | |
| 9,500.00 | 9,484.46 | 9,558.68 | 9,531.76 | 50.52 | 51.31 | -82.99 | -164.95 | -519.18 | 833.83 | 733.66 | 100.17 | 8.324 | |
| 9,600.00 | 9,578.36 | 9,684.89 | 9,643.74 | 50.94 | 51.74 | -83.07 | -108.09 | -509.61 | 822.06 | 721.08 | 100.97 | 8.141 | |
| 9,700.00 | 9,664.94 | 9,805.07 | 9,736.22 | 51.29 | 52.04 | -83.31 | -32.74 | -496.93 | 805.45 | 703.70 | 101.75 | 7.916 | |
| 9,800.00 | 9,741.55 | 9,918.73 | 9,807.24 | 51.57 | 52.21 | -83.77 | 54.53 | -482.25 | 784.80 | 682.24 | 102.56 | 7.652 | |
| 9,900.00 | 9,805.87 | 10,026.11 | 9,857.06 | 51.79 | 52.30 | -84.43 | 148.16 | -466.50 | 761.00 | 657.58 | 103.42 | 7.358 | |
| 10,000.00 | 9,855.94 | 10,127.89 | 9,887.18 | 52.03 | 52.48 | -85.28 | 243.90 | -450.39 | 734.92 | 630.61 | 104.31 | 7.046 | |
| 10,100.00 | 9,890.25 | 10,224.99 | 9,899.49 | 52.40 | 52.89 | -86.31 | 338.76 | -434.43 | 707.41 | 602.22 | 105.20 | 6.725 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 214 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,200.00 | 9,907.75 | 10,305.51 | 9,900.35 | 52.85 | 53.27 | -87.95 | 418.25 | -421.69 | 679.98 | 573.95 | 106.04 | 6.413 | |
| 10,300.00 | 9,910.31 | 10,384.02 | 9,900.82 | 53.35 | 53.72 | -89.07 | 496.08 | -411.34 | 655.16 | 548.18 | 106.98 | 6.124 | |
| 10,400.00 | 9,910.90 | 10,464.12 | 9,901.29 | 53.95 | 54.23 | -89.07 | 575.74 | -402.98 | 636.02 | 527.91 | 108.11 | 5.883 | |
| 10,500.00 | 9,911.49 | 10,545.42 | 9,901.77 | 54.66 | 54.82 | -89.07 | 656.79 | -396.79 | 623.10 | 513.68 | 109.41 | 5.695 | |
| 10,600.00 | 9,912.08 | 10,627.45 | 9,902.26 | 55.47 | 55.48 | -89.07 | 738.73 | -392.86 | 616.49 | 505.60 | 110.88 | 5.560 | |
| 10,697.72 | 9,912.65 | 10,710.00 | 9,902.75 | 56.34 | 56.20 | -89.08 | 821.26 | -391.26 | 614.95 | 502.47 | 112.48 | 5.467 | |
| 10,700.00 | 9,912.67 | 10,712.28 | 9,902.76 | 56.36 | 56.22 | -89.08 | 823.54 | -391.24 | 615.31 | 502.79 | 112.53 | 5.468 | |
| 10,800.00 | 9,913.25 | 10,812.28 | 9,903.35 | 57.35 | 57.19 | -89.08 | 923.54 | -390.35 | 615.33 | 500.86 | 114.47 | 5.375 | |
| 10,900.00 | 9,913.84 | 10,912.28 | 9,903.94 | 58.43 | 58.25 | -89.08 | 1,023.53 | -389.46 | 615.36 | 498.76 | 116.59 | 5.278 | |
| 11,000.00 | 9,914.43 | 11,012.28 | 9,904.52 | 59.59 | 59.39 | -89.08 | 1,123.53 | -388.58 | 615.38 | 496.50 | 118.88 | 5.176 | |
| 11,100.00 | 9,915.01 | 11,112.28 | 9,905.11 | 60.83 | 60.61 | -89.08 | 1,223.52 | -387.69 | 615.40 | 494.07 | 121.33 | 5.072 | |
| 11,200.00 | 9,915.60 | 11,212.28 | 9,905.70 | 62.14 | 61.90 | -89.08 | 1,323.52 | -386.80 | 615.43 | 491.49 | 123.93 | 4.966 | |
| 11,300.00 | 9,916.19 | 11,312.28 | 9,906.29 | 63.52 | 63.26 | -89.08 | 1,423.51 | -385.91 | 615.45 | 488.78 | 126.67 | 4.859 | |
| 11,400.00 | 9,916.77 | 11,412.28 | 9,906.88 | 64.96 | 64.69 | -89.08 | 1,523.50 | -385.02 | 615.47 | 485.93 | 129.54 | 4.751 | |
| 11,500.00 | 9,917.36 | 11,512.28 | 9,907.47 | 66.47 | 66.18 | -89.08 | 1,623.50 | -384.13 | 615.49 | 482.97 | 132.53 | 4.644 | |
| 11,600.00 | 9,917.95 | 11,612.28 | 9,908.06 | 68.03 | 67.73 | -89.08 | 1,723.49 | -383.24 | 615.52 | 479.88 | 135.63 | 4.538 | |
| 11,700.00 | 9,918.53 | 11,712.28 | 9,908.64 | 69.64 | 69.32 | -89.08 | 1,823.49 | -382.35 | 615.54 | 476.70 | 138.84 | 4.433 | |
| 11,800.00 | 9,919.12 | 11,812.28 | 9,909.23 | 71.31 | 70.97 | -89.08 | 1,923.48 | -381.46 | 615.56 | 473.41 | 142.15 | 4.330 | |
| 11,900.00 | 9,919.70 | 11,912.28 | 9,909.82 | 73.01 | 72.67 | -89.08 | 2,023.48 | -380.58 | 615.58 | 470.03 | 145.56 | 4.229 | |
| 12,000.00 | 9,920.29 | 12,012.28 | 9,910.41 | 74.77 | 74.41 | -89.08 | 2,123.47 | -379.69 | 615.61 | 466.56 | 149.05 | 4.130 | |
| 12,100.00 | 9,920.88 | 12,112.28 | 9,911.00 | 76.56 | 76.19 | -89.08 | 2,223.46 | -378.80 | 615.63 | 463.01 | 152.62 | 4.034 | |
| 12,200.00 | 9,921.46 | 12,212.28 | 9,911.59 | 78.38 | 78.01 | -89.08 | 2,323.46 | -377.91 | 615.65 | 459.39 | 156.26 | 3.940 | |
| 12,300.00 | 9,922.05 | 12,312.28 | 9,912.18 | 80.25 | 79.86 | -89.08 | 2,423.45 | -377.02 | 615.68 | 455.70 | 159.98 | 3.849 | |
| 12,400.00 | 9,922.64 | 12,412.28 | 9,912.76 | 82.14 | 81.74 | -89.08 | 2,523.45 | -376.13 | 615.70 | 451.94 | 163.76 | 3.760 | |
| 12,500.00 | 9,923.22 | 12,512.28 | 9,913.35 | 84.07 | 83.66 | -89.08 | 2,623.44 | -375.24 | 615.72 | 448.13 | 167.60 | 3.674 | |
| 12,600.00 | 9,923.81 | 12,612.28 | 9,913.94 | 86.02 | 85.60 | -89.08 | 2,723.44 | -374.35 | 615.74 | 444.25 | 171.49 | 3.591 | |
| 12,700.00 | 9,924.40 | 12,712.28 | 9,914.53 | 88.00 | 87.57 | -89.08 | 2,823.43 | -373.47 | 615.77 | 440.33 | 175.44 | 3.510 | |
| 12,800.00 | 9,924.98 | 12,812.28 | 9,915.12 | 90.00 | 89.57 | -89.08 | 2,923.42 | -372.58 | 615.79 | 436.35 | 179.44 | 3.432 | |
| 12,900.00 | 9,925.57 | 12,912.28 | 9,915.71 | 92.03 | 91.58 | -89.08 | 3,023.42 | -371.69 | 615.81 | 432.33 | 183.48 | 3.356 | |
| 13,000.00 | 9,926.16 | 13,012.28 | 9,916.30 | 94.07 | 93.62 | -89.08 | 3,123.41 | -370.80 | 615.84 | 428.26 | 187.57 | 3.283 | |
| 13,100.00 | 9,926.74 | 13,112.28 | 9,916.88 | 96.14 | 95.69 | -89.08 | 3,223.41 | -369.91 | 615.86 | 424.16 | 191.70 | 3.213 | |
| 13,200.00 | 9,927.33 | 13,212.28 | 9,917.47 | 98.23 | 97.76 | -89.08 | 3,323.40 | -369.02 | 615.88 | 420.02 | 195.86 | 3.144 | |
| 13,300.00 | 9,927.91 | 13,312.28 | 9,918.06 | 100.33 | 99.86 | -89.08 | 3,423.40 | -368.13 | 615.90 | 415.84 | 200.07 | 3.079 | |
| 13,400.00 | 9,928.50 | 13,412.28 | 9,918.65 | 102.45 | 101.98 | -89.08 | 3,523.39 | -367.24 | 615.93 | 411.63 | 204.30 | 3.015 | |
| 13,500.00 | 9,929.09 | 13,512.28 | 9,919.24 | 104.58 | 104.11 | -89.08 | 3,623.38 | -366.36 | 615.95 | 407.38 | 208.56 | 2.953 | |
| 13,600.00 | 9,929.67 | 13,612.28 | 9,919.83 | 106.73 | 106.25 | -89.08 | 3,723.38 | -365.47 | 615.97 | 403.11 | 212.86 | 2.894 | |
| 13,700.00 | 9,930.26 | 13,712.28 | 9,920.41 | 108.90 | 108.41 | -89.08 | 3,823.37 | -364.58 | 615.99 | 398.81 | 217.18 | 2.836 | |
| 13,800.00 | 9,930.85 | 13,812.28 | 9,921.00 | 111.07 | 110.58 | -89.08 | 3,923.37 | -363.69 | 616.02 | 394.49 | 221.53 | 2.781 | |
| 13,900.00 | 9,931.43 | 13,912.28 | 9,921.59 | 113.26 | 112.76 | -89.08 | 4,023.36 | -362.80 | 616.04 | 390.14 | 225.90 | 2.727 | |
| 14,000.00 | 9,932.02 | 14,012.28 | 9,922.18 | 115.46 | 114.96 | -89.09 | 4,123.36 | -361.91 | 616.06 | 385.77 | 230.30 | 2.675 | |
| 14,100.00 | 9,932.61 | 14,112.28 | 9,922.77 | 117.67 | 117.17 | -89.09 | 4,223.35 | -361.02 | 616.09 | 381.37 | 234.71 | 2.625 | |
| 14,200.00 | 9,933.19 | 14,212.28 | 9,923.36 | 119.89 | 119.38 | -89.09 | 4,323.34 | -360.13 | 616.11 | 376.96 | 239.15 | 2.576 | |
| 14,300.00 | 9,933.78 | 14,312.28 | 9,923.95 | 122.12 | 121.61 | -89.09 | 4,423.34 | -359.25 | 616.13 | 372.52 | 243.61 | 2.529 | |
| 14,400.00 | 9,934.36 | 14,412.28 | 9,924.53 | 124.36 | 123.84 | -89.09 | 4,523.33 | -358.36 | 616.15 | 368.07 | 248.08 | 2.484 | |
| 14,500.00 | 9,934.95 | 14,512.28 | 9,925.12 | 126.61 | 126.09 | -89.09 | 4,623.33 | -357.47 | 616.18 | 363.60 | 252.58 | 2.440 | |
| 14,600.00 | 9,935.54 | 14,612.28 | 9,925.71 | 128.86 | 128.34 | -89.09 | 4,723.32 | -356.58 | 616.20 | 359.11 | 257.09 | 2.397 | |
| 14,700.00 | 9,936.12 | 14,712.28 | 9,926.30 | 131.13 | 130.60 | -89.09 | 4,823.32 | -355.69 | 616.22 | 354.61 | 261.61 | 2.355 | |
| 14,800.00 | 9,936.71 | 14,812.28 | 9,926.89 | 133.40 | 132.87 | -89.09 | 4,923.31 | -354.80 | 616.25 | 350.09 | 266.15 | 2.315 | |
| 14,900.00 | 9,937.30 | 14,912.28 | 9,927.48 | 135.68 | 135.15 | -89.09 | 5,023.31 | -353.91 | 616.27 | 345.56 | 270.71 | 2.277 | |
| 15,000.00 | 9,937.88 | 15,012.28 | 9,928.07 | 137.96 | 137.43 | -89.09 | 5,123.30 | -353.02 | 616.29 | 341.02 | 275.27 | 2.239 | |
| 15,100.00 | 9,938.47 | 15,112.28 | 9,928.65 | 140.25 | 139.72 | -89.09 | 5,223.29 | -352.13 | 616.31 | 336.46 | 279.85 | 2.202 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 214 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,200.00 | 9,939.06 | 15,212.28 | 9,929.24 | 142.55 | 142.01 | -89.09 | 5,323.29 | -351.25 | 616.34 | 331.89 | 284.45 | 2.167 | |
| 15,300.00 | 9,939.64 | 15,312.28 | 9,929.83 | 144.85 | 144.31 | -89.09 | 5,423.28 | -350.36 | 616.36 | 327.31 | 289.05 | 2.132 | |
| 15,400.00 | 9,940.23 | 15,412.28 | 9,930.42 | 147.16 | 146.62 | -89.09 | 5,523.28 | -349.47 | 616.38 | 322.72 | 293.66 | 2.099 | |
| 15,500.00 | 9,940.82 | 15,512.28 | 9,931.01 | 149.48 | 148.93 | -89.09 | 5,623.27 | -348.58 | 616.40 | 318.11 | 298.29 | 2.066 | |
| 15,600.00 | 9,941.40 | 15,612.28 | 9,931.60 | 151.79 | 151.25 | -89.09 | 5,723.27 | -347.69 | 616.43 | 313.50 | 302.93 | 2.035 | |
| 15,700.00 | 9,941.99 | 15,712.28 | 9,932.19 | 154.12 | 153.57 | -89.09 | 5,823.26 | -346.80 | 616.45 | 308.88 | 307.57 | 2.004 | |
| 15,800.00 | 9,942.57 | 15,812.28 | 9,932.77 | 156.45 | 155.90 | -89.09 | 5,923.25 | -345.91 | 616.47 | 304.25 | 312.22 | 1.974 | Level 3<2.00 |
| 15,900.00 | 9,943.16 | 15,912.28 | 9,933.36 | 158.78 | 158.23 | -89.09 | 6,023.25 | -345.02 | 616.50 | 299.61 | 316.89 | 1.945 | Level 3<2.00 |
| 16,000.00 | 9,943.75 | 16,012.28 | 9,933.95 | 161.11 | 160.56 | -89.09 | 6,123.24 | -344.14 | 616.52 | 294.96 | 321.56 | 1.917 | Level 3<2.00 |
| 16,100.00 | 9,944.33 | 16,112.28 | 9,934.54 | 163.46 | 162.90 | -89.09 | 6,223.24 | -343.25 | 616.54 | 290.30 | 326.24 | 1.890 | Level 3<2.00 |
| 16,200.00 | 9,944.92 | 16,212.28 | 9,935.13 | 165.80 | 165.24 | -89.09 | 6,323.23 | -342.36 | 616.56 | 285.64 | 330.92 | 1.863 | Level 3<2.00 |
| 16,300.00 | 9,945.51 | 16,312.28 | 9,935.72 | 168.15 | 167.59 | -89.09 | 6,423.23 | -341.47 | 616.59 | 280.97 | 335.62 | 1.837 | Level 3<2.00 |
| 16,400.00 | 9,946.09 | 16,412.28 | 9,936.31 | 170.50 | 169.94 | -89.09 | 6,523.22 | -340.58 | 616.61 | 276.29 | 340.32 | 1.812 | Level 3<2.00 |
| 16,500.00 | 9,946.68 | 16,512.28 | 9,936.89 | 172.85 | 172.29 | -89.09 | 6,623.21 | -339.69 | 616.63 | 271.61 | 345.03 | 1.787 | Level 3<2.00 |
| 16,600.00 | 9,947.27 | 16,612.28 | 9,937.48 | 175.21 | 174.65 | -89.09 | 6,723.21 | -338.80 | 616.65 | 266.92 | 349.74 | 1.763 | Level 3<2.00 |
| 16,700.00 | 9,947.85 | 16,712.28 | 9,938.07 | 177.57 | 177.01 | -89.09 | 6,823.20 | -337.91 | 616.68 | 262.22 | 354.46 | 1.740 | Level 3<2.00 |
| 16,800.00 | 9,948.44 | 16,812.28 | 9,938.66 | 179.94 | 179.37 | -89.09 | 6,923.20 | -337.03 | 616.70 | 257.51 | 359.19 | 1.717 | Level 3<2.00 |
| 16,900.00 | 9,949.02 | 16,912.28 | 9,939.25 | 182.30 | 181.74 | -89.09 | 7,023.19 | -336.14 | 616.72 | 252.81 | 363.92 | 1.695 | Level 3<2.00 |
| 17,000.00 | 9,949.61 | 17,012.28 | 9,939.84 | 184.67 | 184.11 | -89.09 | 7,123.19 | -335.25 | 616.75 | 248.09 | 368.65 | 1.673 | Level 3<2.00 |
| 17,002.25 | 9,949.62 | 17,014.53 | 9,939.85 | 184.73 | 184.16 | -89.09 | 7,125.43 | -335.23 | 616.75 | 247.99 | 368.76 | 1.672 | Level 3<2.00 |
| 17,066.37 | 9,950.00 | 17,040.11 | 9,940.00 | 186.25 | 184.77 | -89.09 | 7,151.01 | -335.00 | 617.96 | 248.31 | 369.65 | 1.672 | Level 3<2.00, SF |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 238 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -90.00 | 0.00 | -25.00 | 25.00 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.20 | 0.20 | -90.00 | 0.00 | -25.00 | 25.00 | 24.60 | 0.40 | 62.829 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.74 | 0.74 | -90.00 | 0.00 | -25.00 | 25.00 | 23.53 | 1.47 | 16.969 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 1.27 | 1.27 | -90.00 | 0.00 | -25.00 | 25.00 | 22.45 | 2.55 | 9.809 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 1.81 | 1.81 | -90.00 | 0.00 | -25.00 | 25.00 | 21.38 | 3.62 | 6.898 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 2.35 | 2.35 | -90.00 | 0.00 | -25.00 | 25.00 | 20.30 | 4.70 | 5.320 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 2.89 | 2.89 | -90.00 | 0.00 | -25.00 | 25.00 | 19.23 | 5.77 | 4.329 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 3.43 | 3.43 | -90.00 | 0.00 | -25.00 | 25.00 | 18.15 | 6.85 | 3.649 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 3.96 | 3.96 | -90.00 | 0.00 | -25.00 | 25.00 | 17.07 | 7.93 | 3.154 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 4.50 | 4.50 | -90.00 | 0.00 | -25.00 | 25.00 | 16.00 | 9.00 | 2.777 | |
| 1,000.00 | 1,000.00 | 1,000.00 | 1,000.00 | 5.04 | 5.04 | -90.00 | 0.00 | -25.00 | 25.00 | 14.92 | 10.08 | 2.481 | |
| 1,100.00 | 1,100.00 | 1,100.00 | 1,100.00 | 5.58 | 5.58 | -90.00 | 0.00 | -25.00 | 25.00 | 13.85 | 11.15 | 2.242 | |
| 1,200.00 | 1,200.00 | 1,200.00 | 1,200.00 | 6.11 | 6.11 | -90.00 | 0.00 | -25.00 | 25.00 | 12.77 | 12.23 | 2.045 | CC, ES |
| 1,300.00 | 1,299.99 | 1,300.01 | 1,299.99 | 6.63 | 6.65 | 149.32 | 0.00 | -25.00 | 26.12 | 12.83 | 13.28 | 1.966 | Level 3<2.00, SF |
| 1,400.00 | 1,399.91 | 1,399.91 | 1,399.91 | 7.13 | 7.19 | 153.18 | 0.00 | -25.00 | 29.56 | 15.24 | 14.32 | 2.064 | |
| 1,500.00 | 1,499.69 | 1,500.31 | 1,500.29 | 7.65 | 7.70 | 156.34 | -1.11 | -24.29 | 34.63 | 19.29 | 15.34 | 2.257 | |
| 1,600.00 | 1,599.41 | 1,600.77 | 1,600.68 | 8.16 | 8.20 | 156.48 | -4.42 | -22.15 | 38.98 | 22.64 | 16.34 | 2.386 | |
| 1,700.00 | 1,699.12 | 1,700.70 | 1,700.49 | 8.69 | 8.70 | 155.58 | -8.56 | -19.49 | 42.67 | 25.32 | 17.35 | 2.459 | |
| 1,800.00 | 1,798.83 | 1,800.63 | 1,800.30 | 9.22 | 9.20 | 154.83 | -12.70 | -16.82 | 46.37 | 27.99 | 18.38 | 2.523 | |
| 1,900.00 | 1,898.54 | 1,900.56 | 1,900.10 | 9.75 | 9.72 | 154.18 | -16.84 | -14.16 | 50.07 | 30.66 | 19.41 | 2.580 | |
| 2,000.00 | 1,998.26 | 2,000.49 | 1,999.91 | 10.29 | 10.23 | 153.63 | -20.98 | -11.49 | 53.78 | 33.33 | 20.45 | 2.630 | |
| 2,100.00 | 2,097.97 | 2,100.42 | 2,099.72 | 10.83 | 10.75 | 153.14 | -25.12 | -8.82 | 57.50 | 36.00 | 21.50 | 2.675 | |
| 2,200.00 | 2,197.68 | 2,200.35 | 2,199.53 | 11.38 | 11.27 | 152.72 | -29.26 | -6.16 | 61.22 | 38.67 | 22.55 | 2.715 | |
| 2,300.00 | 2,297.40 | 2,300.28 | 2,299.34 | 11.92 | 11.79 | 152.34 | -33.40 | -3.49 | 64.94 | 41.34 | 23.60 | 2.751 | |
| 2,400.00 | 2,397.11 | 2,400.21 | 2,399.15 | 12.47 | 12.32 | 152.01 | -37.54 | -0.82 | 68.66 | 44.00 | 24.66 | 2.784 | |
| 2,500.00 | 2,496.82 | 2,500.14 | 2,498.95 | 13.02 | 12.85 | 151.70 | -41.68 | 1.84 | 72.39 | 46.66 | 25.72 | 2.814 | |
| 2,600.00 | 2,596.53 | 2,600.07 | 2,598.76 | 13.57 | 13.38 | 151.43 | -45.83 | 4.51 | 76.12 | 49.33 | 26.79 | 2.841 | |
| 2,700.00 | 2,696.25 | 2,700.00 | 2,698.57 | 14.13 | 13.91 | 151.19 | -49.97 | 7.18 | 79.84 | 51.99 | 27.86 | 2.866 | |
| 2,800.00 | 2,795.96 | 2,800.07 | 2,798.38 | 14.68 | 14.45 | 150.96 | -54.11 | 9.84 | 83.58 | 54.65 | 28.93 | 2.889 | |
| 2,900.00 | 2,895.67 | 2,900.14 | 2,898.19 | 15.24 | 14.98 | 150.76 | -58.25 | 12.51 | 87.31 | 57.30 | 30.00 | 2.910 | |
| 3,000.00 | 2,995.39 | 3,000.21 | 2,998.00 | 15.79 | 15.52 | 150.57 | -62.39 | 15.18 | 91.04 | 59.96 | 31.08 | 2.929 | |
| 3,100.00 | 3,095.10 | 3,100.28 | 3,097.81 | 16.35 | 16.06 | 150.40 | -66.53 | 17.84 | 94.77 | 62.62 | 32.16 | 2.947 | |
| 3,200.00 | 3,194.81 | 3,200.35 | 3,197.61 | 16.91 | 16.60 | 150.24 | -70.67 | 20.51 | 98.51 | 65.27 | 33.24 | 2.964 | |
| 3,300.00 | 3,294.52 | 3,300.42 | 3,297.42 | 17.47 | 17.14 | 150.09 | -74.81 | 23.18 | 102.24 | 67.93 | 34.32 | 2.979 | |
| 3,400.00 | 3,394.24 | 3,400.49 | 3,397.23 | 18.02 | 17.68 | 149.95 | -78.95 | 25.84 | 105.98 | 70.58 | 35.40 | 2.994 | |
| 3,500.00 | 3,493.95 | 3,500.56 | 3,497.04 | 18.58 | 18.22 | 149.82 | -83.09 | 28.51 | 109.72 | 73.23 | 36.48 | 3.007 | |
| 3,600.00 | 3,593.66 | 3,600.63 | 3,596.85 | 19.14 | 18.76 | 149.70 | -87.23 | 31.18 | 113.45 | 75.88 | 37.57 | 3.020 | |
| 3,700.00 | 3,693.38 | 3,700.70 | 3,696.66 | 19.71 | 19.30 | 149.59 | -91.37 | 33.84 | 117.19 | 78.54 | 38.65 | 3.032 | |
| 3,800.00 | 3,793.09 | 3,800.77 | 3,796.46 | 20.27 | 19.85 | 149.48 | -95.51 | 36.51 | 120.93 | 81.19 | 39.74 | 3.043 | |
| 3,900.00 | 3,892.80 | 3,900.84 | 3,896.27 | 20.83 | 20.39 | 149.38 | -99.66 | 39.18 | 124.67 | 83.84 | 40.83 | 3.054 | |
| 4,000.00 | 3,992.51 | 4,000.91 | 3,996.08 | 21.39 | 20.93 | 149.29 | -103.80 | 41.84 | 128.40 | 86.49 | 41.91 | 3.063 | |
| 4,100.00 | 4,092.23 | 4,100.98 | 4,095.89 | 21.95 | 21.48 | 149.20 | -107.94 | 44.51 | 132.14 | 89.14 | 43.00 | 3.073 | |
| 4,200.00 | 4,191.94 | 4,201.05 | 4,195.70 | 22.51 | 22.02 | 149.12 | -112.08 | 47.18 | 135.88 | 91.79 | 44.09 | 3.082 | |
| 4,300.00 | 4,291.65 | 4,301.12 | 4,295.51 | 23.08 | 22.57 | 149.04 | -116.22 | 49.84 | 139.62 | 94.44 | 45.18 | 3.090 | |
| 4,400.00 | 4,391.37 | 4,401.19 | 4,395.32 | 23.64 | 23.11 | 148.96 | -120.36 | 52.51 | 143.36 | 97.09 | 46.27 | 3.098 | |
| 4,500.00 | 4,491.08 | 4,501.26 | 4,495.12 | 24.20 | 23.66 | 148.89 | -124.50 | 55.17 | 147.10 | 99.74 | 47.36 | 3.106 | |
| 4,600.00 | 4,590.79 | 4,601.33 | 4,594.93 | 24.77 | 24.21 | 148.83 | -128.64 | 57.84 | 150.84 | 102.38 | 48.46 | 3.113 | |
| 4,700.00 | 4,690.50 | 4,701.40 | 4,694.74 | 25.33 | 24.75 | 148.76 | -132.78 | 60.51 | 154.58 | 105.03 | 49.55 | 3.120 | |
| 4,800.00 | 4,790.22 | 4,801.47 | 4,794.55 | 25.90 | 25.30 | 148.70 | -136.92 | 63.17 | 158.32 | 107.68 | 50.64 | 3.126 | |
| 4,900.00 | 4,889.93 | 4,901.54 | 4,894.36 | 26.46 | 25.85 | 148.64 | -141.06 | 65.84 | 162.06 | 110.33 | 51.73 | 3.133 | |
| 5,000.00 | 4,989.64 | 5,001.61 | 4,994.17 | 27.02 | 26.39 | 148.59 | -145.20 | 68.51 | 165.80 | 112.98 | 52.83 | 3.139 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 238 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.00 | 5,089.35 | 5,101.68 | 5,093.97 | 27.59 | 26.94 | 148.53 | -149.34 | 71.17 | 169.54 | 115.62 | 53.92 | 3.144 | |
| 5,200.00 | 5,189.07 | 5,201.75 | 5,193.78 | 28.15 | 27.49 | 148.48 | -153.49 | 73.84 | 173.28 | 118.27 | 55.02 | 3.150 | |
| 5,300.00 | 5,288.78 | 5,301.82 | 5,293.59 | 28.72 | 28.04 | 148.43 | -157.63 | 76.51 | 177.03 | 120.92 | 56.11 | 3.155 | |
| 5,400.00 | 5,388.49 | 5,401.89 | 5,393.40 | 29.28 | 28.58 | 148.39 | -161.77 | 79.17 | 180.77 | 123.56 | 57.20 | 3.160 | |
| 5,500.00 | 5,488.21 | 5,501.96 | 5,493.21 | 29.85 | 29.13 | 148.34 | -165.91 | 81.84 | 184.51 | 126.21 | 58.30 | 3.165 | |
| 5,600.00 | 5,587.92 | 5,602.03 | 5,593.02 | 30.41 | 29.68 | 148.30 | -170.05 | 84.51 | 188.25 | 128.86 | 59.39 | 3.169 | |
| 5,700.00 | 5,687.63 | 5,702.10 | 5,692.82 | 30.98 | 30.23 | 148.26 | -174.19 | 87.17 | 191.99 | 131.50 | 60.49 | 3.174 | |
| 5,800.00 | 5,787.34 | 5,802.17 | 5,792.63 | 31.55 | 30.78 | 148.22 | -178.33 | 89.84 | 195.73 | 134.15 | 61.59 | 3.178 | |
| 5,900.00 | 5,887.06 | 5,902.25 | 5,892.44 | 32.11 | 31.33 | 148.18 | -182.47 | 92.51 | 199.48 | 136.79 | 62.68 | 3.182 | |
| 6,000.00 | 5,986.77 | 6,002.32 | 5,992.25 | 32.68 | 31.88 | 148.14 | -186.61 | 95.17 | 203.22 | 139.44 | 63.78 | 3.186 | |
| 6,100.00 | 6,086.48 | 6,102.39 | 6,092.06 | 33.24 | 32.43 | 148.11 | -190.75 | 97.84 | 206.96 | 142.08 | 64.88 | 3.190 | |
| 6,200.00 | 6,186.25 | 6,197.56 | 6,191.89 | 33.80 | 32.95 | 147.98 | -194.89 | 100.51 | 210.07 | 144.12 | 65.95 | 3.185 | |
| 6,300.00 | 6,286.15 | 6,295.22 | 6,289.46 | 34.35 | 33.48 | 147.68 | -198.28 | 102.68 | 211.47 | 144.46 | 67.01 | 3.156 | |
| 6,400.00 | 6,386.14 | 6,392.32 | 6,386.54 | 34.88 | 33.98 | 147.56 | -199.60 | 103.54 | 212.00 | 143.98 | 68.03 | 3.117 | |
| 6,500.00 | 6,486.14 | 6,508.09 | 6,486.14 | 35.37 | 34.56 | -90.24 | -199.62 | 103.55 | 212.01 | 142.91 | 69.10 | 3.068 | |
| 6,600.00 | 6,586.14 | 6,608.09 | 6,586.14 | 35.87 | 35.06 | -90.24 | -199.62 | 103.55 | 212.01 | 141.91 | 70.10 | 3.024 | |
| 6,700.00 | 6,686.14 | 6,708.09 | 6,686.14 | 36.36 | 35.56 | -90.24 | -199.62 | 103.55 | 212.01 | 140.90 | 71.11 | 2.982 | |
| 6,800.00 | 6,786.14 | 6,808.09 | 6,786.14 | 36.86 | 36.07 | -90.24 | -199.62 | 103.55 | 212.01 | 139.90 | 72.11 | 2.940 | |
| 6,900.00 | 6,886.14 | 6,908.09 | 6,886.14 | 37.35 | 36.57 | -90.24 | -199.62 | 103.55 | 212.01 | 138.89 | 73.12 | 2.899 | |
| 7,000.00 | 6,986.14 | 7,008.09 | 6,986.14 | 37.85 | 37.07 | -90.24 | -199.62 | 103.55 | 212.01 | 137.88 | 74.13 | 2.860 | |
| 7,100.00 | 7,086.14 | 7,108.09 | 7,086.14 | 38.35 | 37.58 | -90.24 | -199.62 | 103.55 | 212.01 | 136.87 | 75.14 | 2.821 | |
| 7,200.00 | 7,186.14 | 7,208.09 | 7,186.14 | 38.85 | 38.08 | -90.24 | -199.62 | 103.55 | 212.01 | 135.86 | 76.16 | 2.784 | |
| 7,300.00 | 7,286.14 | 7,308.09 | 7,286.14 | 39.35 | 38.59 | -90.24 | -199.62 | 103.55 | 212.01 | 134.84 | 77.17 | 2.747 | |
| 7,400.00 | 7,386.14 | 7,408.09 | 7,386.14 | 39.86 | 39.10 | -90.24 | -199.62 | 103.55 | 212.01 | 133.83 | 78.19 | 2.712 | |
| 7,500.00 | 7,486.14 | 7,508.09 | 7,486.14 | 40.36 | 39.61 | -90.24 | -199.62 | 103.55 | 212.01 | 132.81 | 79.20 | 2.677 | |
| 7,600.00 | 7,586.14 | 7,608.09 | 7,586.14 | 40.86 | 40.11 | -90.24 | -199.62 | 103.55 | 212.01 | 131.79 | 80.22 | 2.643 | |
| 7,700.00 | 7,686.14 | 7,708.09 | 7,686.14 | 41.37 | 40.62 | -90.24 | -199.62 | 103.55 | 212.01 | 130.77 | 81.24 | 2.610 | |
| 7,800.00 | 7,786.14 | 7,808.09 | 7,786.14 | 41.87 | 41.13 | -90.24 | -199.62 | 103.55 | 212.01 | 129.75 | 82.27 | 2.577 | |
| 7,900.00 | 7,886.14 | 7,908.09 | 7,886.14 | 42.38 | 41.65 | -90.24 | -199.62 | 103.55 | 212.01 | 128.72 | 83.29 | 2.545 | |
| 8,000.00 | 7,986.14 | 8,008.09 | 7,986.14 | 42.89 | 42.16 | -90.24 | -199.62 | 103.55 | 212.01 | 127.70 | 84.32 | 2.515 | |
| 8,100.00 | 8,086.14 | 8,108.09 | 8,086.14 | 43.40 | 42.67 | -90.24 | -199.62 | 103.55 | 212.01 | 126.67 | 85.34 | 2.484 | |
| 8,200.00 | 8,186.14 | 8,208.09 | 8,186.14 | 43.90 | 43.18 | -90.24 | -199.62 | 103.55 | 212.01 | 125.64 | 86.37 | 2.455 | |
| 8,300.00 | 8,286.14 | 8,308.09 | 8,286.14 | 44.41 | 43.70 | -90.24 | -199.62 | 103.55 | 212.01 | 124.61 | 87.40 | 2.426 | |
| 8,400.00 | 8,386.14 | 8,408.09 | 8,386.14 | 44.92 | 44.21 | -90.24 | -199.62 | 103.55 | 212.01 | 123.59 | 88.43 | 2.398 | |
| 8,500.00 | 8,486.14 | 8,508.09 | 8,486.14 | 45.44 | 44.72 | -90.24 | -199.62 | 103.55 | 212.01 | 122.55 | 89.46 | 2.370 | |
| 8,600.00 | 8,586.14 | 8,608.09 | 8,586.14 | 45.95 | 45.24 | -90.24 | -199.62 | 103.55 | 212.01 | 121.52 | 90.49 | 2.343 | |
| 8,700.00 | 8,686.14 | 8,708.09 | 8,686.14 | 46.46 | 45.76 | -90.24 | -199.62 | 103.55 | 212.01 | 120.49 | 91.52 | 2.317 | |
| 8,800.00 | 8,786.14 | 8,808.09 | 8,786.14 | 46.97 | 46.27 | -90.24 | -199.62 | 103.55 | 212.01 | 119.46 | 92.56 | 2.291 | |
| 8,900.00 | 8,886.14 | 8,908.09 | 8,886.14 | 47.48 | 46.79 | -90.24 | -199.62 | 103.55 | 212.01 | 118.42 | 93.59 | 2.265 | |
| 9,000.00 | 8,986.14 | 9,008.09 | 8,986.14 | 48.00 | 47.31 | -90.24 | -199.62 | 103.55 | 212.01 | 117.39 | 94.63 | 2.241 | |
| 9,100.00 | 9,086.14 | 9,108.09 | 9,086.14 | 48.51 | 47.82 | -90.24 | -199.62 | 103.55 | 212.01 | 116.35 | 95.66 | 2.216 | |
| 9,200.00 | 9,186.14 | 9,208.09 | 9,186.14 | 49.03 | 48.34 | -90.24 | -199.62 | 103.55 | 212.01 | 115.31 | 96.70 | 2.192 | |
| 9,300.00 | 9,286.14 | 9,308.09 | 9,286.14 | 49.54 | 48.86 | -90.24 | -199.62 | 103.55 | 212.01 | 114.27 | 97.74 | 2.169 | |
| 9,400.00 | 9,386.08 | 9,408.15 | 9,386.08 | 50.05 | 49.38 | -83.73 | -199.62 | 103.55 | 211.77 | 112.99 | 98.78 | 2.144 | |
| 9,500.00 | 9,484.46 | 9,509.76 | 9,484.46 | 50.52 | 49.91 | -88.41 | -199.62 | 103.55 | 210.58 | 110.71 | 99.87 | 2.109 | |
| 9,521.92 | 9,505.53 | 9,511.31 | 9,505.53 | 50.62 | 49.92 | -90.00 | -199.62 | 103.55 | 210.49 | 110.49 | 100.00 | 2.105 | |
| 9,600.00 | 9,578.36 | 9,584.14 | 9,578.36 | 50.94 | 50.29 | -96.87 | -199.62 | 103.55 | 212.34 | 111.50 | 100.84 | 2.106 | |
| 9,700.00 | 9,664.94 | 9,670.71 | 9,664.94 | 51.29 | 50.74 | -106.85 | -199.62 | 103.55 | 224.40 | 122.56 | 101.84 | 2.203 | |
| 9,800.00 | 9,741.55 | 9,747.32 | 9,741.55 | 51.57 | 51.14 | -115.51 | -199.62 | 103.55 | 253.82 | 151.16 | 102.66 | 2.472 | |
| 9,900.00 | 9,805.87 | 9,811.64 | 9,805.87 | 51.79 | 51.48 | -120.80 | -199.62 | 103.55 | 303.21 | 199.98 | 103.23 | 2.937 | |
| 10,000.00 | 9,855.94 | 9,861.72 | 9,855.94 | 52.03 | 51.74 | -121.54 | -199.62 | 103.55 | 370.30 | 266.71 | 103.59 | 3.575 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 238 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,100.00 | 9,890.25 | 9,903.97 | 9,890.25 | 52.40 | 51.96 | -116.24 | -199.62 | 103.55 | 450.63 | 346.81 | 103.82 | 4.340 | |
| 10,200.00 | 9,907.75 | 9,913.53 | 9,907.75 | 52.85 | 52.01 | -101.83 | -199.62 | 103.55 | 539.53 | 435.70 | 103.83 | 5.196 | |
| 10,300.00 | 9,910.31 | 9,916.09 | 9,910.31 | 53.35 | 52.02 | -91.02 | -199.62 | 103.55 | 632.91 | 529.11 | 103.79 | 6.098 | |
| 10,400.00 | 9,910.90 | 11,046.91 | 10,572.85 | 53.95 | 57.00 | -169.70 | 515.39 | 109.99 | 672.81 | 609.81 | 63.00 | 10.680 | |
| 10,500.00 | 9,911.49 | 11,146.71 | 10,573.44 | 54.66 | 57.66 | -170.21 | 615.18 | 110.89 | 671.72 | 608.29 | 63.43 | 10.590 | |
| 10,600.00 | 9,912.08 | 11,246.67 | 10,574.03 | 55.47 | 58.41 | -170.45 | 715.14 | 111.79 | 671.26 | 607.19 | 64.07 | 10.477 | |
| 10,695.59 | 9,912.64 | 11,342.26 | 10,574.59 | 56.32 | 59.22 | -170.49 | 810.72 | 112.65 | 671.18 | 606.35 | 64.83 | 10.353 | |
| 10,700.00 | 9,912.67 | 11,346.67 | 10,574.61 | 56.36 | 59.26 | -170.46 | 815.13 | 112.69 | 671.24 | 606.36 | 64.88 | 10.346 | |
| 10,800.00 | 9,913.25 | 11,446.67 | 10,575.20 | 57.35 | 60.20 | -170.46 | 915.12 | 113.59 | 671.24 | 605.47 | 65.77 | 10.205 | |
| 10,900.00 | 9,913.84 | 11,546.67 | 10,575.79 | 58.43 | 61.22 | -170.46 | 1,015.12 | 114.49 | 671.25 | 604.50 | 66.74 | 10.057 | |
| 11,000.00 | 9,914.43 | 11,646.67 | 10,576.38 | 59.59 | 62.32 | -170.46 | 1,115.11 | 115.39 | 671.25 | 603.46 | 67.78 | 9.903 | |
| 11,100.00 | 9,915.01 | 11,746.67 | 10,576.96 | 60.83 | 63.50 | -170.46 | 1,215.11 | 116.29 | 671.25 | 602.36 | 68.90 | 9.743 | |
| 11,200.00 | 9,915.60 | 11,846.67 | 10,577.55 | 62.14 | 64.76 | -170.46 | 1,315.10 | 117.19 | 671.25 | 601.18 | 70.07 | 9.579 | |
| 11,300.00 | 9,916.19 | 11,946.67 | 10,578.14 | 63.52 | 66.08 | -170.45 | 1,415.10 | 118.09 | 671.26 | 599.95 | 71.31 | 9.413 | |
| 11,400.00 | 9,916.77 | 12,046.67 | 10,578.73 | 64.96 | 67.47 | -170.45 | 1,515.09 | 118.99 | 671.26 | 598.65 | 72.61 | 9.245 | |
| 11,500.00 | 9,917.36 | 12,146.67 | 10,579.31 | 66.47 | 68.91 | -170.45 | 1,615.08 | 119.90 | 671.26 | 597.30 | 73.96 | 9.076 | |
| 11,600.00 | 9,917.95 | 12,246.67 | 10,579.90 | 68.03 | 70.42 | -170.45 | 1,715.08 | 120.80 | 671.27 | 595.89 | 75.37 | 8.906 | |
| 11,700.00 | 9,918.53 | 12,346.67 | 10,580.49 | 69.64 | 71.98 | -170.45 | 1,815.07 | 121.70 | 671.27 | 594.44 | 76.83 | 8.737 | |
| 11,800.00 | 9,919.12 | 12,446.67 | 10,581.08 | 71.31 | 73.58 | -170.45 | 1,915.07 | 122.60 | 671.27 | 592.94 | 78.33 | 8.570 | |
| 11,900.00 | 9,919.70 | 12,546.67 | 10,581.66 | 73.01 | 75.24 | -170.45 | 2,015.06 | 123.50 | 671.28 | 591.40 | 79.88 | 8.404 | |
| 12,000.00 | 9,920.29 | 12,646.67 | 10,582.25 | 74.77 | 76.94 | -170.45 | 2,115.05 | 124.40 | 671.28 | 589.81 | 81.47 | 8.240 | |
| 12,100.00 | 9,920.88 | 12,746.67 | 10,582.84 | 76.56 | 78.68 | -170.45 | 2,215.05 | 125.30 | 671.28 | 588.18 | 83.10 | 8.078 | |
| 12,200.00 | 9,921.46 | 12,846.67 | 10,583.43 | 78.38 | 80.46 | -170.45 | 2,315.04 | 126.20 | 671.28 | 586.52 | 84.77 | 7.919 | |
| 12,300.00 | 9,922.05 | 12,946.67 | 10,584.01 | 80.25 | 82.27 | -170.45 | 2,415.04 | 127.10 | 671.29 | 584.82 | 86.47 | 7.764 | |
| 12,400.00 | 9,922.64 | 13,046.67 | 10,584.60 | 82.14 | 84.12 | -170.44 | 2,515.03 | 128.00 | 671.29 | 583.09 | 88.20 | 7.611 | |
| 12,500.00 | 9,923.22 | 13,146.67 | 10,585.19 | 84.07 | 85.99 | -170.44 | 2,615.03 | 128.90 | 671.29 | 581.33 | 89.96 | 7.462 | |
| 12,600.00 | 9,923.81 | 13,246.67 | 10,585.78 | 86.02 | 87.90 | -170.44 | 2,715.02 | 129.80 | 671.30 | 579.54 | 91.76 | 7.316 | |
| 12,700.00 | 9,924.40 | 13,346.67 | 10,586.36 | 88.00 | 89.84 | -170.44 | 2,815.01 | 130.70 | 671.30 | 577.72 | 93.58 | 7.174 | |
| 12,800.00 | 9,924.98 | 13,446.67 | 10,586.95 | 90.00 | 91.80 | -170.44 | 2,915.01 | 131.60 | 671.30 | 575.88 | 95.42 | 7.035 | |
| 12,900.00 | 9,925.57 | 13,546.67 | 10,587.54 | 92.03 | 93.78 | -170.44 | 3,015.00 | 132.50 | 671.30 | 574.01 | 97.29 | 6.900 | |
| 13,000.00 | 9,926.16 | 13,646.67 | 10,588.13 | 94.07 | 95.79 | -170.44 | 3,115.00 | 133.40 | 671.31 | 572.12 | 99.19 | 6.768 | |
| 13,100.00 | 9,926.74 | 13,746.67 | 10,588.71 | 96.14 | 97.82 | -170.44 | 3,214.99 | 134.31 | 671.31 | 570.21 | 101.10 | 6.640 | |
| 13,200.00 | 9,927.33 | 13,846.67 | 10,589.30 | 98.23 | 99.87 | -170.44 | 3,314.99 | 135.21 | 671.31 | 568.28 | 103.03 | 6.515 | |
| 13,300.00 | 9,927.91 | 13,946.67 | 10,589.89 | 100.33 | 101.94 | -170.44 | 3,414.98 | 136.11 | 671.32 | 566.33 | 104.99 | 6.394 | |
| 13,400.00 | 9,928.50 | 14,046.67 | 10,590.48 | 102.45 | 104.02 | -170.44 | 3,514.97 | 137.01 | 671.32 | 564.36 | 106.96 | 6.277 | |
| 13,500.00 | 9,929.09 | 14,146.67 | 10,591.06 | 104.58 | 106.13 | -170.44 | 3,614.97 | 137.91 | 671.32 | 562.38 | 108.95 | 6.162 | |
| 13,600.00 | 9,929.67 | 14,246.67 | 10,591.65 | 106.73 | 108.24 | -170.43 | 3,714.96 | 138.81 | 671.33 | 560.38 | 110.95 | 6.051 | |
| 13,700.00 | 9,930.26 | 14,346.67 | 10,592.24 | 108.90 | 110.38 | -170.43 | 3,814.96 | 139.71 | 671.33 | 558.36 | 112.97 | 5.943 | |
| 13,800.00 | 9,930.85 | 14,446.67 | 10,592.83 | 111.07 | 112.52 | -170.43 | 3,914.95 | 140.61 | 671.33 | 556.33 | 115.00 | 5.838 | |
| 13,900.00 | 9,931.43 | 14,546.67 | 10,593.42 | 113.26 | 114.68 | -170.43 | 4,014.95 | 141.51 | 671.33 | 554.29 | 117.05 | 5.736 | |
| 14,000.00 | 9,932.02 | 14,646.67 | 10,594.00 | 115.46 | 116.85 | -170.43 | 4,114.94 | 142.41 | 671.34 | 552.23 | 119.10 | 5.637 | |
| 14,100.00 | 9,932.61 | 14,746.67 | 10,594.59 | 117.67 | 119.04 | -170.43 | 4,214.93 | 143.31 | 671.34 | 550.16 | 121.18 | 5.540 | |
| 14,200.00 | 9,933.19 | 14,846.67 | 10,595.18 | 119.89 | 121.23 | -170.43 | 4,314.93 | 144.21 | 671.34 | 548.08 | 123.26 | 5.447 | |
| 14,300.00 | 9,933.78 | 14,946.67 | 10,595.77 | 122.12 | 123.44 | -170.43 | 4,414.92 | 145.11 | 671.35 | 545.99 | 125.35 | 5.356 | |
| 14,400.00 | 9,934.36 | 15,046.67 | 10,596.35 | 124.36 | 125.65 | -170.43 | 4,514.92 | 146.01 | 671.35 | 543.89 | 127.45 | 5.267 | |
| 14,500.00 | 9,934.95 | 15,146.67 | 10,596.94 | 126.61 | 127.88 | -170.43 | 4,614.91 | 146.91 | 671.35 | 541.78 | 129.57 | 5.181 | |
| 14,600.00 | 9,935.54 | 15,246.67 | 10,597.53 | 128.86 | 130.11 | -170.43 | 4,714.90 | 147.82 | 671.35 | 539.66 | 131.69 | 5.098 | |
| 14,700.00 | 9,936.12 | 15,346.67 | 10,598.12 | 131.13 | 132.35 | -170.42 | 4,814.90 | 148.72 | 671.36 | 537.53 | 133.82 | 5.017 | |
| 14,800.00 | 9,936.71 | 15,446.67 | 10,598.70 | 133.40 | 134.60 | -170.42 | 4,914.89 | 149.62 | 671.36 | 535.40 | 135.96 | 4.938 | |
| 14,900.00 | 9,937.30 | 15,546.67 | 10,599.29 | 135.68 | 136.86 | -170.42 | 5,014.89 | 150.52 | 671.36 | 533.25 | 138.11 | 4.861 | |
| 15,000.00 | 9,937.88 | 15,646.67 | 10,599.88 | 137.96 | 139.12 | -170.42 | 5,114.88 | 151.42 | 671.37 | 531.10 | 140.27 | 4.786 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 238 H - Original Hole - rev0

**Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,100.00 | 9,938.47 | 15,746.67 | 10,600.47 | 140.25 | 141.40 | -170.42 | 5,214.88 | 152.32 | 671.37 | 528.94 | 142.43 | 4.714 | |
| 15,200.00 | 9,939.06 | 15,846.67 | 10,601.05 | 142.55 | 143.67 | -170.42 | 5,314.87 | 153.22 | 671.37 | 526.78 | 144.60 | 4.643 | |
| 15,300.00 | 9,939.64 | 15,946.67 | 10,601.64 | 144.85 | 145.96 | -170.42 | 5,414.86 | 154.12 | 671.38 | 524.60 | 146.77 | 4.574 | |
| 15,400.00 | 9,940.23 | 16,046.67 | 10,602.23 | 147.16 | 148.25 | -170.42 | 5,514.86 | 155.02 | 671.38 | 522.42 | 148.95 | 4.507 | |
| 15,500.00 | 9,940.82 | 16,146.67 | 10,602.82 | 149.48 | 150.55 | -170.42 | 5,614.85 | 155.92 | 671.38 | 520.24 | 151.14 | 4.442 | |
| 15,600.00 | 9,941.40 | 16,246.67 | 10,603.40 | 151.79 | 152.85 | -170.42 | 5,714.85 | 156.82 | 671.38 | 518.05 | 153.34 | 4.379 | |
| 15,700.00 | 9,941.99 | 16,346.67 | 10,603.99 | 154.12 | 155.15 | -170.42 | 5,814.84 | 157.72 | 671.39 | 515.85 | 155.53 | 4.317 | |
| 15,800.00 | 9,942.57 | 16,446.67 | 10,604.58 | 156.45 | 157.47 | -170.41 | 5,914.84 | 158.62 | 671.39 | 513.65 | 157.74 | 4.256 | |
| 15,900.00 | 9,943.16 | 16,546.67 | 10,605.17 | 158.78 | 159.78 | -170.41 | 6,014.83 | 159.52 | 671.39 | 511.45 | 159.95 | 4.198 | |
| 16,000.00 | 9,943.75 | 16,646.67 | 10,605.75 | 161.11 | 162.10 | -170.41 | 6,114.82 | 160.42 | 671.40 | 509.23 | 162.16 | 4.140 | |
| 16,100.00 | 9,944.33 | 16,746.67 | 10,606.34 | 163.46 | 164.43 | -170.41 | 6,214.82 | 161.32 | 671.40 | 507.02 | 164.38 | 4.084 | |
| 16,200.00 | 9,944.92 | 16,846.67 | 10,606.93 | 165.80 | 166.76 | -170.41 | 6,314.81 | 162.23 | 671.40 | 504.80 | 166.60 | 4.030 | |
| 16,300.00 | 9,945.51 | 16,946.67 | 10,607.52 | 168.15 | 169.09 | -170.41 | 6,414.81 | 163.13 | 671.40 | 502.57 | 168.83 | 3.977 | |
| 16,400.00 | 9,946.09 | 17,046.67 | 10,608.10 | 170.50 | 171.43 | -170.41 | 6,514.80 | 164.03 | 671.41 | 500.35 | 171.06 | 3.925 | |
| 16,500.00 | 9,946.68 | 17,146.67 | 10,608.69 | 172.85 | 173.77 | -170.41 | 6,614.79 | 164.93 | 671.41 | 498.12 | 173.29 | 3.874 | |
| 16,600.00 | 9,947.27 | 17,246.67 | 10,609.28 | 175.21 | 176.12 | -170.41 | 6,714.79 | 165.83 | 671.41 | 495.88 | 175.53 | 3.825 | |
| 16,700.00 | 9,947.85 | 17,346.67 | 10,609.87 | 177.57 | 178.47 | -170.41 | 6,814.78 | 166.73 | 671.42 | 493.64 | 177.78 | 3.777 | |
| 16,800.00 | 9,948.44 | 17,446.67 | 10,610.45 | 179.94 | 180.82 | -170.41 | 6,914.78 | 167.63 | 671.42 | 491.40 | 180.02 | 3.730 | |
| 16,900.00 | 9,949.02 | 17,546.67 | 10,611.04 | 182.30 | 183.17 | -170.40 | 7,014.77 | 168.53 | 671.42 | 489.15 | 182.27 | 3.684 | |
| 17,000.00 | 9,949.61 | 17,646.67 | 10,611.63 | 184.67 | 185.53 | -170.40 | 7,114.77 | 169.43 | 671.43 | 486.90 | 184.52 | 3.639 | |
| 17,066.37 | 9,950.00 | 17,713.04 | 10,612.02 | 186.25 | 187.10 | -170.40 | 7,181.13 | 170.03 | 671.43 | 485.41 | 186.02 | 3.610 | |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 246 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -90.76 | -1.00 | -75.00 | 75.01 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.20 | 0.20 | -90.76 | -1.00 | -75.00 | 75.01 | 74.61 | 0.40 | 188.505 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.74 | 0.74 | -90.76 | -1.00 | -75.00 | 75.01 | 73.53 | 1.47 | 50.910 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 1.27 | 1.27 | -90.76 | -1.00 | -75.00 | 75.01 | 72.46 | 2.55 | 29.429 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 1.81 | 1.81 | -90.76 | -1.00 | -75.00 | 75.01 | 71.38 | 3.62 | 20.696 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 2.35 | 2.35 | -90.76 | -1.00 | -75.00 | 75.01 | 70.31 | 4.70 | 15.960 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 2.89 | 2.89 | -90.76 | -1.00 | -75.00 | 75.01 | 69.23 | 5.77 | 12.988 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 3.43 | 3.43 | -90.76 | -1.00 | -75.00 | 75.01 | 68.16 | 6.85 | 10.949 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 3.96 | 3.96 | -90.76 | -1.00 | -75.00 | 75.01 | 67.08 | 7.93 | 9.464 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 4.50 | 4.50 | -90.76 | -1.00 | -75.00 | 75.01 | 66.01 | 9.00 | 8.333 | |
| 1,000.00 | 1,000.00 | 1,000.00 | 1,000.00 | 5.04 | 5.04 | -90.76 | -1.00 | -75.00 | 75.01 | 64.93 | 10.08 | 7.444 | |
| 1,100.00 | 1,100.00 | 1,100.00 | 1,100.00 | 5.58 | 5.58 | -90.76 | -1.00 | -75.00 | 75.01 | 63.85 | 11.15 | 6.726 | |
| 1,200.00 | 1,200.00 | 1,200.00 | 1,200.00 | 6.11 | 6.11 | -90.76 | -1.00 | -75.00 | 75.01 | 62.78 | 12.23 | 6.134 | CC, ES |
| 1,300.00 | 1,299.99 | 1,300.01 | 1,299.99 | 6.63 | 6.65 | 147.56 | -1.00 | -75.00 | 76.11 | 62.83 | 13.28 | 5.730 | |
| 1,400.00 | 1,399.91 | 1,399.91 | 1,399.91 | 7.13 | 7.19 | 149.05 | -1.00 | -75.00 | 79.45 | 65.13 | 14.32 | 5.548 | |
| 1,500.00 | 1,499.69 | 1,498.08 | 1,498.07 | 7.65 | 7.70 | 150.66 | -1.80 | -75.97 | 86.05 | 70.72 | 15.34 | 5.611 | |
| 1,600.00 | 1,599.41 | 1,595.93 | 1,595.84 | 8.16 | 8.18 | 151.31 | -4.21 | -78.87 | 95.49 | 79.16 | 16.32 | 5.849 | |
| 1,700.00 | 1,699.12 | 1,705.75 | 1,693.98 | 8.69 | 8.74 | 150.99 | -8.09 | -83.54 | 106.61 | 89.23 | 17.38 | 6.133 | |
| 1,800.00 | 1,798.83 | 1,806.41 | 1,793.10 | 9.22 | 9.26 | 150.59 | -12.27 | -88.58 | 118.05 | 99.64 | 18.41 | 6.411 | |
| 1,900.00 | 1,898.54 | 1,907.07 | 1,892.22 | 9.75 | 9.78 | 150.26 | -16.45 | -93.62 | 129.50 | 110.05 | 19.45 | 6.658 | |
| 2,000.00 | 1,998.26 | 2,007.73 | 1,991.35 | 10.29 | 10.30 | 149.99 | -20.64 | -98.66 | 140.94 | 120.45 | 20.49 | 6.877 | |
| 2,100.00 | 2,097.97 | 2,108.39 | 2,090.47 | 10.83 | 10.83 | 149.75 | -24.82 | -103.70 | 152.39 | 130.85 | 21.54 | 7.073 | |
| 2,200.00 | 2,197.68 | 2,209.05 | 2,189.60 | 11.38 | 11.37 | 149.55 | -29.00 | -108.74 | 163.84 | 141.24 | 22.60 | 7.250 | |
| 2,300.00 | 2,297.40 | 2,290.29 | 2,288.72 | 11.92 | 11.80 | 149.37 | -33.19 | -113.78 | 175.30 | 151.74 | 23.56 | 7.441 | |
| 2,400.00 | 2,397.11 | 2,389.64 | 2,387.85 | 12.47 | 12.33 | 149.22 | -37.37 | -118.83 | 186.75 | 162.14 | 24.61 | 7.587 | |
| 2,500.00 | 2,496.82 | 2,488.98 | 2,486.97 | 13.02 | 12.87 | 149.08 | -41.55 | -123.87 | 198.21 | 172.53 | 25.67 | 7.720 | |
| 2,600.00 | 2,596.53 | 2,588.32 | 2,586.10 | 13.57 | 13.40 | 148.96 | -45.74 | -128.91 | 209.66 | 182.93 | 26.74 | 7.842 | |
| 2,700.00 | 2,696.25 | 2,687.66 | 2,685.22 | 14.13 | 13.94 | 148.85 | -49.92 | -133.95 | 221.12 | 193.32 | 27.80 | 7.953 | |
| 2,800.00 | 2,795.96 | 2,787.00 | 2,784.34 | 14.68 | 14.48 | 148.75 | -54.10 | -138.99 | 232.58 | 203.71 | 28.87 | 8.056 | |
| 2,900.00 | 2,895.67 | 2,886.34 | 2,883.47 | 15.24 | 15.02 | 148.66 | -58.29 | -144.03 | 244.04 | 214.10 | 29.94 | 8.151 | |
| 3,000.00 | 2,995.39 | 2,985.68 | 2,982.59 | 15.79 | 15.56 | 148.58 | -62.47 | -149.07 | 255.50 | 224.49 | 31.01 | 8.238 | |
| 3,100.00 | 3,095.10 | 3,085.02 | 3,081.72 | 16.35 | 16.10 | 148.51 | -66.65 | -154.11 | 266.96 | 234.87 | 32.09 | 8.320 | |
| 3,200.00 | 3,194.81 | 3,184.36 | 3,180.84 | 16.91 | 16.65 | 148.44 | -70.84 | -159.15 | 278.42 | 245.26 | 33.16 | 8.396 | |
| 3,300.00 | 3,294.52 | 3,283.70 | 3,279.97 | 17.47 | 17.19 | 148.38 | -75.02 | -164.19 | 289.88 | 255.64 | 34.24 | 8.466 | |
| 3,400.00 | 3,394.24 | 3,383.04 | 3,379.09 | 18.02 | 17.74 | 148.32 | -79.20 | -169.23 | 301.34 | 266.03 | 35.32 | 8.533 | |
| 3,500.00 | 3,493.95 | 3,482.38 | 3,478.22 | 18.58 | 18.29 | 148.27 | -83.38 | -174.28 | 312.80 | 276.41 | 36.40 | 8.594 | |
| 3,600.00 | 3,593.66 | 3,581.72 | 3,577.34 | 19.14 | 18.83 | 148.22 | -87.57 | -179.32 | 324.27 | 286.79 | 37.48 | 8.653 | |
| 3,700.00 | 3,693.38 | 3,681.06 | 3,676.46 | 19.71 | 19.38 | 148.17 | -91.75 | -184.36 | 335.73 | 297.17 | 38.56 | 8.707 | |
| 3,800.00 | 3,793.09 | 3,780.40 | 3,775.59 | 20.27 | 19.93 | 148.13 | -95.93 | -189.40 | 347.19 | 307.55 | 39.64 | 8.759 | |
| 3,900.00 | 3,892.80 | 3,879.74 | 3,874.71 | 20.83 | 20.48 | 148.09 | -100.12 | -194.44 | 358.65 | 317.93 | 40.72 | 8.807 | |
| 4,000.00 | 3,992.51 | 3,979.08 | 3,973.84 | 21.39 | 21.03 | 148.05 | -104.30 | -199.48 | 370.12 | 328.31 | 41.81 | 8.853 | |
| 4,100.00 | 4,092.23 | 4,078.43 | 4,072.96 | 21.95 | 21.58 | 148.01 | -108.48 | -204.52 | 381.58 | 338.69 | 42.89 | 8.897 | |
| 4,200.00 | 4,191.94 | 4,177.77 | 4,172.09 | 22.51 | 22.13 | 147.98 | -112.67 | -209.56 | 393.04 | 349.07 | 43.98 | 8.938 | |
| 4,300.00 | 4,291.65 | 4,277.11 | 4,271.21 | 23.08 | 22.68 | 147.95 | -116.85 | -214.60 | 404.50 | 359.44 | 45.06 | 8.977 | |
| 4,400.00 | 4,391.37 | 4,376.45 | 4,370.33 | 23.64 | 23.23 | 147.92 | -121.03 | -219.64 | 415.97 | 369.82 | 46.15 | 9.014 | |
| 4,500.00 | 4,491.08 | 4,475.79 | 4,469.46 | 24.20 | 23.78 | 147.89 | -125.22 | -224.69 | 427.43 | 380.20 | 47.23 | 9.049 | |
| 4,600.00 | 4,590.79 | 4,575.13 | 4,568.58 | 24.77 | 24.33 | 147.86 | -129.40 | -229.73 | 438.89 | 390.57 | 48.32 | 9.083 | |
| 4,700.00 | 4,690.50 | 4,674.47 | 4,667.71 | 25.33 | 24.89 | 147.84 | -133.58 | -234.77 | 450.36 | 400.95 | 49.41 | 9.115 | |
| 4,800.00 | 4,790.22 | 4,773.81 | 4,766.83 | 25.90 | 25.44 | 147.81 | -137.77 | -239.81 | 461.82 | 411.32 | 50.50 | 9.146 | |
| 4,900.00 | 4,889.93 | 4,873.15 | 4,865.96 | 26.46 | 25.99 | 147.79 | -141.95 | -244.85 | 473.28 | 421.70 | 51.59 | 9.175 | |
| 5,000.00 | 4,989.64 | 4,972.49 | 4,965.08 | 27.02 | 26.55 | 147.77 | -146.13 | -249.89 | 484.75 | 432.07 | 52.67 | 9.203 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 246 H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.00 | 5,089.35 | 5,071.83 | 5,064.21 | 27.59 | 27.10 | 147.75 | -150.32 | -254.93 | 496.21 | 442.45 | 53.76 | 9.230 | |
| 5,200.00 | 5,189.07 | 5,171.17 | 5,163.33 | 28.15 | 27.65 | 147.73 | -154.50 | -259.97 | 507.67 | 452.82 | 54.85 | 9.255 | |
| 5,300.00 | 5,288.78 | 5,270.51 | 5,262.45 | 28.72 | 28.21 | 147.71 | -158.68 | -265.01 | 519.14 | 463.20 | 55.94 | 9.280 | |
| 5,400.00 | 5,388.49 | 5,369.85 | 5,361.58 | 29.28 | 28.76 | 147.69 | -162.87 | -270.05 | 530.60 | 473.57 | 57.03 | 9.303 | |
| 5,500.00 | 5,488.21 | 5,469.19 | 5,460.70 | 29.85 | 29.31 | 147.67 | -167.05 | -275.09 | 542.07 | 483.94 | 58.12 | 9.326 | |
| 5,600.00 | 5,587.92 | 5,568.53 | 5,559.83 | 30.41 | 29.87 | 147.66 | -171.23 | -280.14 | 553.53 | 494.32 | 59.21 | 9.348 | |
| 5,700.00 | 5,687.63 | 5,667.87 | 5,658.95 | 30.98 | 30.42 | 147.64 | -175.42 | -285.18 | 564.99 | 504.69 | 60.31 | 9.369 | |
| 5,800.00 | 5,787.34 | 5,767.22 | 5,758.08 | 31.55 | 30.98 | 147.63 | -179.60 | -290.22 | 576.46 | 515.06 | 61.40 | 9.389 | |
| 5,900.00 | 5,887.06 | 5,866.56 | 5,857.20 | 32.11 | 31.53 | 147.61 | -183.78 | -295.26 | 587.92 | 525.43 | 62.49 | 9.408 | |
| 6,000.00 | 5,986.77 | 5,965.90 | 5,956.32 | 32.68 | 32.09 | 147.60 | -187.97 | -300.30 | 599.39 | 535.81 | 63.58 | 9.427 | |
| 6,100.00 | 6,086.48 | 6,065.24 | 6,055.45 | 33.24 | 32.64 | 147.58 | -192.15 | -305.34 | 610.85 | 546.18 | 64.67 | 9.445 | |
| 6,200.00 | 6,186.25 | 6,165.58 | 6,155.58 | 33.80 | 33.20 | 147.60 | -196.37 | -310.43 | 621.68 | 555.91 | 65.77 | 9.452 | |
| 6,300.00 | 6,286.15 | 6,279.72 | 6,269.57 | 34.35 | 33.83 | 147.57 | -199.95 | -314.74 | 629.08 | 562.09 | 66.99 | 9.390 | |
| 6,400.00 | 6,386.14 | 6,394.28 | 6,384.11 | 34.88 | 34.44 | 147.56 | -201.35 | -316.43 | 631.97 | 563.81 | 68.17 | 9.271 | |
| 6,500.00 | 6,486.14 | 6,503.69 | 6,486.14 | 35.37 | 34.99 | -90.24 | -201.37 | -316.45 | 632.02 | 562.80 | 69.22 | 9.130 | |
| 6,600.00 | 6,586.14 | 6,603.69 | 6,586.14 | 35.87 | 35.48 | -90.24 | -201.37 | -316.45 | 632.02 | 561.79 | 70.22 | 9.000 | |
| 6,700.00 | 6,686.14 | 6,703.69 | 6,686.14 | 36.36 | 35.98 | -90.24 | -201.37 | -316.45 | 632.02 | 560.79 | 71.23 | 8.873 | |
| 6,800.00 | 6,786.14 | 6,803.69 | 6,786.14 | 36.86 | 36.48 | -90.24 | -201.37 | -316.45 | 632.02 | 559.78 | 72.24 | 8.749 | |
| 6,900.00 | 6,886.14 | 6,903.69 | 6,886.14 | 37.35 | 36.98 | -90.24 | -201.37 | -316.45 | 632.02 | 558.77 | 73.24 | 8.629 | |
| 7,000.00 | 6,986.14 | 7,003.69 | 6,986.14 | 37.85 | 37.48 | -90.24 | -201.37 | -316.45 | 632.02 | 557.76 | 74.25 | 8.511 | |
| 7,100.00 | 7,086.14 | 7,103.69 | 7,086.14 | 38.35 | 37.99 | -90.24 | -201.37 | -316.45 | 632.02 | 556.75 | 75.27 | 8.397 | |
| 7,200.00 | 7,186.14 | 7,203.69 | 7,186.14 | 38.85 | 38.49 | -90.24 | -201.37 | -316.45 | 632.02 | 555.74 | 76.28 | 8.285 | |
| 7,300.00 | 7,286.14 | 7,303.69 | 7,286.14 | 39.35 | 38.99 | -90.24 | -201.37 | -316.45 | 632.02 | 554.72 | 77.30 | 8.176 | |
| 7,400.00 | 7,386.14 | 7,403.69 | 7,386.14 | 39.86 | 39.50 | -90.24 | -201.37 | -316.45 | 632.02 | 553.70 | 78.31 | 8.070 | |
| 7,500.00 | 7,486.14 | 7,503.69 | 7,486.14 | 40.36 | 40.01 | -90.24 | -201.37 | -316.45 | 632.02 | 552.68 | 79.33 | 7.967 | |
| 7,600.00 | 7,586.14 | 7,603.69 | 7,586.14 | 40.86 | 40.51 | -90.24 | -201.37 | -316.45 | 632.02 | 551.66 | 80.35 | 7.865 | |
| 7,700.00 | 7,686.14 | 7,703.69 | 7,686.14 | 41.37 | 41.02 | -90.24 | -201.37 | -316.45 | 632.02 | 550.64 | 81.38 | 7.767 | |
| 7,800.00 | 7,786.14 | 7,803.69 | 7,786.14 | 41.87 | 41.53 | -90.24 | -201.37 | -316.45 | 632.02 | 549.62 | 82.40 | 7.670 | |
| 7,900.00 | 7,886.14 | 7,903.69 | 7,886.14 | 42.38 | 42.04 | -90.24 | -201.37 | -316.45 | 632.02 | 548.59 | 83.42 | 7.576 | |
| 8,000.00 | 7,986.14 | 8,003.69 | 7,986.14 | 42.89 | 42.55 | -90.24 | -201.37 | -316.45 | 632.02 | 547.57 | 84.45 | 7.484 | |
| 8,100.00 | 8,086.14 | 8,103.69 | 8,086.14 | 43.40 | 43.06 | -90.24 | -201.37 | -316.45 | 632.02 | 546.54 | 85.48 | 7.394 | |
| 8,200.00 | 8,186.14 | 8,203.69 | 8,186.14 | 43.90 | 43.57 | -90.24 | -201.37 | -316.45 | 632.02 | 545.51 | 86.50 | 7.306 | |
| 8,300.00 | 8,286.14 | 8,303.69 | 8,286.14 | 44.41 | 44.08 | -90.24 | -201.37 | -316.45 | 632.02 | 544.48 | 87.53 | 7.220 | |
| 8,400.00 | 8,386.14 | 8,403.69 | 8,386.14 | 44.92 | 44.60 | -90.24 | -201.37 | -316.45 | 632.02 | 543.45 | 88.56 | 7.136 | |
| 8,500.00 | 8,486.14 | 8,503.69 | 8,486.14 | 45.44 | 45.11 | -90.24 | -201.37 | -316.45 | 632.02 | 542.42 | 89.60 | 7.054 | |
| 8,600.00 | 8,586.14 | 8,603.69 | 8,586.14 | 45.95 | 45.62 | -90.24 | -201.37 | -316.45 | 632.02 | 541.39 | 90.63 | 6.974 | |
| 8,700.00 | 8,686.14 | 8,703.69 | 8,686.14 | 46.46 | 46.14 | -90.24 | -201.37 | -316.45 | 632.02 | 540.35 | 91.66 | 6.895 | |
| 8,800.00 | 8,786.14 | 8,803.69 | 8,786.14 | 46.97 | 46.65 | -90.24 | -201.37 | -316.45 | 632.02 | 539.32 | 92.70 | 6.818 | |
| 8,900.00 | 8,886.14 | 8,903.69 | 8,886.14 | 47.48 | 47.17 | -90.24 | -201.37 | -316.45 | 632.02 | 538.28 | 93.73 | 6.743 | |
| 9,000.00 | 8,986.14 | 9,003.69 | 8,986.14 | 48.00 | 47.68 | -90.24 | -201.37 | -316.45 | 632.02 | 537.25 | 94.77 | 6.669 | |
| 9,100.00 | 9,086.14 | 9,103.69 | 9,086.14 | 48.51 | 48.20 | -90.24 | -201.37 | -316.45 | 632.02 | 536.21 | 95.81 | 6.597 | |
| 9,200.00 | 9,186.14 | 9,203.69 | 9,186.14 | 49.03 | 48.72 | -90.24 | -201.37 | -316.45 | 632.02 | 535.17 | 96.84 | 6.526 | |
| 9,300.00 | 9,286.14 | 9,303.69 | 9,286.14 | 49.54 | 49.24 | -90.24 | -201.37 | -316.45 | 632.02 | 534.13 | 97.88 | 6.457 | |
| 9,400.00 | 9,386.08 | 9,403.75 | 9,386.08 | 50.05 | 49.75 | -83.35 | -201.37 | -316.45 | 631.77 | 532.85 | 98.92 | 6.387 | |
| 9,500.00 | 9,484.46 | 9,505.37 | 9,484.46 | 50.52 | 50.28 | -85.05 | -201.37 | -316.45 | 630.00 | 530.07 | 99.93 | 6.304 | |
| 9,600.00 | 9,578.36 | 9,588.54 | 9,578.36 | 50.94 | 50.71 | -88.16 | -201.37 | -316.45 | 627.88 | 527.08 | 100.81 | 6.229 | |
| 9,648.40 | 9,621.35 | 9,631.52 | 9,621.35 | 51.11 | 50.93 | -90.00 | -201.37 | -316.45 | 627.49 | 526.26 | 101.23 | 6.199 | |
| 9,700.00 | 9,664.94 | 9,675.11 | 9,664.94 | 51.29 | 51.16 | -92.06 | -201.37 | -316.45 | 628.10 | 526.44 | 101.66 | 6.178 | |
| 9,800.00 | 9,741.55 | 9,751.72 | 9,741.55 | 51.57 | 51.56 | -95.91 | -201.37 | -316.45 | 634.15 | 531.72 | 102.43 | 6.191 | |
| 9,900.00 | 9,805.87 | 9,816.04 | 9,805.87 | 51.79 | 51.89 | -98.75 | -201.37 | -316.45 | 649.61 | 546.51 | 103.10 | 6.301 | |
| 10,000.00 | 9,855.94 | 9,866.11 | 9,855.94 | 52.03 | 52.15 | -99.76 | -201.37 | -316.45 | 677.13 | 573.47 | 103.66 | 6.532 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

TAP ROCK

# Anticollision Report

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 246 H - Original Hole - rev0 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD — Offset Well Error: 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,100.00 | 9,890.25 | 9,900.42 | 9,890.25 | 52.40 | 52.33 | -98.22 | -201.37 | -316.45 | 717.66 | 613.60 | 104.06 | 6.896 | |
| 10,200.00 | 9,907.75 | 9,917.92 | 9,907.75 | 52.85 | 52.42 | -93.61 | -201.37 | -316.45 | 770.19 | 665.89 | 104.31 | 7.384 | |
| 10,300.00 | 9,910.31 | 9,920.48 | 9,910.31 | 53.35 | 52.44 | -90.31 | -201.37 | -316.45 | 832.49 | 728.09 | 104.41 | 7.974 | |
| 10,400.00 | 9,910.90 | 9,921.08 | 9,910.90 | 53.95 | 52.44 | -90.39 | -201.37 | -316.45 | 903.75 | 799.26 | 104.49 | 8.649 | |
| 10,500.00 | 9,911.49 | 9,921.67 | 9,911.49 | 54.66 | 52.44 | -90.47 | -201.37 | -316.45 | 982.16 | 877.60 | 104.56 | 9.393 | |
| 10,600.00 | 9,912.08 | 11,453.36 | 10,772.06 | 55.47 | 59.54 | -148.28 | 717.68 | -308.27 | 1,010.95 | 931.30 | 79.65 | 12.692 | |
| 10,694.86 | 9,912.64 | 11,548.21 | 10,772.62 | 56.31 | 60.32 | -148.31 | 812.53 | -307.43 | 1,010.70 | 930.06 | 80.64 | 12.534 | |
| 10,700.00 | 9,912.67 | 11,553.36 | 10,772.65 | 56.36 | 60.37 | -148.29 | 817.68 | -307.38 | 1,010.89 | 930.18 | 80.71 | 12.525 | |
| 10,800.00 | 9,913.25 | 11,653.36 | 10,773.24 | 57.35 | 61.28 | -148.29 | 917.67 | -306.49 | 1,010.90 | 929.02 | 81.88 | 12.346 | |
| 10,900.00 | 9,913.84 | 11,753.36 | 10,773.83 | 58.43 | 62.29 | -148.29 | 1,017.66 | -305.60 | 1,010.92 | 927.76 | 83.16 | 12.156 | |
| 11,000.00 | 9,914.43 | 11,853.36 | 10,774.42 | 59.59 | 63.37 | -148.29 | 1,117.66 | -304.72 | 1,010.93 | 926.40 | 84.53 | 11.959 | |
| 11,100.00 | 9,915.01 | 11,953.36 | 10,775.00 | 60.83 | 64.53 | -148.29 | 1,217.65 | -303.83 | 1,010.95 | 924.94 | 86.00 | 11.755 | |
| 11,200.00 | 9,915.60 | 12,053.36 | 10,775.59 | 62.14 | 65.76 | -148.29 | 1,317.65 | -302.94 | 1,010.96 | 923.40 | 87.56 | 11.546 | |
| 11,300.00 | 9,916.19 | 12,153.36 | 10,776.18 | 63.52 | 67.05 | -148.29 | 1,417.64 | -302.05 | 1,010.97 | 921.78 | 89.20 | 11.334 | |
| 11,400.00 | 9,916.77 | 12,253.36 | 10,776.77 | 64.96 | 68.42 | -148.28 | 1,517.64 | -301.16 | 1,010.99 | 920.07 | 90.91 | 11.120 | |
| 11,500.00 | 9,917.36 | 12,353.36 | 10,777.36 | 66.47 | 69.84 | -148.28 | 1,617.63 | -300.27 | 1,011.00 | 918.30 | 92.70 | 10.906 | |
| 11,600.00 | 9,917.95 | 12,453.36 | 10,777.95 | 68.03 | 71.32 | -148.28 | 1,717.62 | -299.38 | 1,011.02 | 916.45 | 94.56 | 10.691 | |
| 11,700.00 | 9,918.53 | 12,553.36 | 10,778.54 | 69.64 | 72.85 | -148.28 | 1,817.62 | -298.49 | 1,011.03 | 914.55 | 96.48 | 10.479 | |
| 11,800.00 | 9,919.12 | 12,653.36 | 10,779.13 | 71.31 | 74.44 | -148.28 | 1,917.61 | -297.60 | 1,011.04 | 912.58 | 98.47 | 10.268 | |
| 11,900.00 | 9,919.70 | 12,753.36 | 10,779.72 | 73.01 | 76.07 | -148.28 | 2,017.61 | -296.71 | 1,011.06 | 910.55 | 100.51 | 10.060 | |
| 12,000.00 | 9,920.29 | 12,853.36 | 10,780.31 | 74.77 | 77.74 | -148.28 | 2,117.60 | -295.82 | 1,011.07 | 908.48 | 102.60 | 9.855 | |
| 12,100.00 | 9,920.88 | 12,953.36 | 10,780.90 | 76.56 | 79.46 | -148.28 | 2,217.60 | -294.93 | 1,011.09 | 906.35 | 104.73 | 9.654 | |
| 12,200.00 | 9,921.46 | 13,053.36 | 10,781.49 | 78.38 | 81.22 | -148.28 | 2,317.59 | -294.04 | 1,011.10 | 904.18 | 106.92 | 9.457 | |
| 12,300.00 | 9,922.05 | 13,153.36 | 10,782.08 | 80.25 | 83.01 | -148.28 | 2,417.58 | -293.15 | 1,011.11 | 901.97 | 109.14 | 9.264 | |
| 12,400.00 | 9,922.64 | 13,253.36 | 10,782.67 | 82.14 | 84.84 | -148.27 | 2,517.58 | -292.26 | 1,011.13 | 899.72 | 111.41 | 9.076 | |
| 12,500.00 | 9,923.22 | 13,353.36 | 10,783.26 | 84.07 | 86.70 | -148.27 | 2,617.57 | -291.37 | 1,011.14 | 897.43 | 113.71 | 8.892 | |
| 12,600.00 | 9,923.81 | 13,453.36 | 10,783.85 | 86.02 | 88.58 | -148.27 | 2,717.57 | -290.48 | 1,011.16 | 895.11 | 116.04 | 8.714 | |
| 12,700.00 | 9,924.40 | 13,553.36 | 10,784.43 | 88.00 | 90.50 | -148.27 | 2,817.56 | -289.59 | 1,011.17 | 892.76 | 118.41 | 8.540 | |
| 12,800.00 | 9,924.98 | 13,653.36 | 10,785.02 | 90.00 | 92.44 | -148.27 | 2,917.56 | -288.70 | 1,011.18 | 890.38 | 120.80 | 8.371 | |
| 12,900.00 | 9,925.57 | 13,753.36 | 10,785.61 | 92.03 | 94.41 | -148.27 | 3,017.55 | -287.81 | 1,011.20 | 887.98 | 123.22 | 8.206 | |
| 13,000.00 | 9,926.16 | 13,853.36 | 10,786.20 | 94.07 | 96.40 | -148.27 | 3,117.54 | -286.92 | 1,011.21 | 885.55 | 125.67 | 8.047 | |
| 13,100.00 | 9,926.74 | 13,953.36 | 10,786.79 | 96.14 | 98.42 | -148.27 | 3,217.54 | -286.03 | 1,011.23 | 883.09 | 128.14 | 7.892 | |
| 13,200.00 | 9,927.33 | 14,053.36 | 10,787.38 | 98.23 | 100.45 | -148.27 | 3,317.53 | -285.14 | 1,011.24 | 880.61 | 130.63 | 7.741 | |
| 13,300.00 | 9,927.91 | 14,153.36 | 10,787.97 | 100.33 | 102.50 | -148.27 | 3,417.53 | -284.25 | 1,011.26 | 878.12 | 133.14 | 7.595 | |
| 13,400.00 | 9,928.50 | 14,253.36 | 10,788.56 | 102.45 | 104.57 | -148.27 | 3,517.52 | -283.36 | 1,011.27 | 875.60 | 135.67 | 7.454 | |
| 13,500.00 | 9,929.09 | 14,353.36 | 10,789.15 | 104.58 | 106.66 | -148.26 | 3,617.52 | -282.47 | 1,011.28 | 873.07 | 138.21 | 7.317 | |
| 13,600.00 | 9,929.67 | 14,453.36 | 10,789.74 | 106.73 | 108.76 | -148.26 | 3,717.51 | -281.58 | 1,011.30 | 870.52 | 140.78 | 7.184 | |
| 13,700.00 | 9,930.26 | 14,553.36 | 10,790.33 | 108.90 | 110.88 | -148.26 | 3,817.50 | -280.69 | 1,011.31 | 867.96 | 143.35 | 7.055 | |
| 13,800.00 | 9,930.85 | 14,653.36 | 10,790.92 | 111.07 | 113.02 | -148.26 | 3,917.50 | -279.80 | 1,011.33 | 865.38 | 145.94 | 6.930 | |
| 13,900.00 | 9,931.43 | 14,753.36 | 10,791.51 | 113.26 | 115.16 | -148.26 | 4,017.49 | -278.92 | 1,011.34 | 862.79 | 148.55 | 6.808 | |
| 14,000.00 | 9,932.02 | 14,853.36 | 10,792.10 | 115.46 | 117.32 | -148.26 | 4,117.49 | -278.03 | 1,011.35 | 860.19 | 151.16 | 6.691 | |
| 14,100.00 | 9,932.61 | 14,953.36 | 10,792.69 | 117.67 | 119.49 | -148.26 | 4,217.48 | -277.14 | 1,011.37 | 857.58 | 153.79 | 6.576 | |
| 14,200.00 | 9,933.19 | 15,053.36 | 10,793.28 | 119.89 | 121.68 | -148.26 | 4,317.48 | -276.25 | 1,011.38 | 854.96 | 156.42 | 6.466 | |
| 14,300.00 | 9,933.78 | 15,153.36 | 10,793.86 | 122.12 | 123.87 | -148.26 | 4,417.47 | -275.36 | 1,011.40 | 852.33 | 159.06 | 6.358 | |
| 14,400.00 | 9,934.36 | 15,253.36 | 10,794.45 | 124.36 | 126.07 | -148.26 | 4,517.47 | -274.47 | 1,011.41 | 849.69 | 161.72 | 6.254 | |
| 14,500.00 | 9,934.95 | 15,353.36 | 10,795.04 | 126.61 | 128.29 | -148.25 | 4,617.46 | -273.58 | 1,011.42 | 847.05 | 164.38 | 6.153 | |
| 14,600.00 | 9,935.54 | 15,453.36 | 10,795.63 | 128.86 | 130.51 | -148.25 | 4,717.45 | -272.69 | 1,011.44 | 844.39 | 167.05 | 6.055 | |
| 14,700.00 | 9,936.12 | 15,553.36 | 10,796.22 | 131.13 | 132.74 | -148.25 | 4,817.45 | -271.80 | 1,011.45 | 841.73 | 169.72 | 5.960 | |
| 14,800.00 | 9,936.71 | 15,653.36 | 10,796.81 | 133.40 | 134.98 | -148.25 | 4,917.44 | -270.91 | 1,011.47 | 839.07 | 172.40 | 5.867 | |
| 14,900.00 | 9,937.30 | 15,753.36 | 10,797.40 | 135.68 | 137.23 | -148.25 | 5,017.44 | -270.02 | 1,011.48 | 836.39 | 175.09 | 5.777 | |
| 15,000.00 | 9,937.88 | 15,853.36 | 10,797.99 | 137.96 | 139.49 | -148.25 | 5,117.43 | -269.13 | 1,011.49 | 833.72 | 177.78 | 5.690 | |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Money Graham Fed Com Well No. 246 H - Original Hole - rev0

**Offset Site Error:** 0.00 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,100.00 | 9,938.47 | 15,953.36 | 10,798.58 | 140.25 | 141.75 | -148.25 | 5,217.43 | -268.24 | 1,011.51 | 831.04 | 180.47 | 5.605 | |
| 15,200.00 | 9,939.06 | 16,053.36 | 10,799.17 | 142.55 | 144.02 | -148.25 | 5,317.42 | -267.35 | 1,011.52 | 828.35 | 183.17 | 5.522 | |
| 15,300.00 | 9,939.64 | 16,153.36 | 10,799.76 | 144.85 | 146.30 | -148.25 | 5,417.41 | -266.46 | 1,011.54 | 825.66 | 185.87 | 5.442 | |
| 15,400.00 | 9,940.23 | 16,253.36 | 10,800.35 | 147.16 | 148.58 | -148.25 | 5,517.41 | -265.57 | 1,011.55 | 822.97 | 188.58 | 5.364 | |
| 15,500.00 | 9,940.82 | 16,353.36 | 10,800.94 | 149.48 | 150.87 | -148.24 | 5,617.40 | -264.68 | 1,011.56 | 820.28 | 191.29 | 5.288 | |
| 15,600.00 | 9,941.40 | 16,453.36 | 10,801.53 | 151.79 | 153.16 | -148.24 | 5,717.40 | -263.79 | 1,011.58 | 817.58 | 194.00 | 5.214 | |
| 15,700.00 | 9,941.99 | 16,553.36 | 10,802.12 | 154.12 | 155.46 | -148.24 | 5,817.39 | -262.90 | 1,011.59 | 814.88 | 196.72 | 5.142 | |
| 15,800.00 | 9,942.57 | 16,653.36 | 10,802.71 | 156.45 | 157.77 | -148.24 | 5,917.39 | -262.01 | 1,011.61 | 812.17 | 199.43 | 5.072 | |
| 15,900.00 | 9,943.16 | 16,753.36 | 10,803.29 | 158.78 | 160.08 | -148.24 | 6,017.38 | -261.12 | 1,011.62 | 809.47 | 202.15 | 5.004 | |
| 16,000.00 | 9,943.75 | 16,853.36 | 10,803.88 | 161.11 | 162.39 | -148.24 | 6,117.37 | -260.23 | 1,011.63 | 806.76 | 204.87 | 4.938 | |
| 16,100.00 | 9,944.33 | 16,953.36 | 10,804.47 | 163.46 | 164.71 | -148.24 | 6,217.37 | -259.34 | 1,011.65 | 804.05 | 207.59 | 4.873 | |
| 16,200.00 | 9,944.92 | 17,053.36 | 10,805.06 | 165.80 | 167.04 | -148.24 | 6,317.36 | -258.45 | 1,011.66 | 801.35 | 210.32 | 4.810 | |
| 16,300.00 | 9,945.51 | 17,153.36 | 10,805.65 | 168.15 | 169.36 | -148.24 | 6,417.36 | -257.56 | 1,011.68 | 798.63 | 213.04 | 4.749 | |
| 16,400.00 | 9,946.09 | 17,253.36 | 10,806.24 | 170.50 | 171.70 | -148.24 | 6,517.35 | -256.67 | 1,011.69 | 795.93 | 215.77 | 4.689 | |
| 16,500.00 | 9,946.68 | 17,353.36 | 10,806.83 | 172.85 | 174.03 | -148.24 | 6,617.35 | -255.78 | 1,011.71 | 793.21 | 218.49 | 4.630 | |
| 16,600.00 | 9,947.27 | 17,453.36 | 10,807.42 | 175.21 | 176.37 | -148.23 | 6,717.34 | -254.89 | 1,011.72 | 790.50 | 221.22 | 4.573 | |
| 16,700.00 | 9,947.85 | 17,553.36 | 10,808.01 | 177.57 | 178.71 | -148.23 | 6,817.33 | -254.00 | 1,011.73 | 787.79 | 223.94 | 4.518 | |
| 16,800.00 | 9,948.44 | 17,653.36 | 10,808.60 | 179.94 | 181.06 | -148.23 | 6,917.33 | -253.12 | 1,011.75 | 785.08 | 226.67 | 4.464 | |
| 16,900.00 | 9,949.02 | 17,753.36 | 10,809.19 | 182.30 | 183.41 | -148.23 | 7,017.32 | -252.23 | 1,011.76 | 782.37 | 229.40 | 4.411 | |
| 17,000.00 | 9,949.61 | 17,853.36 | 10,809.78 | 184.67 | 185.76 | -148.23 | 7,117.32 | -251.34 | 1,011.78 | 779.65 | 232.12 | 4.359 | |
| 17,000.03 | 9,949.61 | 17,853.39 | 10,809.78 | 184.67 | 185.76 | -148.23 | 7,117.34 | -251.34 | 1,011.78 | 779.65 | 232.12 | 4.359 | |
| 17,066.37 | 9,950.00 | 17,891.06 | 10,810.00 | 186.25 | 186.65 | -148.23 | 7,155.01 | -251.00 | 1,012.19 | 779.01 | 233.19 | 4.341 SF | |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Section 32-T26S-R29E - Sidewinder #1H - Original Hole - Surveys Original Hole — **Offset Site Error:** 0.00 ft

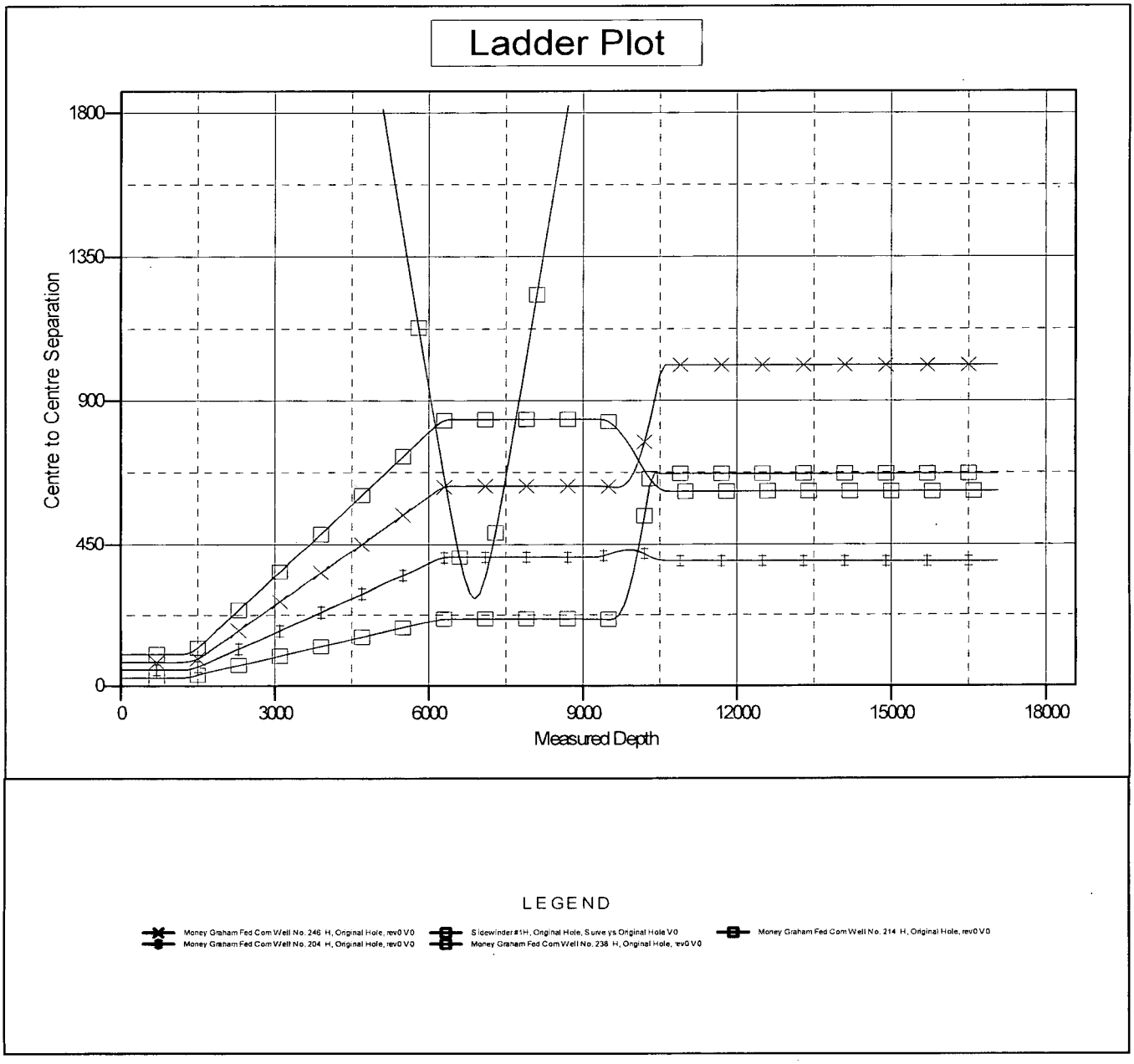
**Survey Program:** 673-GYRO-NS, 6162-MWD — **Offset Well Error:** 0.00 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.00 | 5,089.35 | 10,826.42 | 6,901.40 | 27.59 | 155.28 | -138.12 | 80.53 | 268.71 | 1,812.19 | 1,746.95 | 65.24 | 27.777 | |
| 5,200.00 | 5,189.07 | 10,831.76 | 6,901.35 | 28.15 | 155.47 | -137.20 | 80.27 | 274.04 | 1,713.81 | 1,647.80 | 66.01 | 25.963 | |
| 5,300.00 | 5,288.78 | 10,837.13 | 6,901.30 | 28.72 | 155.66 | -136.27 | 80.00 | 279.41 | 1,615.60 | 1,548.74 | 66.86 | 24.164 | |
| 5,400.00 | 5,388.49 | 10,842.54 | 6,901.26 | 29.28 | 155.86 | -135.32 | 79.74 | 284.81 | 1,517.62 | 1,449.80 | 67.81 | 22.379 | |
| 5,500.00 | 5,488.21 | 10,847.99 | 6,901.21 | 29.85 | 156.05 | -134.35 | 79.47 | 290.25 | 1,419.89 | 1,350.99 | 68.90 | 20.609 | |
| 5,600.00 | 5,587.92 | 10,853.48 | 6,901.16 | 30.41 | 156.25 | -133.37 | 79.20 | 295.73 | 1,322.47 | 1,252.33 | 70.14 | 18.854 | |
| 5,700.00 | 5,687.63 | 10,859.00 | 6,901.12 | 30.98 | 156.45 | -132.38 | 78.93 | 301.25 | 1,225.45 | 1,153.85 | 71.60 | 17.116 | |
| 5,800.00 | 5,787.34 | 10,864.57 | 6,901.07 | 31.55 | 156.64 | -131.36 | 78.66 | 306.81 | 1,128.92 | 1,055.60 | 73.32 | 15.397 | |
| 5,900.00 | 5,887.06 | 10,870.17 | 6,901.03 | 32.11 | 156.85 | -130.34 | 78.39 | 312.41 | 1,033.02 | 957.62 | 75.40 | 13.700 | |
| 6,000.00 | 5,986.77 | 10,875.82 | 6,900.99 | 32.68 | 157.05 | -129.29 | 78.11 | 318.05 | 937.94 | 859.97 | 77.97 | 12.030 | |
| 6,100.00 | 6,086.48 | 10,881.50 | 6,900.94 | 33.24 | 157.25 | -128.24 | 77.84 | 323.72 | 843.96 | 762.76 | 81.20 | 10.394 | |
| 6,200.00 | 6,186.25 | 10,886.59 | 6,900.91 | 33.80 | 157.43 | -125.06 | 77.59 | 328.81 | 751.31 | 665.99 | 85.31 | 8.806 | |
| 6,300.00 | 6,286.15 | 10,889.56 | 6,900.89 | 34.35 | 157.54 | -121.69 | 77.44 | 331.77 | 660.13 | 569.56 | 90.57 | 7.289 | |
| 6,400.00 | 6,386.14 | 10,890.31 | 6,900.88 | 34.88 | 157.57 | -119.01 | 77.41 | 332.52 | 571.21 | 473.70 | 97.52 | 5.858 | |
| 6,500.00 | 6,486.14 | 10,889.64 | 6,900.89 | 35.37 | 157.54 | 3.38 | 77.44 | 331.86 | 486.15 | 378.96 | 107.19 | 4.535 | |
| 6,600.00 | 6,586.14 | 10,888.95 | 6,900.89 | 35.87 | 157.52 | 3.23 | 77.47 | 331.17 | 407.91 | 286.43 | 121.48 | 3.358 | |
| 6,700.00 | 6,686.14 | 10,888.26 | 6,900.90 | 36.36 | 157.49 | 3.09 | 77.51 | 330.47 | 341.23 | 198.22 | 143.01 | 2.386 | |
| 6,800.00 | 6,786.14 | 10,887.56 | 6,900.90 | 36.86 | 157.47 | 2.95 | 77.54 | 329.78 | 294.08 | 120.96 | 173.13 | 1.699 | Level 3<2.00 |
| 6,899.77 | 6,885.91 | 10,886.86 | 6,900.91 | 37.35 | 157.44 | 2.80 | 77.57 | 329.07 | 276.64 | 82.29 | 194.36 | 1.423 | Level 2<1.50, CC, ES, SF |
| 6,900.00 | 6,886.14 | 10,886.86 | 6,900.91 | 37.35 | 157.44 | 2.80 | 77.57 | 329.07 | 276.64 | 82.29 | 194.36 | 1.423 | Level 2<1.50 |
| 7,000.00 | 6,986.14 | 10,886.15 | 6,900.91 | 37.85 | 157.42 | 2.65 | 77.61 | 328.37 | 294.24 | 120.99 | 173.25 | 1.698 | Level 3<2.00 |
| 7,100.00 | 7,086.14 | 10,885.43 | 6,900.92 | 38.35 | 157.39 | 2.51 | 77.64 | 327.65 | 341.50 | 197.76 | 143.74 | 2.376 | |
| 7,200.00 | 7,186.14 | 10,884.72 | 6,900.92 | 38.85 | 157.37 | 2.36 | 77.68 | 326.93 | 408.25 | 285.35 | 122.90 | 3.322 | |
| 7,300.00 | 7,286.14 | 10,883.99 | 6,900.93 | 39.35 | 157.34 | 2.21 | 77.71 | 326.21 | 486.53 | 377.22 | 109.31 | 4.451 | |
| 7,400.00 | 7,386.14 | 10,883.26 | 6,900.93 | 39.86 | 157.31 | 2.05 | 77.75 | 325.48 | 571.62 | 471.29 | 100.33 | 5.697 | |
| 7,500.00 | 7,486.14 | 10,882.52 | 6,900.94 | 40.36 | 157.29 | 1.90 | 77.79 | 324.75 | 660.90 | 566.69 | 94.21 | 7.015 | |
| 7,600.00 | 7,586.14 | 10,881.78 | 6,900.94 | 40.86 | 157.26 | 1.75 | 77.82 | 324.01 | 752.88 | 662.95 | 89.93 | 8.372 | |
| 7,700.00 | 7,686.14 | 10,881.04 | 6,900.95 | 41.37 | 157.23 | 1.59 | 77.86 | 323.26 | 846.68 | 759.83 | 86.85 | 9.748 | |
| 7,800.00 | 7,786.14 | 10,880.28 | 6,900.95 | 41.87 | 157.21 | 1.44 | 77.90 | 322.51 | 941.76 | 857.15 | 84.61 | 11.131 | |
| 7,900.00 | 7,886.14 | 10,879.53 | 6,900.96 | 42.38 | 157.18 | 1.28 | 77.93 | 321.75 | 1,037.76 | 954.81 | 82.95 | 12.511 | |
| 8,000.00 | 7,986.14 | 10,878.76 | 6,900.96 | 42.89 | 157.15 | 1.12 | 77.97 | 320.99 | 1,134.45 | 1,052.74 | 81.71 | 13.884 | |
| 8,100.00 | 8,086.14 | 10,877.99 | 6,900.97 | 43.40 | 157.13 | 0.96 | 78.01 | 320.22 | 1,231.67 | 1,150.88 | 80.79 | 15.245 | |
| 8,200.00 | 8,186.14 | 10,877.22 | 6,900.98 | 43.90 | 157.10 | 0.80 | 78.04 | 319.44 | 1,329.30 | 1,249.19 | 80.11 | 16.593 | |
| 8,300.00 | 8,286.14 | 10,876.43 | 6,900.98 | 44.41 | 157.07 | 0.64 | 78.08 | 318.66 | 1,427.26 | 1,347.64 | 79.62 | 17.926 | |
| 8,400.00 | 8,386.14 | 10,875.65 | 6,900.99 | 44.92 | 157.04 | 0.48 | 78.12 | 317.87 | 1,525.48 | 1,446.21 | 79.27 | 19.244 | |
| 8,500.00 | 8,486.14 | 10,874.85 | 6,900.99 | 45.44 | 157.01 | 0.31 | 78.16 | 317.08 | 1,623.92 | 1,544.88 | 79.04 | 20.546 | |
| 8,600.00 | 8,586.14 | 10,874.05 | 6,901.00 | 45.95 | 156.98 | 0.15 | 78.20 | 316.28 | 1,722.54 | 1,643.64 | 78.91 | 21.830 | |
| 8,700.00 | 8,686.14 | 10,873.24 | 6,901.01 | 46.46 | 156.96 | -0.02 | 78.24 | 315.48 | 1,821.31 | 1,742.47 | 78.85 | 23.099 | |

| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to RKB=2866+26 @ 2892.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Money Graham Fed Com Well No. 218 H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.18°

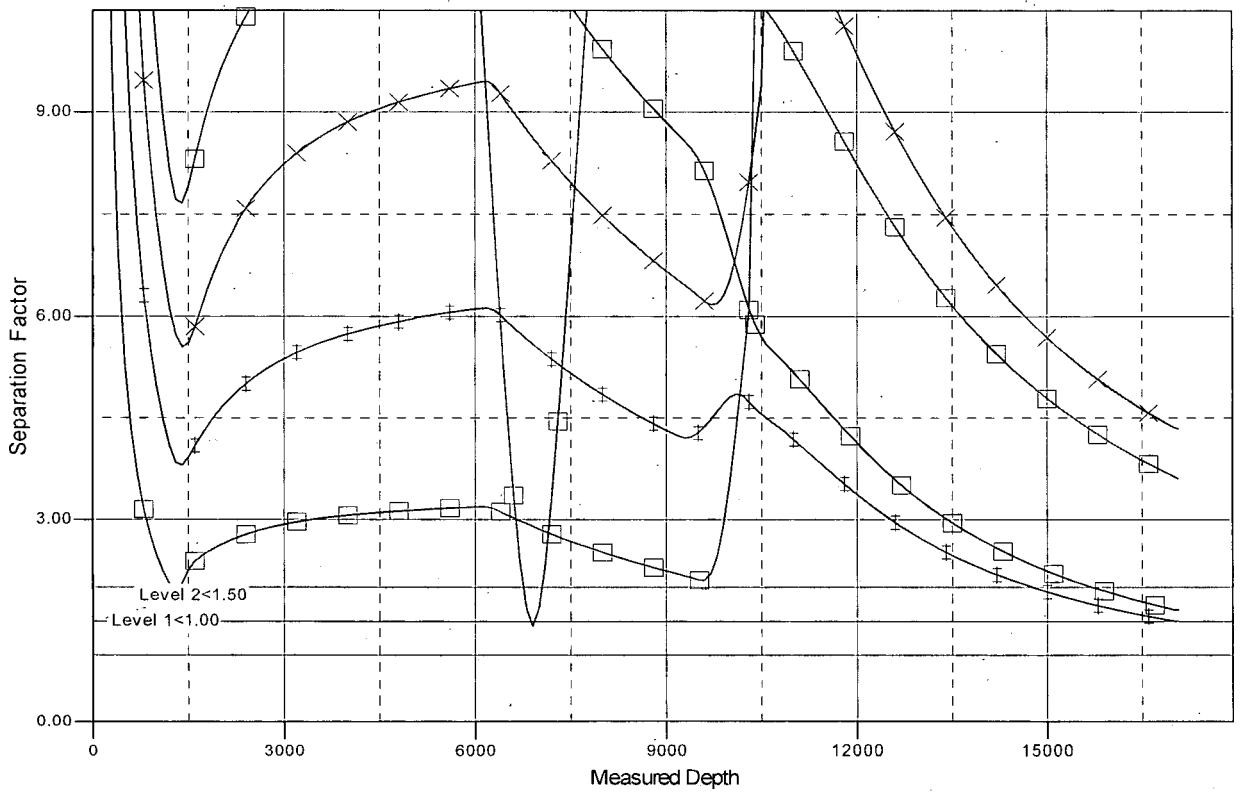


| | | | |
|---|---|---|---|
| **Company:** | Tap Rock Operating LLC | **Local Co-ordinate Reference:** | Well Money Graham Fed Com Well No. 218 H |
| **Project:** | Eddy County, New Mexico NAD83 NM east | **TVD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Reference Site:** | Section 32-T26S-R29E | **MD Reference:** | RKB=2866+26 @ 2892.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Money Graham Fed Com Well No. 218 H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 3.00 sigma |
| **Reference Wellbore** | Original Hole | **Database:** | DB_Jul2216dt_v14 |
| **Reference Design:** | rev0 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to RKB=2866+26 @ 2892.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

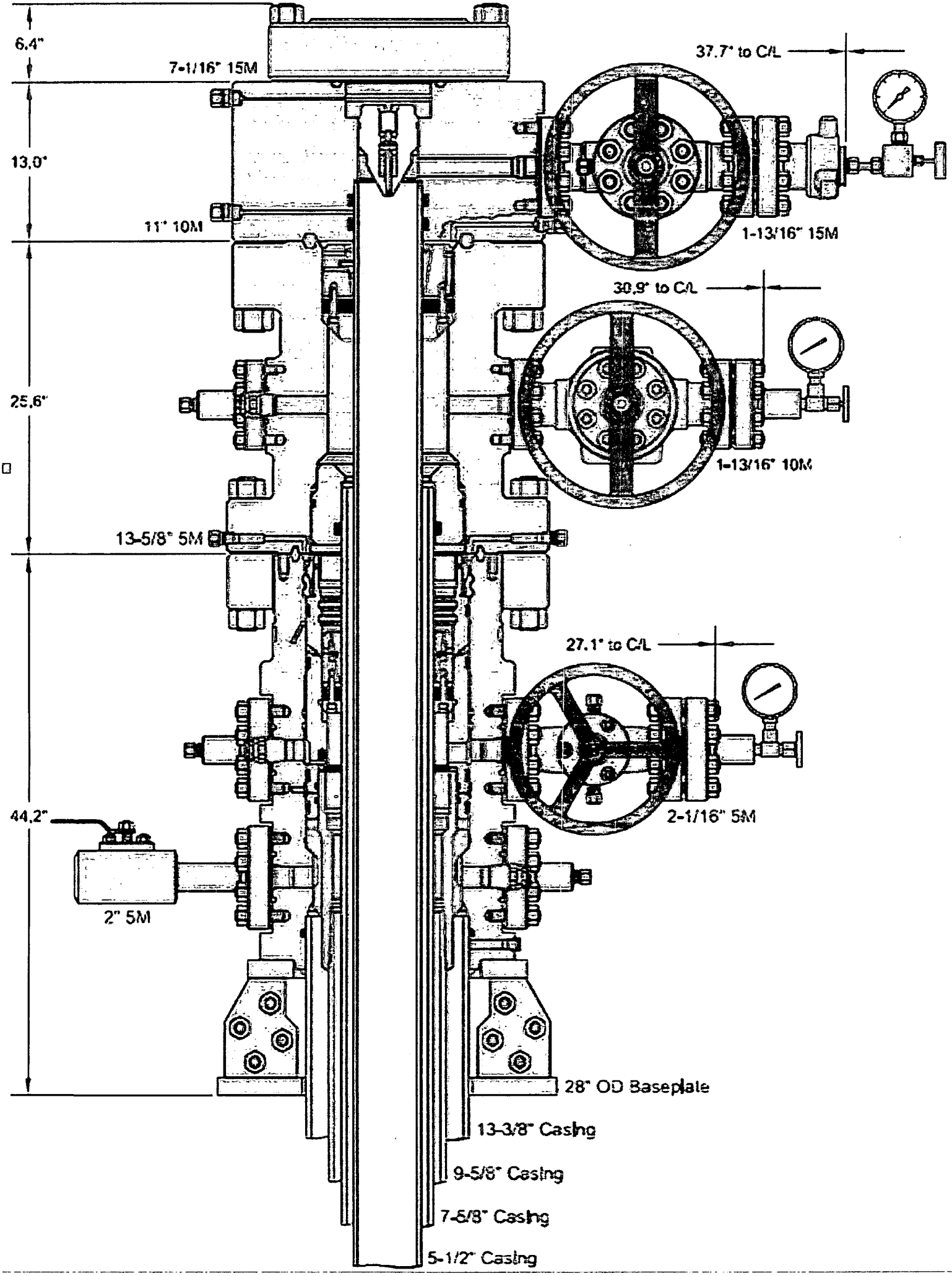
Coordinates are relative to: Money Graham Fed Com Well No. 218 H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.18°

## Separation Factor Plot




LEGEND

Money Graham Fed Com Well No. 246 H, Original Hole, rev0 V0
Money Graham Fed Com Well No. 204 H, Original Hole, rev0 V0
Sidewinder #1H, Original Hole, Surveys Original Hole V0
Money Graham Fed Com Well No. 238 H; Original Hole, rev0 V0
Money Graham Fed Com Well No. 214 H, Original Hole, rev0 V0


6.4"
7-1/16" 15M
13.0"
11" 10M
25.6"
13-5/8" 5M
44.2"
2" 5M
37.7" to C/L
1-13/16" 15M
30.9" to C/L
1-13/16" 10M
27.1" to C/L
2-1/16" 5M
28" OD Baseplate
13-3/8" Casing
9-5/8" Casing
7-5/8" Casing
5-1/2" Casing

# Tenaris

## Casing and Tubing Performance Data

**Choose pipe size, wall thickness and steel grade to view API connection options and performance data.**

Size | Wall | Grade | Connection | Unit

### Pipe Body Data

| | | | | | |
|---|---|---|---|---|---|
| **GEOMETRY** | | | | | |
| Nominal OD | 13.375 in | Wall Thickness | 0.380 in | API Drift Diameter | 12.459 in |
| Nominal Weight | 54.50 lbs/ft | Nominal ID | 12.615 in | Alternate Drift Diameter | n.a. |
| Plain End Weight | 52.79 lbs/ft | Nominal Cross Section | 15.513 sq in | | |
| **PERFORMANCE** | | | | | |
| Steel Grade | J55 | Minimum Yield | 55,000 psi | Minimum Ultimate | 75,000 psi |
| Body Yield Strength | 853,000 lbs | Internal Yield Pressure | 2,730 psi | Collapse Pressure | 1,130 psi |

### Connection Data

| | | | | | |
|---|---|---|---|---|---|
| **GEOMETRY** | | | | | |
| Regular OD | 14.375 in | Threads Per Inch | 5 | Make-Up Thread Turns | 1 |
| **PERFORMANCE** | | | | | |
| Steel Grade | J55 | Minimum Yield | 55,000 psi | Minimum Ultimate | 75,000 psi |
| Joint Strength | 909,000 lbs | Internal Pressure Resistance | 2,730 psi | | |

TenarisHydril Premium Connections

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Ver 8.6

# Tenaris

## Casing and Tubing Performance Data

**Choose pipe size, wall thickness and steel grade to view API connection options and performance data.**

Size | Wall | Grade | Connection | Unit

### Pipe Body Data

| GEOMETRY | | | | | |
|---|---|---|---|---|---|
| Nominal OD | 9.625 in | Wall Thickness | 0.395 in | API Drift Diameter | 8.679 in |
| Nominal Weight | 40.00 lbs/ft | Nominal ID | 8.835 in | Alternate Drift Diameter | 8.75 in |
| Plain End Weight | 38.97 lbs/ft | Nominal Cross Section | 11.454 sq in | | |
| **PERFORMANCE** | | | | | |
| Steel Grade | J55 | Minimum Yield | 55,000 psi | Minimum Ultimate | 75,000 psi |
| Body Yield Strength | 630,000 lbs | Internal Yield Pressure | 3,950 psi | Collapse Pressure | 2,570 psi |

### Connection Data

| GEOMETRY | | | | | |
|---|---|---|---|---|---|
| Regular OD | 10.625 in | Threads Per Inch | 5 | Make-Up Thread Turns | 1 |
| **PERFORMANCE** | | | | | |
| Steel Grade | J55 | Minimum Yield | 55,000 psi | Minimum Ultimate | 75,000 psi |
| Joint Strength | 714,000 lbs | Internal Pressure Resistance | 3,950 psi | | |

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Ver 8.6

Tenaris

# Casing and Tubing Performance Data

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | 7.625 in | Wall Thickness | 0.375 in | API Drift Diameter | 6.750 in |
| Nominal Weight | 29.70 lbs/ft | Nominal ID | 6.875 in | Alternative Drift Diameter | n.a. |
| Plain End Weight | 29.06 lbs/ft | Nominal cross section | 8.541 in | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Minimum Yield | 110,000 psi | Minimum Ultimate | 125,000 psi |
| Tension Yield | 940,000 in | Internal Pressure Yield | 9,470 psi | Collapse Pressure | 5,350 psi |
| Available Seamless | Yes | Available Welded | Yes | | |

## CONNECTION DATA

TYPE: BTC

### GEOMETRY

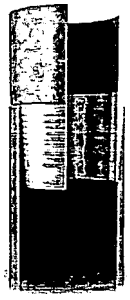
| | | | | | |
|---|---|---|---|---|---|
| Coupling Reg OD | 8.500 in | Threads per in | 5 | Thread turns make up | 1 |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Coupling Min Yield | 110,000 psi | Coupling Min Ultimate | 125,000 psi |
| Joint Strength | 960,000 lbs | | | Internal Pressure Resistance | 9,470 psi |

# Wedge 513®

Printed on: 01/30/2018



| | | | | | |
|---|---|---|---|---|---|
| **Outside Diameter** | **7.625** in. | **Min. Wall Thickness** | **87.5%** | **(*) Grade P110** | |
| **Wall Thickness** | **0.375** in. | **Connection OD Option** | **REGULAR** | COUPLING | PIPE BODY |
| **Grade** | **P110*** | **Drift** | **API Standard** | Body: **White**<br>1st Band: -<br>2nd Band: - | 1st Band: **White**<br>2nd Band: -<br>3rd Band: - |
| | | **Type** | **Casing** | 3rd Band: - | 4th Band: - |

| | | | | | |
|---|---|---|---|---|---|
| **GEOMETRY** | | | | | |
| Nominal OD | **7.625** in. | Nominal Weight | **29.70** lbs/ft | Drift | **6.75** in. |
| Nominal ID | **6.875** in. | Wall Thickness | **0.375** in. | Plain End Weight | **29.06** lbs/ft |
| OD Tolerance | **API** | | | | |
| **PERFORMANCE** | | | | | |
| Body Yield Strength | **940** x1000 lbs | Internal Yield | **9470** psi | SMYS | **110000** psi |
| Collapse | **5350** psi | | | | |
| **GEOMETRY** | | | | | |
| Connection OD | **7.625** in. | Connection ID | **6.800** in. | Make-up Loss | **4.420** in. |
| Threads per in | **3.29** | Connection OD Option | **REGULAR** | | |
| **PERFORMANCE** | | | | | |
| Tension Efficiency | **60.0** % | Joint Yield Strength | **564.000** x1000 lbs | Internal Pressure Capacity | **9470.000** psi |
| Compression Efficiency | **75.2** % | Compression Strength | **706.880** x1000 lbs | Max. Allowable Bending | **39.6** °/100 ft |
| External Pressure Capacity | **5350.000** psi | | | | |
| **MAKE-UP TORQUES** | | | | | |
| Minimum | **9000** ft-lbs | Optimum | **10800** ft-lbs | Maximum | **15800** ft-lbs |
| **OPERATION LIMIT TORQUES** | | | | | |
| Operating Torque | **47000** ft-lbs | Yield Torque | **70000** ft-lbs | | |

## Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

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# Casing and Tubing Performance Data

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | 7.000 in | Wall Thickness | 0.408 in | API Drift Diameter | 6.059 in |
| Nominal Weight | 29.00 lbs/ft | Nominal ID | 6.184 in | Alternative Drift Diameter | 6.125 in |
| Plain End Weight | 28.75 lbs/ft | Nominal cross section | 8.449 in | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Minimum Yield | 110,000 psi | Minimum Ultimate | 125,000 psi |
| Tension Yield | 929,000 in | Internal Pressure Yield | 11,220 psi | Collapse Pressure | 8,530 psi |
| Available Seamless | Yes | Available Welded | Yes | | |

## CONNECTION DATA

TYPE: BTC

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Coupling Reg OD | 7.656 in | Threads per in | 5 | Thread turns make up | 1 |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Coupling Min Yield | 110,000 psi | Coupling Min Ultimate | 125,000 psi |
| Joint Strength | 955,000 lbs | | | Internal Pressure Resistance | 11,220 psi |

5.5", 20#, P-110, TXP connection (modified buttress connection that provides a torque rating of nearly 24000ft-lbs)

TXP® BTC

SHARE EXPORT DATA PRINT

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | 5.500 in | Min. Wall Thickness | 87.5% | | |
| Wall Thickness | 0.361 in | Drift | API Standard | | |
| Grade | P110 | Type | Casing | | |
| | | Connection OD Option | REGULAR | | |

Clear Filters
Compare
Request Info

CONNECTION INFORMATION
- Blanking Dimensions
- Connection's Page
- Brochure
- Datasheet Manual

## PIPE BODY DATA

**GEOMETRY**

| | | | | | |
|---|---|---|---|---|---|
| Nominal OD | 5.500 in | Nominal Weight | 20 lbs/ft | Drift | 4.653 in. |
| Nominal ID | 4.778 in | Wall Thickness | 0.361 in | Plain End Weight | 19.83 lbs/ft |
| OD Tolerance | API | | | | |

**PERFORMANCE**

| | | | | | |
|---|---|---|---|---|---|
| Body Yield Strength | 641 x1000 lbs | Internal Yield | 12640 psi | SMYS | 110000 psi |
| Collapse | 11100 psi | | | | |

## CONNECTION DATA

**GEOMETRY**

| | | | | | |
|---|---|---|---|---|---|
| Connection OD | 6.100 in | Coupling Length | 9.450 in | Connection ID | 4.766 in. |
| Make-up Loss | 4.204 in | Threads per in | 5 | Connection OD Option | REGULAR |

**PERFORMANCE**

| | | | | | |
|---|---|---|---|---|---|
| Tension Efficiency | 100.0 % | Joint Yield Strength | 641.000 x1000 lbs | Internal Pressure Capacity [1] | 12640.000 psi |
| Compression Efficiency | 100 % | Compression Strength | 641.000 x1000 lbs | Max. Allowable Bending | 92 °/100 ft |
| External Pressure Capacity | 11100.000 psi | | | | |

**MAKE-UP TORQUES**

| | | | | | |
|---|---|---|---|---|---|
| Minimum | 11270 ft-lbs | Optimum | 12520 ft-lbs | Maximum | 13770 ft-lbs |

**OPERATION LIMIT TORQUES**

| | | | |
|---|---|---|---|
| Operating Torque | 21500 ft-lbs | Yield Torque | 23900 ft-lbs |

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# Casing and Tubing Performance Data

## PIPE BODY DATA

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Outside Diameter | 4.500 in | Wall Thickness | 0.290 in | API Drift Diameter | 3.795 in |
| Nominal Weight | 13.50 lbs/ft | Nominal ID | 3.920 in | Alternative Drift Diameter | n.a. |
| Plain End Weight | 13.05 lbs/ft | Nominal cross section | 3.836 in | | |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Minimum Yield | 110,000 psi | Minimum Ultimate | 125,000 psi |
| Tension Yield | 422,000 in | Internal Pressure Yield | 12,410 psi | Collapse Pressure | 10,690 psi |
| Available Seamless | Yes | Available Welded | Yes | | |

## CONNECTION DATA

TYPE: BTC

### GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Coupling Reg OD | 5.000 in | Threads per in | 5 | Thread turns make up | 0.5 |

### PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Steel Grade | P110 | Coupling Min Yield | 110,000 psi | Coupling Min Ultimate | 125,000 psi |
| Joint Strength | 443,000 lbs | | | Internal Pressure Resistance | 12,410 psi |

**Tap Rock Operating, LLC**
**MONEY GRAHAM FED COM #218H**
**SHL 250' FSL & 854' FEL, Sec. 32**
**BHL 200' FNL & 638' FEL, Sec. 29**
**T. 26S., R. 29E., Eddy County, NM**

## DRILLING PROGRAM

1. ESTIMATED TOPS

| Formation Name | MD' | TVD' | Bearing |
|---|---|---|---|
| Quaternary caliche | 0 | 0 | water/salt |
| Rustler anhydrite | 507 | 507 | salt |
| Salado salt (top salt) | 682 | 682 | salt |
| Base salt | 2,395 | 2,392 | salt |
| Bell Canyon | 2,851 | 2,847 | hydrocarbons |
| Brushy Canyon | 4,846 | 4,837 | hydrocarbons |
| Bone Spring Lime | 6,440 | 6,427 | hydrocarbons |
| 1st Bone Spring Sand | 7,365 | 7,352 | hydrocarbons |
| 2nd Bone Spring Sand | 7,945 | 7,932 | hydrocarbons |
| 3rd Bone Spring Sand | 9,197 | 9,184 | hydrocarbons |
| **(KOP** | **9,351** | **9,337** | **hydrocarbons)** |
| 3rd Bone Spring W Sand | 9,455 | 9,441 | hydrocarbons |
| Wolfcamp A | 9,549 | 9,531 | hydrocarbons |
| Wolfcamp A Y Sand | 9,672 | 9,641 | hydrocarbons |
| Wolfcamp A Fat **(Goal)** | 9,830 | 9,762 | hydrocarbons |
| **TD** | **17,350** | **9,950** | **--** |

2. NOTABLE ZONES

Wolfcamp A Fat is the goal. Depth to water was not reported but OSE estimated ground water depth is 45'.

3. PRESSURE CONTROL

A 13,000' 10,000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. The BOP will be utilized below surface casing to TD. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

BOP Test procedure will be as follows:
After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 3,500 psi. The BOP will be tested in this manner after any breaks, nipple ups, or passage of allotted time.

Casing Test procedure:
Casing will be tested to .22 psi per foot of casing length or 1500 psi, whichever is greater, but not to exceed 70% of minimum internal yield.

Tap Rock requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used.

4. CASING & CEMENT

All casing will be API and new. See attached casing assumption worksheet.

| Hole O. D. | Set MD' | Set TVD' | Casing O. D. | Weight (lb/ft) | Grade | Joint | Collapse | Burst | Tension |
|---|---|---|---|---|---|---|---|---|---|
| 17.5" | 0 - 580 | 0 - 580 | 13.375" surface | 54.5 | J-55 | BTC | 1.13 | 1.15 | 1.51 |
| 12.25" | 0 - 2900 | 0 - 2896 | 9.625" inter. 1 | 40.0 | J-55 | BTC | 1.13 | 1.15 | 1.51 |
| 8.75" | 0 - 2700 | 0 – 2696 | 7.625" inter. 2 top | 29.7 | P-110 | BTC | 1.13 | 1.15 | 1.51 |
| 8.75" | 2700 – 9210 | 2696 – 9196 | 7.625" inter. 2 bottom | 29.7 | P-110 | W-513 | 1.13 | 1.15 | 1.51 |
| 6.75" | 0 – 9010 | 0 – 8996 | 5.5" product. top | 20.0 | P-110 | BTC | 1.13 | 1.15 | 1.51 |
| 6.75" | 9010 – 17350 | 8996 – 9950 | 5" product. bottom | 18.0 | P-110 | W-521 | 1.13 | 1.15 | 1.51 |

***Tap Rock requests a variance to run 7-5/8" BTC inside 9-5/8" BTC, Tap Rock is requesting a variance to be less than the 0.422" standoff regulation per Onshore Order No. 2.***

| Name | Type | Sacks | Yield | Cu. Ft. | Weight | Blend |
|---|---|---|---|---|---|---|
| Surface | Tail | 584 | 1.38 | 765 | 14.8 | Class C + 5% NaCl + LCM |
| TOC = GL | | 100% Excess | | | Centralizers per Onshore Order 2 III. B. 1f | |
| Intermediate 1 | Lead | 803 | 1.81 | 1453 | 13.5 | Class C + bentonite + 1% $CaCl_2$ + 8% NaCl + LCM |
| | Tail | 263 | 1.38 | 363 | 14.8 | Class C + 5% NaCl + LCM |
| TOC = GL | | 100% Excess | | | 2 on btm jt, 1 on 2nd jt, 1 every 4th jt to GL | |
| Intermediate 2 | Lead | 316 | 2.35 | 743 | 11.5 | TXI + fluid loss + dispersant + retarder + LCM |
| | Tail | 180 | 1.39 | 250 | 13.2 | TXI + fluid loss + dispersant + retarder + LCM |
| TOC = 1900 | | 35% Excess | | | 2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement (500' above TOC) | |
| Production | Tail | 950 | 1.17 | 1112 | 15.8 | Class H + fluid loss + dispersant + retarder + LCM |
| TOC = 8210' | | 10% Excess | | | 2 on btm jt, 1 on 2nd jt, 1 every third jt to top of curve | |

5. MUD PROGRAM

Electronic Pason mud monitor system complying with Onshore Order 1 will be used. All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions. A closed loop system will be used.

| Casing | Hole Size | Type | Interval (MD) | lb/gal | Viscosity | Fluid Loss |
|---|---|---|---|---|---|---|
| Surface | 17.5" | FW spud mud | 0-580 | 8.3 | 28 | NC |
| Inter. 1 | 12.25" | Brine water | 580 - 2900 | 10.0 | 30-32 | NC |
| Inter. 2 | 8.75" | FW & cut brine | 2900 - 9210 | 9.0 | 30-32 | NC |
| Production | 6.75" | OBM | 9210 – 17350 | 12.50 | 15-20 | <10 |

6. CORES, TESTS, & LOGS

- Electric Logging Program: No open-hole logs are planned at this time for the pilot hole. GR will be collected while drilling through the MWD tools from intermediate casing to TD.
- No DSTs or cores are planned at this time.
- CBL w/ CCL from as far as gravity will let it fall to TOC.

7. DOWN HOLE CONDITIONS

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Tap Rock Operating does not anticipate that there will be enough $H_2S$ from the surface to the Wolfcamp formations to meet the BLM's minimum requirements for the submission of an "$H_2S$ Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an $H_2S$ safety package on all wells, attached is an "$H_2S$ Drilling Operations Plan". Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used

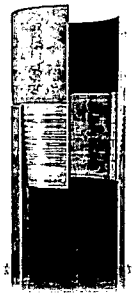
Estimated BHP: 6,000 psi
Estimated BHT: 140°

8. OTHER INFORMATION

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved. Drilling expected to take 30 days. If production casing is run an additional 60 days will be required to complete and construct surface facilities.

# Wedge 513®

Printed on: 01/30/2018



| | | | | | |
|---|---|---|---|---|---|
| **Outside Diameter** | 7.625 in. | **Min. Wall Thickness** | 87.5% | (*) Grade P110 | |
| **Wall Thickness** | 0.375 in. | **Connection OD Option** | REGULAR | COUPLING | PIPE BODY |
| **Grade** | P110* | **Drift** | API Standard | Body: White<br>1st Band: -<br>2nd Band: - | 1st Band: White<br>2nd Band: -<br>3rd Band: - |
| | | **Type** | Casing | 3rd Band: - | 4th Band: - |

## GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Nominal OD | **7.625** in. | Nominal Weight | **29.70** lbs/ft | Drift | **6.75** in. |
| Nominal ID | **6.875** in. | Wall Thickness | **0.375** in. | Plain End Weight | **29.06** lbs/ft |
| OD Tolerance | **API** | | | | |

## PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Body Yield Strength | **940** x1000 lbs | Internal Yield | **9470** psi | SMYS | **110000** psi |
| Collapse | **5350** psi | | | | |

## GEOMETRY

| | | | | | |
|---|---|---|---|---|---|
| Connection OD | **7.625** in. | Connection ID | **6.800** in. | Make-up Loss | **4.420** in. |
| Threads per in | **3.29** | Connection OD Option | **REGULAR** | | |

## PERFORMANCE

| | | | | | |
|---|---|---|---|---|---|
| Tension Efficiency | **60.0** % | Joint Yield Strength | **564.000** x1000 lbs | Internal Pressure Capacity | **9470.000** psi |
| Compression Efficiency | **75.2** % | Compression Strength | **706.880** x1000 lbs | Max. Allowable Bending | **39.6** °/100 ft |
| External Pressure Capacity | **5350.000** psi | | | | |

## MAKE-UP TORQUES

| | | | | | |
|---|---|---|---|---|---|
| Minimum | **9000** ft-lbs | Optimum | **10800** ft-lbs | Maximum | **15800** ft-lbs |

## OPERATION LIMIT TORQUES

| | | | |
|---|---|---|---|
| Operating Torque | **47000** ft-lbs | Yield Torque | **70000** ft-lbs |

### Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

Connections with Dopeless® Technology are fully compatible with the same connection in its Standard version

For further information on concepts indicated in this datasheet, download the Datasheet Manual from www.tenaris.com

**Money Graham 208H Casing Variance Request**

Tap Rock requests a variance to run 7-5/8" BTC inside 9-5/8" BTC, Tap Rock is requesting a variance to be less than the 0.422" standoff regulation per Onshore Order No. 2.

**APD ID:** 10400038197 **Submission Date:** 01/24/2019

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Well Type:** CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

Money_218H_Fee_Fee_Fed_20190117155240.docx

**Existing Road Purpose:** ACCESS **Row(s) Exist?** NO

### ROW ID(s)

**ID:**

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

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

## Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** NO

## Section 3 - Location of Existing Wells

**Existing Wells Map?** NO

**Attach Well map:**

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Existing Wells description:** Fee Fee Fed - SUPO not required

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

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

**Estimated Production Facilities description:** Fee Fee Fed - SUPO not required

## Section 5 - Location and Types of Water Supply

### Water Source Table

**Water source use type:** DUST CONTROL, INTERMEDIATE/PRODUCTION CASING, OTHER, SURFACE CASING

**Water source type:** OTHER

**Describe type:**

**Source longitude:**

**Source latitude:**

**Source datum:**

**Water source permit type:** PRIVATE CONTRACT

**Source land ownership:** OTHER

**Describe land ownership:** Fee Fee Fed - SUPO not r

**Water source transport method:** TRUCKING

**Source transportation land ownership:** OTHER

**Describe transportation land ownership:** Fee Fee F

**Water source volume (barrels):** 0

**Source volume (acre-feet):** 0

**Source volume (gal):** 0

**Water source and transportation map:**

Money_218H_Fee_Fee_Fed_20190117155223.docx

**Water source comments:**

**New water well?** NO

### New Water Well Info

**Well latitude:** **Well Longitude:** **Well datum:**

**Well target aquifer:**

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

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):** **Well casing type:**

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

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**New water well casing?** **Used casing source:**

**Drilling method:** **Drill material:**

**Grout material:** **Grout depth:**

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

**Well Production type:** **Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

## Section 6 - Construction Materials

**Using any construction materials:** NO

**Construction Materials description:** Fee Fee Fed - SUPO not required

**Construction Materials source location attachment:**

## Section 7 - Methods for Handling Waste

**Waste type:** DRILLING

**Waste content description:** Fee Fee Fed - SUPO not required

**Amount of waste:** 1000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Fee Fee Fed - SUPO not required

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** Fee Fee Fed - SUPO not required

## Reserve Pit

**Reserve Pit being used?** NO

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

**Reserve pit length (ft.)** **Reserve pit width (ft.)**

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

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

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

## Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** NO

**Description of cuttings location** Fee Fee Fed - SUPO not required

**Cuttings area length (ft.)** **Cuttings area width (ft.)**

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

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

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

## Section 8 - Ancillary Facilities

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

**Ancillary Facilities attachment:**

**Comments:**

## Section 9 - Well Site Layout

**Well Site Layout Diagram:**

Money_218H_Well_Site_Layout_20190430143725.pdf

**Comments:**

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** New Surface Disturbance **Multiple Well Pad Name:** MONEY GRAHAM EAST PAD

**Multiple Well Pad Number:** 1

**Recontouring attachment:**

**Drainage/Erosion control construction:** Fee Fee Fed - SUPO not required

**Drainage/Erosion control reclamation:** Fee Fee Fed - SUPO not required

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

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

**Wellpad short term disturbance (acres):** 0

**Access road long term disturbance (acres):** 0

**Access road short term disturbance (acres):** 0

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

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

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

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

**Total long term disturbance:** 0

**Total short term disturbance:** 0

**Disturbance Comments:**

**Reconstruction method:** Fee Fee Fed - SUPO not required

**Topsoil redistribution:** Fee Fee Fed - SUPO not required

**Soil treatment:** Fee Fee Fed - SUPO not required

**Existing Vegetation at the well pad:**

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

**Existing Vegetation Community at the road:**

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

**Existing Vegetation Community at the pipeline:**

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

**Existing Vegetation Community at other disturbances:**

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

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

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

**Seedling transplant description attachment:**

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

**Seed harvest description:**

**Seed harvest description attachment:**

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

## Seed Management

### Seed Table

**Seed type:** **Seed source:**

**Seed name:**

**Source name:** **Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:**

**PLS pounds per acre:** **Proposed seeding season:**

| Seed Summary | |
|---|---|
| **Seed Type** | **Pounds/Acre** |

**Total pounds/Acre:**

**Seed reclamation attachment:**

## Operator Contact/Responsible Official Contact Info

**First Name:** **Last Name:**

**Phone:** **Email:**

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** Fee Fee Fed - SUPO not required

**Weed treatment plan attachment:**

**Monitoring plan description:** Fee Fee Fed - SUPO not required

**Monitoring plan attachment:**

**Success standards:** Fee Fee Fed - SUPO not required

**Pit closure description:** Fee Fee Fed - SUPO not required

**Pit closure attachment:**

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

## Section 11 - Surface Ownership

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** PRIVATE OWNERSHIP

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:** **USFS Ranger District:**

## Section 12 - Other Information

**Right of Way needed?** NO **Use APD as ROW?**

**ROW Type(s):**

## ROW Applications

**SUPO Additional Information:** Fee Fee Fed - SUPO not required

**Use a previously conducted onsite?** NO

**Previous Onsite information:**

## Other SUPO Attachment

# Tap Rock Operating Money Graham Fed Com 218H

Fee Fee Fed – SUPO not required

# Tap Rock Operating Money Graham Fed Com 218H

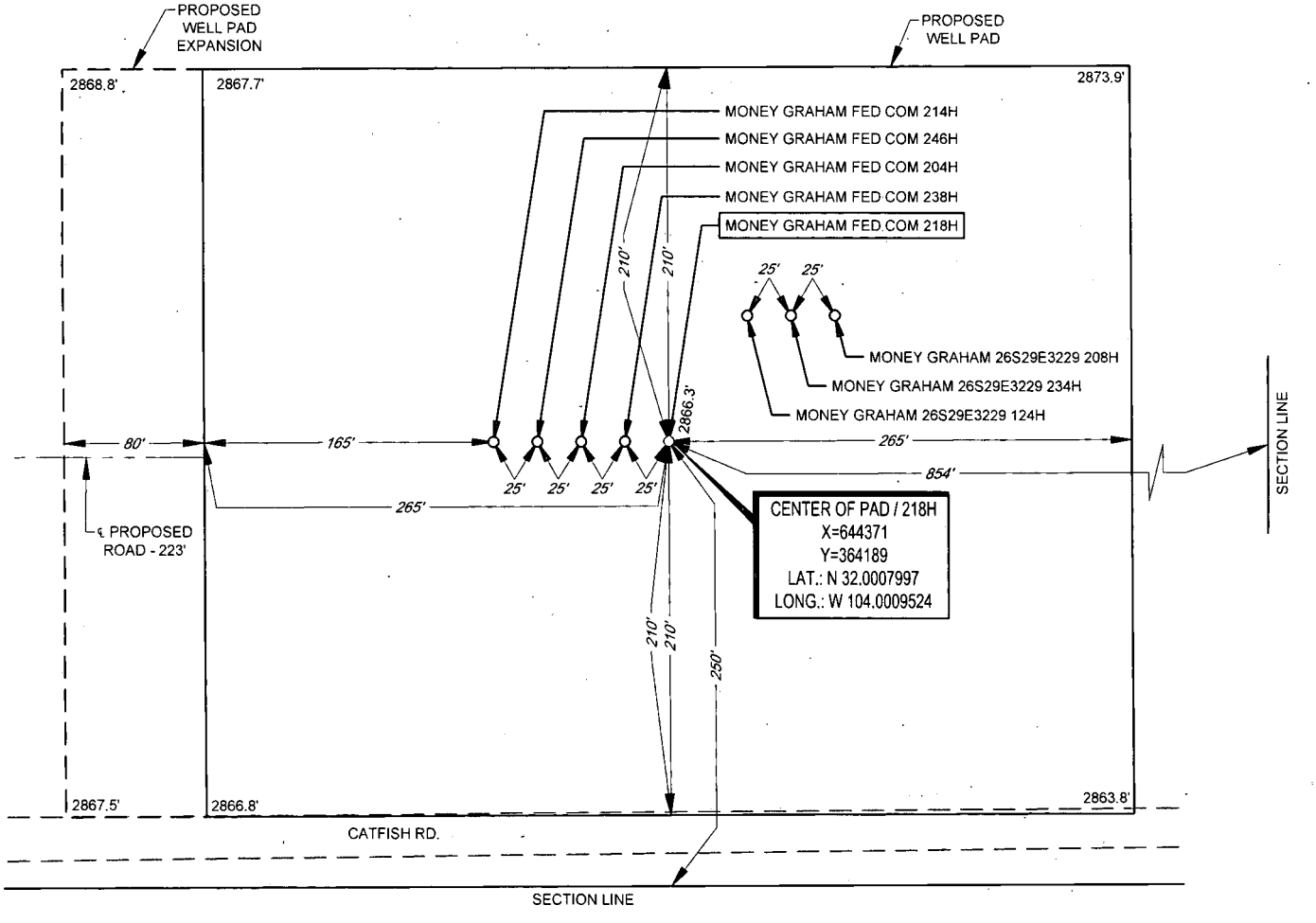
Fee Fee Fed – SUPO not required

# EXHIBIT 2B

TAP ROCK

SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'




LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 218H

218H LATITUDE N 32.0007997 218H LONGITUDE W 104.0009524

CENTER OF PAD IS 250' FSL & 854' FEL

-N-

SCALE: 1" = 100'

0' 50' 100'

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.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U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

# PWD Data Report
08/12/2019

**APD ID:** 10400038197 **Submission Date:** 01/24/2019

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Well Type:** CONVENTIONAL GAS WELL **Well Work Type:** Drill

## Section 1 - General

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

## Section 2 - Lined Pits

**Would you like to utilize Lined Pit PWD options?** NO

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

**PWD surface owner:** **PWD disturbance (acres):**

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

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

**Lined pit specifications:**

**Pit liner description:**

**Pit liner manufacturers information:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Lined pit precipitated solids disposal schedule:**

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

**Lined pit reclamation description:**

**Lined pit reclamation attachment:**

**Leak detection system description:**

**Leak detection system attachment:**

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Lined pit Monitor description:**

**Lined pit Monitor attachment:**

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

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

**Lined pit bond number:**

**Lined pit bond amount:**

**Additional bond information attachment:**

## Section 3 - Unlined Pits

**Would you like to utilize Unlined Pit PWD options?** NO

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

**PWD disturbance (acres):** **PWD surface owner:**

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

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

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

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

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

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

**Beneficial use user confirmation:**

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

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

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

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

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

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

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**

## Section 4 - Injection

**Would you like to utilize Injection PWD options?** NO

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

**PWD surface owner:** **PWD disturbance (acres):**

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

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:** **Injection well name:**

**Assigned injection well API number?** **Injection well API number:**

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

**Minerals protection information:**

**Mineral protection attachment:**

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

**UIC Permit attachment:**

## Section 5 - Surface Discharge

**Would you like to utilize Surface Discharge PWD options?** NO

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

**PWD surface owner:** **PWD disturbance (acres):**

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

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

## Section 6 - Other

**Would you like to utilize Other PWD options?** NO

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

**PWD surface owner:** **PWD disturbance (acres):**

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

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM **Well Number:** 218H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

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

# Bond Info Data Report

08/12/2019

**APD ID:** 10400038197

**Submission Date:** 01/24/2019

**Operator Name:** TAP ROCK OPERATING LLC

**Well Name:** MONEY GRAHAM FED COM

**Well Number:** 218H

**Well Type:** CONVENTIONAL GAS WELL

**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB001443

**BIA Bond number:**

**Do you have a reclamation bond?** NO

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

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**