

RECEIVED

AUG 13 2019

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DISTRICT/ARTESIA O.C.D.

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM138607
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator TAP ROCK OPERATING LLC		8. Lease Name and Well No. MONEY GRAHAM FED COM 246H 326031
3a. Address 602 Park Point Drive Suite 200 Golden CO 80401	3b. Phone No. (include area code) (720)460-3316	9. API Well No. 30-015-46222
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 4 / 250 FSL / 929 FEL / LAT 32.0007994 / LONG -104.0011943 At proposed prod. zone NENE / 200 FNL / 1170 FEL / LAT 32.0204716 / LONG -104.0016906		10. Field and Pool, or Exploratory PURPLE SAGE WOLFCAMP
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* 16 miles		12. County or Parish EDDY
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 929 feet	16. No of acres in lease 874.57	17. Spacing Unit dedicated to this well 445.6
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 25 feet	19. Proposed Depth 10810 feet / 18210 feet	20. BLM/BIA Bond No. in file FED: NMB001443
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2866 feet	22. Approximate date work will start* 04/01/2019	23. Estimated duration 60 days
24. Attachments		

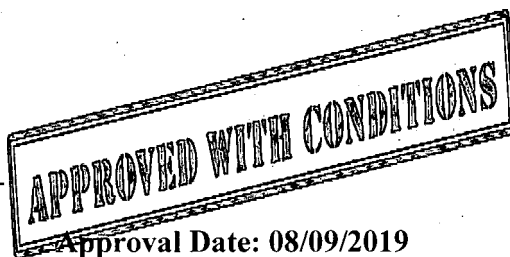
The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Brian Wood / Ph: (505)466-8120	Date 01/24/2019
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 08/09/2019
Title Assistant Field Manager Lands & Minerals		

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.



(Continued on page 2)

*(Instructions on page 2)

RW 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 1: 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 well, 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 directionally 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 well 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 will 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 connects this information to an 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 Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

1. SHL: LOT 4 / 250 FSL / 929 FEL / TWSP: 26S / RANGE: 29E / SECTION: 32 / LAT: 32.0007994 / LONG: -104.0011943 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 4 / 150 FSL / 1170 FEL / TWSP: 26S / RANGE: 29E / SECTION: 2 / LAT: 32.0005256 / LONG: -104.0019717 (TVD: 10521 feet, MD: 10552 feet)
BHL: NENE / 200 FNL / 1170 FEL / TWSP: 26S / RANGE: 29E / SECTION: 29 / LAT: 32.0204716 / LONG: -104.0016906 (TVD: 10810 feet, MD: 18210 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.:	246H – MONEY GRAHAM FED COM
SURFACE HOLE FOOTAGE:	250'/S & 929'/E
BOTTOM HOLE FOOTAGE:	200'/N & 1170'/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".

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



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:



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

Application Data Report

08/12/2019

APD ID: 10400038225

Submission Date: 01/24/2019

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400038225

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: 246H

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: 246H

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: **Number:** 1

MONEY GRAHAM EAST PAD

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: 929 FT

Reservoir well spacing assigned acres Measurement: 445.6 Acres

Well plat: Money_246H_C102_ETAL_011619_20190118124047.pdf

Well work start Date: 04/01/2019

Duration: 60 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

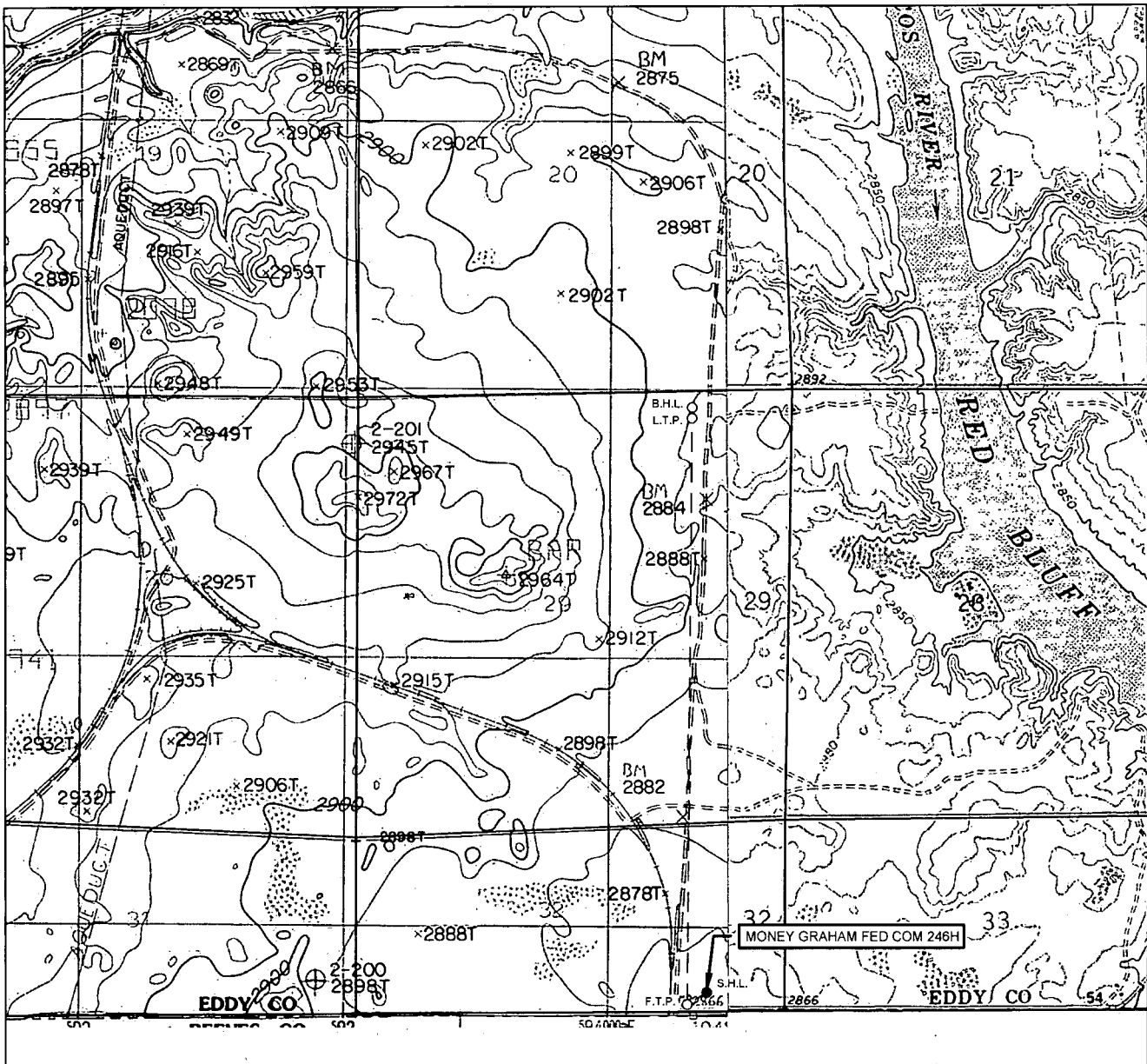
Vertical Datum: NAVD88

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	929	FEL	26S	29E	32	Lot 4	32.00079 94	- 104.0011 943	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	286 6	0	0
KOP Leg #1	50	FSL	117 0	FEL	26S	29E	32	Lot 4	32.00025 18	- 104.0019 717	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 733 1	102 07	101 97
PPP Leg #1	150	FSL	117 0	FEL	26S	29E	2	Lot 4	32.00052 56	- 104.0019 717	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 765 5	105 52	105 21

LOCATION & ELEVATION VERIFICATION MAP



LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 246H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
 COUNTY EDDY STATE NM ELEVATION 2866'
 DESCRIPTION 250' FSL & 929' FEL

LATITUDE N 32.0007994 LONGITUDE W 104.0011943



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

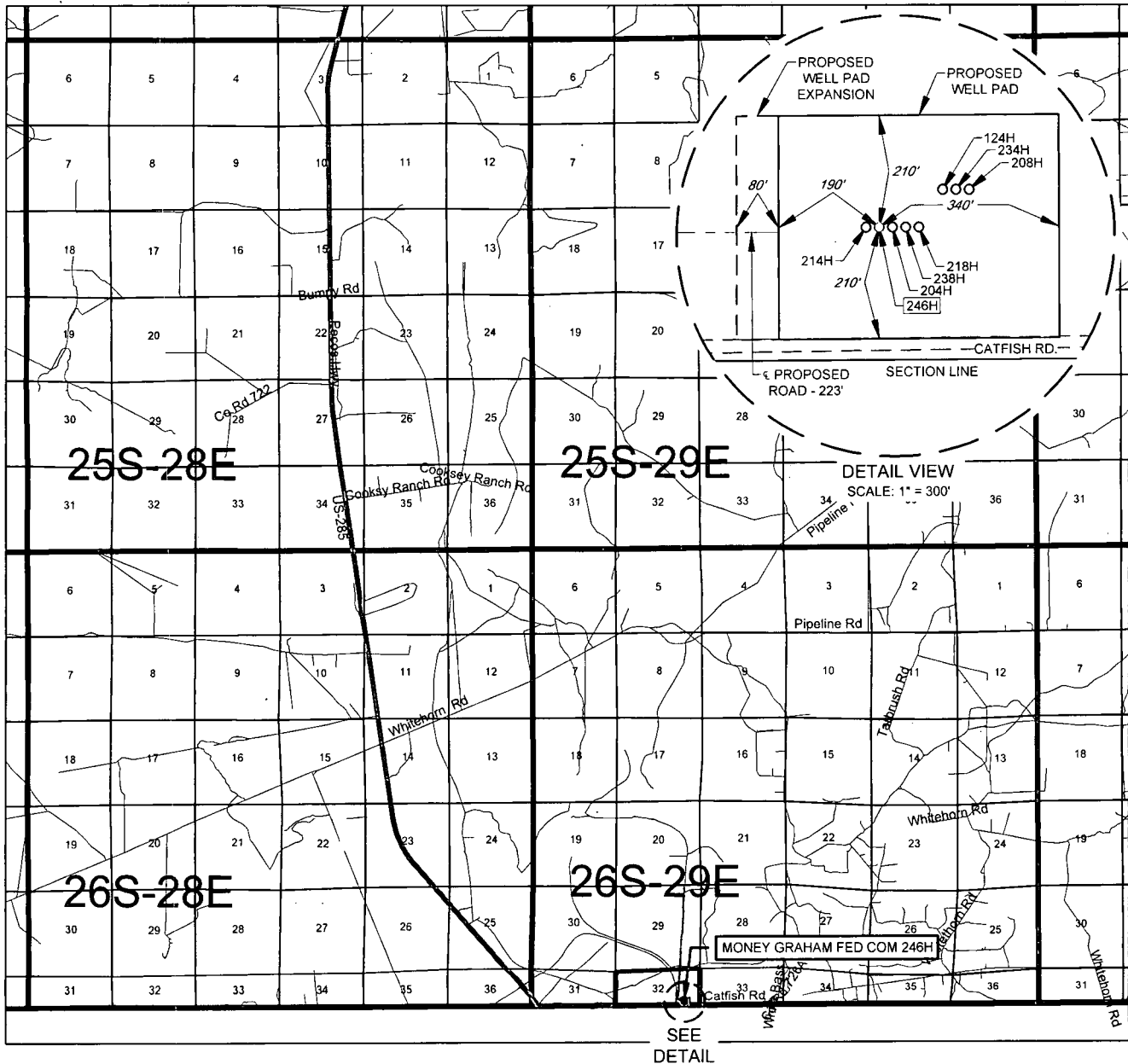
THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF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

EXHIBIT 2 VICINITY MAP



LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 246H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 250' FSL & 929' 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 ±190 FEET WEST OF THE LOCATION.

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.



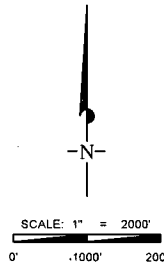
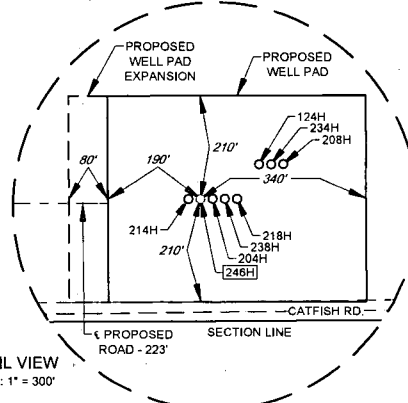
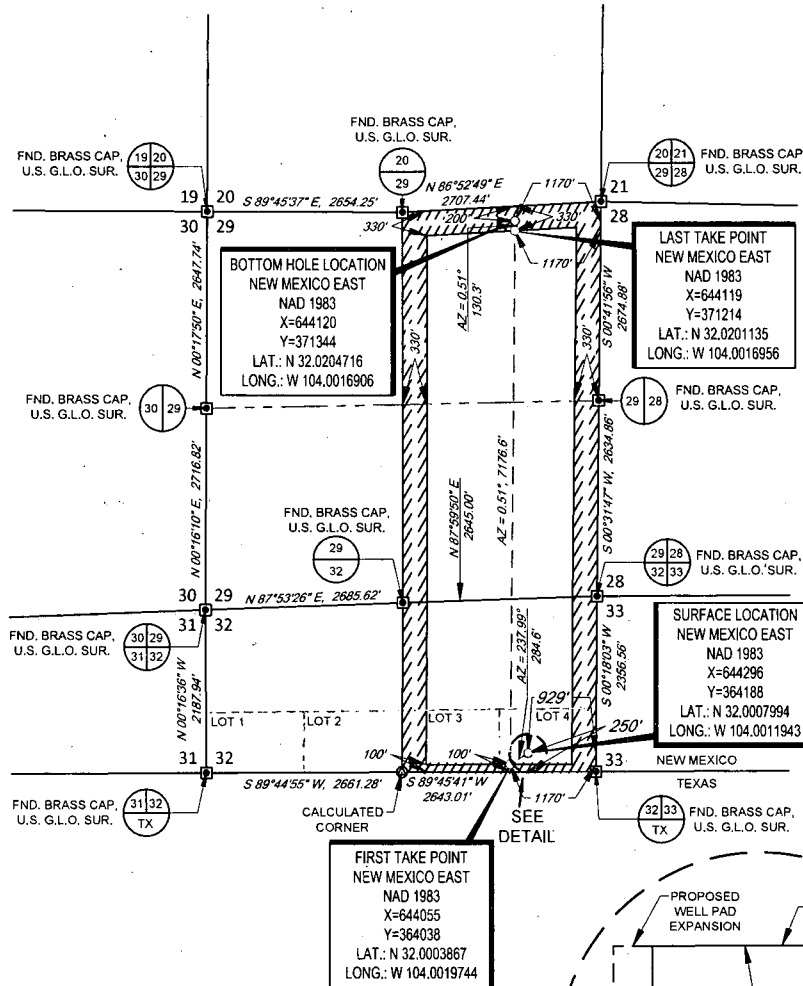
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

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TAP ROCK

EXHIBIT 2A

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



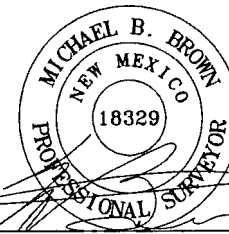
LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 246H

SECTION 32 TWP 26-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 250' FSL & 929' 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 ±190 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
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NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.



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

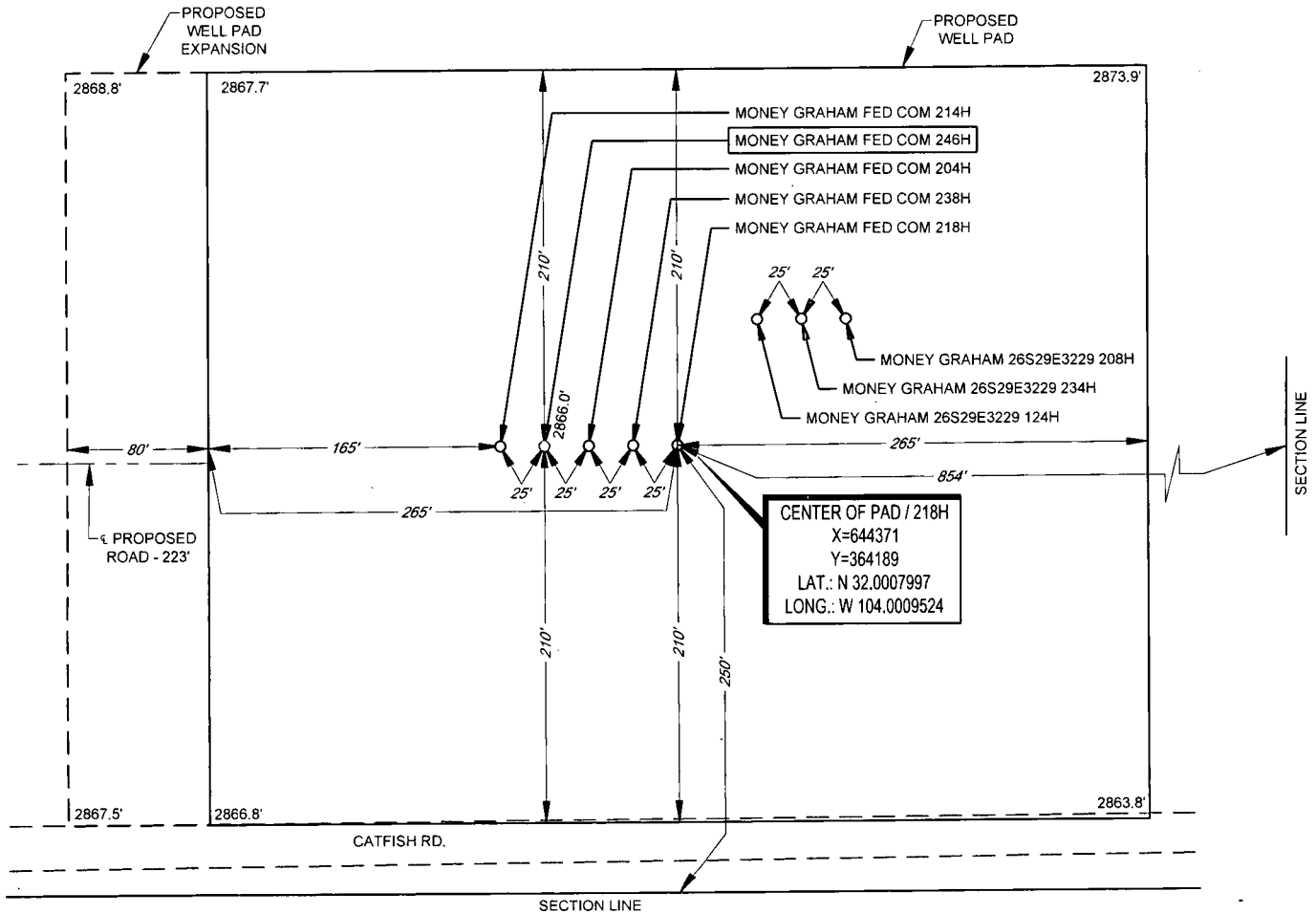
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX: (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX: (432) 682-1743
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EXHIBIT 2B

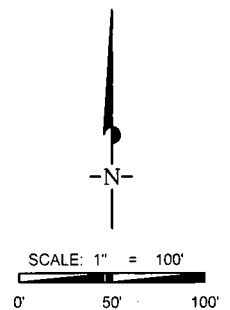


SECTION 32, TOWNSHIP 26-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: MONEY GRAHAM FED COM 246H
246H LATITUDE N 32.0007994 246H LONGITUDE W 104.0011943
CENTER OF PAD IS 250' FSL & 854' FEL



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, L.L.C. 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.

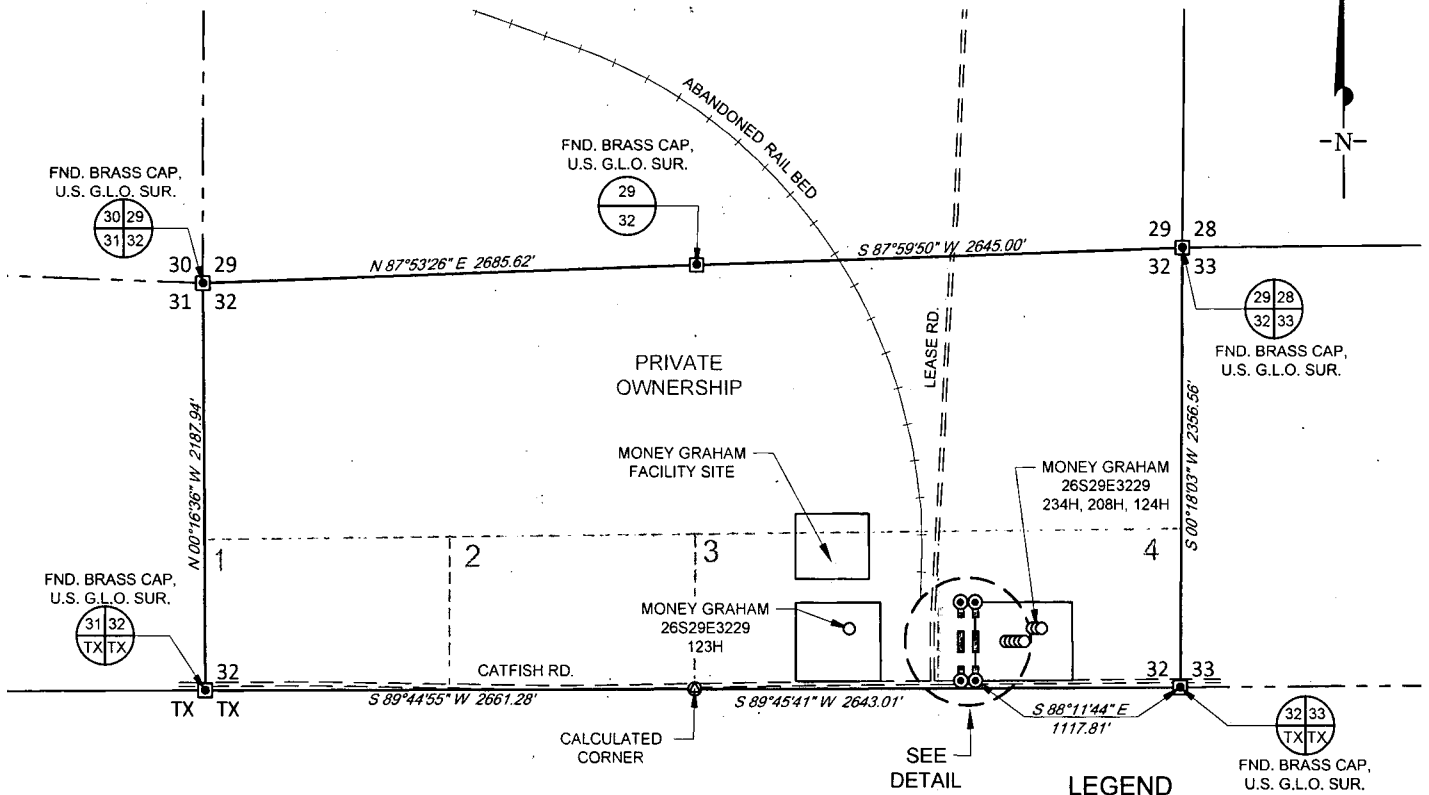
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
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TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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SCALE: 1" = 1000'

0' 500' 1000'

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



**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.

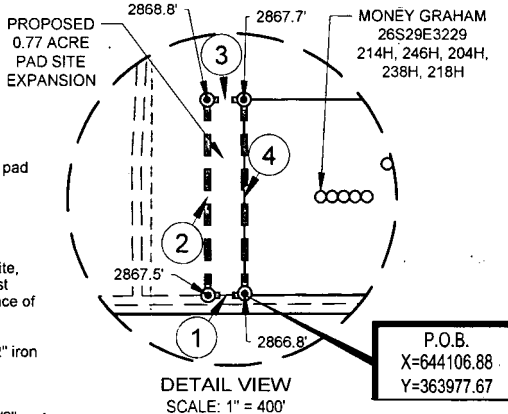
BEGINNING at a 1/2" iron rod with cap marked "TOPOGRAPHIC" set for the Southeast corner of this site, whence a U.S. G.L.O. brass cap found for the Southeast corner of said Section 32, bears S 88°11'44" E, a distance of 1,117.81 feet;

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.



LEGEND

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

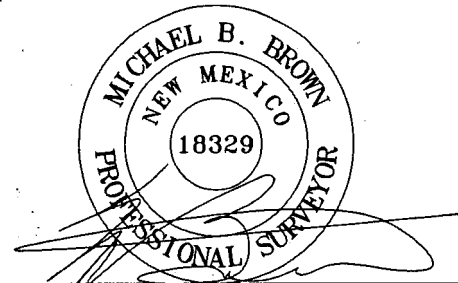
LINE TABLE

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'



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

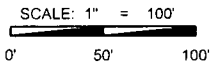
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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Michael Blake Brown, P.S. No. 18329
DECEMBER 12, 2018

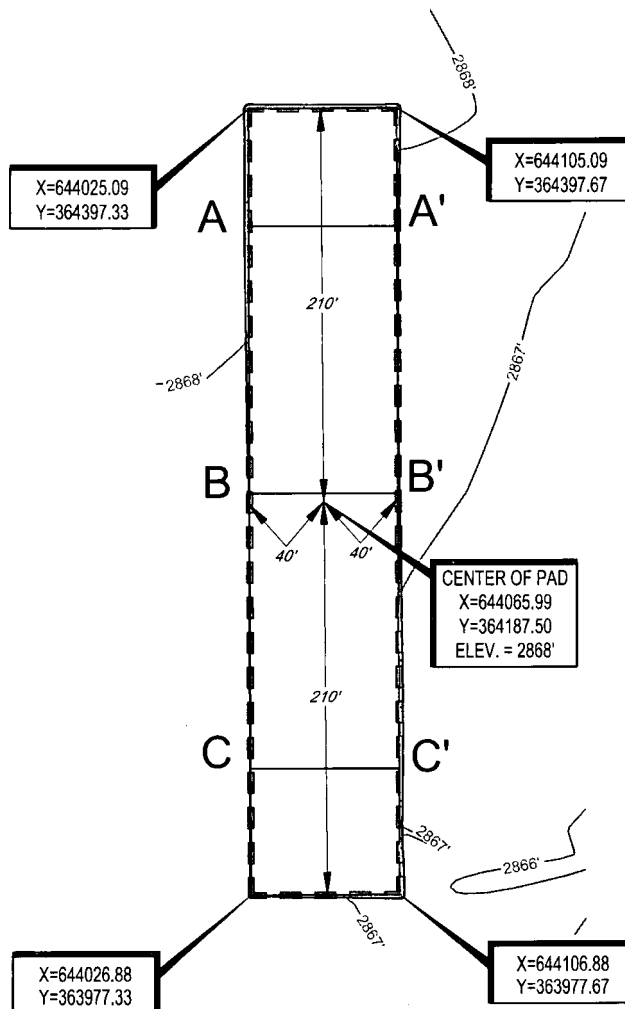
**TAP
ROCK**

MONEY GRAHAM FED COM PAD SITE EXPANSION	REVISION:		NOTES:
	INT	DATE	
DATE: 12/07/18			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
FILE: 30_MONEY_GRAHAM_FED_COM_PAD_SITE_EXPANSION			
DRAWN BY: MML			
SHEET: 1 OF 1			



PRELIMINARY

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



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



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

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

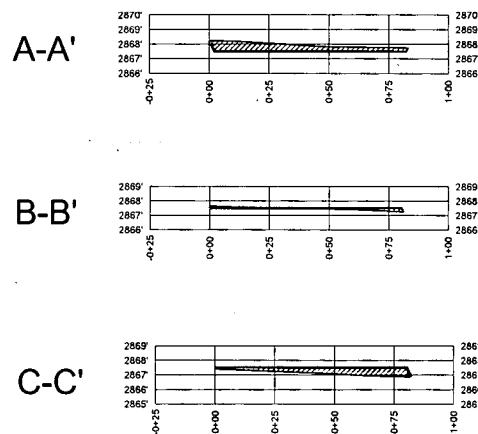
TAP
ROCK

MONEY GRAHAM 26S29E3229 EXPANSION PAD SITE	REVISION:		NOTES:
	INT	DATE	
DATE: 12/10/18			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.
FILE: 02_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION			
DRAWN BY: EAH			
SHEET: 1 OF 3			

Horizontal Scale = 1/50
Vertical Scale = 1/10

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

TAP



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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

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

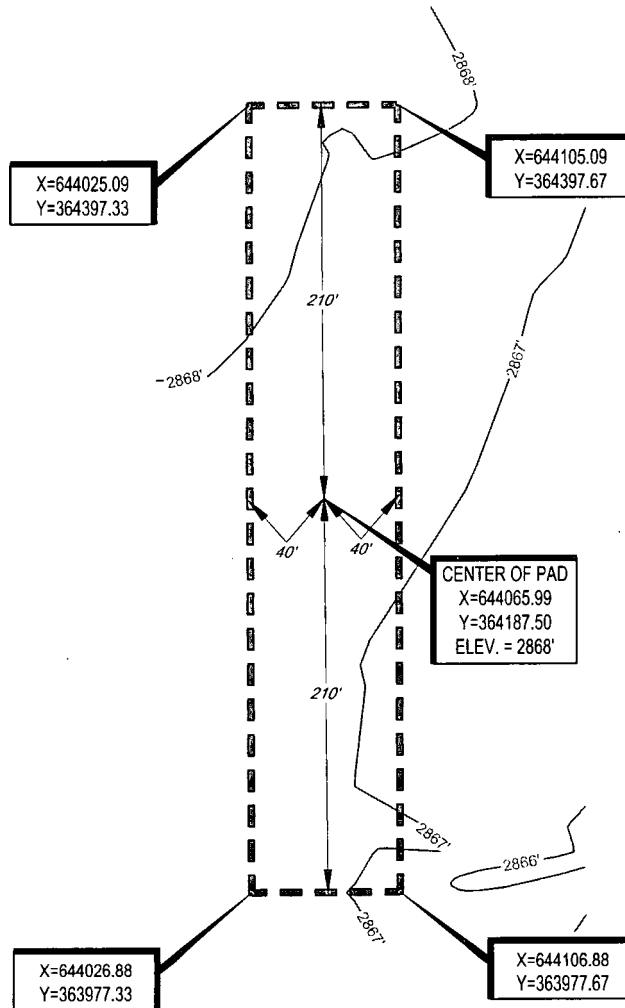
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SCALE: 1" = 100'

0' 50' 100'

PRELIMINARY

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



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



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

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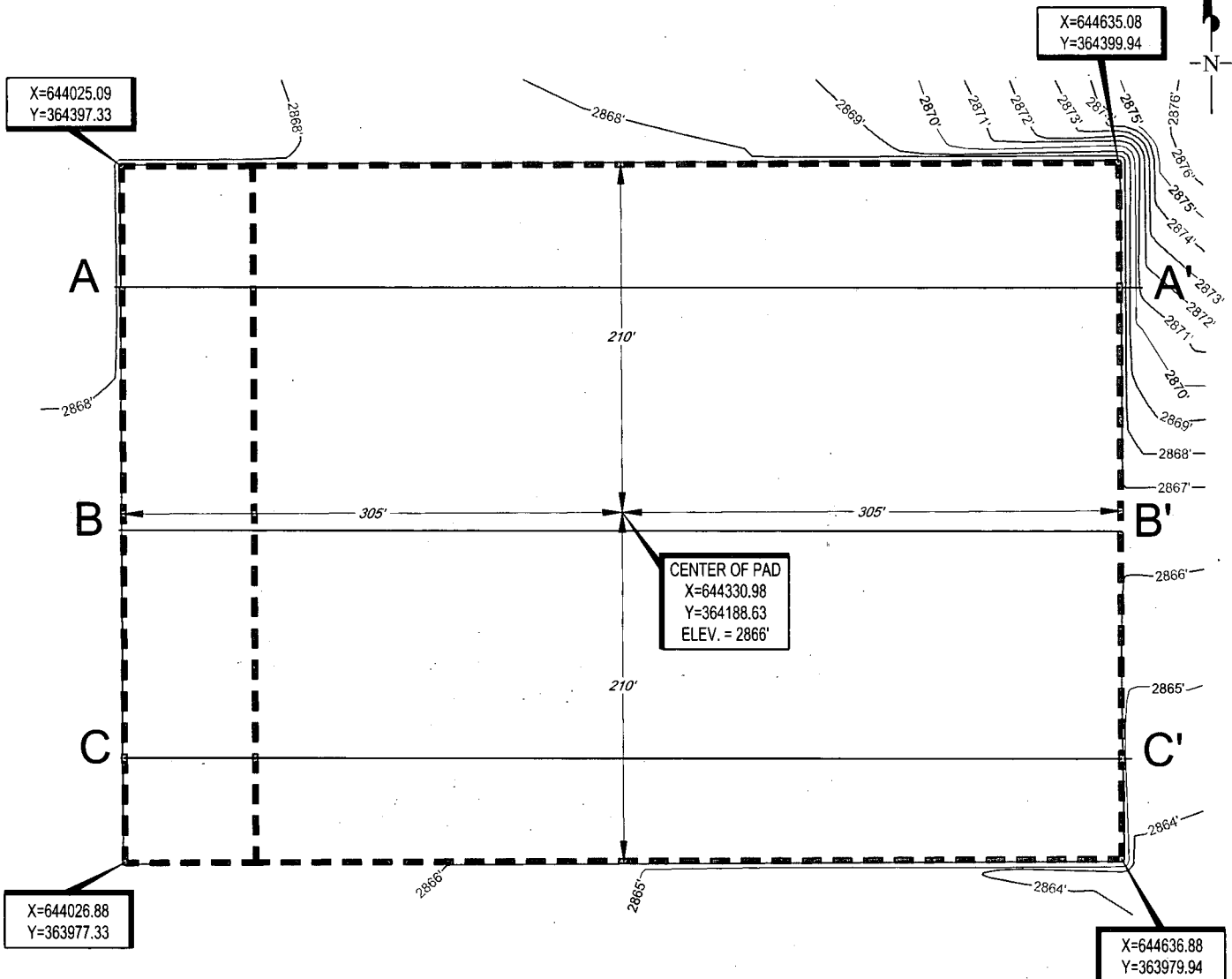
TAP
ROCK

MONEY GRAHAM 26S29E3229 EXPANSION PAD SITE	REVISION:		NOTES:
	INT	DATE	
DATE: 12/10/18			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.
FILE: 00_MONEY_GRAHAM_26S29E3229_PAD_SITE_EXPANSION			
DRAWN BY: EAH			
SHEET: 3 OF 3			

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



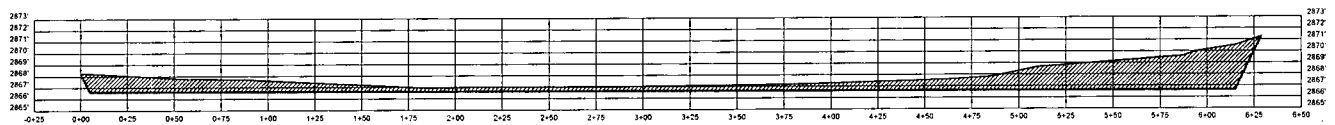
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

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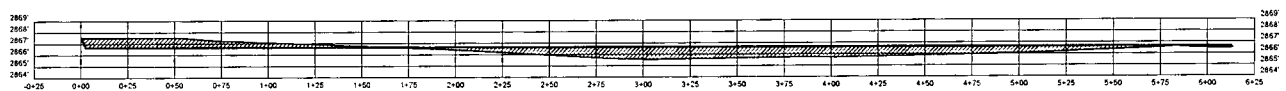
TAP
ROCK

MONEY GRAHAM FED COM EXPANSION PAD SITE	REVISION:		NOTES:
	MML	12/12/18	
DATE: 12/10/18			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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DRAWN BY: EAH			
SHEET: 1 OF 3			

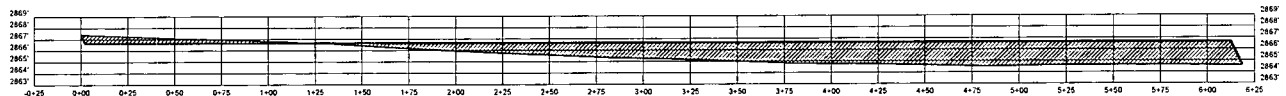
A-A'



B-B'



C-C'



1400 EVERMAN PARKWAY, Ste. 148 • 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

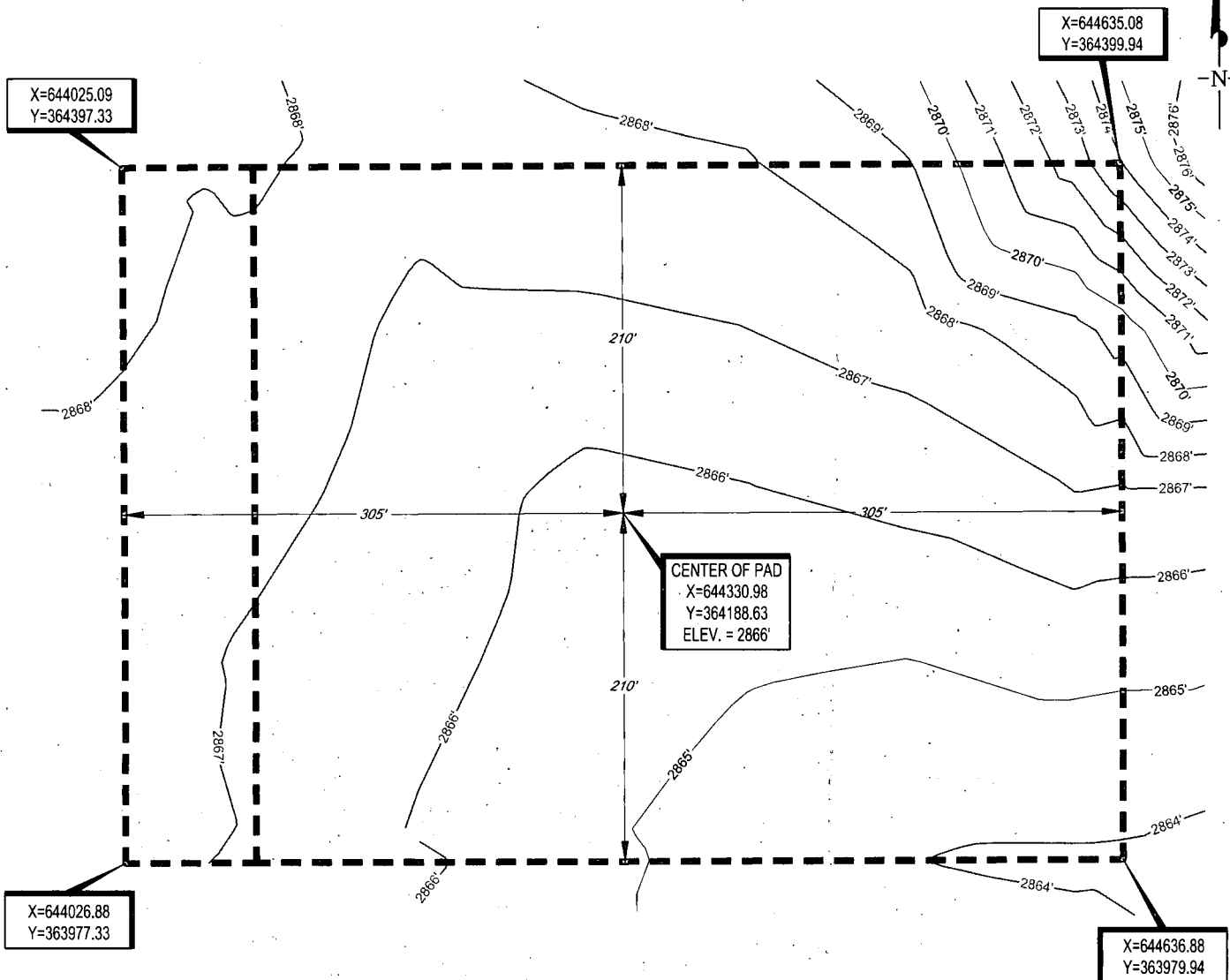
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DATE:	12/10/18			
FILE:	MONEY GRAHAM FID COM SITE EXPANSION PAD			
DRAWN BY:	EAH			
SHEET:	2 OF 3			

S:\SURVEY\TAPROCK\MONEY_GRAPH\MONEY_GRAPH\UNIT\FINAL_PRODUCT\TAPROCK\MONEY_GRAPH\FED COM SITE EXPANSION_NEV1.DWG 12/12/2018 11:17 AM kmahony

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
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TAP
ROCK

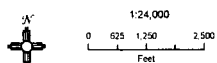
MONEY GRAHAM FED COM EXPANSION PAD SITE	REVISION:		NOTES:
	MML	12/12/18	
DATE: 12/10/18			1. ORIGINAL DOCUMENT SIZE: 8.5" X 11" 2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
FILE: CD_MONEY_GRAHAM_FED_COM_SITE_EXPANSION_REV1			
DRAWN BY: EAH			
SHEET: 3 OF 3			

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

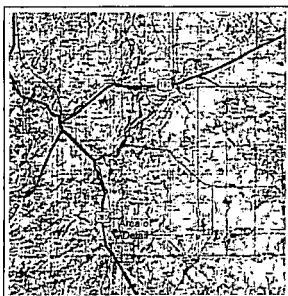
- Oil - Active
- Oil - New
- Oil - TA
- Oil - P&A
- ✕ Gas - Active
- ✕ Gas - New
- ✕ Gas - P&A
- ✦ SWD - Active
- ⊙ Proposed SHL
- ▽ Proposed BHL
- - - Proposed Wellbore
- ▭ BLM
- ▭ STATE
- ▭ PRIVATE



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERRIN WEST, INC.

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





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

Drilling Plan Data Report

08/12/2019

APD ID: 10400038225

Submission Date: 01/24/2019

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

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	2394		NATURAL GAS,OIL	N
5	BELL CANYON	19	2847	2849		NATURAL GAS,OIL	N
6	BRUSHY CANYON	-1971	4837	4843		NATURAL GAS,OIL	N
7	BONE SPRING	-3561	6427	6436	LIMESTONE	NATURAL GAS,OIL	N
8	BONE SPRING 1ST	-4486	7352	7361	SANDSTONE	NATURAL GAS,OIL	N
9	BONE SPRING 2ND	-5066	7932	7941	SANDSTONE	NATURAL GAS,OIL	N
10	BONE SPRING 3RD	-6298	9164	9173	SANDSTONE	NATURAL GAS,OIL	N
11	BONE SPRING 3RD	-6555	9421	9431	OTHER,SANDSTONE : W	NATURAL GAS,OIL	N
12	WOLFCAMP	-6645	9511	9521	OTHER : A	NATURAL GAS,OIL	N
13	WOLFCAMP	-6755	9621	9631	OTHER,SANDSTONE : A Y	NATURAL GAS,OIL	N
14	WOLFCAMP	-6885	9751	9761	OTHER : A Fat	NATURAL GAS,OIL	N
15	WOLFCAMP	-7145	10011	10021	OTHER : B	NATURAL GAS,OIL	N
16	WOLFCAMP	-7655	10521	10552	OTHER : B2	NATURAL GAS,OIL	Y

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC**Well Name:** MONEY GRAHAM FED COM**Well Number:** 246H**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 nipped 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_246H_10M_Choke_032918_20190118123936.pdf

BOP Diagram Attachment:

Money_246H_BOP_5M_Annular_REVISED_20190430145643.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	2698	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	2897	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	9870	0	9660	2866		9870	P-110	20	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
5	INTERMEDIATE	8.75	7.625	NEW	API	N	2700	10070	2698	10060			7370	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	9870	18210	9860	10810			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: 246H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124114.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124217.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124145.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Money_246H_5.5in_Casing_Spec_20190118124325.PDF

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124426.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124257.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Money_246H_5in_Casing_Spec_20190118124408.pdf

Casing Design Assumptions and Worksheet(s):

Money_246H_Casing_Design_Assumptions_20190118124435.pdf

Section 4 - Cement

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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		8872	18210	950	1.17	15.8	1112	10	Class H	Fluid Loss + Dispersant + Retarder + LCM
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	10070	355	2.35	11.5	834	35	TXI	Fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		1900	10070	197	1.39	13.2	274	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: 246H

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	10070	OTHER : Fresh water/cut brine	9	9							
10070	18210	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: 6500

Anticipated Surface Pressure: 4121.8

Anticipated Bottom Hole Temperature(F): 150

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

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Money_East_Pad_H2S_Plan_20190118125711.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Money_246H_Horizontal_Plan_011619_20190118125726.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

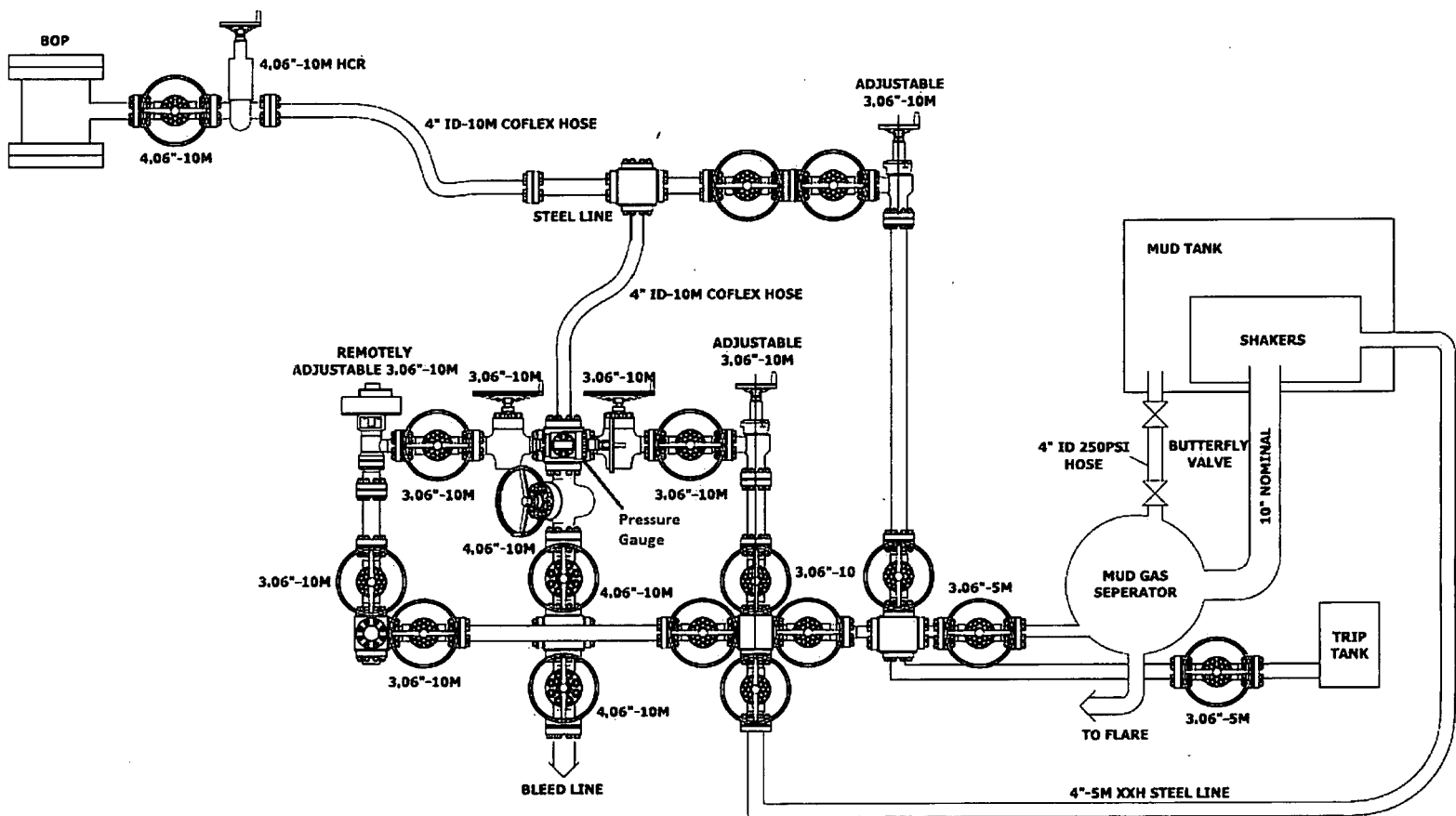
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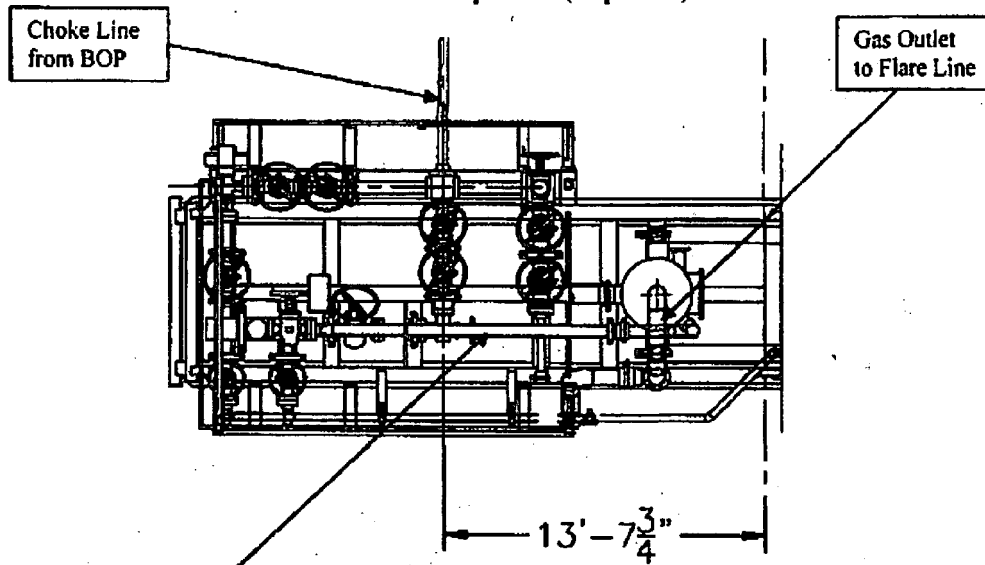
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Other Variance attachment:

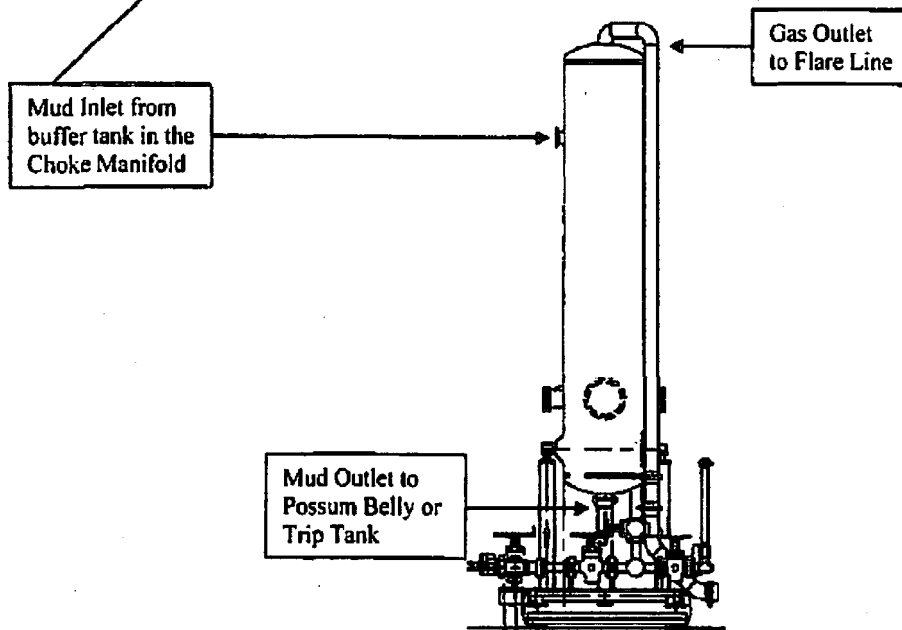
Money_246H_Casing_Variance_Request_20190118125801.pdf



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)

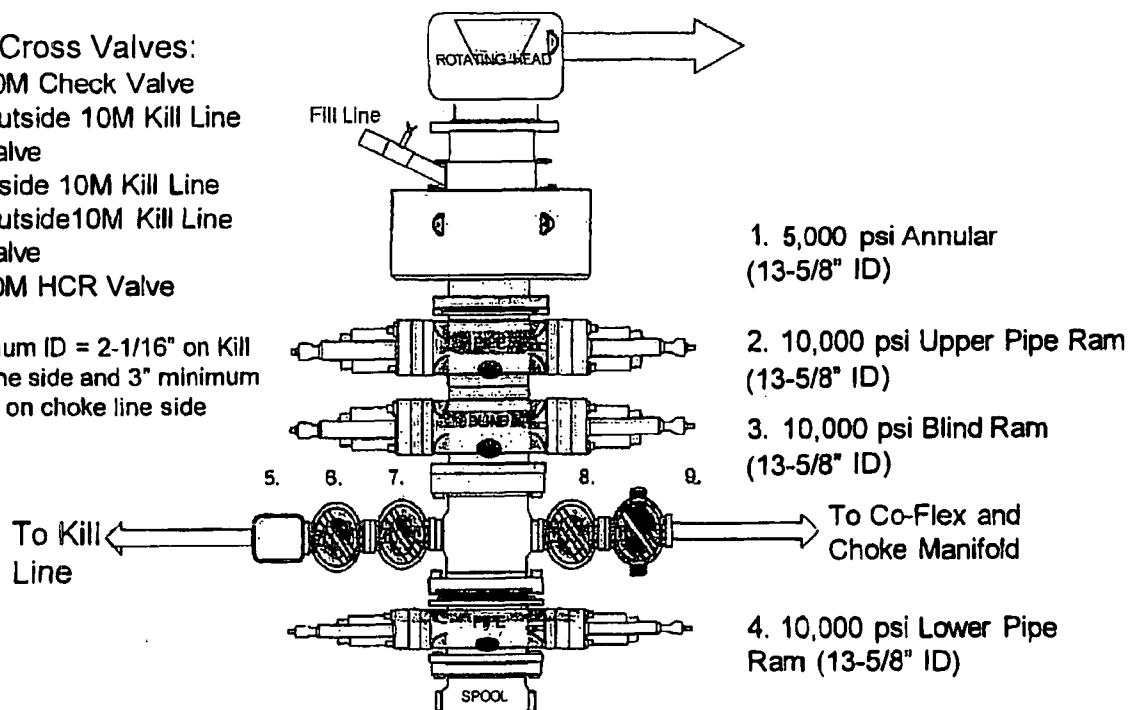


10,000 psi BOP Stack

Mud Cross Valves:

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

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



Wedge 521®

Printed on: 05/22/2018



Outside Diameter 5.000 in.

Wall Thickness 0.362 in.

Grade P110-IC*

Min. Wall Thickness 87.5%

Connection OD Option REGULAR

Drift API Standard

Type Casing

(*) Grade P110-IC

COUPLING

Body: White

1st Band: -

2nd Band: -

3rd Band: -

PIPE BODY

1st Band: White

2nd Band: Pale

Green

3rd Band: -

4th Band: -

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

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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

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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	

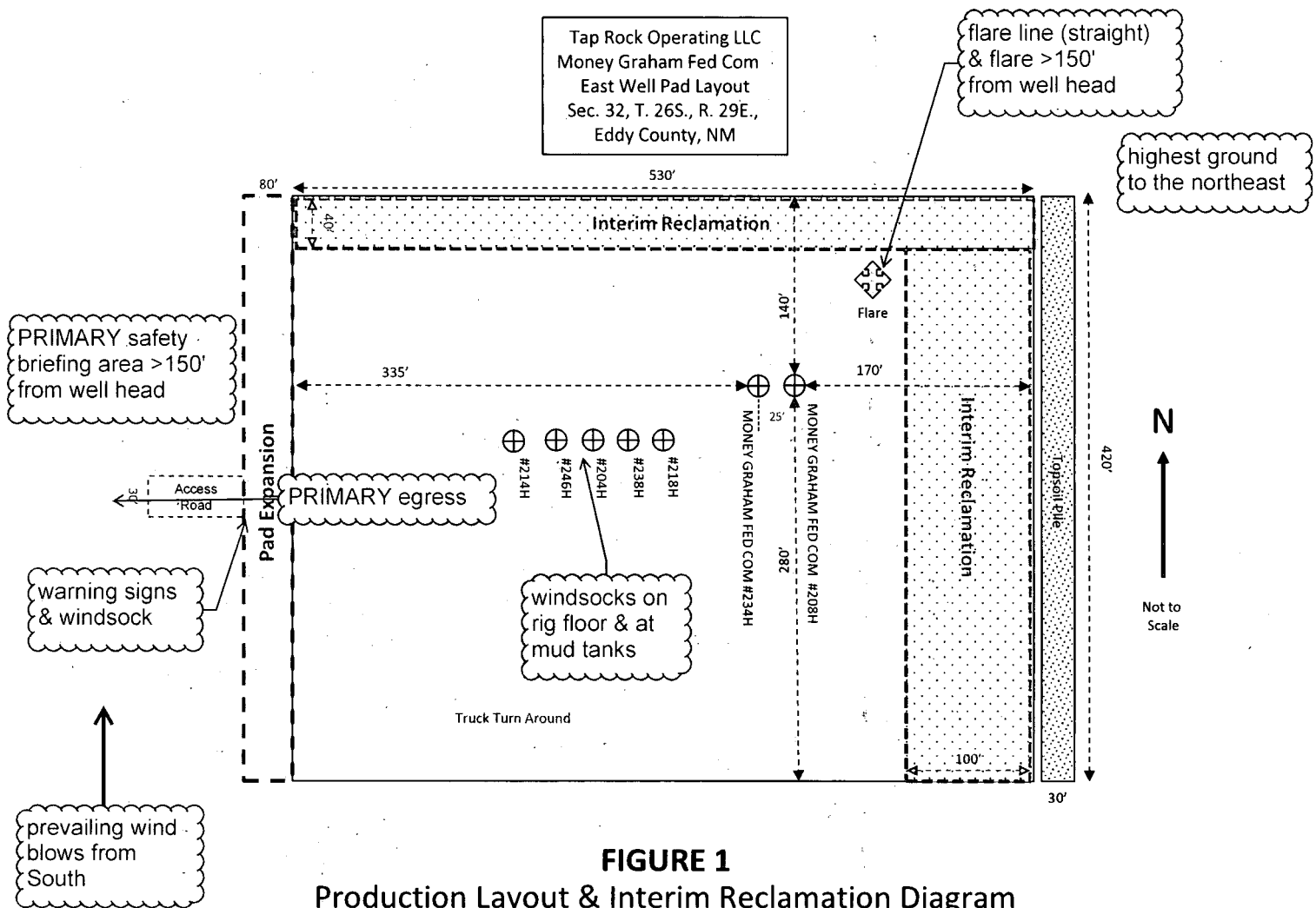


FIGURE 1
Production Layout & Interim Reclamation Diagram

Tap Rock Operating, LLC

Money Graham East Pad
H2S Contingency Plan:
Radius Map

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

⊙ Surface Hole Location

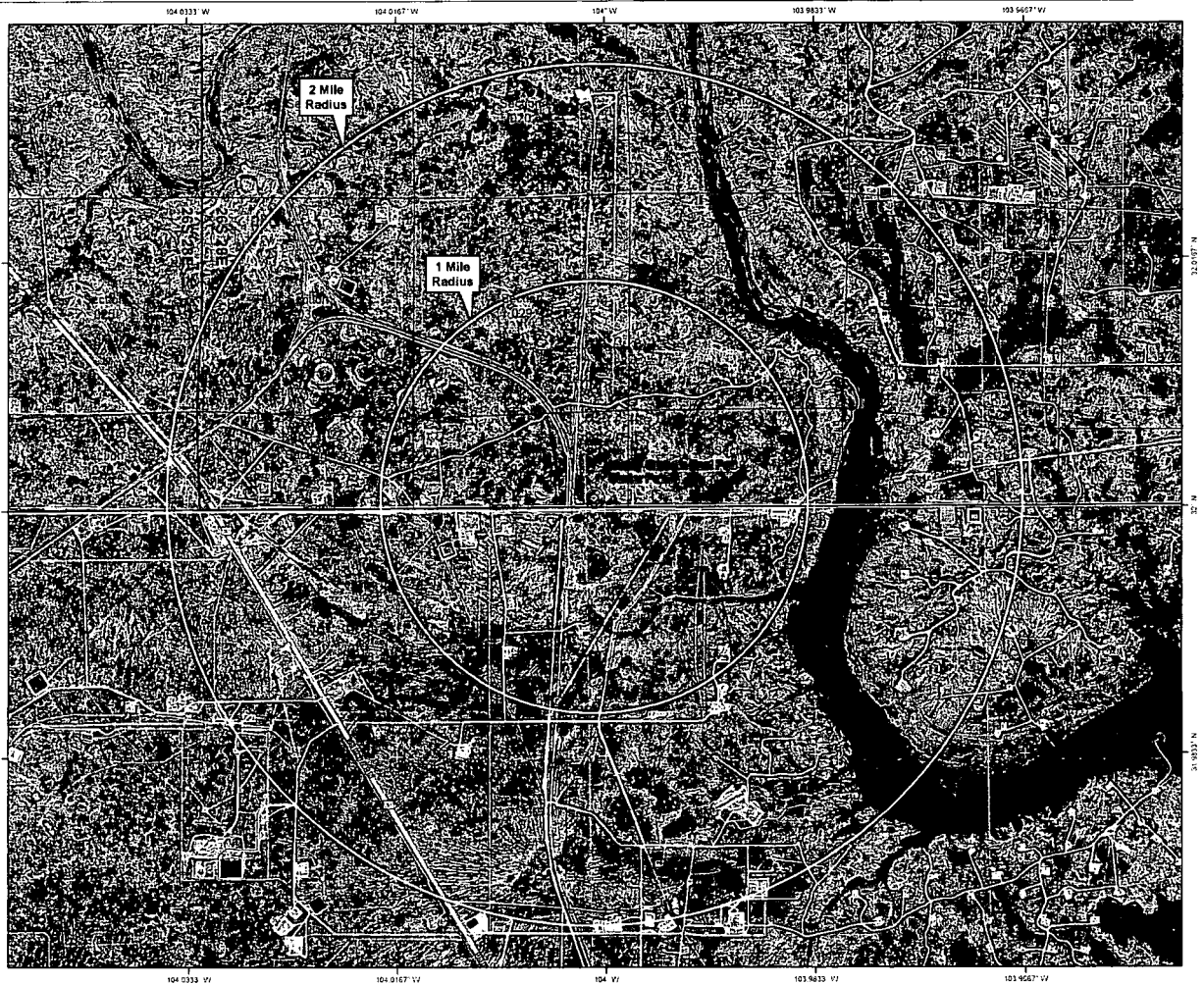
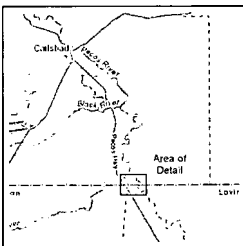
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0 0.25 0.5 1
Miles



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., July 28, 2018
for Tap Rock Operating, LLC





Well: Money Graham Fed Com Well No. 246 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	V Sect	Annotation	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	KOP Begin 1.5"/100' build	
3	1652.06	3.78	230.31	1651.88	-5.31	-6.40	1.50	-5.15	Begin 3.78" tangent	
4	6158.11	3.78	230.31	6148.12	-195.06	-235.05	0.00	-189.22	Begin 1.5"/100' drop	
5	6410.17	0.00	0.00	6400.00	-200.37	-241.45	1.50	-194.37	Begin vertical hold	
6	10207.22	0.00	0.00	10197.05	-200.37	-241.45	0.00	-194.37	Begin 10"/100' build	
7	11103.85	89.66	0.51	10770.00	369.19	-236.38	10.00	374.89	Begin 89.66" lateral	
8	17891.06	89.66	0.51	10810.00	7156.01	-176.00	0.00	7158.18	PBH/TD 17891.06 MD/10810.00 TVD	

DESIGN TARGET DETAILS

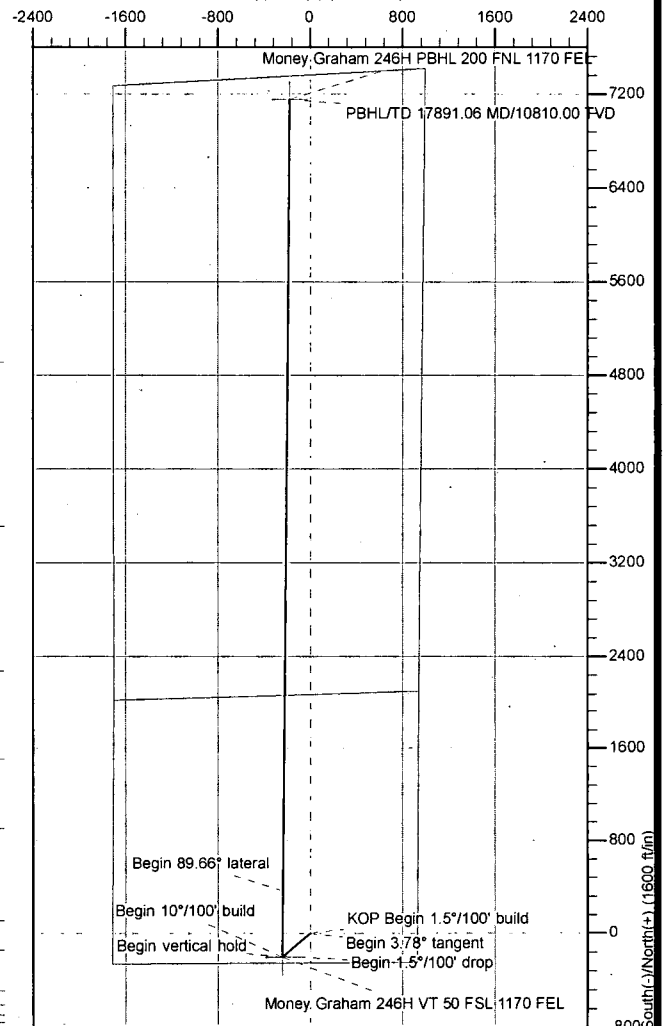
Name	TVD	+N/-S	+E/-W	Northing	Easting
Money Graham 246H VT 50 FSL 1170 FEL	6400.00	-200.37	-241.45	363987.63	644054.55
Money Graham 246H PBHL 200 FNL 1170 FEL	10810.00	7156.01	-176.00	371344.00	644120.00

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:

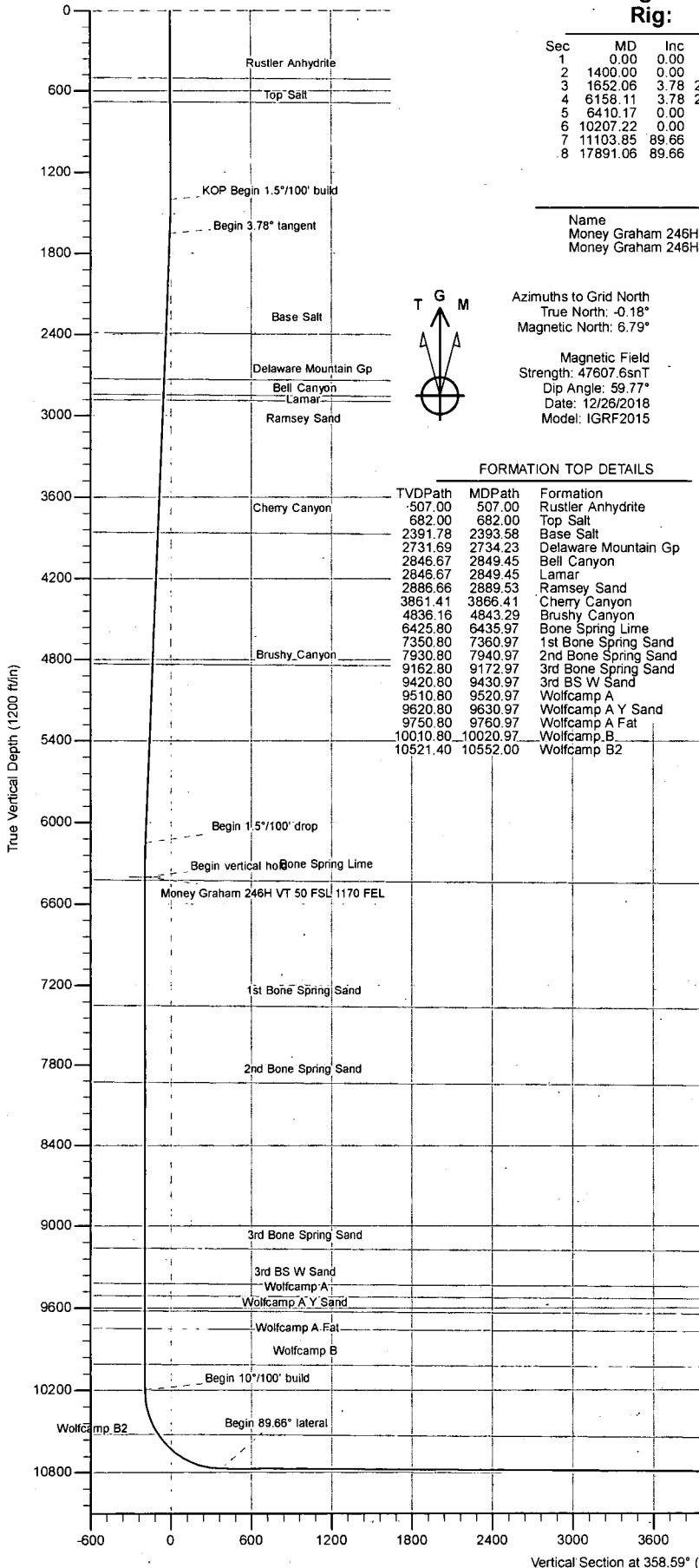
Northing	Easting	Latitude	Longitude
364188.00	644296.00	32.00079810	-104.00119430

West(-)/East(+) (1600 ft/in)



FORMATION TOP DETAILS

TVDP	MD	Formation
507.00	507.00	Rustler Anhydrite
682.00	682.00	Top Salt
2391.78	2393.58	Base Salt
2731.69	2734.23	Delaware Mountain Gp
2846.67	2849.45	Bell Canyon
2846.67	2849.45	Lamar
2886.66	2889.53	Ramsey Sand
3861.41	3866.41	Cherry Canyon
4836.16	4843.29	Brushy Canyon
6425.80	6435.97	Bone Spring Lime
7350.80	7360.97	1st Bone Spring Sand
7930.80	7940.97	2nd Bone Spring Sand
9162.80	9172.97	3rd Bone Spring Sand
9420.80	9430.97	3rd BS W Sand
9510.80	9520.97	Wolfcamp A
9620.80	9630.97	Wolfcamp A Y Sand
9750.80	9760.97	Wolfcamp A Fat
10010.80	10020.97	Wolfcamp B
10521.40	10552.00	Wolfcamp B2





Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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. 246 H, Surf loc: 250 FSL 929 FEL Section 32-T26S-R29E		
Well Position	+N/-S	-1.00 ft	Northing: 364,188.00 usft
	+E/-W	-75.00 ft	Easting: 644,296.00 usft
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	47,607.57730043

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	358.59

Plan Survey Tool Program:	Date	12/28/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,891.06 rev0 (Original Hole)	MWD	
			OWSG MWD - Standard	

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	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,652.06	3.78	230.31	1,651.88	-5.31	-6.40	1.50	1.50	0.00	230.31	
6,158.11	3.78	230.31	6,148.12	-195.06	-235.05	0.00	0.00	0.00	0.00	
6,410.17	0.00	0.00	6,400.00	-200.37	-241.45	1.50	-1.50	0.00	180.00	Money Graham 246H
10,207.22	0.00	0.00	10,197.05	-200.37	-241.45	0.00	0.00	0.00	0.00	
11,103.85	89.66	0.51	10,770.00	369.19	-236.38	10.00	10.00	0.06	0.51	
17,891.06	89.66	0.51	10,810.00	7,156.01	-176.00	0.00	0.00	0.00	0.00	Money Graham 246H



Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Begin 1.5°/100' build									
1,500.00	1.50	230.31	1,499.99	-0.84	-1.01	-0.81	1.50	1.50	0.00
1,600.00	3.00	230.31	1,599.91	-3.34	-4.03	-3.24	1.50	1.50	0.00
1,652.06	3.78	230.31	1,651.88	-5.31	-6.40	-5.15	1.50	1.50	0.00
Begin 3.78° tangent									
1,700.00	3.78	230.31	1,699.71	-7.33	-8.83	-7.11	0.00	0.00	0.00
1,800.00	3.78	230.31	1,799.50	-11.54	-13.90	-11.19	0.00	0.00	0.00
1,900.00	3.78	230.31	1,899.28	-15.75	-18.98	-15.28	0.00	0.00	0.00
2,000.00	3.78	230.31	1,999.06	-19.96	-24.05	-19.36	0.00	0.00	0.00
2,100.00	3.78	230.31	2,098.84	-24.17	-29.13	-23.45	0.00	0.00	0.00
2,200.00	3.78	230.31	2,198.62	-28.38	-34.20	-27.53	0.00	0.00	0.00
2,300.00	3.78	230.31	2,298.41	-32.59	-39.28	-31.62	0.00	0.00	0.00
2,393.58	3.78	230.31	2,391.78	-36.53	-44.03	-35.44	0.00	0.00	0.00
Base Salt									
2,400.00	3.78	230.31	2,398.19	-36.81	-44.35	-35.70	0.00	0.00	0.00
2,500.00	3.78	230.31	2,497.97	-41.02	-49.43	-39.79	0.00	0.00	0.00
2,600.00	3.78	230.31	2,597.75	-45.23	-54.50	-43.87	0.00	0.00	0.00
2,700.00	3.78	230.31	2,697.54	-49.44	-59.57	-47.96	0.00	0.00	0.00
2,734.23	3.78	230.31	2,731.69	-50.88	-61.31	-49.36	0.00	0.00	0.00
Delaware Mountain Gp									
2,800.00	3.78	230.31	2,797.32	-53.65	-64.65	-52.04	0.00	0.00	0.00
2,849.45	3.78	230.31	2,846.67	-55.73	-67.16	-54.06	0.00	0.00	0.00
Bell Canyon - Lamar									
2,889.53	3.78	230.31	2,886.66	-57.42	-69.19	-55.70	0.00	0.00	0.00
Ramsey Sand									
2,900.00	3.78	230.31	2,897.10	-57.86	-69.72	-56.13	0.00	0.00	0.00
3,000.00	3.78	230.31	2,996.88	-62.07	-74.80	-60.21	0.00	0.00	0.00
3,100.00	3.78	230.31	3,096.67	-66.28	-79.87	-64.30	0.00	0.00	0.00
3,200.00	3.78	230.31	3,196.45	-70.49	-84.95	-68.38	0.00	0.00	0.00
3,300.00	3.78	230.31	3,296.23	-74.70	-90.02	-72.47	0.00	0.00	0.00
3,400.00	3.78	230.31	3,396.01	-78.92	-95.10	-76.55	0.00	0.00	0.00
3,500.00	3.78	230.31	3,495.80	-83.13	-100.17	-80.64	0.00	0.00	0.00
3,600.00	3.78	230.31	3,595.58	-87.34	-105.24	-84.72	0.00	0.00	0.00
3,700.00	3.78	230.31	3,695.36	-91.55	-110.32	-88.81	0.00	0.00	0.00



Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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	3.78	230.31	3,795.14	-95.76	-115.39	-92.89	0.00	0.00	0.00
3,866.41	3.78	230.31	3,861.41	-98.56	-118.76	-95.61	0.00	0.00	0.00
Cherry Canyon									
3,900.00	3.78	230.31	3,894.92	-99.97	-120.47	-96.98	0.00	0.00	0.00
4,000.00	3.78	230.31	3,994.71	-104.18	-125.54	-101.06	0.00	0.00	0.00
4,100.00	3.78	230.31	4,094.49	-108.39	-130.62	-105.15	0.00	0.00	0.00
4,200.00	3.78	230.31	4,194.27	-112.60	-135.69	-109.23	0.00	0.00	0.00
4,300.00	3.78	230.31	4,294.05	-116.82	-140.76	-113.32	0.00	0.00	0.00
4,400.00	3.78	230.31	4,393.84	-121.03	-145.84	-117.40	0.00	0.00	0.00
4,500.00	3.78	230.31	4,493.62	-125.24	-150.91	-121.49	0.00	0.00	0.00
4,600.00	3.78	230.31	4,593.40	-129.45	-155.99	-125.57	0.00	0.00	0.00
4,700.00	3.78	230.31	4,693.18	-133.66	-161.06	-129.66	0.00	0.00	0.00
4,800.00	3.78	230.31	4,792.97	-137.87	-166.14	-133.74	0.00	0.00	0.00
4,843.29	3.78	230.31	4,836.16	-139.69	-168.33	-135.51	0.00	0.00	0.00
Brushy Canyon									
4,900.00	3.78	230.31	4,892.75	-142.08	-171.21	-137.83	0.00	0.00	0.00
5,000.00	3.78	230.31	4,992.53	-146.29	-176.29	-141.91	0.00	0.00	0.00
5,100.00	3.78	230.31	5,092.31	-150.50	-181.36	-146.00	0.00	0.00	0.00
5,200.00	3.78	230.31	5,192.10	-154.71	-186.43	-150.08	0.00	0.00	0.00
5,300.00	3.78	230.31	5,291.88	-158.93	-191.51	-154.17	0.00	0.00	0.00
5,400.00	3.78	230.31	5,391.66	-163.14	-196.58	-158.25	0.00	0.00	0.00
5,500.00	3.78	230.31	5,491.44	-167.35	-201.66	-162.34	0.00	0.00	0.00
5,600.00	3.78	230.31	5,591.22	-171.56	-206.73	-166.42	0.00	0.00	0.00
5,700.00	3.78	230.31	5,691.01	-175.77	-211.81	-170.51	0.00	0.00	0.00
5,800.00	3.78	230.31	5,790.79	-179.98	-216.88	-174.59	0.00	0.00	0.00
5,900.00	3.78	230.31	5,890.57	-184.19	-221.96	-178.68	0.00	0.00	0.00
6,000.00	3.78	230.31	5,990.35	-188.40	-227.03	-182.76	0.00	0.00	0.00
6,100.00	3.78	230.31	6,090.14	-192.61	-232.10	-186.85	0.00	0.00	0.00
6,158.11	3.78	230.31	6,148.12	-195.06	-235.05	-189.22	0.00	0.00	0.00
Begin 1.5°/100' drop									
6,200.00	3.15	230.31	6,189.93	-196.68	-237.00	-190.79	1.50	-1.50	0.00
6,300.00	1.65	230.31	6,289.84	-199.36	-240.23	-193.39	1.50	-1.50	0.00
6,400.00	0.15	230.31	6,389.83	-200.36	-241.44	-194.36	1.50	-1.50	0.00
6,410.17	0.00	0.00	6,400.00	-200.37	-241.45	-194.37	1.50	-1.50	0.00
Begin vertical hold									
6,435.97	0.00	0.00	6,425.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
Bone Spring Lime									
6,500.00	0.00	0.00	6,489.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
6,600.00	0.00	0.00	6,589.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
6,700.00	0.00	0.00	6,689.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
6,800.00	0.00	0.00	6,789.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
6,900.00	0.00	0.00	6,889.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,000.00	0.00	0.00	6,989.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,100.00	0.00	0.00	7,089.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,200.00	0.00	0.00	7,189.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,300.00	0.00	0.00	7,289.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,360.97	0.00	0.00	7,350.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
1st Bone Spring Sand									
7,400.00	0.00	0.00	7,389.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,500.00	0.00	0.00	7,489.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,600.00	0.00	0.00	7,589.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,700.00	0.00	0.00	7,689.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,800.00	0.00	0.00	7,789.83	-200.37	-241.45	-194.37	0.00	0.00	0.00



Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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	7,889.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
7,940.97	0.00	0.00	7,930.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
2nd Bone Spring Sand									
8,000.00	0.00	0.00	7,989.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,100.00	0.00	0.00	8,089.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,200.00	0.00	0.00	8,189.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,300.00	0.00	0.00	8,289.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,400.00	0.00	0.00	8,389.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,500.00	0.00	0.00	8,489.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,600.00	0.00	0.00	8,589.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,700.00	0.00	0.00	8,689.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,800.00	0.00	0.00	8,789.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
8,900.00	0.00	0.00	8,889.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,000.00	0.00	0.00	8,989.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,100.00	0.00	0.00	9,089.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,172.97	0.00	0.00	9,162.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
3rd Bone Spring Sand									
9,200.00	0.00	0.00	9,189.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,300.00	0.00	0.00	9,289.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,400.00	0.00	0.00	9,389.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,430.97	0.00	0.00	9,420.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
3rd BS W Sand									
9,500.00	0.00	0.00	9,489.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,520.97	0.00	0.00	9,510.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
Wolfcamp A									
9,600.00	0.00	0.00	9,589.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,630.97	0.00	0.00	9,620.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
Wolfcamp A Y Sand									
9,700.00	0.00	0.00	9,689.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,760.97	0.00	0.00	9,750.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
Wolfcamp A Fat									
9,800.00	0.00	0.00	9,789.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
9,900.00	0.00	0.00	9,889.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
10,000.00	0.00	0.00	9,989.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
10,020.97	0.00	0.00	10,010.80	-200.37	-241.45	-194.37	0.00	0.00	0.00
Wolfcamp B									
10,100.00	0.00	0.00	10,089.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
10,200.00	0.00	0.00	10,189.83	-200.37	-241.45	-194.37	0.00	0.00	0.00
10,207.22	0.00	0.00	10,197.05	-200.37	-241.45	-194.37	0.00	0.00	0.00
Begin 10°/100' build									
10,300.00	9.28	0.51	10,289.42	-192.88	-241.38	-186.88	10.00	10.00	0.00
10,400.00	19.28	0.51	10,386.21	-168.25	-241.16	-162.27	10.00	10.00	0.00
10,500.00	29.28	0.51	10,477.25	-127.18	-240.80	-121.22	10.00	10.00	0.00
10,552.00	34.48	0.51	10,521.40	-99.73	-240.56	-93.79	10.00	10.00	0.00
Wolfcamp B2									
10,600.00	39.28	0.51	10,559.78	-70.94	-240.30	-65.01	10.00	10.00	0.00
10,700.00	49.28	0.51	10,631.28	-1.21	-239.68	4.68	10.00	10.00	0.00
10,800.00	59.28	0.51	10,689.60	79.86	-238.96	85.72	10.00	10.00	0.00
10,900.00	69.28	0.51	10,732.94	169.84	-238.16	175.64	10.00	10.00	0.00
11,000.00	79.28	0.51	10,760.00	265.97	-237.30	271.72	10.00	10.00	0.00
11,100.00	89.28	0.51	10,769.96	365.34	-236.42	371.04	10.00	10.00	0.00
11,103.85	89.66	0.51	10,770.00	369.19	-236.38	374.89	10.00	10.00	0.00
Begin 89.66° lateral									



Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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)
11,200.00	89.66	0.51	10,770.56	465.34	-235.53	470.99	0.00	0.00	0.00
11,300.00	89.66	0.51	10,771.15	565.33	-234.64	570.93	0.00	0.00	0.00
11,400.00	89.66	0.51	10,771.74	665.32	-233.75	670.87	0.00	0.00	0.00
11,500.00	89.66	0.51	10,772.33	765.32	-232.86	770.81	0.00	0.00	0.00
11,600.00	89.66	0.51	10,772.92	865.31	-231.97	870.76	0.00	0.00	0.00
11,700.00	89.66	0.51	10,773.51	965.31	-231.08	970.70	0.00	0.00	0.00
11,800.00	89.66	0.51	10,774.10	1,065.30	-230.19	1,070.64	0.00	0.00	0.00
11,900.00	89.66	0.51	10,774.69	1,165.30	-229.30	1,170.58	0.00	0.00	0.00
12,000.00	89.66	0.51	10,775.28	1,265.29	-228.41	1,270.52	0.00	0.00	0.00
12,100.00	89.66	0.51	10,775.87	1,365.28	-227.52	1,370.47	0.00	0.00	0.00
12,200.00	89.66	0.51	10,776.46	1,465.28	-226.63	1,470.41	0.00	0.00	0.00
12,300.00	89.66	0.51	10,777.05	1,565.27	-225.74	1,570.35	0.00	0.00	0.00
12,400.00	89.66	0.51	10,777.64	1,665.27	-224.85	1,670.29	0.00	0.00	0.00
12,500.00	89.66	0.51	10,778.23	1,765.26	-223.96	1,770.24	0.00	0.00	0.00
12,600.00	89.66	0.51	10,778.82	1,865.26	-223.07	1,870.18	0.00	0.00	0.00
12,700.00	89.66	0.51	10,779.41	1,965.25	-222.18	1,970.12	0.00	0.00	0.00
12,800.00	89.66	0.51	10,779.99	2,065.25	-221.29	2,070.06	0.00	0.00	0.00
12,900.00	89.66	0.51	10,780.58	2,165.24	-220.40	2,170.00	0.00	0.00	0.00
13,000.00	89.66	0.51	10,781.17	2,265.23	-219.51	2,269.95	0.00	0.00	0.00
13,100.00	89.66	0.51	10,781.76	2,365.23	-218.62	2,369.89	0.00	0.00	0.00
13,200.00	89.66	0.51	10,782.35	2,465.22	-217.73	2,469.83	0.00	0.00	0.00
13,300.00	89.66	0.51	10,782.94	2,565.22	-216.84	2,569.77	0.00	0.00	0.00
13,400.00	89.66	0.51	10,783.53	2,665.21	-215.96	2,669.71	0.00	0.00	0.00
13,500.00	89.66	0.51	10,784.12	2,765.21	-215.07	2,769.66	0.00	0.00	0.00
13,600.00	89.66	0.51	10,784.71	2,865.20	-214.18	2,869.60	0.00	0.00	0.00
13,700.00	89.66	0.51	10,785.30	2,965.19	-213.29	2,969.54	0.00	0.00	0.00
13,800.00	89.66	0.51	10,785.89	3,065.19	-212.40	3,069.48	0.00	0.00	0.00
13,900.00	89.66	0.51	10,786.48	3,165.18	-211.51	3,169.43	0.00	0.00	0.00
14,000.00	89.66	0.51	10,787.07	3,265.18	-210.62	3,269.37	0.00	0.00	0.00
14,100.00	89.66	0.51	10,787.66	3,365.17	-209.73	3,369.31	0.00	0.00	0.00
14,200.00	89.66	0.51	10,788.25	3,465.17	-208.84	3,469.25	0.00	0.00	0.00
14,300.00	89.66	0.51	10,788.84	3,565.16	-207.95	3,569.19	0.00	0.00	0.00
14,400.00	89.66	0.51	10,789.42	3,665.15	-207.06	3,669.14	0.00	0.00	0.00
14,500.00	89.66	0.51	10,790.01	3,765.15	-206.17	3,769.08	0.00	0.00	0.00
14,600.00	89.66	0.51	10,790.60	3,865.14	-205.28	3,869.02	0.00	0.00	0.00
14,700.00	89.66	0.51	10,791.19	3,965.14	-204.39	3,968.96	0.00	0.00	0.00
14,800.00	89.66	0.51	10,791.78	4,065.13	-203.50	4,068.91	0.00	0.00	0.00
14,900.00	89.66	0.51	10,792.37	4,165.13	-202.61	4,168.85	0.00	0.00	0.00
15,000.00	89.66	0.51	10,792.96	4,265.12	-201.72	4,268.79	0.00	0.00	0.00
15,100.00	89.66	0.51	10,793.55	4,365.11	-200.83	4,368.73	0.00	0.00	0.00
15,200.00	89.66	0.51	10,794.14	4,465.11	-199.94	4,468.67	0.00	0.00	0.00
15,300.00	89.66	0.51	10,794.73	4,565.10	-199.05	4,568.62	0.00	0.00	0.00
15,400.00	89.66	0.51	10,795.32	4,665.10	-198.16	4,668.56	0.00	0.00	0.00
15,500.00	89.66	0.51	10,795.91	4,765.09	-197.27	4,768.50	0.00	0.00	0.00
15,600.00	89.66	0.51	10,796.50	4,865.09	-196.38	4,868.44	0.00	0.00	0.00
15,700.00	89.66	0.51	10,797.09	4,965.08	-195.49	4,968.39	0.00	0.00	0.00
15,800.00	89.66	0.51	10,797.68	5,065.07	-194.60	5,068.33	0.00	0.00	0.00
15,900.00	89.66	0.51	10,798.27	5,165.07	-193.71	5,168.27	0.00	0.00	0.00
16,000.00	89.66	0.51	10,798.85	5,265.06	-192.82	5,268.21	0.00	0.00	0.00
16,100.00	89.66	0.51	10,799.44	5,365.06	-191.93	5,368.15	0.00	0.00	0.00
16,200.00	89.66	0.51	10,800.03	5,465.05	-191.04	5,468.10	0.00	0.00	0.00
16,300.00	89.66	0.51	10,800.62	5,565.05	-190.16	5,568.04	0.00	0.00	0.00
16,400.00	89.66	0.51	10,801.21	5,665.04	-189.27	5,667.98	0.00	0.00	0.00
16,500.00	89.66	0.51	10,801.80	5,765.03	-188.38	5,767.92	0.00	0.00	0.00



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

Bond Info Data Report

08/12/2019

APD ID: 10400038225

Submission Date: 01/24/2019

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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:

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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: 246H

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:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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



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

PWD Data Report

08/12/2019

APD ID: 10400038225

Submission Date: 01/24/2019

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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:

Describe 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:

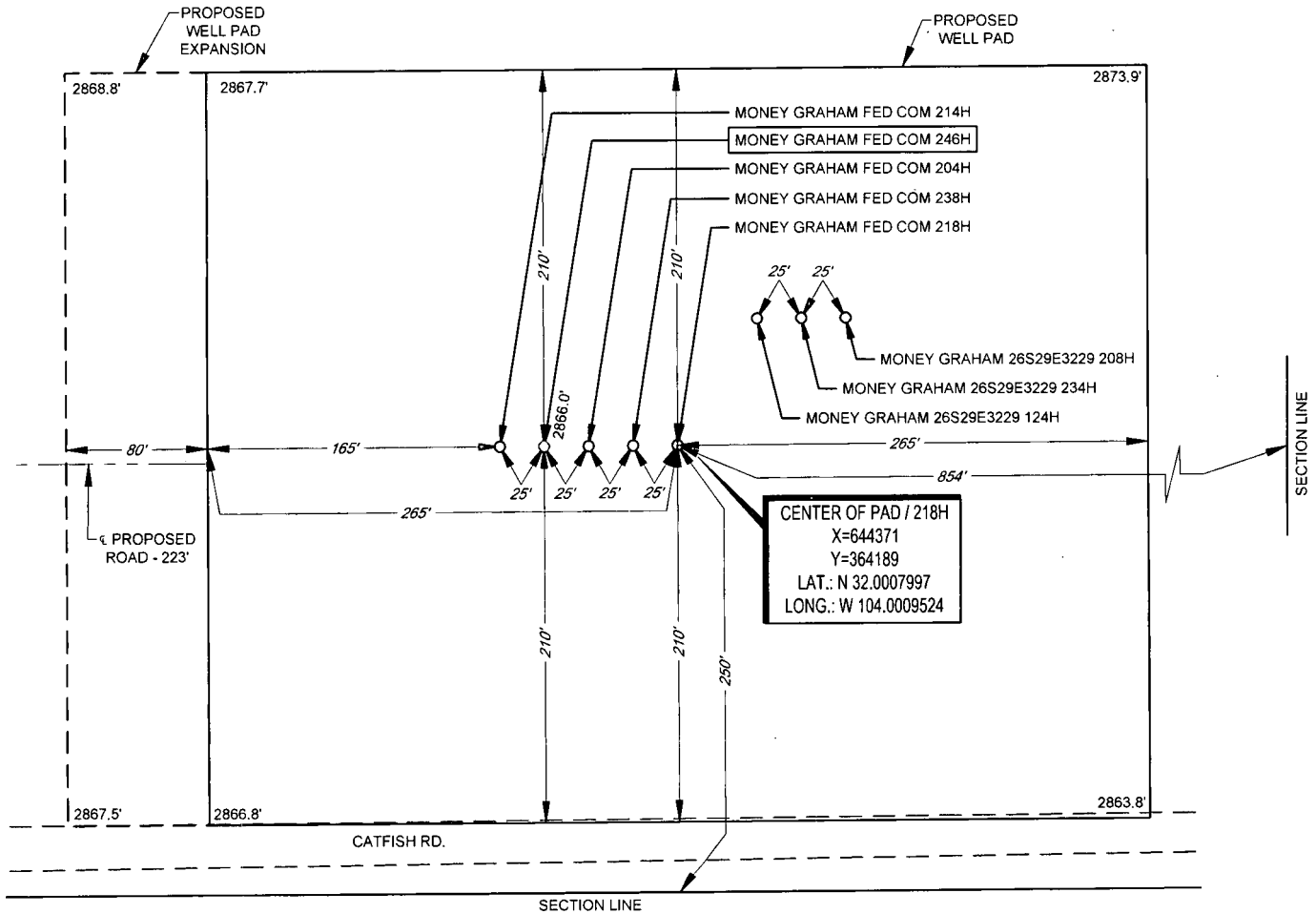
Leak detection system attachment:

EXHIBIT 2B



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 246H
246H LATITUDE N 32.0007994 246H LONGITUDE W 104.0011943
CENTER OF PAD IS 250' FSL & 854' FEL

SCALE: 1" = 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.

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 Operating Money Graham Fed Com 246H

Fee Fee Fed – SUPO not required

Tap Rock Operating Money Graham Fed Com 246H

Fee Fee Fed – SUPO not required

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

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: 246H

Wellpad long term disturbance (acres): 0

Access road long term disturbance (acres): 0

Pipeline long term disturbance (acres): 0

Other long term disturbance (acres): 0

Total long term disturbance: 0

Wellpad short term disturbance (acres): 0

Access road short term disturbance (acres): 0

Pipeline short term disturbance (acres): 0

Other short term disturbance (acres): 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: 246H

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_246H_Well_Site_Layout_20190430150534.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: 246H

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: 246H

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, STIMULATION,
SURFACE CASING

Describe type: Fee Fee Fed - No SUPO required

Source latitude:

Source datum:

Water source permit type: OTHER

Source land ownership: OTHER

Water source transport method: TRUCKING

Source transportation land ownership: OTHER

Water source volume (barrels): 0

Source volume (gal): 0

Water source type: OTHER

Source longitude:

Describe land ownership: Fee Fee Fed - No SUPO required

Describe transportation land ownership: Fee Fee Fed - No SUPO required

Source volume (acre-feet): 0

Water source and transportation map:

Money_246H_Fee_Fee_Fed_20190118130029.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.):



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

SUPO Data Report

08/12/2019

APD ID: 10400038225

Submission Date: 01/24/2019

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: MONEY GRAHAM FED COM

Well Number: 246H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Money_246H_Fee_Fee_Fed_20190118125920.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:

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.

**Tap Rock Operating, LLC
MONEY GRAHAM FED COM #246H
SHL 250' FSL & 929' FEL, Sec. 32
BHL 200' FNL & 1170' FEL, Sec. 29
T. 26S., R. 29E., Eddy County, NM**

DRILL PLAN PAGE 4

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 H₂S from the surface to the Wolfcamp formations to meet the BLM's minimum requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H₂S safety package on all wells, attached is an "H₂S 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: 6,500 psi

Estimated BHT: 150°

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.

Tap Rock Operating, LLC
MONEY GRAHAM FED COM #246H
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BHL 200' FNL & 1170' FEL, Sec. 29
T. 26S., R. 29E., Eddy County, NM

DRILL PLAN PAGE 3

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	355	2.35	834	11.5	TXI + fluid loss + dispersant + retarder + LCM
	Tail	197	1.39	274	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 = 8872'		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 - 10070	9.0	30-32	NC
Production	6.75"	OBM	10070 - 18210	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.

Tap Rock Operating, LLC
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T. 26S., R. 29E., Eddy County, NM

DRILL PLAN PAGE 2

BOP Test procedure will be as follows:

After surface casing is set and the BOP is nipped 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 - 2897	9.625" inter. 1	40.0	J-55	BTC	1.13	1.15	1.51
8.75"	0 - 2700	0 - 2698	7.625" inter. 2 top	29.7	P-110	BTC	1.13	1.15	1.51
8.75"	2700 - 10070	2698 - 10060	7.625" inter. 2 bottom	29.7	P-110	W-513	1.13	1.15	1.51
6.75"	0 - 9870	0 - 9860	5.5" product. top	20.0	P-110	BTC	1.13	1.15	1.51
6.75"	9870 - 18210	9860 - 10810	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.

Tap Rock Operating, LLC
MONEY GRAHAM FED COM #246H
SHL 250' FSL & 929' FEL, Sec. 32
BHL 200' FNL & 1170' FEL, Sec. 29
T. 26S., R. 29E., Eddy County, NM

DRILL PLAN PAGE 1

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	2,394	2,392	salt
Bell Canyon	2,849	2,847	hydrocarbons
Brushy Canyon	4,843	4,837	hydrocarbons
Bone Spring Lime	6,436	6,427	hydrocarbons
1 st Bone Spring Sand	7,361	7,352	hydrocarbons
2 nd Bone Spring Sand	7,941	7,932	hydrocarbons
3 rd Bone Spring Sand	9,173	9,164	hydrocarbons
3 rd Bone Spring W Sand	9,431	9,421	hydrocarbons
Wolfcamp A	9,521	9,511	hydrocarbons
Wolfcamp A Y Sand	9,631	9,621	hydrocarbons
Wolfcamp A Fat	9,761	9,751	hydrocarbons
Wolfcamp B	10,021	10,011	hydrocarbons
(KOP	10,207	10,197	hydrocarbons)
Wolfcamp B2 (Goal)	10,552	10,521	hydrocarbons
TD	18,210	10,810	--

2. NOTABLE ZONES

Wolfcamp B2 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.

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	1st Band: White
		Type	Casing	1st Band: -	2nd Band: -
				2nd Band: -	3rd Band: -
				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	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
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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

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%	▼	Clear Filters
		Drift	API Standard	▼	Compare
Wall Thickness	0.361 in	Type	Casing	▼	Request Info
Grade	<u>P110</u>	Connection OD Option	REGULAR	▼	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 x 1000 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
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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	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
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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

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	1st Band: White
		Type	Casing	1st Band: -	2nd Band: -
				2nd Band: -	3rd Band: -
				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	7.625 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
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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



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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
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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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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
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PERFORMANCE

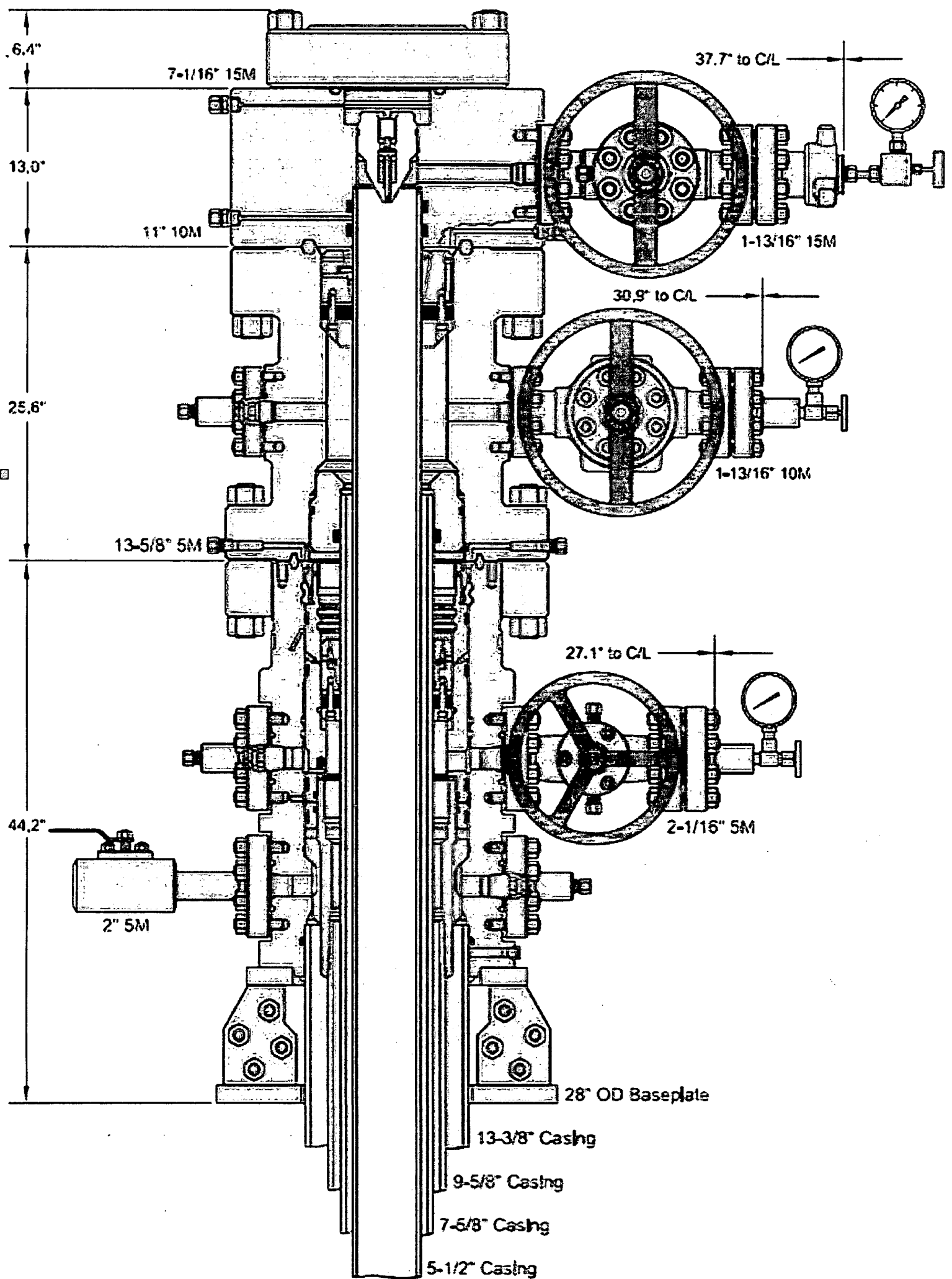
Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Joint Strength	909,000 lbs	Internal Pressure Resistance	2,730 psi		

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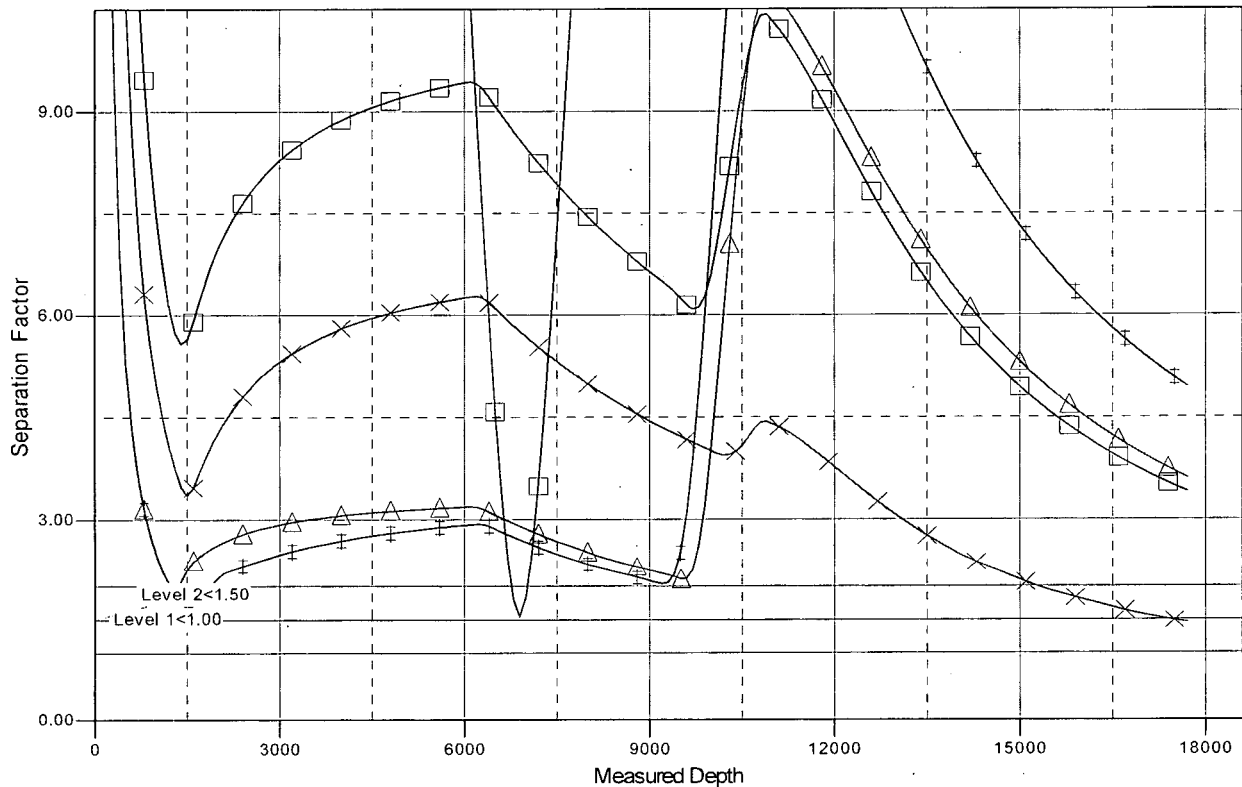
Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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 -104.3333334

Coordinates are relative to: Money Graham Fed Com Well No. 238 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. 218 H, Original Hole, rev0 V0
Money Graham Fed Com Well No. 214 H, Original Hole, rev0 V0
Sidewinder #1H, Original Hole, Surveys Original Hole V0



Anticollision Report

30-015-46222

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

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		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,000.00	4,995.78	10,652.01	6,903.39	26.39	149.04	-151.69	89.05	119.52	1,907.24	1,844.55	62.69	30.422		
5,100.00	5,095.66	10,654.76	6,903.37	26.93	149.14	-151.19	88.91	122.27	1,808.67	1,745.30	63.37	28.541		
5,200.00	5,195.53	10,657.42	6,903.35	27.48	149.23	-150.70	88.78	124.92	1,710.27	1,646.15	64.12	26.674		
5,300.00	5,295.41	10,659.99	6,903.32	28.03	149.32	-150.23	88.66	127.49	1,612.06	1,547.10	64.95	24.818		
5,400.00	5,395.29	10,662.48	6,903.30	28.57	149.41	-149.78	88.53	129.97	1,514.08	1,448.18	65.90	22.977		
5,500.00	5,495.17	10,664.88	6,903.28	29.12	149.50	-149.34	88.42	132.38	1,416.38	1,349.41	66.97	21.149		
5,600.00	5,595.05	10,667.21	6,903.26	29.67	149.58	-148.92	88.30	134.70	1,319.02	1,250.80	68.21	19.336		
5,700.00	5,694.93	10,669.47	6,903.24	30.22	149.66	-148.50	88.19	136.96	1,222.08	1,152.41	69.67	17.541		
5,800.00	5,794.81	10,671.66	6,903.21	30.77	149.74	-148.10	88.09	139.14	1,125.68	1,054.27	71.41	15.764		
5,900.00	5,894.68	10,673.78	6,903.19	31.32	149.82	-147.71	87.98	141.26	1,029.96	956.44	73.52	14.010		
6,000.00	5,994.56	10,675.84	6,903.17	31.86	149.89	-147.33	87.88	143.32	935.13	859.00	76.13	12.284		
6,100.00	6,094.44	10,677.83	6,903.15	32.41	149.96	-146.97	87.78	145.31	841.49	762.07	79.42	10.595		
6,200.00	6,194.32	10,679.78	6,903.13	32.96	150.03	-146.61	87.69	147.25	749.50	665.80	83.70	8.955		
6,300.00	6,294.24	10,681.10	6,903.11	33.51	150.08	-144.94	87.62	148.57	659.49	570.22	89.27	7.387		
6,400.00	6,394.22	10,680.78	6,903.11	34.02	150.07	-143.38	87.64	148.25	571.69	475.18	96.52	5.923		
6,500.00	6,494.22	10,679.58	6,903.13	34.52	150.02	3.68	87.70	147.05	487.91	381.42	106.49	4.582		
6,600.00	6,594.22	10,678.40	6,903.14	35.02	149.98	3.45	87.76	145.88	411.43	290.40	121.03	3.400		
6,700.00	6,694.22	10,677.26	6,903.15	35.52	149.94	3.22	87.81	144.74	347.12	204.82	142.30	2.439		
6,800.00	6,794.22	10,676.15	6,903.17	36.03	149.90	3.00	87.87	143.63	302.82	132.88	169.95	1.782 Level 3<2.00		
6,893.96	6,888.18	10,675.13	6,903.18	36.50	149.86	2.80	87.92	142.61	287.88	101.98	185.90	1.549 Level 3<2.00, CC, ES, SF		
6,900.00	6,894.22	10,675.07	6,903.18	36.53	149.86	2.79	87.92	142.55	287.94	102.13	185.82	1.550 Level 3<2.00		
7,000.00	6,994.22	10,674.01	6,903.19	37.03	149.82	2.58	87.97	141.50	306.79	139.98	166.81	1.839 Level 3<2.00		
7,100.00	7,094.22	10,672.99	6,903.20	37.54	149.79	2.37	88.02	140.47	354.01	213.91	140.10	2.527		
7,200.00	7,194.22	10,671.99	6,903.21	38.04	149.75	2.17	88.07	139.47	420.15	299.76	120.39	3.490		
7,300.00	7,294.22	10,671.01	6,903.22	38.55	149.72	1.98	88.12	138.50	497.72	390.54	107.19	4.643		
7,400.00	7,394.22	10,670.06	6,903.23	39.06	149.68	1.79	88.16	137.54	582.18	483.86	98.32	5.921		
7,500.00	7,494.22	10,669.13	6,903.24	39.56	149.65	1.61	88.21	136.62	670.91	578.70	92.21	7.276		
7,600.00	7,594.22	10,668.22	6,903.25	40.07	149.62	1.42	88.25	135.71	762.44	674.55	87.90	8.674		
7,700.00	7,694.22	10,667.34	6,903.26	40.58	149.59	1.25	88.30	134.83	855.87	771.08	84.79	10.094		
7,800.00	7,794.22	10,666.47	6,903.26	41.09	149.55	1.08	88.34	133.96	950.64	868.13	82.50	11.522		
7,900.00	7,894.22	10,665.63	6,903.27	41.60	149.52	0.91	88.38	133.12	1,046.37	965.57	80.81	12.949		
8,000.00	7,994.22	10,664.80	6,903.28	42.12	149.49	0.75	88.42	132.30	1,142.84	1,063.30	79.54	14.368		
8,100.00	8,094.22	10,664.00	6,903.29	42.63	149.47	0.59	88.46	131.49	1,239.87	1,161.27	78.59	15.775		
8,200.00	8,194.22	10,663.21	6,903.30	43.14	149.44	0.43	88.50	130.70	1,337.33	1,259.44	77.89	17.169		
8,300.00	8,294.22	10,662.44	6,903.30	43.65	149.41	0.28	88.54	129.94	1,435.15	1,357.77	77.38	18.547		
8,400.00	8,394.22	10,661.68	6,903.31	44.17	149.38	0.13	88.57	129.18	1,533.24	1,456.23	77.02	19.908		
8,500.00	8,494.22	10,660.95	6,903.32	44.68	149.36	-0.02	88.61	128.45	1,631.57	1,554.79	76.77	21.252		
8,600.00	8,594.22	10,660.23	6,903.32	45.20	149.33	-0.16	88.64	127.73	1,730.08	1,653.46	76.63	22.578		
8,700.00	8,694.22	10,659.52	6,903.33	45.71	149.31	-0.30	88.68	127.02	1,828.76	1,752.20	76.56	23.886		
8,800.00	8,794.22	10,658.83	6,903.33	46.23	149.28	-0.44	88.71	126.33	1,927.58	1,851.01	76.56	25.177		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

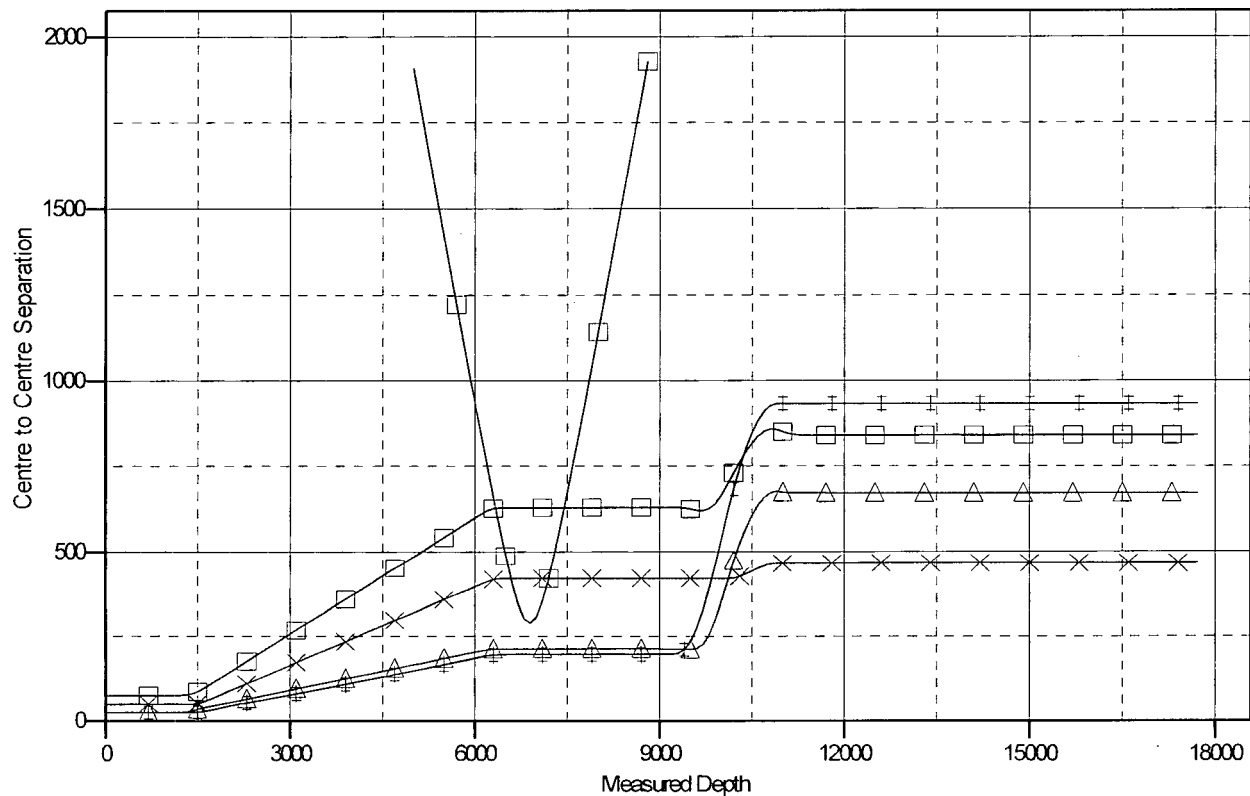
Central Meridian is -104.33333334

Coordinates are relative to: Money Graham Fed Com Well No. 238 H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.18°

Ladder Plot



LEGEND

Money Graham Fed Com Well No. 246 H, Original Hole, rev0 V0
 Money Graham Fed Com Well No. 218 H, Original Hole, rev0 V0
 Money Graham Fed Com Well No. 214 H, Original Hole, rev0 V0



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

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
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
15,200.00	10,597.25	15,406.71	10,795.36	129.07	129.47	-115.23	-115.23	4,670.81	-248.10	464.83	235.32	229.51	2.025	
15,300.00	10,597.84	15,506.71	10,795.95	131.30	131.70	-115.23	-115.23	4,770.81	-247.21	464.84	231.65	233.19	1.993 Level 3<2.00	
15,400.00	10,598.43	15,606.71	10,796.54	133.55	133.94	-115.23	-115.23	4,870.80	-246.32	464.85	227.98	236.87	1.962 Level 3<2.00	
15,500.00	10,599.02	15,706.71	10,797.13	135.80	136.18	-115.23	-115.23	4,970.79	-245.43	464.87	224.31	240.56	1.932 Level 3<2.00	
15,600.00	10,599.60	15,806.71	10,797.72	138.07	138.43	-115.22	-115.22	5,070.79	-244.54	464.88	220.64	244.24	1.903 Level 3<2.00	
15,700.00	10,600.19	15,906.71	10,798.31	140.33	140.69	-115.22	-115.22	5,170.78	-243.65	464.89	216.97	247.92	1.875 Level 3<2.00	
15,800.00	10,600.78	16,006.71	10,798.89	142.61	142.96	-115.22	-115.22	5,270.78	-242.76	464.90	213.30	251.60	1.848 Level 3<2.00	
15,900.00	10,601.37	16,106.71	10,799.48	144.89	145.23	-115.22	-115.22	5,370.77	-241.87	464.91	209.63	255.27	1.821 Level 3<2.00	
16,000.00	10,601.95	16,206.71	10,800.07	147.18	147.51	-115.22	-115.22	5,470.77	-240.99	464.92	205.97	258.95	1.795 Level 3<2.00	
16,100.00	10,602.54	16,306.71	10,800.66	149.47	149.80	-115.22	-115.22	5,570.76	-240.10	464.93	202.32	262.61	1.770 Level 3<2.00	
16,200.00	10,603.13	16,406.71	10,801.25	151.77	152.09	-115.22	-115.22	5,670.75	-239.21	464.94	198.67	266.28	1.746 Level 3<2.00	
16,300.00	10,603.72	16,506.71	10,801.84	154.08	154.39	-115.22	-115.22	5,770.75	-238.32	464.95	195.02	269.93	1.722 Level 3<2.00	
16,400.00	10,604.30	16,606.71	10,802.43	156.39	156.69	-115.22	-115.22	5,870.74	-237.43	464.96	191.38	273.58	1.700 Level 3<2.00	
16,500.00	10,604.89	16,706.71	10,803.02	158.70	159.00	-115.22	-115.22	5,970.74	-236.54	464.97	187.75	277.22	1.677 Level 3<2.00	
16,600.00	10,605.48	16,806.71	10,803.61	161.02	161.31	-115.22	-115.22	6,070.73	-235.65	464.98	184.12	280.86	1.656 Level 3<2.00	
16,700.00	10,606.07	16,906.71	10,804.20	163.34	163.63	-115.22	-115.22	6,170.73	-234.76	464.99	180.51	284.49	1.635 Level 3<2.00	
16,800.00	10,606.65	17,006.71	10,804.79	165.67	165.95	-115.22	-115.22	6,270.72	-233.87	465.01	176.90	288.10	1.614 Level 3<2.00	
16,900.00	10,607.24	17,106.71	10,805.38	168.00	168.28	-115.22	-115.22	6,370.71	-232.98	465.02	173.30	291.71	1.594 Level 3<2.00	
17,000.00	10,607.83	17,206.71	10,805.97	170.34	170.61	-115.22	-115.22	6,470.71	-232.09	465.03	169.71	295.31	1.575 Level 3<2.00	
17,100.00	10,608.42	17,306.71	10,806.56	172.68	172.94	-115.22	-115.22	6,570.70	-231.20	465.04	166.13	298.90	1.556 Level 3<2.00	
17,200.00	10,609.00	17,406.71	10,807.15	175.02	175.28	-115.22	-115.22	6,670.70	-230.31	465.05	162.57	302.48	1.537 Level 3<2.00	
17,300.00	10,609.59	17,506.71	10,807.74	177.37	177.62	-115.22	-115.22	6,770.69	-229.42	465.06	159.01	306.05	1.520 Level 3<2.00	
17,400.00	10,610.18	17,606.71	10,808.32	179.72	179.97	-115.22	-115.22	6,870.69	-228.53	465.07	155.46	309.61	1.502 Level 3<2.00	
17,500.00	10,610.77	17,706.71	10,808.91	182.07	182.31	-115.22	-115.22	6,970.68	-227.64	465.08	151.93	313.15	1.485 Level 2<1.50	
17,600.00	10,611.35	17,806.71	10,809.50	184.43	184.67	-115.22	-115.22	7,070.67	-226.75	465.09	148.40	316.69	1.469 Level 2<1.50	
17,604.71	10,611.38	17,811.43	10,809.53	184.54	184.78	-115.22	-115.22	7,075.39	-226.71	465.09	148.24	316.85	1.468 Level 2<1.50	
17,700.00	10,611.94	17,891.06	10,810.00	186.79	186.65	-115.22	-115.22	7,155.01	-226.00	465.37	146.15	319.22	1.458 Level 2<1.50, SF	
17,709.92	10,612.00	17,891.06	10,810.00	187.03	186.65	-115.22	-115.22	7,155.01	-226.00	465.81	147.23	318.57	1.462 Level 2<1.50	



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
10,200.00	10,190.47	10,200.64	10,190.47	53.43	53.89	-94.93	-201.37	-291.45	421.72	314.83	106.89	3.945		
10,300.00	10,281.34	10,304.22	10,293.59	53.85	54.42	-99.26	-193.18	-291.38	426.22	318.46	107.76	3.955		
10,400.00	10,363.63	10,416.10	10,401.33	54.22	54.93	-103.42	-163.72	-291.12	433.09	324.78	108.31	3.999		
10,500.00	10,434.84	10,536.99	10,508.91	54.58	55.40	-107.26	-109.06	-290.63	441.49	333.30	108.19	4.081		
10,600.00	10,492.81	10,667.58	10,609.52	54.94	55.79	-110.58	-26.10	-289.89	450.20	342.97	107.23	4.199		
10,700.00	10,535.78	10,807.94	10,693.60	55.34	56.16	-113.16	85.71	-288.90	457.79	352.07	105.72	4.330		
10,800.00	10,562.45	10,955.98	10,750.16	55.76	56.72	-114.77	222.08	-287.68	462.85	358.32	104.53	4.428		
10,900.00	10,571.99	11,108.23	10,770.01	56.20	57.37	-115.24	372.57	-286.34	464.37	359.66	104.71	4.435		
10,981.97	10,572.59	11,188.69	10,770.50	56.62	57.78	-115.23	453.02	-285.63	464.33	358.90	105.43	4.404		
11,000.00	10,572.58	11,206.71	10,770.60	56.71	57.87	-115.24	471.05	-285.47	464.38	358.80	105.59	4.398		
11,100.00	10,573.16	11,306.71	10,771.19	57.32	58.47	-115.24	571.04	-284.58	464.39	357.75	106.64	4.355		
11,200.00	10,573.75	11,406.71	10,771.78	58.04	59.17	-115.24	671.04	-283.69	464.40	356.52	107.88	4.305		
11,300.00	10,574.34	11,506.71	10,772.37	58.84	59.96	-115.24	771.03	-282.80	464.42	355.13	109.29	4.249		
11,400.00	10,574.93	11,606.71	10,772.96	59.74	60.83	-115.24	871.03	-281.91	464.43	353.58	110.85	4.190		
11,500.00	10,575.51	11,706.71	10,773.55	60.72	61.80	-115.24	971.02	-281.02	464.44	351.87	112.57	4.126		
11,600.00	10,576.10	11,806.71	10,774.14	61.79	62.85	-115.24	1,071.02	-280.13	464.45	350.01	114.44	4.058		
11,700.00	10,576.69	11,906.71	10,774.73	62.94	63.96	-115.24	1,171.01	-279.24	464.46	348.02	116.44	3.989		
11,800.00	10,577.28	12,006.71	10,775.32	64.16	65.17	-115.24	1,271.00	-278.35	464.47	345.89	118.58	3.917		
11,900.00	10,577.86	12,106.71	10,775.91	65.45	66.43	-115.24	1,371.00	-277.46	464.48	343.64	120.84	3.844		
12,000.00	10,578.45	12,206.71	10,776.50	66.80	67.76	-115.24	1,470.99	-276.57	464.49	341.28	123.21	3.770		
12,100.00	10,579.04	12,306.71	10,777.09	68.22	69.16	-115.24	1,570.99	-275.68	464.50	338.80	125.70	3.695		
12,200.00	10,579.63	12,406.71	10,777.68	69.70	70.62	-115.24	1,670.98	-274.79	464.51	336.23	128.28	3.621		
12,300.00	10,580.22	12,506.71	10,778.27	71.24	72.12	-115.24	1,770.98	-273.90	464.52	333.56	130.96	3.547		
12,400.00	10,580.80	12,606.71	10,778.86	72.82	73.69	-115.24	1,870.97	-273.01	464.53	330.80	133.73	3.474		
12,500.00	10,581.39	12,706.71	10,779.44	74.46	75.29	-115.24	1,970.96	-272.12	464.54	327.96	136.58	3.401		
12,600.00	10,581.98	12,806.71	10,780.03	76.13	76.95	-115.24	2,070.96	-271.23	464.55	325.05	139.51	3.330		
12,700.00	10,582.57	12,906.71	10,780.62	77.86	78.85	-115.24	2,170.95	-270.34	464.57	322.06	142.50	3.260		
12,800.00	10,583.15	13,006.71	10,781.21	79.62	80.39	-115.24	2,270.95	-269.45	464.58	319.01	145.57	3.191		
12,900.00	10,583.74	13,106.71	10,781.80	81.41	82.16	-115.23	2,370.94	-268.56	464.59	315.90	148.69	3.125		
13,000.00	10,584.33	13,206.71	10,782.39	83.25	83.98	-115.23	2,470.94	-267.67	464.60	312.73	151.87	3.059		
13,100.00	10,584.92	13,306.71	10,782.98	85.11	85.82	-115.23	2,570.93	-266.79	464.61	309.51	155.10	2.996		
13,200.00	10,585.50	13,406.71	10,783.57	87.01	87.70	-115.23	2,670.93	-265.90	464.62	306.24	158.38	2.934		
13,300.00	10,586.09	13,506.71	10,784.16	88.93	89.60	-115.23	2,770.92	-265.01	464.63	302.93	161.70	2.873		
13,400.00	10,586.68	13,606.71	10,784.75	90.88	91.53	-115.23	2,870.91	-264.12	464.64	299.58	165.06	2.815		
13,500.00	10,587.27	13,706.71	10,785.34	92.85	93.49	-115.23	2,970.91	-263.23	464.65	296.19	168.46	2.758		
13,600.00	10,587.85	13,806.71	10,785.93	94.85	95.47	-115.23	3,070.90	-262.34	464.66	292.77	171.89	2.703		
13,700.00	10,588.44	13,906.71	10,786.52	96.87	97.47	-115.23	3,170.90	-261.45	464.67	289.32	175.35	2.650		
13,800.00	10,589.03	14,006.71	10,787.11	98.91	99.50	-115.23	3,270.89	-260.56	464.68	285.84	178.85	2.598		
13,900.00	10,589.62	14,106.71	10,787.70	100.97	101.54	-115.23	3,370.89	-259.67	464.69	282.33	182.36	2.548		
14,000.00	10,590.20	14,206.71	10,788.29	103.05	103.60	-115.23	3,470.88	-258.78	464.70	278.80	185.90	2.500		
14,100.00	10,590.79	14,306.71	10,788.87	105.14	105.68	-115.23	3,570.87	-257.89	464.72	275.25	189.47	2.453		
14,200.00	10,591.38	14,406.71	10,789.46	107.25	107.78	-115.23	3,670.87	-257.00	464.73	271.68	193.05	2.407		
14,300.00	10,591.97	14,506.71	10,790.05	109.38	109.89	-115.23	3,770.86	-256.11	464.74	268.09	196.64	2.363		
14,400.00	10,592.55	14,606.71	10,790.64	111.52	112.02	-115.23	3,870.86	-255.22	464.75	264.49	200.26	2.321		
14,500.00	10,593.14	14,706.71	10,791.23	113.67	114.16	-115.23	3,970.85	-254.33	464.76	260.88	203.88	2.280		
14,600.00	10,593.73	14,806.71	10,791.82	115.84	116.31	-115.23	4,070.85	-253.44	464.77	257.25	207.52	2.240		
14,700.00	10,594.32	14,906.71	10,792.41	118.02	118.48	-115.23	4,170.84	-252.55	464.78	253.61	211.17	2.201		
14,800.00	10,594.90	15,006.71	10,793.00	120.21	120.66	-115.23	4,270.83	-251.66	464.79	249.97	214.82	2.164		
14,900.00	10,595.49	15,106.71	10,793.59	122.41	122.84	-115.23	4,370.83	-250.77	464.80	246.31	218.49	2.127		
15,000.00	10,596.08	15,206.71	10,794.18	124.62	125.04	-115.23	4,470.82	-249.88	464.81	242.66	222.16	2.092		
15,100.00	10,596.67	15,306.71	10,794.77	126.84	127.25	-115.23	4,570.82	-248.99	464.82	238.99	225.83	2.058		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	5,095.66	5,086.63	5,078.97	26.93	27.18	122.36	-150.94	-230.68	327.33	273.67	53.66	6.100		
5,200.00	5,195.53	5,186.33	5,178.45	27.48	27.74	122.36	-155.14	-235.74	335.07	280.32	54.75	6.120		
5,300.00	5,295.41	5,286.03	5,277.93	28.03	28.29	122.35	-159.34	-240.80	342.81	286.97	55.84	6.139		
5,400.00	5,395.29	5,385.73	5,377.42	28.57	28.85	122.35	-163.54	-245.86	350.54	293.61	56.93	6.158		
5,500.00	5,495.17	5,485.43	5,476.90	29.12	29.40	122.35	-167.73	-250.92	358.28	300.26	58.02	6.175		
5,600.00	5,595.05	5,585.13	5,576.38	29.67	29.96	122.34	-171.93	-255.98	366.02	306.91	59.11	6.192		
5,700.00	5,694.93	5,684.83	5,675.87	30.22	30.52	122.34	-176.13	-261.04	373.76	313.56	60.20	6.209		
5,800.00	5,794.81	5,784.53	5,775.35	30.77	31.07	122.34	-180.33	-266.10	381.49	320.21	61.29	6.224		
5,900.00	5,894.68	5,884.23	5,874.83	31.32	31.63	122.34	-184.53	-271.15	389.23	326.85	62.38	6.240		
6,000.00	5,994.56	5,983.93	5,974.32	31.86	32.19	122.34	-188.73	-276.21	396.97	333.50	63.47	6.254		
6,100.00	6,094.44	6,083.63	6,073.80	32.41	32.74	122.33	-192.92	-281.27	404.71	340.15	64.56	6.268		
6,200.00	6,194.32	6,185.63	6,175.58	32.96	33.31	122.34	-197.16	-286.37	412.38	346.70	65.68	6.279		
6,300.00	6,294.24	6,284.62	6,274.47	33.51	33.91	122.48	-200.25	-290.11	417.98	351.13	66.85	6.253		
6,400.00	6,394.22	6,403.86	6,393.69	34.02	34.49	122.54	-201.37	-291.45	420.00	352.05	67.95	6.181		
6,500.00	6,494.22	6,504.40	6,494.22	34.52	34.99	-90.24	-201.37	-291.45	420.00	351.05	68.96	6.091		
6,600.00	6,594.22	6,604.40	6,594.22	35.02	35.49	-90.24	-201.37	-291.45	420.00	350.04	69.96	6.003		
6,700.00	6,694.22	6,704.40	6,694.22	35.52	35.98	-90.24	-201.37	-291.45	420.00	349.04	70.96	5.918		
6,800.00	6,794.22	6,804.40	6,794.22	36.03	36.48	-90.24	-201.37	-291.45	420.00	348.03	71.97	5.836		
6,900.00	6,894.22	6,904.40	6,894.22	36.53	36.99	-90.24	-201.37	-291.45	420.00	347.02	72.98	5.755		
7,000.00	6,994.22	7,004.40	6,994.22	37.03	37.49	-90.24	-201.37	-291.45	420.00	346.01	73.99	5.676		
7,100.00	7,094.22	7,104.40	7,094.22	37.54	37.99	-90.24	-201.37	-291.45	420.00	345.00	75.00	5.600		
7,200.00	7,194.22	7,204.40	7,194.22	38.04	38.49	-90.24	-201.37	-291.45	420.00	343.99	76.02	5.525		
7,300.00	7,294.22	7,304.40	7,294.22	38.55	39.00	-90.24	-201.37	-291.45	420.00	342.97	77.03	5.452		
7,400.00	7,394.22	7,404.40	7,394.22	39.06	39.50	-90.24	-201.37	-291.45	420.00	341.95	78.05	5.381		
7,500.00	7,494.22	7,504.40	7,494.22	39.56	40.01	-90.24	-201.37	-291.45	420.00	340.94	79.07	5.312		
7,600.00	7,594.22	7,604.40	7,594.22	40.07	40.52	-90.24	-201.37	-291.45	420.00	339.92	80.09	5.244		
7,700.00	7,694.22	7,704.40	7,694.22	40.58	41.03	-90.24	-201.37	-291.45	420.00	338.89	81.11	5.178		
7,800.00	7,794.22	7,804.40	7,794.22	41.09	41.53	-90.24	-201.37	-291.45	420.00	337.87	82.13	5.114		
7,900.00	7,894.22	7,904.40	7,894.22	41.60	42.04	-90.24	-201.37	-291.45	420.00	336.85	83.16	5.051		
8,000.00	7,994.22	8,004.40	7,994.22	42.12	42.55	-90.24	-201.37	-291.45	420.00	335.82	84.18	4.989		
8,100.00	8,094.22	8,104.40	8,094.22	42.63	43.06	-90.24	-201.37	-291.45	420.00	334.79	85.21	4.929		
8,200.00	8,194.22	8,204.40	8,194.22	43.14	43.58	-90.24	-201.37	-291.45	420.00	333.76	86.24	4.870		
8,300.00	8,294.22	8,304.40	8,294.22	43.65	44.09	-90.24	-201.37	-291.45	420.00	332.74	87.27	4.813		
8,400.00	8,394.22	8,404.40	8,394.22	44.17	44.60	-90.24	-201.37	-291.45	420.00	331.71	88.30	4.757		
8,500.00	8,494.22	8,504.40	8,494.22	44.68	45.11	-90.24	-201.37	-291.45	420.00	330.67	89.33	4.702		
8,600.00	8,594.22	8,604.40	8,594.22	45.20	45.63	-90.24	-201.37	-291.45	420.00	329.64	90.36	4.648		
8,700.00	8,694.22	8,704.40	8,694.22	45.71	46.14	-90.24	-201.37	-291.45	420.00	328.61	91.40	4.595		
8,800.00	8,794.22	8,804.40	8,794.22	46.23	46.66	-90.24	-201.37	-291.45	420.00	327.57	92.43	4.544		
8,900.00	8,894.22	8,904.40	8,894.22	46.75	47.17	-90.24	-201.37	-291.45	420.00	326.54	93.47	4.494		
9,000.00	8,994.22	9,004.40	8,994.22	47.26	47.69	-90.24	-201.37	-291.45	420.00	325.50	94.50	4.444		
9,100.00	9,094.22	9,104.40	9,094.22	47.78	48.21	-90.24	-201.37	-291.45	420.00	324.46	95.54	4.396		
9,200.00	9,194.22	9,204.40	9,194.22	48.30	48.72	-90.24	-201.37	-291.45	420.00	323.43	96.58	4.349		
9,300.00	9,294.22	9,304.40	9,294.22	48.82	49.24	-90.24	-201.37	-291.45	420.00	322.39	97.62	4.303		
9,400.00	9,394.22	9,404.40	9,394.22	49.34	49.76	-90.24	-201.37	-291.45	420.00	321.35	98.66	4.257		
9,500.00	9,494.22	9,504.40	9,494.22	49.86	50.28	-90.24	-201.37	-291.45	420.00	320.31	99.70	4.213		
9,600.00	9,594.22	9,604.40	9,594.22	50.38	50.79	-90.24	-201.37	-291.45	420.00	319.27	100.74	4.169		
9,700.00	9,694.22	9,704.40	9,694.22	50.90	51.31	-90.24	-201.37	-291.45	420.00	318.23	101.78	4.127		
9,800.00	9,794.22	9,804.40	9,794.22	51.42	51.83	-90.24	-201.37	-291.45	420.00	317.18	102.82	4.085		
9,900.00	9,894.22	9,904.40	9,894.22	51.94	52.35	-90.24	-201.37	-291.45	420.00	316.14	103.86	4.044		
10,000.00	9,994.22	10,004.40	9,994.22	52.46	52.87	-90.24	-201.37	-291.45	420.00	315.10	104.91	4.004		
10,100.00	10,093.79	10,103.96	10,093.79	52.97	53.39	-91.80	-201.37	-291.45	420.18	314.25	105.93	3.967		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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													Offset Site Error:	0.00 ft
Section 32-T26S-R29E - Money Graham Fed Com Well No. 246 H - Original Hole - rev0													Offset Well Error:	0.00 ft
Survey Program: 0-MWD														
Reference				Offset			Semi Major Axis			Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-91.15	-1.00	-50.00	50.01					
100.00	100.00	100.00	100.00	0.20	0.20	-91.15	-1.00	-50.00	50.01	49.61	0.40	125.684		
200.00	200.00	200.00	200.00	0.74	0.74	-91.15	-1.00	-50.00	50.01	48.54	1.47	33.944		
300.00	300.00	300.00	300.00	1.27	1.27	-91.15	-1.00	-50.00	50.01	47.46	2.55	19.622		
400.00	400.00	400.00	400.00	1.81	1.81	-91.15	-1.00	-50.00	50.01	46.39	3.62	13.799		
500.00	500.00	500.00	500.00	2.35	2.35	-91.15	-1.00	-50.00	50.01	45.31	4.70	10.641		
600.00	600.00	600.00	600.00	2.89	2.89	-91.15	-1.00	-50.00	50.01	44.24	5.77	8.660		
700.00	700.00	700.00	700.00	3.43	3.43	-91.15	-1.00	-50.00	50.01	43.16	6.85	7.300		
800.00	800.00	800.00	800.00	3.96	3.96	-91.15	-1.00	-50.00	50.01	42.08	7.93	6.310		
900.00	900.00	900.00	900.00	4.50	4.50	-91.15	-1.00	-50.00	50.01	41.01	9.00	5.556		
1,000.00	1,000.00	1,000.00	1,000.00	5.04	5.04	-91.15	-1.00	-50.00	50.01	39.93	10.08	4.963		
1,100.00	1,100.00	1,100.00	1,100.00	5.58	5.58	-91.15	-1.00	-50.00	50.01	38.86	11.15	4.484		
1,200.00	1,200.00	1,200.00	1,200.00	6.11	6.11	-91.15	-1.00	-50.00	50.01	37.78	12.23	4.090		
1,300.00	1,300.00	1,300.00	1,300.00	6.65	6.65	-91.15	-1.00	-50.00	50.01	36.71	13.30	3.759		
1,400.00	1,400.00	1,400.00	1,400.00	7.19	7.19	-91.15	-1.00	-50.00	50.01	35.63	14.38	3.478 CC, ES		
1,500.00	1,499.99	1,498.96	1,498.95	7.70	7.70	121.95	-1.82	-50.99	51.71	36.31	15.40	3.358		
1,600.00	1,599.91	1,597.74	1,597.65	8.20	8.19	122.77	-4.27	-53.94	56.81	40.43	16.37	3.469		
1,700.00	1,699.79	1,703.18	1,696.54	8.70	8.73	122.93	-8.19	-58.67	64.25	46.85	17.39	3.694		
1,800.00	1,799.67	1,803.48	1,796.02	9.20	9.24	122.85	-12.39	-63.73	71.98	53.58	18.41	3.911		
1,900.00	1,899.54	1,903.78	1,895.51	9.71	9.76	122.79	-16.59	-68.79	79.72	60.29	19.43	4.103		
2,000.00	1,999.42	2,004.08	1,994.99	10.23	10.28	122.74	-20.79	-73.85	87.46	67.00	20.46	4.275		
2,100.00	2,099.30	2,104.38	2,094.47	10.75	10.81	122.70	-24.99	-78.91	95.20	73.70	21.50	4.428		
2,200.00	2,199.18	2,204.68	2,193.96	11.27	11.34	122.66	-29.19	-83.96	102.93	80.39	22.54	4.567		
2,300.00	2,299.06	2,304.98	2,293.44	11.79	11.88	122.63	-33.38	-89.02	110.67	87.08	23.59	4.692		
2,400.00	2,398.94	2,405.28	2,392.92	12.32	12.42	122.60	-37.58	-94.08	118.41	93.77	24.64	4.805		
2,500.00	2,498.82	2,505.58	2,492.40	12.85	12.95	122.58	-41.78	-99.14	126.15	100.45	25.70	4.908		
2,600.00	2,598.69	2,605.88	2,591.89	13.38	13.50	122.56	-45.98	-104.20	133.88	107.12	26.76	5.003		
2,700.00	2,698.57	2,693.82	2,691.37	13.91	13.97	122.54	-50.18	-109.26	141.62	113.86	27.76	5.102		
2,800.00	2,798.45	2,806.48	2,790.85	14.45	14.58	122.53	-54.38	-114.32	149.36	120.47	28.89	5.170		
2,900.00	2,898.33	2,906.78	2,890.34	14.98	15.13	122.51	-58.58	-119.38	157.10	127.14	29.96	5.244		
3,000.00	2,998.21	3,007.08	2,989.82	15.52	15.68	122.50	-62.77	-124.44	164.83	133.80	31.03	5.312		
3,100.00	3,098.09	3,107.38	3,089.30	16.06	16.23	122.48	-66.97	-129.50	172.57	140.47	32.11	5.375		
3,200.00	3,197.97	3,207.68	3,188.79	16.60	16.78	122.47	-71.17	-134.56	180.31	147.13	33.18	5.434		
3,300.00	3,297.84	3,307.98	3,288.27	17.13	17.33	122.46	-75.37	-139.62	188.05	153.79	34.26	5.489		
3,400.00	3,397.72	3,408.28	3,387.75	17.67	17.88	122.45	-79.57	-144.68	195.79	160.45	35.34	5.541		
3,500.00	3,497.60	3,508.58	3,487.24	18.22	18.43	122.44	-83.77	-149.73	203.52	167.11	36.42	5.589		
3,600.00	3,597.48	3,608.88	3,586.72	18.76	18.98	122.44	-87.96	-154.79	211.26	173.77	37.50	5.634		
3,700.00	3,697.36	3,709.18	3,686.20	19.30	19.54	122.43	-92.16	-159.85	219.00	180.42	38.58	5.677		
3,800.00	3,797.24	3,809.48	3,785.69	19.84	20.09	122.42	-96.36	-164.91	226.74	187.08	39.66	5.717		
3,900.00	3,897.11	3,909.78	3,885.17	20.39	20.65	122.41	-100.56	-169.97	234.48	193.73	40.75	5.755		
4,000.00	3,996.99	3,989.92	3,984.65	20.93	21.09	122.41	-104.76	-175.03	242.21	200.49	41.72	5.806		
4,100.00	4,096.87	4,089.62	4,084.14	21.47	21.64	122.40	-108.96	-180.09	249.95	207.15	42.80	5.840		
4,200.00	4,196.75	4,189.32	4,183.62	22.02	22.19	122.40	-113.15	-185.15	257.69	213.80	43.89	5.872		
4,300.00	4,296.63	4,289.02	4,283.10	22.56	22.75	122.39	-117.35	-190.21	265.43	220.46	44.97	5.902		
4,400.00	4,396.51	4,388.72	4,382.59	23.11	23.30	122.39	-121.55	-195.27	273.16	227.11	46.05	5.931		
4,500.00	4,496.39	4,488.42	4,482.07	23.65	23.85	122.38	-125.75	-200.33	280.90	233.76	47.14	5.959		
4,600.00	4,596.26	4,588.12	4,581.55	24.20	24.41	122.38	-129.95	-205.39	288.64	240.41	48.23	5.985		
4,700.00	4,696.14	4,687.82	4,681.03	24.75	24.96	122.37	-134.15	-210.44	296.38	247.07	49.31	6.010		
4,800.00	4,796.02	4,787.53	4,780.52	25.29	25.52	122.37	-138.35	-215.50	304.12	253.72	50.40	6.034		
4,900.00	4,895.90	4,887.23	4,880.00	25.84	26.07	122.37	-142.54	-220.56	311.85	260.37	51.49	6.057		
5,000.00	4,995.78	4,986.93	4,979.48	26.39	26.63	122.36	-146.74	-225.62	319.59	267.02	52.57	6.079		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

Section 32-T26S-R29E - Money Graham Fed Com Well No. 218 H - Original Hole - rev0													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
15,100.00	10,596.67	14,453.31	9,934.68	126.84	125.56	9.57	4,571.11	283.18	671.35	542.77	128.58	5.221		
15,200.00	10,597.25	14,553.31	9,935.26	129.07	127.81	9.57	4,671.10	284.09	671.35	540.65	130.70	5.137		
15,300.00	10,597.84	14,653.31	9,935.85	131.30	130.07	9.58	4,771.10	285.00	671.36	538.53	132.83	5.054		
15,400.00	10,598.43	14,753.31	9,936.44	133.55	132.34	9.58	4,871.09	285.92	671.36	536.40	134.96	4.974		
15,500.00	10,599.02	14,853.31	9,937.02	135.80	134.61	9.58	4,971.08	286.83	671.36	534.26	137.11	4.897		
15,600.00	10,599.60	14,953.31	9,937.61	138.07	136.90	9.58	5,071.08	287.74	671.36	532.11	139.26	4.821		
15,700.00	10,600.19	15,053.31	9,938.20	140.33	139.18	9.58	5,171.07	288.65	671.37	529.95	141.42	4.747		
15,800.00	10,600.78	15,153.31	9,938.78	142.61	141.48	9.58	5,271.07	289.56	671.37	527.79	143.58	4.676		
15,900.00	10,601.37	15,253.31	9,939.37	144.89	143.78	9.58	5,371.06	290.47	671.37	525.62	145.76	4.606		
16,000.00	10,601.95	15,353.31	9,939.95	147.18	146.08	9.58	5,471.05	291.38	671.38	523.44	147.93	4.538		
16,100.00	10,602.54	15,453.31	9,940.54	149.47	148.40	9.58	5,571.05	292.30	671.38	521.26	150.12	4.472		
16,200.00	10,603.13	15,553.31	9,941.13	151.77	150.71	9.58	5,671.04	293.21	671.38	519.07	152.31	4.408		
16,300.00	10,603.72	15,653.31	9,941.71	154.08	153.03	9.58	5,771.04	294.12	671.39	516.88	154.51	4.345		
16,400.00	10,604.30	15,753.31	9,942.30	156.39	155.36	9.59	5,871.03	295.03	671.39	514.68	156.71	4.284		
16,500.00	10,604.89	15,853.31	9,942.89	158.70	157.69	9.59	5,971.03	295.94	671.39	512.47	158.92	4.225		
16,600.00	10,605.48	15,953.31	9,943.47	161.02	160.02	9.59	6,071.02	296.85	671.39	510.27	161.13	4.167		
16,700.00	10,606.07	16,053.31	9,944.06	163.34	162.36	9.59	6,171.01	297.77	671.40	508.05	163.34	4.110		
16,800.00	10,606.65	16,153.31	9,944.65	165.67	164.71	9.59	6,271.01	298.68	671.40	505.83	165.57	4.055		
16,900.00	10,607.24	16,253.31	9,945.23	168.00	167.05	9.59	6,371.00	299.59	671.40	503.61	167.79	4.001		
17,000.00	10,607.83	16,353.31	9,945.82	170.34	169.40	9.59	6,471.00	300.50	671.41	501.39	170.02	3.949		
17,100.00	10,608.42	16,453.31	9,946.41	172.68	171.75	9.59	6,570.99	301.41	671.41	499.16	172.25	3.898		
17,200.00	10,609.00	16,553.31	9,946.99	175.02	174.11	9.59	6,670.98	302.32	671.41	496.92	174.49	3.848		
17,300.00	10,609.59	16,653.31	9,947.58	177.37	176.47	9.59	6,770.98	303.24	671.41	494.69	176.73	3.799		
17,400.00	10,610.18	16,753.31	9,948.16	179.72	178.83	9.59	6,870.97	304.15	671.42	492.45	178.97	3.752		
17,500.00	10,610.77	16,853.31	9,948.75	182.07	181.20	9.60	6,970.97	305.06	671.42	490.20	181.22	3.705		
17,600.00	10,611.35	16,953.31	9,949.34	184.43	183.57	9.60	7,070.96	305.97	671.42	487.95	183.47	3.660		
17,700.00	10,611.94	17,053.31	9,949.92	186.79	185.94	9.60	7,170.95	306.88	671.43	485.70	185.72	3.615		
17,709.92	10,612.00	17,063.23	9,949.98	187.03	186.17	9.60	7,180.88	306.97	671.43	485.48	185.95	3.611		



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

Section 32-T26S-R29E - Money Graham Fed Com Well No. 218 H - Original Hole - rev0													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,100.00	10,093.79	9,900.00	9,805.87	52.97	51.79	32.63	42.97	310.45	413.58	331.20	82.38	5.021	
10,200.00	10,190.47	9,939.83	9,827.61	53.43	51.87	26.50	76.07	306.33	471.28	393.27	78.01	6.041	
10,300.00	10,281.34	9,984.40	9,849.13	53.85	51.98	21.90	114.79	301.51	523.55	449.16	74.40	7.037	
10,400.00	10,363.63	10,029.45	9,867.74	54.22	52.12	18.59	155.49	296.44	589.16	498.03	71.14	8.001	
10,500.00	10,434.84	10,074.83	9,883.16	54.58	52.29	16.18	197.83	291.17	607.30	539.02	68.28	8.894	
10,600.00	10,492.81	10,120.45	9,895.22	54.94	52.48	14.41	241.48	285.73	637.38	571.46	65.92	9.669	
10,700.00	10,535.78	10,166.24	9,903.76	55.34	52.69	13.11	286.11	280.17	658.99	594.84	64.15	10.273	
10,800.00	10,562.45	10,212.14	9,908.70	55.76	52.90	12.18	331.38	274.53	671.84	608.78	63.06	10.654	
10,900.00	10,571.99	10,269.30	9,910.13	56.20	53.19	11.42	388.08	267.55	675.55	612.82	62.73	10.769	
11,000.00	10,572.58	10,364.40	9,910.69	56.71	53.74	10.56	482.70	258.09	673.46	610.60	62.86	10.713	
11,100.00	10,573.16	10,460.09	9,911.25	57.32	54.38	9.95	578.17	251.74	672.11	608.90	63.21	10.634	
11,200.00	10,573.75	10,556.16	9,911.82	58.04	55.11	9.62	674.18	248.57	671.39	607.64	63.75	10.531	
11,271.88	10,574.17	10,632.05	9,912.23	58.61	55.74	9.54	743.22	248.28	671.24	606.94	64.29	10.440	
11,300.00	10,574.34	10,653.31	9,912.39	58.84	55.94	9.54	771.33	248.54	671.24	606.75	64.49	10.409	
11,400.00	10,574.93	10,753.31	9,912.98	59.74	56.89	9.54	871.32	249.45	671.24	605.89	65.35	10.272	
11,500.00	10,575.51	10,853.31	9,913.57	60.72	57.92	9.54	971.32	250.36	671.24	604.96	66.28	10.127	
11,600.00	10,576.10	10,953.31	9,914.15	61.79	59.05	9.54	1,071.31	251.27	671.25	603.96	67.29	9.975	
11,700.00	10,576.69	11,053.31	9,914.74	62.94	60.25	9.54	1,171.31	252.19	671.25	602.88	68.37	9.818	
11,800.00	10,577.28	11,153.31	9,915.33	64.16	61.52	9.54	1,271.30	253.10	671.25	601.74	69.52	9.656	
11,900.00	10,577.86	11,253.31	9,915.91	65.45	62.87	9.54	1,371.30	254.01	671.26	600.53	70.73	9.491	
12,000.00	10,578.45	11,353.31	9,916.50	66.80	64.29	9.55	1,471.29	254.92	671.26	599.26	72.00	9.323	
12,100.00	10,579.04	11,453.31	9,917.09	68.22	65.76	9.55	1,571.28	255.83	671.26	597.94	73.33	9.155	
12,200.00	10,579.63	11,553.31	9,917.67	69.70	67.30	9.55	1,671.28	256.74	671.26	596.56	74.71	8.985	
12,300.00	10,580.22	11,653.31	9,918.26	71.24	68.89	9.55	1,771.27	257.66	671.27	595.13	76.14	8.816	
12,400.00	10,580.80	11,753.31	9,918.84	72.82	70.53	9.55	1,871.27	258.57	671.27	593.65	77.62	8.648	
12,500.00	10,581.39	11,853.31	9,919.43	74.46	72.22	9.55	1,971.26	259.48	671.27	592.12	79.15	8.481	
12,600.00	10,581.98	11,953.31	9,920.02	76.13	73.95	9.55	2,071.25	260.39	671.28	590.55	80.72	8.316	
12,700.00	10,582.57	12,053.31	9,920.60	77.86	75.72	9.55	2,171.25	261.30	671.28	588.95	82.33	8.153	
12,800.00	10,583.15	12,153.31	9,921.19	79.62	77.53	9.55	2,271.24	262.21	671.28	587.30	83.98	7.993	
12,900.00	10,583.74	12,253.31	9,921.78	81.41	79.38	9.55	2,371.24	263.13	671.29	585.62	85.67	7.836	
13,000.00	10,584.33	12,353.31	9,922.36	83.25	81.26	9.55	2,471.23	264.04	671.29	583.90	87.39	7.682	
13,100.00	10,584.92	12,453.31	9,922.95	85.11	83.17	9.56	2,571.22	264.95	671.29	582.15	89.14	7.531	
13,200.00	10,585.50	12,553.31	9,923.54	87.01	85.11	9.56	2,671.22	265.86	671.29	580.38	90.92	7.384	
13,300.00	10,586.09	12,653.31	9,924.12	88.93	87.07	9.56	2,771.21	266.77	671.30	578.57	92.73	7.240	
13,400.00	10,586.68	12,753.31	9,924.71	90.88	89.06	9.56	2,871.21	267.68	671.30	576.74	94.56	7.099	
13,500.00	10,587.27	12,853.31	9,925.29	92.85	91.08	9.56	2,971.20	268.59	671.30	574.89	96.42	6.962	
13,600.00	10,587.85	12,953.31	9,925.88	94.85	93.12	9.56	3,071.20	269.51	671.31	573.01	98.30	6.829	
13,700.00	10,588.44	13,053.31	9,926.47	96.87	95.17	9.56	3,171.19	270.42	671.31	571.10	100.20	6.699	
13,800.00	10,589.03	13,153.31	9,927.05	98.91	97.25	9.56	3,271.18	271.33	671.31	569.18	102.13	6.573	
13,900.00	10,589.62	13,253.31	9,927.64	100.97	99.35	9.56	3,371.18	272.24	671.31	567.24	104.07	6.451	
14,000.00	10,590.20	13,353.31	9,928.23	103.05	101.46	9.56	3,471.17	273.15	671.32	565.28	106.03	6.331	
14,100.00	10,590.79	13,453.31	9,928.81	105.14	103.59	9.56	3,571.17	274.06	671.32	563.31	108.02	6.215	
14,200.00	10,591.38	13,553.31	9,929.40	107.25	105.73	9.57	3,671.16	274.98	671.32	561.31	110.01	6.102	
14,300.00	10,591.97	13,653.31	9,929.99	109.38	107.89	9.57	3,771.15	275.89	671.33	559.30	112.02	5.993	
14,400.00	10,592.55	13,753.31	9,930.57	111.52	110.06	9.57	3,871.15	276.80	671.33	557.28	114.05	5.886	
14,500.00	10,593.14	13,853.31	9,931.16	113.67	112.24	9.57	3,971.14	277.71	671.33	555.24	116.09	5.783	
14,600.00	10,593.73	13,953.31	9,931.75	115.84	114.43	9.57	4,071.14	278.62	671.34	553.19	118.14	5.682	
14,700.00	10,594.32	14,053.31	9,932.33	118.02	116.64	9.57	4,171.13	279.53	671.34	551.13	120.21	5.585	
14,800.00	10,594.90	14,153.31	9,932.92	120.21	118.85	9.57	4,271.13	280.45	671.34	549.06	122.29	5.490	
14,900.00	10,595.49	14,253.31	9,933.50	122.41	121.08	9.57	4,371.12	281.36	671.34	546.97	124.37	5.398	
15,000.00	10,596.08	14,353.31	9,934.09	124.62	123.31	9.57	4,471.11	282.27	671.35	544.88	126.47	5.308	

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

Section 32-T26S-R29E - Money Graham Fed Com Well No. 218 H - Original Hole - rev0													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	5,095.66	5,104.66	5,084.71	26.93	27.62	-56.44	-151.37	265.34	169.49	115.58	53.91	3.144		
5,200.00	5,195.53	5,204.73	5,184.35	27.48	28.18	-56.49	-155.40	271.75	173.23	118.22	55.01	3.149		
5,300.00	5,295.41	5,304.80	5,283.99	28.03	28.75	-56.54	-159.43	278.15	176.97	120.87	56.10	3.155		
5,400.00	5,395.29	5,404.87	5,383.64	28.57	29.31	-56.58	-163.47	284.55	180.71	123.52	57.19	3.160		
5,500.00	5,495.17	5,504.94	5,483.28	29.12	29.88	-56.63	-167.50	290.96	184.45	126.16	58.29	3.164		
5,600.00	5,595.05	5,605.01	5,582.92	29.67	30.44	-56.67	-171.53	297.36	188.19	128.81	59.39	3.169		
5,700.00	5,694.93	5,705.08	5,682.57	30.22	31.01	-56.71	-175.57	303.76	191.94	131.46	60.48	3.174		
5,800.00	5,794.81	5,805.15	5,782.21	30.77	31.57	-56.75	-179.60	310.17	195.68	134.10	61.58	3.178		
5,900.00	5,894.68	5,894.78	5,881.85	31.32	32.08	-56.79	-183.63	316.57	199.42	136.80	62.62	3.185		
6,000.00	5,994.56	6,005.29	5,981.49	31.86	32.71	-56.83	-187.66	322.97	203.16	139.39	63.77	3.186		
6,100.00	6,094.44	6,094.64	6,081.14	32.41	33.21	-56.86	-191.70	329.38	206.90	142.10	64.81	3.193		
6,200.00	6,194.32	6,198.01	6,184.26	32.96	33.79	-57.00	-195.49	335.40	210.07	144.13	65.95	3.186		
6,300.00	6,294.24	6,302.89	6,289.04	33.51	34.36	-57.33	-197.88	339.20	211.50	144.44	67.06	3.154		
6,400.00	6,394.22	6,407.80	6,393.94	34.02	34.92	-57.46	-198.74	340.56	212.01	143.91	68.10	3.113		
6,500.00	6,494.22	6,508.09	6,494.22	34.52	35.41	89.76	-198.74	340.56	212.01	142.91	69.10	3.068		
6,600.00	6,594.22	6,608.09	6,594.22	35.02	35.91	89.76	-198.74	340.56	212.01	141.91	70.10	3.024		
6,700.00	6,694.22	6,708.09	6,694.22	35.52	36.40	89.76	-198.74	340.56	212.01	140.90	71.11	2.982		
6,800.00	6,794.22	6,808.09	6,794.22	36.03	36.90	89.76	-198.74	340.56	212.01	139.90	72.11	2.940		
6,900.00	6,894.22	6,908.09	6,894.22	36.53	37.39	89.76	-198.74	340.56	212.01	138.89	73.12	2.899		
7,000.00	6,994.22	7,008.09	6,994.22	37.03	37.89	89.76	-198.74	340.56	212.01	137.88	74.13	2.860		
7,100.00	7,094.22	7,108.09	7,094.22	37.54	38.39	89.76	-198.74	340.56	212.01	136.87	75.14	2.821		
7,200.00	7,194.22	7,208.09	7,194.22	38.04	38.89	89.76	-198.74	340.56	212.01	135.86	76.16	2.784		
7,300.00	7,294.22	7,308.09	7,294.22	38.55	39.39	89.76	-198.74	340.56	212.01	134.84	77.17	2.747		
7,400.00	7,394.22	7,408.09	7,394.22	39.06	39.90	89.76	-198.74	340.56	212.01	133.83	78.19	2.712		
7,500.00	7,494.22	7,508.09	7,494.22	39.56	40.40	89.76	-198.74	340.56	212.01	132.81	79.20	2.677		
7,600.00	7,594.22	7,608.09	7,594.22	40.07	40.90	89.76	-198.74	340.56	212.01	131.79	80.22	2.643		
7,700.00	7,694.22	7,708.09	7,694.22	40.58	41.41	89.76	-198.74	340.56	212.01	130.77	81.24	2.610		
7,800.00	7,794.22	7,808.09	7,794.22	41.09	41.91	89.76	-198.74	340.56	212.01	129.75	82.27	2.577		
7,900.00	7,894.22	7,908.09	7,894.22	41.60	42.42	89.76	-198.74	340.56	212.01	128.72	83.29	2.545		
8,000.00	7,994.22	8,008.09	7,994.22	42.12	42.93	89.76	-198.74	340.56	212.01	127.70	84.32	2.515		
8,100.00	8,094.22	8,108.09	8,094.22	42.63	43.44	89.76	-198.74	340.56	212.01	126.67	85.34	2.484		
8,200.00	8,194.22	8,208.09	8,194.22	43.14	43.95	89.76	-198.74	340.56	212.01	125.64	86.37	2.455		
8,300.00	8,294.22	8,308.09	8,294.22	43.65	44.46	89.76	-198.74	340.56	212.01	124.61	87.40	2.426		
8,400.00	8,394.22	8,408.09	8,394.22	44.17	44.97	89.76	-198.74	340.56	212.01	123.59	88.43	2.398		
8,500.00	8,494.22	8,508.09	8,494.22	44.68	45.48	89.76	-198.74	340.56	212.01	122.55	89.46	2.370		
8,600.00	8,594.22	8,608.09	8,594.22	45.20	45.99	89.76	-198.74	340.56	212.01	121.52	90.49	2.343		
8,700.00	8,694.22	8,708.09	8,694.22	45.71	46.50	89.76	-198.74	340.56	212.01	120.49	91.52	2.317		
8,800.00	8,794.22	8,808.09	8,794.22	46.23	47.01	89.76	-198.74	340.56	212.01	119.46	92.56	2.291		
8,900.00	8,894.22	8,908.09	8,894.22	46.75	47.53	89.76	-198.74	340.56	212.01	118.42	93.59	2.265		
9,000.00	8,994.22	9,008.09	8,994.22	47.26	48.04	89.76	-198.74	340.56	212.01	117.39	94.63	2.241		
9,100.00	9,094.22	9,108.09	9,094.22	47.78	48.55	89.76	-198.74	340.56	212.01	116.35	95.66	2.216		
9,200.00	9,194.22	9,208.09	9,194.22	48.30	49.07	89.76	-198.74	340.56	212.01	115.31	96.70	2.192		
9,300.00	9,294.22	9,308.09	9,294.22	48.82	49.58	89.76	-198.74	340.56	212.01	114.27	97.74	2.169		
9,400.00	9,394.22	9,410.51	9,396.54	49.34	50.10	88.93	-195.67	340.18	211.68	112.92	98.76	2.143		
9,500.00	9,494.22	9,511.05	9,495.11	49.86	50.57	83.74	-176.68	337.81	210.52	110.65	99.87	2.108		
9,511.31	9,505.53	9,521.92	9,505.53	49.92	50.62	82.90	-173.60	337.43	210.49	110.49	100.00	2.105		
9,600.00	9,594.22	9,602.47	9,580.60	50.38	50.95	75.05	-144.82	333.84	212.92	112.07	100.85	2.111		
9,700.00	9,694.22	9,682.05	9,650.05	50.90	51.23	65.07	-106.40	329.06	225.49	125.34	100.14	2.252		
9,800.00	9,794.22	9,750.00	9,704.64	51.42	51.44	55.71	-66.30	324.06	253.03	156.34	96.69	2.617		
9,900.00	9,894.22	9,805.86	9,745.68	51.94	51.58	48.15	-28.72	319.38	296.12	204.61	91.51	3.236		
10,000.00	9,994.22	9,850.00	9,775.37	52.46	51.68	42.58	3.66	315.35	352.30	266.17	86.13	4.090		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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. 218 H - Original Hole - rev0													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
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	1,300.00	1,299.43	1,299.42	6.65	6.63	91.51	-0.69	26.09	26.11	12.83	13.28	1.967 Level 3<2.00, SF		
1,400.00	1,400.00	1,398.72	1,398.63	7.19	7.13	95.36	-2.75	29.37	29.53	15.24	14.30	2.066		
1,500.00	1,499.99	1,502.11	1,497.59	7.70	7.66	-48.68	-6.18	34.82	34.57	19.26	15.31	2.258		
1,600.00	1,599.91	1,602.21	1,597.21	8.20	8.18	-48.48	-10.21	41.22	38.93	22.61	16.31	2.386		
1,700.00	1,699.79	1,702.28	1,696.85	8.70	8.70	-49.38	-14.25	47.62	42.62	25.29	17.33	2.459		
1,800.00	1,799.67	1,802.35	1,796.49	9.20	9.23	-50.14	-18.28	54.03	46.31	27.96	18.35	2.523		
1,900.00	1,899.54	1,902.42	1,896.14	9.71	9.77	-50.78	-22.31	60.43	50.02	30.63	19.39	2.580		
2,000.00	1,999.42	2,002.49	1,995.78	10.23	10.31	-51.34	-26.35	66.83	53.73	33.30	20.43	2.630		
2,100.00	2,099.30	2,102.56	2,095.42	10.75	10.85	-51.82	-30.38	73.24	57.44	35.97	21.48	2.675		
2,200.00	2,199.18	2,202.63	2,195.06	11.27	11.39	-52.25	-34.41	79.64	61.16	38.63	22.53	2.715		
2,300.00	2,299.06	2,302.70	2,294.71	11.79	11.94	-52.63	-38.44	86.04	64.88	41.30	23.58	2.751		
2,400.00	2,398.94	2,402.77	2,394.35	12.32	12.49	-52.96	-42.48	92.45	68.61	43.96	24.64	2.784		
2,500.00	2,498.82	2,497.16	2,493.99	12.85	13.01	-53.26	-46.51	98.85	72.33	46.66	25.68	2.817		
2,600.00	2,598.69	2,602.91	2,593.64	13.38	13.59	-53.53	-50.54	105.25	76.06	49.29	26.77	2.841		
2,700.00	2,698.57	2,702.98	2,693.28	13.91	14.14	-53.78	-54.58	111.66	79.79	51.94	27.84	2.866		
2,800.00	2,798.45	2,803.05	2,792.92	14.45	14.70	-54.01	-58.61	118.06	83.52	54.60	28.92	2.888		
2,900.00	2,898.33	2,903.12	2,892.56	14.98	15.25	-54.21	-62.64	124.46	87.25	57.26	29.99	2.909		
3,000.00	2,998.21	3,003.19	2,992.21	15.52	15.81	-54.40	-66.68	130.87	90.98	59.92	31.07	2.929		
3,100.00	3,098.09	3,103.26	3,091.85	16.06	16.37	-54.57	-70.71	137.27	94.72	62.57	32.14	2.947		
3,200.00	3,197.97	3,203.33	3,191.49	16.60	16.93	-54.73	-74.74	143.67	98.45	65.23	33.22	2.963		
3,300.00	3,297.84	3,303.40	3,291.14	17.13	17.48	-54.88	-78.77	150.08	102.19	67.88	34.31	2.979		
3,400.00	3,397.72	3,403.47	3,390.78	17.67	18.04	-55.02	-82.81	156.48	105.92	70.54	35.39	2.993		
3,500.00	3,497.60	3,503.54	3,490.42	18.22	18.60	-55.15	-86.84	162.89	109.66	73.19	36.47	3.007		
3,600.00	3,597.48	3,603.61	3,590.06	18.76	19.16	-55.27	-90.87	169.29	113.40	75.84	37.56	3.019		
3,700.00	3,697.36	3,703.68	3,689.71	19.30	19.73	-55.38	-94.91	175.69	117.13	78.49	38.64	3.031		
3,800.00	3,797.24	3,803.75	3,789.35	19.84	20.29	-55.49	-98.94	182.10	120.87	81.14	39.73	3.043		
3,900.00	3,897.11	3,903.82	3,888.99	20.39	20.85	-55.59	-102.97	188.50	124.61	83.79	40.82	3.053		
4,000.00	3,996.99	4,003.89	3,988.64	20.93	21.41	-55.68	-107.01	194.90	128.35	86.45	41.90	3.063		
4,100.00	4,096.87	4,096.04	4,088.28	21.47	21.93	-55.77	-111.04	201.31	132.09	89.14	42.95	3.075		
4,200.00	4,196.75	4,204.03	4,187.92	22.02	22.54	-55.85	-115.07	207.71	135.83	91.74	44.08	3.081		
4,300.00	4,296.63	4,304.10	4,287.57	22.56	23.10	-55.93	-119.10	214.11	139.57	94.39	45.17	3.090		
4,400.00	4,396.51	4,395.83	4,387.21	23.11	23.62	-56.01	-123.14	220.52	143.31	97.09	46.22	3.101		
4,500.00	4,496.39	4,504.24	4,486.85	23.65	24.23	-56.08	-127.17	226.92	147.04	99.69	47.35	3.105		
4,600.00	4,596.26	4,604.31	4,586.49	24.20	24.79	-56.14	-131.20	233.32	150.79	102.34	48.45	3.112		
4,700.00	4,696.14	4,704.38	4,686.14	24.75	25.36	-56.21	-135.24	239.73	154.53	104.99	49.54	3.119		
4,800.00	4,796.02	4,804.45	4,785.78	25.29	25.92	-56.27	-139.27	246.13	158.27	107.64	50.63	3.126		
4,900.00	4,895.90	4,904.52	4,885.42	25.84	26.49	-56.33	-143.30	252.53	162.01	110.28	51.72	3.132		
5,000.00	4,995.78	5,004.59	4,985.07	26.39	27.05	-56.38	-147.33	258.94	165.75	112.93	52.82	3.138		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
15,100.00	10,596.67	14,465.63	9,924.85	126.84	125.04	-36.90	4,576.68	-332.88	840.12	667.29	172.84	4.861		
15,200.00	10,597.25	14,565.63	9,925.44	129.07	127.29	-36.90	4,676.67	-331.99	840.13	664.49	175.64	4.783		
15,300.00	10,597.84	14,665.63	9,926.03	131.30	129.55	-36.90	4,776.67	-331.10	840.13	661.69	178.45	4.708		
15,400.00	10,598.43	14,765.63	9,926.61	133.55	131.81	-36.90	4,876.66	-330.22	840.14	658.88	181.26	4.635		
15,500.00	10,599.02	14,865.63	9,927.20	135.80	134.09	-36.90	4,976.66	-329.33	840.15	656.07	184.08	4.564		
15,600.00	10,599.60	14,965.63	9,927.79	138.07	136.36	-36.90	5,076.65	-328.44	840.15	653.25	186.90	4.495		
15,700.00	10,600.19	15,065.63	9,928.38	140.33	138.65	-36.90	5,176.65	-327.55	840.16	650.43	189.73	4.428		
15,800.00	10,600.78	15,165.63	9,928.97	142.61	140.94	-36.91	5,276.64	-326.66	840.17	647.61	192.56	4.363		
15,900.00	10,601.37	15,265.63	9,929.56	144.89	143.24	-36.91	5,376.64	-325.77	840.17	644.79	195.39	4.300		
16,000.00	10,601.95	15,365.63	9,930.15	147.18	145.54	-36.91	5,476.63	-324.88	840.18	641.96	198.22	4.239		
16,100.00	10,602.54	15,465.63	9,930.73	149.47	147.85	-36.91	5,576.62	-323.99	840.19	639.13	201.05	4.179		
16,200.00	10,603.13	15,565.63	9,931.32	151.77	150.17	-36.91	5,676.62	-323.11	840.19	636.30	203.89	4.121		
16,300.00	10,603.72	15,665.63	9,931.91	154.08	152.49	-36.91	5,776.61	-322.22	840.20	633.47	206.72	4.064		
16,400.00	10,604.30	15,765.63	9,932.50	156.39	154.81	-36.91	5,876.61	-321.33	840.20	630.64	209.56	4.009		
16,500.00	10,604.89	15,865.63	9,933.09	158.70	157.14	-36.91	5,976.60	-320.44	840.21	627.81	212.40	3.956		
16,600.00	10,605.48	15,965.63	9,933.68	161.02	159.47	-36.91	6,076.60	-319.55	840.22	624.98	215.24	3.904		
16,700.00	10,606.07	16,065.63	9,934.27	163.34	161.81	-36.91	6,176.59	-318.66	840.22	622.15	218.08	3.853		
16,800.00	10,606.65	16,165.63	9,934.85	165.67	164.15	-36.91	6,276.58	-317.77	840.23	619.32	220.91	3.803		
16,900.00	10,607.24	16,265.63	9,935.44	168.00	166.50	-36.91	6,376.58	-316.88	840.24	616.48	223.75	3.755		
17,000.00	10,607.83	16,365.63	9,936.03	170.34	168.84	-36.91	6,476.57	-316.00	840.24	613.65	226.59	3.708		
17,100.00	10,608.42	16,465.63	9,936.62	172.68	171.20	-36.91	6,576.57	-315.11	840.25	610.82	229.43	3.662		
17,200.00	10,609.00	16,565.63	9,937.21	175.02	173.55	-36.91	6,676.56	-314.22	840.26	607.99	232.26	3.618		
17,300.00	10,609.59	16,665.63	9,937.80	177.37	175.91	-36.92	6,776.56	-313.33	840.26	605.17	235.09	3.574		
17,400.00	10,610.18	16,765.63	9,938.38	179.72	178.27	-36.92	6,876.55	-312.44	840.27	602.34	237.93	3.532		
17,500.00	10,610.77	16,865.63	9,938.97	182.07	180.63	-36.92	6,976.54	-311.55	840.27	599.52	240.76	3.490		
17,600.00	10,611.35	16,965.63	9,939.56	184.43	183.00	-36.92	7,076.54	-310.66	840.28	596.69	243.59	3.450		
17,600.02	10,611.35	16,965.65	9,939.56	184.43	183.00	-36.92	7,076.56	-310.66	840.28	596.69	243.59	3.450		
17,700.00	10,611.94	17,040.11	9,940.00	186.79	184.77	-36.92	7,151.01	-310.00	840.67	594.36	246.31	3.413		
17,709.92	10,612.00	17,040.11	9,940.00	187.03	184.77	-36.92	7,151.01	-310.00	841.03	594.54	246.49	3.412 SF		



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

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
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.00	10,093.79	9,940.71	9,818.87	52.97	52.24	-62.76		72.92	-454.16	696.60	598.12	98.48	7.073	
10,200.00	10,190.47	9,982.75	9,839.09	53.43	52.28	-57.25		109.25	-448.05	729.67	633.81	95.86	7.612	
10,300.00	10,281.34	10,025.74	9,856.92	53.85	52.30	-52.35		147.82	-441.56	761.90	668.85	93.04	8.189	
10,400.00	10,363.63	10,069.41	9,871.98	54.22	52.34	-48.18		188.23	-434.76	791.43	701.18	90.24	8.770	
10,500.00	10,434.84	10,113.58	9,884.00	54.58	52.43	-44.79		230.14	-427.71	816.83	729.18	87.65	9.319	
10,600.00	10,492.81	10,150.00	9,891.42	54.94	52.57	-42.35		265.30	-421.79	837.09	751.79	85.29	9.814	
10,700.00	10,535.78	10,200.00	9,897.88	55.34	52.78	-40.27		314.17	-413.57	851.14	767.50	83.64	10.177	
10,800.00	10,562.45	10,249.49	9,900.02	55.76	53.00	-38.92		362.91	-405.37	858.61	776.09	82.52	10.405	
10,900.00	10,571.99	10,332.36	9,900.51	56.20	53.42	-38.11		444.84	-392.91	856.73	774.54	82.19	10.423	
11,000.00	10,572.58	10,416.31	9,901.01	56.71	53.91	-37.62		528.16	-382.70	849.79	767.41	82.37	10.316	
11,100.00	10,573.16	10,500.74	9,901.51	57.32	54.48	-37.24		612.22	-374.91	844.70	761.90	82.80	10.202	
11,200.00	10,573.75	10,585.51	9,902.01	58.04	55.13	-36.99		696.82	-369.58	841.44	757.96	83.48	10.079	
11,300.00	10,574.34	10,670.48	9,902.51	58.84	55.85	-36.88		781.74	-366.75	839.98	755.56	84.42	9.950	
11,332.67	10,574.53	10,698.30	9,902.68	59.13	56.09	-36.87		809.56	-366.37	839.88	755.11	84.78	9.907	
11,400.00	10,574.93	10,765.63	9,903.07	59.74	56.73	-36.88		876.89	-365.77	839.89	754.27	85.62	9.810	
11,500.00	10,575.51	10,865.63	9,903.66	60.72	57.75	-36.88		976.89	-364.88	839.89	752.94	86.96	9.659	
11,600.00	10,576.10	10,965.63	9,904.25	61.79	58.85	-36.88		1,076.88	-363.99	839.90	751.50	88.40	9.501	
11,700.00	10,576.69	11,065.63	9,904.84	62.94	60.03	-36.88		1,176.87	-363.10	839.91	749.96	89.95	9.338	
11,800.00	10,577.28	11,165.63	9,905.43	64.16	61.29	-36.88		1,276.87	-362.21	839.91	748.32	91.59	9.170	
11,900.00	10,577.86	11,265.63	9,906.02	65.45	62.62	-36.88		1,376.86	-361.32	839.92	746.60	93.32	9.000	
12,000.00	10,578.45	11,365.63	9,906.60	66.80	64.02	-36.88		1,476.86	-360.43	839.93	744.78	95.14	8.828	
12,100.00	10,579.04	11,465.63	9,907.19	68.22	65.48	-36.88		1,576.85	-359.55	839.93	742.89	97.04	8.656	
12,200.00	10,579.63	11,565.63	9,907.78	69.70	67.00	-36.88		1,676.85	-358.66	839.94	740.93	99.01	8.484	
12,300.00	10,580.22	11,665.63	9,908.37	71.24	68.58	-36.88		1,776.84	-357.77	839.95	738.90	101.05	8.312	
12,400.00	10,580.80	11,765.63	9,908.96	72.82	70.20	-36.88		1,876.83	-356.88	839.95	736.80	103.15	8.143	
12,500.00	10,581.39	11,865.63	9,909.55	74.46	71.88	-36.88		1,976.83	-355.99	839.96	734.65	105.31	7.976	
12,600.00	10,581.98	11,965.63	9,910.14	76.13	73.60	-36.88		2,076.82	-355.10	839.96	732.44	107.53	7.812	
12,700.00	10,582.57	12,065.63	9,910.72	77.86	75.36	-36.88		2,176.82	-354.21	839.97	730.17	109.80	7.650	
12,800.00	10,583.15	12,165.63	9,911.31	79.62	77.16	-36.88		2,276.81	-353.32	839.98	727.86	112.11	7.492	
12,900.00	10,583.74	12,265.63	9,911.90	81.41	78.99	-36.89		2,376.81	-352.44	839.98	725.51	114.48	7.338	
13,000.00	10,584.33	12,365.63	9,912.49	83.25	80.86	-36.89		2,476.80	-351.55	839.99	723.11	116.88	7.187	
13,100.00	10,584.92	12,465.63	9,913.08	85.11	82.76	-36.89		2,576.79	-350.66	840.00	720.68	119.32	7.040	
13,200.00	10,585.50	12,565.63	9,913.67	87.01	84.69	-36.89		2,676.79	-349.77	840.00	718.21	121.79	6.897	
13,300.00	10,586.09	12,665.63	9,914.26	88.93	86.65	-36.89		2,776.78	-348.88	840.01	715.71	124.30	6.758	
13,400.00	10,586.68	12,765.63	9,914.84	90.88	88.63	-36.89		2,876.78	-347.99	840.01	713.18	126.84	6.623	
13,500.00	10,587.27	12,865.63	9,915.43	92.85	90.64	-36.89		2,976.77	-347.10	840.02	710.62	129.40	6.492	
13,600.00	10,587.85	12,965.63	9,916.02	94.85	92.67	-36.89		3,076.77	-346.21	840.03	708.04	131.99	6.364	
13,700.00	10,588.44	13,065.63	9,916.61	96.87	94.72	-36.89		3,176.76	-345.33	840.03	705.43	134.61	6.241	
13,800.00	10,589.03	13,165.63	9,917.20	98.91	96.79	-36.89		3,276.75	-344.44	840.04	702.80	137.24	6.121	
13,900.00	10,589.62	13,265.63	9,917.79	100.97	98.88	-36.89		3,376.75	-343.55	840.05	700.15	139.90	6.005	
14,000.00	10,590.20	13,365.63	9,918.37	103.05	100.99	-36.89		3,476.74	-342.66	840.05	697.48	142.57	5.892	
14,100.00	10,590.79	13,465.63	9,918.96	105.14	103.11	-36.89		3,576.74	-341.77	840.06	694.80	145.26	5.783	
14,200.00	10,591.38	13,565.63	9,919.55	107.25	105.25	-36.89		3,676.73	-340.88	840.07	692.10	147.97	5.677	
14,300.00	10,591.97	13,665.63	9,920.14	109.38	107.40	-36.89		3,776.73	-339.99	840.07	689.38	150.69	5.575	
14,400.00	10,592.55	13,765.63	9,920.73	111.52	109.57	-36.90		3,876.72	-339.10	840.08	686.66	153.42	5.476	
14,500.00	10,593.14	13,865.63	9,921.32	113.67	111.74	-36.90		3,976.71	-338.21	840.08	683.92	156.17	5.379	
14,600.00	10,593.73	13,965.63	9,921.91	115.84	113.93	-36.90		4,076.71	-337.33	840.09	681.17	158.92	5.286	
14,700.00	10,594.32	14,065.63	9,922.49	118.02	116.14	-36.90		4,176.70	-336.44	840.10	678.41	161.69	5.196	
14,800.00	10,594.90	14,165.63	9,923.08	120.21	118.35	-36.90		4,276.70	-335.55	840.10	675.64	164.46	5.108	
14,900.00	10,595.49	14,265.63	9,923.67	122.41	120.57	-36.90		4,376.69	-334.66	840.11	672.86	167.25	5.023	
15,000.00	10,596.08	14,365.63	9,924.26	124.62	122.80	-36.90		4,476.69	-333.77	840.12	670.08	170.04	4.941	

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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													Offset Site Error:	0.00 ft
Section 32-T26S-R29E - Money Graham Fed Com Well No. 214 H - Original Hole - rev0													Offset Well Error:	0.00 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	5,095.66	5,069.01	5,051.92	26.93	27.96	122.03	-153.80	-398.03	496.20	442.47	53.73	9.235		
5,200.00	5,195.53	5,168.35	5,150.80	27.48	28.54	122.04	-157.92	-406.75	507.63	452.81	54.82	9.260		
5,300.00	5,295.41	5,267.70	5,249.68	28.03	29.12	122.06	-162.04	-415.46	519.05	463.14	55.91	9.283		
5,400.00	5,395.29	5,367.04	5,348.55	28.57	29.70	122.07	-166.16	-424.17	530.48	473.47	57.01	9.306		
5,500.00	5,495.17	5,466.39	5,447.43	29.12	30.28	122.08	-170.28	-432.88	541.90	483.80	58.10	9.327		
5,600.00	5,595.05	5,565.73	5,546.31	29.67	30.85	122.09	-174.40	-441.59	553.32	494.13	59.19	9.348		
5,700.00	5,694.93	5,665.08	5,645.18	30.22	31.43	122.10	-178.52	-450.31	564.75	504.46	60.28	9.368		
5,800.00	5,794.81	5,764.42	5,744.06	30.77	32.01	122.12	-182.64	-459.02	576.17	514.80	61.38	9.388		
5,900.00	5,894.68	5,863.77	5,842.94	31.32	32.59	122.13	-186.76	-467.73	587.60	525.13	62.47	9.406		
6,000.00	5,994.56	5,963.11	5,941.81	31.86	33.18	122.14	-190.88	-476.44	599.02	535.46	63.56	9.424		
6,100.00	6,094.44	6,064.38	6,042.60	32.41	33.77	122.15	-195.08	-485.30	610.43	545.75	64.68	9.438		
6,200.00	6,194.32	6,180.94	6,158.80	32.96	34.43	122.24	-198.98	-493.56	620.16	554.22	65.94	9.405		
6,300.00	6,294.24	6,298.04	6,275.77	33.51	35.07	122.46	-201.38	-498.62	626.66	559.52	67.15	9.333		
6,400.00	6,394.22	6,415.51	6,393.21	34.02	35.68	122.54	-202.24	-500.45	629.00	560.73	68.27	9.213		
6,500.00	6,494.22	6,516.52	6,494.22	34.52	36.17	-90.24	-202.24	-500.45	629.01	559.73	69.27	9.080		
6,600.00	6,594.22	6,616.52	6,594.22	35.02	36.66	-90.24	-202.24	-500.45	629.01	558.73	70.27	8.951		
6,700.00	6,694.22	6,716.52	6,694.22	35.52	37.14	-90.24	-202.24	-500.45	629.01	557.73	71.28	8.825		
6,800.00	6,794.22	6,816.52	6,794.22	36.03	37.63	-90.24	-202.24	-500.45	629.01	556.72	72.28	8.702		
6,900.00	6,894.22	6,916.52	6,894.22	36.53	38.12	-90.24	-202.24	-500.45	629.01	555.72	73.29	8.583		
7,000.00	6,994.22	7,016.52	6,994.22	37.03	38.61	-90.24	-202.24	-500.45	629.01	554.71	74.30	8.466		
7,100.00	7,094.22	7,116.52	7,094.22	37.54	39.11	-90.24	-202.24	-500.45	629.01	553.70	75.31	8.352		
7,200.00	7,194.22	7,216.52	7,194.22	38.04	39.60	-90.24	-202.24	-500.45	629.01	552.69	76.32	8.242		
7,300.00	7,294.22	7,316.52	7,294.22	38.55	40.10	-90.24	-202.24	-500.45	629.01	551.67	77.34	8.134		
7,400.00	7,394.22	7,416.52	7,394.22	39.06	40.59	-90.24	-202.24	-500.45	629.01	550.66	78.35	8.028		
7,500.00	7,494.22	7,516.52	7,494.22	39.56	41.09	-90.24	-202.24	-500.45	629.01	549.64	79.37	7.925		
7,600.00	7,594.22	7,616.52	7,594.22	40.07	41.59	-90.24	-202.24	-500.45	629.01	548.62	80.39	7.825		
7,700.00	7,694.22	7,716.52	7,694.22	40.58	42.09	-90.24	-202.24	-500.45	629.01	547.60	81.41	7.727		
7,800.00	7,794.22	7,816.52	7,794.22	41.09	42.59	-90.24	-202.24	-500.45	629.01	546.58	82.43	7.631		
7,900.00	7,894.22	7,916.52	7,894.22	41.60	43.09	-90.24	-202.24	-500.45	629.01	545.55	83.45	7.537		
8,000.00	7,994.22	8,016.52	7,994.22	42.12	43.59	-90.24	-202.24	-500.45	629.01	544.53	84.48	7.446		
8,100.00	8,094.22	8,116.52	8,094.22	42.63	44.09	-90.24	-202.24	-500.45	629.01	543.50	85.50	7.357		
8,200.00	8,194.22	8,216.52	8,194.22	43.14	44.60	-90.24	-202.24	-500.45	629.01	542.48	86.53	7.269		
8,300.00	8,294.22	8,316.52	8,294.22	43.65	45.10	-90.24	-202.24	-500.45	629.01	541.45	87.56	7.184		
8,400.00	8,394.22	8,416.52	8,394.22	44.17	45.61	-90.24	-202.24	-500.45	629.01	540.42	88.59	7.101		
8,500.00	8,494.22	8,516.52	8,494.22	44.68	46.11	-90.24	-202.24	-500.45	629.01	539.39	89.62	7.019		
8,600.00	8,594.22	8,616.52	8,594.22	45.20	46.62	-90.24	-202.24	-500.45	629.01	538.36	90.65	6.939		
8,700.00	8,694.22	8,716.52	8,694.22	45.71	47.12	-90.24	-202.24	-500.45	629.01	537.33	91.68	6.861		
8,800.00	8,794.22	8,816.52	8,794.22	46.23	47.63	-90.24	-202.24	-500.45	629.01	536.29	92.71	6.784		
8,900.00	8,894.22	8,916.52	8,894.22	46.75	48.14	-90.24	-202.24	-500.45	629.01	535.26	93.75	6.710		
9,000.00	8,994.22	9,016.52	8,994.22	47.26	48.65	-90.24	-202.24	-500.45	629.01	534.22	94.78	6.636		
9,100.00	9,094.22	9,116.52	9,094.22	47.78	49.16	-90.24	-202.24	-500.45	629.01	533.19	95.82	6.565		
9,200.00	9,194.22	9,216.52	9,194.22	48.30	49.67	-90.24	-202.24	-500.45	629.01	532.15	96.86	6.494		
9,300.00	9,294.22	9,316.52	9,294.22	48.82	50.18	-90.24	-202.24	-500.45	629.01	531.11	97.89	6.425		
9,400.00	9,394.22	9,431.37	9,408.79	49.34	50.75	-89.71	-196.46	-499.48	628.21	529.26	98.94	6.349		
9,500.00	9,494.22	9,546.69	9,520.51	49.86	51.26	-87.19	-169.06	-494.87	624.72	524.78	99.94	6.251		
9,600.00	9,594.22	9,647.61	9,612.02	50.38	51.82	-83.32	-127.40	-487.86	620.88	519.91	100.97	6.149		
9,666.16	9,660.38	9,705.10	9,660.38	50.72	51.80	-80.45	-96.78	-482.71	619.85	518.23	101.62	6.099		
9,700.00	9,694.22	9,731.69	9,681.64	50.90	51.87	-78.97	-81.04	-480.06	620.18	518.27	101.91	6.085		
9,800.00	9,794.22	9,800.06	9,732.69	51.42	52.03	-74.80	-36.26	-472.53	625.91	523.52	102.39	6.113		
9,900.00	9,894.22	9,855.27	9,769.74	51.94	52.13	-71.08	4.08	-465.74	640.45	538.42	102.02	6.277		
10,000.00	9,994.22	9,900.00	9,796.76	52.46	52.19	-67.91	39.22	-459.83	665.00	564.34	100.65	6.607		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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														Offset Site Error:		0.00 ft
Survey Program: 0-MWD														Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
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	-1,000.00	-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	1,300.00	1,298.22	1,298.21	6.65	6.62	-91.16	-1.54	-76.14	76.18	62.91	13.27	5.740				
1,400.00	1,400.00	1,396.32	1,396.23	7.19	7.12	-92.27	-3.16	-79.56	79.71	65.42	14.29	5.577				
1,500.00	1,499.99	1,494.13	1,493.84	7.70	7.62	-119.52	-5.84	-85.23	86.29	71.01	15.28	5.645				
1,600.00	1,599.91	1,608.08	1,591.24	8.20	8.22	119.44	-9.57	-93.11	96.46	80.12	16.34	5.902				
1,700.00	1,699.79	1,708.73	1,690.12	8.70	8.75	119.78	-13.69	-101.82	107.87	90.51	17.36	6.214				
1,800.00	1,799.67	1,809.39	1,788.99	9.20	9.30	120.05	-17.81	-110.53	119.28	100.90	18.39	6.487				
1,900.00	1,899.54	1,889.96	1,887.87	9.71	9.73	120.28	-21.93	-119.25	130.70	111.38	19.32	6.765				
2,000.00	1,999.42	1,989.30	1,986.75	10.23	10.28	120.47	-26.05	-127.96	142.11	121.76	20.35	6.982				
2,100.00	2,099.30	2,088.65	2,085.62	10.75	10.83	120.63	-30.17	-136.67	153.53	132.13	21.40	7.175				
2,200.00	2,199.18	2,187.99	2,184.50	11.27	11.38	120.77	-34.29	-145.38	164.95	142.50	22.45	7.349				
2,300.00	2,299.06	2,287.34	2,283.38	11.79	11.94	120.90	-38.41	-154.09	176.37	152.87	23.50	7.506				
2,400.00	2,398.94	2,386.68	2,382.25	12.32	12.49	121.00	-42.53	-162.81	187.79	163.23	24.55	7.648				
2,500.00	2,498.82	2,486.03	2,481.13	12.85	13.05	121.10	-46.65	-171.52	199.21	173.59	25.61	7.777				
2,600.00	2,598.69	2,585.38	2,580.01	13.38	13.62	121.18	-50.77	-180.23	210.63	183.95	26.68	7.895				
2,700.00	2,698.57	2,684.72	2,678.88	13.91	14.18	121.26	-54.90	-188.94	222.05	194.31	27.74	8.004				
2,800.00	2,798.45	2,784.07	2,777.76	14.45	14.74	121.33	-59.02	-197.65	233.47	204.66	28.81	8.103				
2,900.00	2,898.33	2,883.41	2,876.64	14.98	15.31	121.39	-63.14	-206.37	244.89	215.01	29.88	8.195				
3,000.00	2,998.21	2,982.76	2,975.51	15.52	15.88	121.44	-67.26	-215.08	256.31	225.36	30.95	8.280				
3,100.00	3,098.09	3,082.10	3,074.39	16.06	16.45	121.50	-71.38	-223.79	267.74	235.71	32.03	8.359				
3,200.00	3,197.97	3,181.45	3,173.27	16.60	17.02	121.54	-75.50	-232.50	279.16	246.05	33.11	8.432				
3,300.00	3,297.84	3,280.79	3,272.14	17.13	17.59	121.59	-79.62	-241.22	290.58	256.40	34.18	8.501				
3,400.00	3,397.72	3,380.14	3,371.02	17.67	18.16	121.63	-83.74	-249.93	302.00	266.74	35.26	8.565				
3,500.00	3,497.60	3,479.48	3,469.90	18.22	18.73	121.66	-87.86	-258.64	313.43	277.09	36.34	8.624				
3,600.00	3,597.48	3,578.83	3,568.77	18.76	19.31	121.70	-91.98	-267.35	324.85	287.43	37.42	8.680				
3,700.00	3,697.36	3,678.17	3,667.65	19.30	19.88	121.73	-96.10	-276.06	336.27	297.77	38.51	8.733				
3,800.00	3,797.24	3,777.52	3,766.53	19.84	20.46	121.76	-100.23	-284.78	347.70	308.11	39.59	8.783				
3,900.00	3,897.11	3,876.86	3,865.40	20.39	21.03	121.79	-104.35	-293.49	359.12	318.45	40.67	8.830				
4,000.00	3,996.99	3,976.21	3,964.28	20.93	21.61	121.82	-108.47	-302.20	370.54	328.79	41.76	8.874				
4,100.00	4,096.87	4,075.55	4,063.16	21.47	22.18	121.84	-112.59	-310.91	381.97	339.12	42.84	8.915				
4,200.00	4,196.75	4,174.90	4,162.03	22.02	22.76	121.87	-116.71	-319.62	393.39	349.46	43.93	8.955				
4,300.00	4,296.63	4,274.24	4,260.91	22.56	23.33	121.89	-120.83	-328.34	404.81	359.80	45.02	8.993				
4,400.00	4,396.51	4,373.59	4,359.79	23.11	23.91	121.91	-124.95	-337.05	416.24	370.13	46.10	9.028				
4,500.00	4,496.39	4,472.93	4,458.66	23.65	24.49	121.93	-129.07	-345.76	427.66	380.47	47.19	9.062				
4,600.00	4,596.26	4,572.28	4,557.54	24.20	25.07	121.95	-133.19	-354.47	439.08	390.80	48.28	9.094				
4,700.00	4,696.14	4,671.63	4,656.42	24.75	25.64	121.97	-137.31	-363.19	450.51	401.14	49.37	9.125				
4,800.00	4,796.02	4,770.97	4,755.29	25.29	26.22	121.98	-141.43	-371.90	461.93	411.47	50.46	9.155				
4,900.00	4,895.90	4,870.32	4,854.17	25.84	26.80	122.00	-145.55	-380.61	473.36	421.81	51.55	9.183				
5,000.00	4,995.78	4,969.66	4,953.05	26.39	27.38	122.01	-149.68	-389.32	484.78	432.14	52.64	9.209				

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis			Distance						Warning					
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor							
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)							
16,900.00	10,607.24	16,004.92	9,695.34	168.00	167.04	-12.12	6,375.27	-8.14	932.72	762.76	169.96	5.488						
17,000.00	10,607.83	16,104.92	9,695.93	170.34	169.40	-12.12	6,475.27	-7.24	932.72	760.48	172.24	5.415						
17,100.00	10,608.42	16,204.92	9,696.52	172.68	171.76	-12.12	6,575.26	-6.34	932.72	758.21	174.51	5.345						
17,200.00	10,609.00	16,304.92	9,697.11	175.02	174.13	-12.12	6,675.25	-5.44	932.72	755.92	176.79	5.276						
17,300.00	10,609.59	16,404.92	9,697.69	177.37	176.50	-12.12	6,775.25	-4.53	932.72	753.64	179.08	5.208						
17,400.00	10,610.18	16,495.08	9,698.28	179.72	178.63	-12.12	6,875.24	-3.63	932.72	751.46	181.25	5.146						
17,500.00	10,610.77	16,604.92	9,698.87	182.07	181.24	-12.12	6,975.24	-2.73	932.71	749.06	183.66	5.079						
17,600.00	10,611.35	16,704.92	9,699.46	184.43	183.62	-12.12	7,075.23	-1.83	932.71	746.76	185.95	5.016						
17,700.00	10,611.94	16,795.08	9,700.05	186.79	185.76	-12.12	7,175.23	-0.93	932.71	744.58	188.13	4.958						
17,700.45	10,611.94	16,795.53	9,700.05	186.80	185.77	-12.12	7,175.68	-0.92	932.71	744.57	188.14	4.957						
17,709.92	10,612.00	16,786.87	9,700.00	187.03	185.57	-12.12	7,167.01	-1.00	932.89	744.54	188.35	4.953						



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
11,800.00	10,577.28	10,904.92	9,665.33	64.16	60.32	-12.13	1,275.57	-54.14	932.78	863.91	68.87	13.544		
11,900.00	10,577.86	10,995.08	9,665.92	65.45	61.57	-12.13	1,375.56	-53.24	932.78	862.72	70.06	13.314		
12,000.00	10,578.45	11,104.92	9,666.51	66.80	63.18	-12.13	1,475.56	-52.33	932.78	861.34	71.44	13.057		
12,100.00	10,579.04	11,204.92	9,667.10	68.22	64.70	-12.13	1,575.55	-51.43	932.78	859.96	72.82	12.810		
12,200.00	10,579.63	11,304.92	9,667.69	69.70	66.28	-12.13	1,675.54	-50.53	932.77	858.52	74.25	12.562		
12,300.00	10,580.22	11,404.92	9,668.27	71.24	67.91	-12.13	1,775.54	-49.63	932.77	857.03	75.74	12.316		
12,400.00	10,580.80	11,495.08	9,668.86	72.82	69.43	-12.13	1,875.53	-48.73	932.77	855.58	77.20	12.083		
12,500.00	10,581.39	11,604.92	9,669.45	74.46	71.32	-12.13	1,975.53	-47.82	932.77	853.91	78.86	11.828		
12,600.00	10,581.98	11,704.92	9,670.04	76.13	73.10	-12.13	2,075.52	-46.92	932.77	852.28	80.49	11.589		
12,700.00	10,582.57	11,804.92	9,670.63	77.86	74.91	-12.13	2,175.52	-46.02	932.77	850.61	82.16	11.353		
12,800.00	10,583.15	11,895.08	9,671.22	79.62	76.57	-12.13	2,275.51	-45.12	932.77	848.99	83.78	11.134		
12,900.00	10,583.74	12,004.92	9,671.80	81.41	78.64	-12.13	2,375.50	-44.22	932.77	847.15	85.61	10.895		
13,000.00	10,584.33	12,104.92	9,672.39	83.25	80.55	-12.13	2,475.50	-43.31	932.77	845.37	87.39	10.673		
13,100.00	10,584.92	12,204.92	9,672.98	85.11	82.50	-12.13	2,575.49	-42.41	932.76	843.56	89.20	10.456		
13,200.00	10,585.50	12,304.92	9,673.57	87.01	84.47	-12.13	2,675.49	-41.51	932.76	841.72	91.04	10.245		
13,300.00	10,586.09	12,395.08	9,674.16	88.93	86.27	-12.13	2,775.48	-40.61	932.76	839.94	92.82	10.049		
13,400.00	10,586.68	12,504.92	9,674.75	90.88	88.49	-12.13	2,875.47	-39.71	932.76	837.95	94.81	9.838		
13,500.00	10,587.27	12,604.92	9,675.34	92.85	90.53	-12.13	2,975.47	-38.81	932.76	836.03	96.73	9.643		
13,600.00	10,587.85	12,704.92	9,675.92	94.85	92.59	-12.13	3,075.46	-37.90	932.76	834.08	98.67	9.453		
13,700.00	10,588.44	12,795.08	9,676.51	96.87	94.47	-12.13	3,175.46	-37.00	932.76	832.22	100.54	9.277		
13,800.00	10,589.03	12,904.92	9,677.10	98.91	96.78	-12.13	3,275.45	-36.10	932.76	830.13	102.63	9.089		
13,900.00	10,589.62	13,004.92	9,677.69	100.97	98.90	-12.13	3,375.45	-35.20	932.76	828.12	104.63	8.915		
14,000.00	10,590.20	13,104.92	9,678.28	103.05	101.03	-12.13	3,475.44	-34.30	932.75	826.10	106.65	8.746		
14,100.00	10,590.79	13,204.92	9,678.87	105.14	103.18	-12.13	3,575.43	-33.39	932.75	824.06	108.69	8.581		
14,200.00	10,591.38	13,295.08	9,679.45	107.25	105.14	-12.13	3,675.43	-32.49	932.75	822.10	110.65	8.430		
14,300.00	10,591.97	13,404.92	9,680.04	109.38	107.53	-12.13	3,775.42	-31.59	932.75	819.93	112.82	8.268		
14,400.00	10,592.55	13,504.92	9,680.63	111.52	109.72	-12.13	3,875.42	-30.69	932.75	817.84	114.91	8.117		
14,500.00	10,593.14	13,604.92	9,681.22	113.67	111.92	-12.13	3,975.41	-29.79	932.75	815.74	117.00	7.972		
14,600.00	10,593.73	13,704.92	9,681.81	115.84	114.13	-12.13	4,075.41	-28.88	932.75	813.63	119.12	7.831		
14,700.00	10,594.32	13,795.08	9,682.40	118.02	116.14	-12.13	4,175.40	-27.98	932.75	811.61	121.13	7.700		
14,800.00	10,594.90	13,904.92	9,682.98	120.21	118.59	-12.13	4,275.39	-27.08	932.75	809.37	123.38	7.560		
14,900.00	10,595.49	14,004.92	9,683.57	122.41	120.83	-12.13	4,375.39	-26.18	932.74	807.23	125.52	7.431		
15,000.00	10,596.08	14,104.92	9,684.16	124.62	123.08	-12.13	4,475.38	-25.28	932.74	805.07	127.67	7.306		
15,100.00	10,596.67	14,204.92	9,684.75	126.84	125.34	-12.13	4,575.38	-24.38	932.74	802.90	129.84	7.184		
15,200.00	10,597.25	14,304.92	9,685.34	129.07	127.61	-12.13	4,675.37	-23.47	932.74	800.73	132.01	7.066		
15,300.00	10,597.84	14,404.92	9,685.93	131.30	129.88	-12.13	4,775.36	-22.57	932.74	798.55	134.19	6.951		
15,400.00	10,598.43	14,504.92	9,686.51	133.55	132.17	-12.13	4,875.36	-21.67	932.74	796.36	136.38	6.839		
15,500.00	10,599.02	14,604.92	9,687.10	135.80	134.45	-12.13	4,975.35	-20.77	932.74	794.16	138.58	6.731		
15,600.00	10,599.60	14,695.08	9,687.69	138.07	136.52	-12.13	5,075.35	-19.87	932.74	792.06	140.67	6.630		
15,700.00	10,600.19	14,804.92	9,688.28	140.33	139.05	-12.13	5,175.34	-18.96	932.73	789.74	143.00	6.523		
15,800.00	10,600.78	14,904.92	9,688.87	142.61	141.36	-12.13	5,275.34	-18.06	932.73	787.52	145.22	6.423		
15,900.00	10,601.37	15,004.92	9,689.46	144.89	143.67	-12.12	5,375.33	-17.16	932.73	785.29	147.44	6.326		
16,000.00	10,601.95	15,104.92	9,690.05	147.18	145.99	-12.12	5,475.32	-16.26	932.73	783.06	149.67	6.232		
16,100.00	10,602.54	15,204.92	9,690.63	149.47	148.31	-12.12	5,575.32	-15.36	932.73	780.83	151.90	6.140		
16,200.00	10,603.13	15,304.92	9,691.22	151.77	150.64	-12.12	5,675.31	-14.45	932.73	778.58	154.15	6.051		
16,300.00	10,603.72	15,404.92	9,691.81	154.08	152.97	-12.12	5,775.31	-13.55	932.73	776.34	156.39	5.964		
16,400.00	10,604.30	15,504.92	9,692.40	156.39	155.31	-12.12	5,875.30	-12.65	932.73	774.08	158.64	5.879		
16,500.00	10,604.89	15,595.08	9,692.99	158.70	157.42	-12.12	5,975.30	-11.75	932.73	771.94	160.78	5.801		
16,600.00	10,605.48	15,704.92	9,693.58	161.02	159.99	-12.12	6,075.29	-10.85	932.72	769.57	163.16	5.717		
16,700.00	10,606.07	15,804.92	9,694.16	163.34	162.34	-12.12	6,175.28	-9.94	932.72	767.30	165.42	5.638		
16,800.00	10,606.65	15,904.92	9,694.75	165.67	164.69	-12.12	6,275.28	-9.04	932.72	765.03	167.69	5.562		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
6,800.00	6,794.22	6,800.87	6,794.22	36.03	35.72	-90.24	-200.44	-67.45	196.00	124.39	71.61	2.737		
6,900.00	6,894.22	6,900.87	6,894.22	36.53	36.22	-90.24	-200.44	-67.45	196.00	123.38	72.62	2.699		
7,000.00	6,994.22	7,000.87	6,994.22	37.03	36.73	-90.24	-200.44	-67.45	196.00	122.36	73.64	2.662		
7,100.00	7,094.22	7,100.87	7,094.22	37.54	37.24	-90.24	-200.44	-67.45	196.00	121.35	74.65	2.626		
7,200.00	7,194.22	7,200.87	7,194.22	38.04	37.75	-90.24	-200.44	-67.45	196.00	120.33	75.67	2.590		
7,300.00	7,294.22	7,300.87	7,294.22	38.55	38.27	-90.24	-200.44	-67.45	196.00	119.31	76.69	2.556		
7,400.00	7,394.22	7,400.87	7,394.22	39.06	38.78	-90.24	-200.44	-67.45	196.00	118.29	77.71	2.522		
7,500.00	7,494.22	7,500.87	7,494.22	39.56	39.29	-90.24	-200.44	-67.45	196.00	117.27	78.73	2.489		
7,600.00	7,594.22	7,600.87	7,594.22	40.07	39.80	-90.24	-200.44	-67.45	196.00	116.25	79.76	2.458		
7,700.00	7,694.22	7,700.87	7,694.22	40.58	40.32	-90.24	-200.44	-67.45	196.00	115.22	80.78	2.426		
7,800.00	7,794.22	7,800.87	7,794.22	41.09	40.83	-90.24	-200.44	-67.45	196.00	114.20	81.81	2.396		
7,900.00	7,894.22	7,900.87	7,894.22	41.60	41.35	-90.24	-200.44	-67.45	196.00	113.17	82.83	2.366		
8,000.00	7,994.22	8,000.87	7,994.22	42.12	41.87	-90.24	-200.44	-67.45	196.00	112.14	83.86	2.337		
8,100.00	8,094.22	8,100.87	8,094.22	42.63	42.38	-90.24	-200.44	-67.45	196.00	111.11	84.89	2.309		
8,200.00	8,194.22	8,200.87	8,194.22	43.14	42.90	-90.24	-200.44	-67.45	196.00	110.08	85.92	2.281		
8,300.00	8,294.22	8,300.87	8,294.22	43.65	43.42	-90.24	-200.44	-67.45	196.00	109.05	86.95	2.254		
8,400.00	8,394.22	8,400.87	8,394.22	44.17	43.93	-90.24	-200.44	-67.45	196.00	108.02	87.99	2.228		
8,500.00	8,494.22	8,500.87	8,494.22	44.68	44.45	-90.24	-200.44	-67.45	196.00	106.98	89.02	2.202		
8,600.00	8,594.22	8,600.87	8,594.22	45.20	44.97	-90.24	-200.44	-67.45	196.00	105.95	90.06	2.176		
8,700.00	8,694.22	8,700.87	8,694.22	45.71	45.49	-90.24	-200.44	-67.45	196.00	104.91	91.09	2.152		
8,800.00	8,794.22	8,800.87	8,794.22	46.23	46.01	-90.24	-200.44	-67.45	196.00	103.87	92.13	2.127		
8,900.00	8,894.22	8,900.87	8,894.22	46.75	46.53	-90.24	-200.44	-67.45	196.00	102.84	93.17	2.104		
9,000.00	8,994.22	9,000.87	8,994.22	47.26	47.05	-90.24	-200.44	-67.45	196.00	101.80	94.20	2.081		
9,100.00	9,094.22	9,099.16	9,094.25	47.78	47.56	-90.23	-200.40	-67.45	196.00	100.77	95.23	2.058		
9,147.22	9,141.44	9,146.43	9,141.44	48.03	47.80	-89.48	-197.85	-67.43	195.99	100.27	95.72	2.048		
9,200.00	9,194.22	9,198.37	9,192.86	48.30	48.06	-87.36	-190.59	-67.36	196.12	99.89	96.23	2.038		
9,300.00	9,294.22	9,291.58	9,282.66	48.82	48.49	-80.26	-166.02	-67.14	198.89	101.98	96.91	2.052		
9,400.00	9,394.22	9,375.00	9,358.72	49.34	48.85	-70.89	-131.94	-66.83	209.80	113.55	96.25	2.180		
9,500.00	9,494.22	9,447.17	9,419.95	49.86	49.14	-61.52	-93.81	-66.49	233.99	140.77	93.22	2.510		
9,600.00	9,594.22	9,508.39	9,467.78	50.38	49.38	-53.52	-55.66	-66.14	273.17	184.59	88.58	3.084		
9,700.00	9,694.22	9,559.86	9,504.65	50.90	49.57	-47.22	-19.78	-65.82	325.67	241.90	83.77	3.888		
9,800.00	9,794.22	9,600.00	9,531.09	51.42	49.73	-42.74	10.42	-65.55	388.62	309.35	79.27	4.903		
9,900.00	9,894.22	9,639.49	9,554.97	51.94	49.88	-38.75	41.86	-65.26	459.31	383.12	76.19	6.029		
10,000.00	9,994.22	9,670.36	9,572.10	52.46	50.01	-35.93	67.54	-65.03	535.76	462.25	73.50	7.289		
10,100.00	10,093.79	9,700.00	9,587.22	52.97	50.13	-28.37	93.02	-64.80	612.46	541.23	71.23	8.599		
10,200.00	10,190.47	9,732.26	9,602.15	53.43	50.26	-22.78	121.61	-64.55	683.11	614.02	69.09	9.887		
10,300.00	10,281.34	9,766.42	9,616.19	53.85	50.40	-19.03	152.74	-64.26	746.42	679.34	67.08	11.127		
10,400.00	10,363.63	9,800.00	9,628.15	54.22	50.55	-16.50	184.12	-63.98	801.47	736.31	65.16	12.301		
10,500.00	10,434.84	9,850.00	9,642.51	54.58	50.77	-14.62	231.99	-63.55	847.69	783.69	64.00	13.244		
10,600.00	10,492.81	9,876.15	9,648.34	54.94	50.90	-13.51	257.48	-63.32	884.01	821.69	62.32	14.184		
10,700.00	10,535.78	9,914.17	9,654.74	55.34	51.08	-12.73	294.95	-62.98	910.57	849.16	61.41	14.828		
10,800.00	10,562.45	9,950.00	9,658.47	55.76	51.25	-12.29	330.58	-62.66	926.90	865.96	60.94	15.210		
10,900.00	10,571.99	9,995.08	9,660.04	56.20	51.47	-12.13	375.62	-62.25	932.79	871.74	61.05	15.279		
11,000.00	10,572.58	10,095.08	9,660.62	56.71	52.05	-12.13	475.61	-61.35	932.79	871.23	61.56	15.153		
11,100.00	10,573.16	10,204.92	9,661.21	57.32	52.80	-12.13	575.61	-60.45	932.79	870.59	62.20	14.997		
11,200.00	10,573.75	10,304.92	9,661.80	58.04	53.60	-12.13	675.60	-59.55	932.79	869.88	62.90	14.829		
11,300.00	10,574.34	10,404.92	9,662.39	58.84	54.50	-12.13	775.60	-58.65	932.78	869.09	63.69	14.645		
11,400.00	10,574.93	10,504.92	9,662.98	59.74	55.49	-12.13	875.59	-57.74	932.78	868.21	64.57	14.446		
11,500.00	10,575.51	10,595.08	9,663.57	60.72	56.46	-12.13	975.58	-56.84	932.78	867.30	65.48	14.246		
11,600.00	10,576.10	10,704.92	9,664.16	61.79	57.74	-12.13	1,075.58	-55.94	932.78	866.21	66.57	14.012		
11,700.00	10,576.69	10,804.92	9,664.74	62.94	58.99	-12.13	1,175.57	-55.04	932.78	865.10	67.68	13.781		

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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

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		Offset		Semi Major Axis			Distance		Between		Minimum	Separation	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor			
1,700.00	1,699.79	1,700.21	1,699.79	8.70	8.80	138.37	0.00	-25.00	31.66	14.17	17.50	1.810	Level 3<2.00		
1,800.00	1,799.67	1,800.33	1,799.67	9.20	9.34	143.66	0.00	-25.00	35.50	16.96	18.54	1.915	Level 3<2.00		
1,900.00	1,899.54	1,900.46	1,899.54	9.71	9.88	147.89	0.00	-25.00	39.58	20.00	19.58	2.021			
2,000.00	1,999.42	1,999.42	1,999.42	10.23	10.41	151.32	0.00	-25.00	43.83	23.21	20.63	2.125			
2,100.00	2,099.30	2,099.70	2,099.69	10.75	10.92	152.67	-1.27	-25.27	47.80	26.15	21.65	2.208			
2,200.00	2,199.18	2,200.03	2,199.88	11.27	11.41	151.04	-5.09	-26.08	51.00	28.35	22.65	2.251			
2,300.00	2,299.06	2,300.10	2,299.69	11.79	11.91	148.63	-9.84	-27.08	54.00	30.33	23.67	2.282			
2,400.00	2,398.94	2,400.17	2,399.50	12.32	12.40	146.47	-14.59	-28.09	57.08	32.39	24.69	2.312			
2,500.00	2,498.82	2,500.24	2,499.32	12.85	12.90	144.54	-19.33	-29.09	60.24	34.52	25.71	2.342			
2,600.00	2,598.69	2,600.31	2,599.13	13.38	13.41	142.80	-24.08	-30.10	63.45	36.70	26.75	2.372			
2,700.00	2,698.57	2,700.38	2,698.94	13.91	13.92	141.23	-28.83	-31.11	66.72	38.93	27.79	2.401			
2,800.00	2,798.45	2,800.45	2,798.75	14.45	14.43	139.80	-33.58	-32.11	70.04	41.21	28.83	2.429			
2,900.00	2,898.33	2,900.52	2,898.57	14.98	14.95	138.51	-38.32	-33.12	73.39	43.51	29.88	2.456			
3,000.00	2,998.21	3,000.59	2,998.38	15.52	15.46	137.33	-43.07	-34.12	76.78	45.85	30.93	2.483			
3,100.00	3,098.09	3,100.66	3,098.19	16.06	15.98	136.25	-47.82	-35.13	80.19	48.21	31.98	2.508			
3,200.00	3,197.97	3,200.73	3,198.00	16.60	16.51	135.26	-52.56	-36.13	83.64	50.60	33.04	2.531			
3,300.00	3,297.84	3,300.80	3,297.82	17.13	17.03	134.35	-57.31	-37.14	87.10	53.01	34.10	2.554			
3,400.00	3,397.72	3,400.87	3,397.63	17.67	17.55	133.50	-62.06	-38.14	90.59	55.43	35.16	2.576			
3,500.00	3,497.60	3,500.93	3,497.44	18.22	18.08	132.72	-66.81	-39.15	94.10	57.87	36.23	2.597			
3,600.00	3,597.48	3,601.00	3,597.26	18.76	18.61	132.00	-71.55	-40.15	97.62	60.32	37.30	2.617			
3,700.00	3,697.36	3,701.07	3,697.07	19.30	19.14	131.33	-76.30	-41.16	101.15	62.79	38.37	2.637			
3,800.00	3,797.24	3,801.14	3,796.88	19.84	19.67	130.70	-81.05	-42.16	104.70	65.27	39.44	2.655			
3,900.00	3,897.11	3,901.21	3,896.69	20.39	20.21	130.11	-85.79	-43.17	108.26	67.75	40.51	2.673			
4,000.00	3,996.99	4,001.28	3,996.51	20.93	20.74	129.56	-90.54	-44.18	111.84	70.25	41.58	2.689			
4,100.00	4,096.87	4,101.35	4,096.32	21.47	21.27	129.05	-95.29	-45.18	115.42	72.76	42.66	2.705			
4,200.00	4,196.75	4,201.42	4,196.13	22.02	21.81	128.56	-100.04	-46.19	119.01	75.27	43.74	2.721			
4,300.00	4,296.63	4,301.49	4,295.95	22.56	22.35	128.11	-104.78	-47.19	122.60	77.79	44.82	2.736			
4,400.00	4,396.51	4,401.56	4,395.76	23.11	22.88	127.68	-109.53	-48.20	126.21	80.31	45.90	2.750			
4,500.00	4,496.39	4,501.63	4,495.57	23.65	23.42	127.27	-114.28	-49.20	129.82	82.84	46.98	2.764			
4,600.00	4,596.26	4,601.70	4,595.38	24.20	23.96	126.89	-119.02	-50.21	133.44	85.38	48.06	2.777			
4,700.00	4,696.14	4,701.77	4,695.20	24.75	24.50	126.52	-123.77	-51.21	137.06	87.92	49.14	2.789			
4,800.00	4,796.02	4,801.84	4,795.01	25.29	25.04	126.18	-128.52	-52.22	140.69	90.47	50.22	2.801			
4,900.00	4,895.90	4,901.91	4,894.82	25.84	25.58	125.85	-133.27	-53.22	144.32	93.02	51.31	2.813			
5,000.00	4,995.78	5,001.98	4,994.63	26.39	26.12	125.54	-138.01	-54.23	147.96	95.57	52.39	2.824			
5,100.00	5,095.66	5,102.04	5,094.45	26.93	26.66	125.24	-142.76	-55.23	151.60	98.13	53.48	2.835			
5,200.00	5,195.53	5,202.11	5,194.26	27.48	27.20	124.96	-147.51	-56.24	155.25	100.69	54.57	2.845			
5,300.00	5,295.41	5,302.18	5,294.07	28.03	27.74	124.69	-152.26	-57.25	158.90	103.25	55.65	2.855			
5,400.00	5,395.29	5,402.25	5,393.89	28.57	28.29	124.44	-157.00	-58.25	162.55	105.81	56.74	2.865			
5,500.00	5,495.17	5,502.32	5,493.70	29.12	28.83	124.19	-161.75	-59.26	166.21	108.38	57.83	2.874			
5,600.00	5,595.05	5,602.39	5,593.51	29.67	29.37	123.95	-166.50	-60.26	169.87	110.95	58.92	2.883			
5,700.00	5,694.93	5,702.46	5,693.32	30.22	29.92	123.73	-171.24	-61.27	173.53	113.53	60.00	2.892			
5,800.00	5,794.81	5,802.53	5,793.14	30.77	30.46	123.51	-175.99	-62.27	177.19	116.10	61.09	2.900			
5,900.00	5,894.68	5,902.60	5,892.95	31.32	31.00	123.30	-180.74	-63.28	180.86	118.68	62.18	2.908			
6,000.00	5,994.56	6,002.67	5,992.76	31.86	31.55	123.10	-185.49	-64.28	184.53	121.26	63.27	2.916			
6,100.00	6,094.44	6,102.74	6,092.57	32.41	32.09	122.91	-190.23	-65.29	188.20	123.84	64.37	2.924			
6,200.00	6,194.32	6,197.19	6,192.39	32.96	32.61	122.73	-194.98	-66.29	191.87	126.45	65.43	2.933			
6,300.00	6,294.24	6,297.98	6,293.09	33.51	33.15	122.59	-198.98	-67.14	194.90	128.38	66.52	2.930			
6,400.00	6,394.22	6,399.06	6,394.16	34.02	33.68	122.54	-200.44	-67.45	196.00	128.43	67.57	2.901			
6,500.00	6,494.22	6,500.87	6,494.22	34.52	34.20	-90.24	-200.44	-67.45	196.00	127.42	68.59	2.858			
6,600.00	6,594.22	6,600.87	6,594.22	35.02	34.70	-90.24	-200.44	-67.45	196.00	126.41	69.59	2.816			
6,700.00	6,694.22	6,700.87	6,694.22	35.52	35.21	-90.24	-200.44	-67.45	196.00	125.40	70.60	2.776			

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



Anticollision Report

Company:	Tap Rock Operating LLC	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 238 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. 238 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 1,970.99 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	17,709.92	rev0 (Original Hole)	MWD	OWSG MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Section 32-T26S-R29E						
Money Graham Fed Com Well No. 204 H - Original Hole	1,400.00	1,400.00	25.00	10.62	1.739	Level 3<2.00, CC
Money Graham Fed Com Well No. 204 H - Original Hole	1,500.00	1,500.01	25.73	10.30	1.668	Level 3<2.00, ES, SF
Money Graham Fed Com Well No. 214 H - Original Hole	1,200.00	1,200.00	75.01	62.78	6.134	CC, ES
Money Graham Fed Com Well No. 214 H - Original Hole	17,709.92	17,040.11	841.03	594.54	3.412	SF
Money Graham Fed Com Well No. 218 H - Original Hole	1,200.00	1,200.00	25.00	12.77	2.045	CC, ES
Money Graham Fed Com Well No. 218 H - Original Hole	1,300.00	1,299.43	26.11	12.83	1.967	Level 3<2.00, SF
Money Graham Fed Com Well No. 246 H - Original Hole	1,400.00	1,400.00	50.01	35.63	3.478	CC, ES
Money Graham Fed Com Well No. 246 H - Original Hole	17,700.00	17,891.06	465.37	146.15	1.458	Level 2<1.50, SF
Sidewinder #1H - Original Hole - Surveys Original Hole	6,893.96	10,675.13	287.88	101.98	1.549	Level 3<2.00, 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		Offset		Semi Major Axis			Distance				Minimum Separation	Separation Factor	Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
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		
1,300.00	1,300.00	1,300.00	1,300.00	6.65	6.65	-90.00	0.00	-25.00	25.00	11.70	13.30	1.879	Level 3<2.00	
1,400.00	1,400.00	1,400.00	1,400.00	7.19	7.19	-90.00	0.00	-25.00	25.00	10.62	14.38	1.739	Level 3<2.00, CC	
1,500.00	1,499.99	1,500.01	1,499.99	7.70	7.73	125.22	0.00	-25.00	25.73	10.30	15.43	1.668	Level 3<2.00, ES, SF	
1,600.00	1,599.91	1,600.09	1,599.91	8.20	8.27	131.70	0.00	-25.00	28.17	11.71	16.46	1.711	Level 3<2.00	

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



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
507.00	507.00	Rustler Anhydrite		0.34	0.51	
682.00	682.00	Top Salt		0.34	0.51	
2,393.58	2,391.78	Base Salt		0.34	0.51	
2,734.23	2,731.69	Delaware Mountain Gp		0.34	0.51	
2,849.45	2,846.67	Bell Canyon		0.34	0.51	
2,849.45	2,846.67	Lamar		0.34	0.51	
2,889.53	2,886.66	Ramsey Sand		0.34	0.51	
3,866.41	3,861.41	Cherry Canyon		0.34	0.51	
4,843.29	4,836.16	Brushy Canyon		0.34	0.51	
6,435.97	6,425.80	Bone Spring Lime		0.34	0.51	
7,360.97	7,350.80	1st Bone Spring Sand		0.34	0.51	
7,940.97	7,930.80	2nd Bone Spring Sand		0.34	0.51	
9,172.97	9,162.80	3rd Bone Spring Sand		0.34	0.51	
9,430.97	9,420.80	3rd BS W Sand		0.34	0.51	
9,520.97	9,510.80	Wolfcamp A		0.34	0.51	
9,630.97	9,620.80	Wolfcamp A Y Sand		0.34	0.51	
9,760.97	9,750.80	Wolfcamp A Fat		0.34	0.51	
10,020.97	10,010.80	Wolfcamp B		0.34	0.51	
10,552.00	10,521.40	Wolfcamp B2		0.34	0.51	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,400.00	1,400.00	0.00	0.00	KOP Begin 1.5°/100' build	
1,652.06	1,651.88	-5.31	-6.40	Begin 3.78° tangent	
6,158.11	6,148.12	-195.06	-235.05	Begin 1.5°/100' drop	
6,410.17	6,400.00	-200.37	-241.45	Begin vertical hold	
10,207.22	10,197.05	-200.37	-241.45	Begin 10°/100' build	
11,103.85	10,770.00	369.19	-236.38	Begin 89.66° lateral	
17,891.06	10,810.00	7,156.01	-176.00	PBHL/TD 17891.06 MD/10810.00 TVD	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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
16,300.00	89.66	0.51	10,800.62	5,565.05	-190.16	369,753.03	644,105.85	32.01609774	-104.00175265
16,400.00	89.66	0.51	10,801.21	5,665.04	-189.27	369,853.03	644,106.74	32.01637261	-104.00174879
16,500.00	89.66	0.51	10,801.80	5,765.03	-188.38	369,953.02	644,107.63	32.01664748	-104.00174493
16,600.00	89.66	0.51	10,802.39	5,865.03	-187.49	370,053.02	644,108.52	32.01692235	-104.00174107
16,700.00	89.66	0.51	10,802.98	5,965.02	-186.60	370,153.01	644,109.41	32.01719723	-104.00173721
16,800.00	89.66	0.51	10,803.57	6,065.02	-185.71	370,253.00	644,110.30	32.01747210	-104.00173335
16,900.00	89.66	0.51	10,804.16	6,165.01	-184.82	370,353.00	644,111.19	32.01774697	-104.00172949
17,000.00	89.66	0.51	10,804.75	6,265.01	-183.93	370,452.99	644,112.08	32.01802184	-104.00172563
17,100.00	89.66	0.51	10,805.34	6,365.00	-183.04	370,552.99	644,112.97	32.01829671	-104.00172177
17,200.00	89.66	0.51	10,805.93	6,464.99	-182.15	370,652.98	644,113.86	32.01857158	-104.00171791
17,300.00	89.66	0.51	10,806.52	6,564.99	-181.26	370,752.97	644,114.75	32.01884645	-104.00171405
17,400.00	89.66	0.51	10,807.11	6,664.98	-180.37	370,852.97	644,115.64	32.01912132	-104.00171019
17,500.00	89.66	0.51	10,807.70	6,764.98	-179.48	370,952.96	644,116.53	32.01939620	-104.00170633
17,600.00	89.66	0.51	10,808.28	6,864.97	-178.59	371,052.96	644,117.41	32.01967107	-104.00170247
17,700.00	89.66	0.51	10,808.87	6,964.97	-177.70	371,152.95	644,118.30	32.01994594	-104.00169861
17,800.00	89.66	0.51	10,809.46	7,064.96	-176.81	371,252.94	644,119.19	32.02022081	-104.00169475
17,891.06	89.66	0.51	10,810.00	7,156.01	-176.00	371,344.00	644,120.00	32.02047111	-104.00169123
PBHL/TD 17891.06 MD/10810.00 TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Money Graham 246H V1 - hit/miss target - Shape - Point	0.00	0.00	6,400.00	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Money Graham 246H PI - plan hits target center - Point	0.00	0.00	10,810.00	7,156.01	-176.00	371,344.00	644,120.00	32.02047111	-104.00169123



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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
11,103.85	89.66	0.51	10,770.00	369.19	-236.38	364,557.19	644,059.62	32.00181498	-104.00195320
Begin 89.66° lateral									
11,200.00	89.66	0.51	10,770.56	465.34	-235.53	364,653.33	644,060.48	32.00207928	-104.00194949
11,300.00	89.66	0.51	10,771.15	565.33	-234.64	364,753.33	644,061.37	32.00235415	-104.00194563
11,400.00	89.66	0.51	10,771.74	665.32	-233.75	364,853.32	644,062.26	32.00262903	-104.00194177
11,500.00	89.66	0.51	10,772.33	765.32	-232.86	364,953.32	644,063.15	32.00290390	-104.00193791
11,600.00	89.66	0.51	10,772.92	865.31	-231.97	365,053.31	644,064.04	32.00317877	-104.00193405
11,700.00	89.66	0.51	10,773.51	965.31	-231.08	365,153.30	644,064.93	32.00345364	-104.00193019
11,800.00	89.66	0.51	10,774.10	1,065.30	-230.19	365,253.30	644,065.82	32.00372851	-104.00192633
11,900.00	89.66	0.51	10,774.69	1,165.30	-229.30	365,353.29	644,066.70	32.00400339	-104.00192248
12,000.00	89.66	0.51	10,775.28	1,265.29	-228.41	365,453.29	644,067.59	32.00427826	-104.00191862
12,100.00	89.66	0.51	10,775.87	1,365.28	-227.52	365,553.28	644,068.48	32.00455313	-104.00191476
12,200.00	89.66	0.51	10,776.46	1,465.28	-226.63	365,653.27	644,069.37	32.00482800	-104.00191090
12,300.00	89.66	0.51	10,777.05	1,565.27	-225.74	365,753.27	644,070.26	32.00510287	-104.00190704
12,400.00	89.66	0.51	10,777.64	1,665.27	-224.85	365,853.26	644,071.15	32.00537775	-104.00190318
12,500.00	89.66	0.51	10,778.23	1,765.26	-223.96	365,953.26	644,072.04	32.00565262	-104.00189932
12,600.00	89.66	0.51	10,778.82	1,865.26	-223.07	366,053.25	644,072.93	32.00592749	-104.00189546
12,700.00	89.66	0.51	10,779.41	1,965.25	-222.18	366,153.24	644,073.82	32.00620236	-104.00189160
12,800.00	89.66	0.51	10,779.99	2,065.25	-221.29	366,253.24	644,074.71	32.00647723	-104.00188774
12,900.00	89.66	0.51	10,780.58	2,165.24	-220.40	366,353.23	644,075.60	32.00675210	-104.00188389
13,000.00	89.66	0.51	10,781.17	2,265.23	-219.51	366,453.23	644,076.49	32.00702698	-104.00188003
13,100.00	89.66	0.51	10,781.76	2,365.23	-218.62	366,553.22	644,077.38	32.00730185	-104.00187617
13,200.00	89.66	0.51	10,782.35	2,465.22	-217.73	366,653.22	644,078.27	32.00757672	-104.00187231
13,300.00	89.66	0.51	10,782.94	2,565.22	-216.84	366,753.21	644,079.16	32.00785159	-104.00186845
13,400.00	89.66	0.51	10,783.53	2,665.21	-215.96	366,853.20	644,080.05	32.00812646	-104.00186459
13,500.00	89.66	0.51	10,784.12	2,765.21	-215.07	366,953.20	644,080.94	32.00840134	-104.00186073
13,600.00	89.66	0.51	10,784.71	2,865.20	-214.18	367,053.19	644,081.83	32.00867621	-104.00185687
13,700.00	89.66	0.51	10,785.30	2,965.19	-213.29	367,153.19	644,082.72	32.00895108	-104.00185301
13,800.00	89.66	0.51	10,785.89	3,065.19	-212.40	367,253.18	644,083.61	32.00922595	-104.00184915
13,900.00	89.66	0.51	10,786.48	3,165.18	-211.51	367,353.17	644,084.50	32.00950082	-104.00184529
14,000.00	89.66	0.51	10,787.07	3,265.18	-210.62	367,453.17	644,085.39	32.00977569	-104.00184143
14,100.00	89.66	0.51	10,787.66	3,365.17	-209.73	367,553.16	644,086.28	32.01005057	-104.00183757
14,200.00	89.66	0.51	10,788.25	3,465.17	-208.84	367,653.16	644,087.17	32.01032544	-104.00183371
14,300.00	89.66	0.51	10,788.84	3,565.16	-207.95	367,753.15	644,088.06	32.01060031	-104.00182985
14,400.00	89.66	0.51	10,789.42	3,665.15	-207.06	367,853.14	644,088.95	32.01087518	-104.00182599
14,500.00	89.66	0.51	10,790.01	3,765.15	-206.17	367,953.14	644,089.84	32.01115005	-104.00182213
14,600.00	89.66	0.51	10,790.60	3,865.14	-205.28	368,053.13	644,090.73	32.01142492	-104.00181827
14,700.00	89.66	0.51	10,791.19	3,965.14	-204.39	368,153.13	644,091.62	32.01169980	-104.00181441
14,800.00	89.66	0.51	10,791.78	4,065.13	-203.50	368,253.12	644,092.50	32.01197467	-104.00181055
14,900.00	89.66	0.51	10,792.37	4,165.13	-202.61	368,353.12	644,093.39	32.01224954	-104.00180669
15,000.00	89.66	0.51	10,792.96	4,265.12	-201.72	368,453.11	644,094.28	32.01252441	-104.00180283
15,100.00	89.66	0.51	10,793.55	4,365.11	-200.83	368,553.10	644,095.17	32.01279928	-104.00179897
15,200.00	89.66	0.51	10,794.14	4,465.11	-199.94	368,653.10	644,096.06	32.01307415	-104.00179511
15,300.00	89.66	0.51	10,794.73	4,565.10	-199.05	368,753.09	644,096.95	32.01334903	-104.00179125
15,400.00	89.66	0.51	10,795.32	4,665.10	-198.16	368,853.09	644,097.84	32.01362390	-104.00178739
15,500.00	89.66	0.51	10,795.91	4,765.09	-197.27	368,953.08	644,098.73	32.01389877	-104.00178353
15,600.00	89.66	0.51	10,796.50	4,865.09	-196.38	369,053.07	644,099.62	32.01417364	-104.00177967
15,700.00	89.66	0.51	10,797.09	4,965.08	-195.49	369,153.07	644,100.51	32.01444851	-104.00177581
15,800.00	89.66	0.51	10,797.68	5,065.07	-194.60	369,253.06	644,101.40	32.01472338	-104.00177195
15,900.00	89.66	0.51	10,798.27	5,165.07	-193.71	369,353.06	644,102.29	32.01499825	-104.00176809
16,000.00	89.66	0.51	10,798.85	5,265.06	-192.82	369,453.05	644,103.18	32.01527313	-104.00176423
16,100.00	89.66	0.51	10,799.44	5,365.06	-191.93	369,553.04	644,104.07	32.01554800	-104.00176037
16,200.00	89.66	0.51	10,800.03	5,465.05	-191.04	369,653.04	644,104.96	32.01582287	-104.00175651



Planning Report - Geographic

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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. 246 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	7,889.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,940.97	0.00	0.00	7,930.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
2nd Bone Spring Sand									
8,000.00	0.00	0.00	7,989.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,100.00	0.00	0.00	8,089.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,200.00	0.00	0.00	8,189.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,300.00	0.00	0.00	8,289.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,400.00	0.00	0.00	8,389.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,500.00	0.00	0.00	8,489.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,600.00	0.00	0.00	8,589.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,700.00	0.00	0.00	8,689.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,800.00	0.00	0.00	8,789.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
8,900.00	0.00	0.00	8,889.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,000.00	0.00	0.00	8,989.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,100.00	0.00	0.00	9,089.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,172.97	0.00	0.00	9,162.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
3rd Bone Spring Sand									
9,200.00	0.00	0.00	9,189.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,300.00	0.00	0.00	9,289.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,400.00	0.00	0.00	9,389.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,430.97	0.00	0.00	9,420.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
3rd BS W Sand									
9,500.00	0.00	0.00	9,489.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,520.97	0.00	0.00	9,510.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Wolfcamp A									
9,600.00	0.00	0.00	9,589.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,630.97	0.00	0.00	9,620.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Wolfcamp A Y Sand									
9,700.00	0.00	0.00	9,689.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,760.97	0.00	0.00	9,750.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Wolfcamp A Fat									
9,800.00	0.00	0.00	9,789.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
9,900.00	0.00	0.00	9,889.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
10,000.00	0.00	0.00	9,989.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
10,020.97	0.00	0.00	10,010.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Wolfcamp B									
10,100.00	0.00	0.00	10,089.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
10,200.00	0.00	0.00	10,189.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
10,207.22	0.00	0.00	10,197.05	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Begin 10°/100' build									
10,300.00	9.28	0.51	10,289.42	-192.88	-241.38	363,995.12	644,054.62	32.00026994	-104.00197489
10,400.00	19.28	0.51	10,386.21	-168.25	-241.16	364,019.75	644,054.84	32.00033764	-104.00197394
10,500.00	29.28	0.51	10,477.25	-127.18	-240.80	364,060.81	644,055.21	32.00045052	-104.00197235
10,552.00	34.48	0.51	10,521.40	-99.73	-240.56	364,088.27	644,055.45	32.00052598	-104.00197129
Wolfcamp B2									
10,600.00	39.28	0.51	10,559.78	-70.94	-240.30	364,117.06	644,055.71	32.00060513	-104.00197018
10,700.00	49.28	0.51	10,631.28	-1.21	-239.68	364,186.78	644,056.33	32.00079679	-104.00196749
10,800.00	59.28	0.51	10,689.60	79.86	-238.96	364,267.86	644,057.05	32.00101967	-104.00196436
10,900.00	69.28	0.51	10,732.94	169.84	-238.16	364,357.84	644,057.85	32.00126699	-104.00196089
11,000.00	79.28	0.51	10,760.00	265.97	-237.30	364,453.97	644,058.70	32.00153125	-104.00195718
11,100.00	89.28	0.51	10,769.96	365.34	-236.42	364,553.34	644,059.59	32.00180441	-104.00195335



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246
Company:	Tap Rock Operating LLC	TVD Reference:	H
Project:	Eddy County, New Mexico NAD83 NM east	MD Reference:	RKB=2866+26 @ 2892.00ft
Site:	Section 32-T26S-R29E	North Reference:	RKB=2866+26 @ 2892.00ft
Well:	Money Graham Fed Com Well No. 246 H	Survey Calculation Method:	Grid
Wellbore:	Original Hole		Minimum Curvature
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	3.78	230.31	3,795.14	-95.76	-115.39	364,092.24	644,180.61	32.00053584	-104.00156749
3,866.41	3.78	230.31	3,861.41	-98.56	-118.76	364,089.44	644,177.24	32.00052818	-104.00157839
Cherry Canyon									
3,900.00	3.78	230.31	3,894.92	-99.97	-120.47	364,088.03	644,175.54	32.00052431	-104.00158390
4,000.00	3.78	230.31	3,994.71	-104.18	-125.54	364,083.82	644,170.46	32.00051278	-104.00160032
4,100.00	3.78	230.31	4,094.49	-108.39	-130.62	364,079.61	644,165.39	32.00050124	-104.00161673
4,200.00	3.78	230.31	4,194.27	-112.60	-135.69	364,075.39	644,160.31	32.00048971	-104.00163314
4,300.00	3.78	230.31	4,294.05	-116.82	-140.76	364,071.18	644,155.24	32.00047818	-104.00164955
4,400.00	3.78	230.31	4,393.84	-121.03	-145.84	364,066.97	644,150.17	32.00046664	-104.00166596
4,500.00	3.78	230.31	4,493.62	-125.24	-150.91	364,062.76	644,145.09	32.00045511	-104.00168237
4,600.00	3.78	230.31	4,593.40	-129.45	-155.99	364,058.55	644,140.02	32.00044358	-104.00169878
4,700.00	3.78	230.31	4,693.18	-133.66	-161.06	364,054.34	644,134.94	32.00043204	-104.00171519
4,800.00	3.78	230.31	4,792.97	-137.87	-166.14	364,050.13	644,129.87	32.00042051	-104.00173160
4,843.29	3.78	230.31	4,836.16	-139.69	-168.33	364,048.30	644,127.67	32.00041552	-104.00173871
Brushy Canyon									
4,900.00	3.78	230.31	4,892.75	-142.08	-171.21	364,045.92	644,124.79	32.00040898	-104.00174802
5,000.00	3.78	230.31	4,992.53	-146.29	-176.29	364,041.71	644,119.72	32.00039744	-104.00176443
5,100.00	3.78	230.31	5,092.31	-150.50	-181.36	364,037.49	644,114.64	32.00038591	-104.00178084
5,200.00	3.78	230.31	5,192.10	-154.71	-186.43	364,033.28	644,109.57	32.00037438	-104.00179725
5,300.00	3.78	230.31	5,291.88	-158.93	-191.51	364,029.07	644,104.50	32.00036285	-104.00181366
5,400.00	3.78	230.31	5,391.66	-163.14	-196.58	364,024.86	644,099.42	32.00035131	-104.00183007
5,500.00	3.78	230.31	5,491.44	-167.35	-201.66	364,020.65	644,094.35	32.00033978	-104.00184648
5,600.00	3.78	230.31	5,591.22	-171.56	-206.73	364,016.44	644,089.27	32.00032825	-104.00186289
5,700.00	3.78	230.31	5,691.01	-175.77	-211.81	364,012.23	644,084.20	32.00031671	-104.00187930
5,800.00	3.78	230.31	5,790.79	-179.98	-216.88	364,008.02	644,079.12	32.00030518	-104.00189572
5,900.00	3.78	230.31	5,890.57	-184.19	-221.96	364,003.81	644,074.05	32.00029365	-104.00191213
6,000.00	3.78	230.31	5,990.35	-188.40	-227.03	363,999.60	644,068.98	32.00028211	-104.00192854
6,100.00	3.78	230.31	6,090.14	-192.61	-232.10	363,995.38	644,063.90	32.00027058	-104.00194495
6,158.11	3.78	230.31	6,148.12	-195.06	-235.05	363,992.94	644,060.95	32.00026388	-104.00195449
Begin 1.5"/100' drop									
6,200.00	3.15	230.31	6,189.93	-196.68	-237.00	363,991.32	644,059.00	32.00025945	-104.00196079
6,300.00	1.65	230.31	6,289.84	-199.36	-240.23	363,988.64	644,055.78	32.00025212	-104.00197122
6,400.00	0.15	230.31	6,389.83	-200.36	-241.44	363,987.64	644,054.56	32.00024936	-104.00197514
6,410.17	0.00	0.00	6,400.00	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Begin vertical hold									
6,435.97	0.00	0.00	6,425.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
Bone Spring Lime									
6,500.00	0.00	0.00	6,489.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
6,600.00	0.00	0.00	6,589.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
6,700.00	0.00	0.00	6,689.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
6,800.00	0.00	0.00	6,789.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
6,900.00	0.00	0.00	6,889.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,000.00	0.00	0.00	6,989.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,100.00	0.00	0.00	7,089.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,200.00	0.00	0.00	7,189.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,300.00	0.00	0.00	7,289.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,360.97	0.00	0.00	7,350.80	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
1st Bone Spring Sand									
7,400.00	0.00	0.00	7,389.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,500.00	0.00	0.00	7,489.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,600.00	0.00	0.00	7,589.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,700.00	0.00	0.00	7,689.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
7,800.00	0.00	0.00	7,789.83	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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	364,188.00	644,296.00	32.00079811	-104.00119430	
100.00	0.00	0.00	100.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
200.00	0.00	0.00	200.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
300.00	0.00	0.00	300.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
400.00	0.00	0.00	400.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
500.00	0.00	0.00	500.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
507.00	0.00	0.00	507.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
Rustler Anhydrite										
600.00	0.00	0.00	600.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
682.00	0.00	0.00	682.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
Top Salt										
700.00	0.00	0.00	700.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
800.00	0.00	0.00	800.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
900.00	0.00	0.00	900.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	364,188.00	644,296.00	32.00079811	-104.00119430	
KOP Begin 1.5°/100' build										
1,500.00	1.50	230.31	1,499.99	-0.84	-1.01	364,187.16	644,295.00	32.00079582	-104.00119756	
1,600.00	3.00	230.31	1,599.91	-3.34	-4.03	364,184.66	644,291.98	32.00078895	-104.00120733	
1,652.06	3.78	230.31	1,651.88	-5.31	-6.40	364,182.69	644,289.61	32.00078357	-104.00121499	
Begin 3.78° tangent										
1,700.00	3.78	230.31	1,699.71	-7.33	-8.83	364,180.67	644,287.17	32.00077804	-104.00122286	
1,800.00	3.78	230.31	1,799.50	-11.54	-13.90	364,176.46	644,282.10	32.00076651	-104.00123927	
1,900.00	3.78	230.31	1,899.28	-15.75	-18.98	364,172.25	644,277.03	32.00075497	-104.00125568	
2,000.00	3.78	230.31	1,999.06	-19.96	-24.05	364,168.04	644,271.95	32.00074344	-104.00127209	
2,100.00	3.78	230.31	2,098.84	-24.17	-29.13	364,163.83	644,266.88	32.00073191	-104.00128850	
2,200.00	3.78	230.31	2,198.62	-28.38	-34.20	364,159.62	644,261.80	32.00072037	-104.00130491	
2,300.00	3.78	230.31	2,298.41	-32.59	-39.28	364,155.40	644,256.73	32.00070884	-104.00132133	
2,393.58	3.78	230.31	2,391.78	-36.53	-44.03	364,151.46	644,251.98	32.00069805	-104.00133668	
Base Salt										
2,400.00	3.78	230.31	2,398.19	-36.81	-44.35	364,151.19	644,251.65	32.00069731	-104.00133774	
2,500.00	3.78	230.31	2,497.97	-41.02	-49.43	364,146.98	644,246.58	32.00068577	-104.00135415	
2,600.00	3.78	230.31	2,597.75	-45.23	-54.50	364,142.77	644,241.50	32.00067424	-104.00137056	
2,700.00	3.78	230.31	2,697.54	-49.44	-59.57	364,138.56	644,236.43	32.00066271	-104.00138697	
2,734.23	3.78	230.31	2,731.69	-50.88	-61.31	364,137.12	644,234.69	32.00065876	-104.00139259	
Delaware Mountain Gp										
2,800.00	3.78	230.31	2,797.32	-53.65	-64.65	364,134.35	644,231.36	32.00065117	-104.00140338	
2,849.45	3.78	230.31	2,846.67	-55.73	-67.16	364,132.27	644,228.85	32.00064547	-104.00141150	
Bell Canyon - Lamar										
2,889.53	3.78	230.31	2,886.66	-57.42	-69.19	364,130.58	644,226.81	32.00064085	-104.00141808	
Ramsey Sand										
2,900.00	3.78	230.31	2,897.10	-57.86	-69.72	364,130.14	644,226.28	32.00063964	-104.00141979	
3,000.00	3.78	230.31	2,996.88	-62.07	-74.80	364,125.93	644,221.21	32.00062811	-104.00143620	
3,100.00	3.78	230.31	3,096.67	-66.28	-79.87	364,121.72	644,216.13	32.00061658	-104.00145262	
3,200.00	3.78	230.31	3,196.45	-70.49	-84.95	364,117.50	644,211.06	32.00060504	-104.00146903	
3,300.00	3.78	230.31	3,296.23	-74.70	-90.02	364,113.29	644,205.98	32.00059351	-104.00148544	
3,400.00	3.78	230.31	3,396.01	-78.92	-95.10	364,109.08	644,200.91	32.00058198	-104.00150185	
3,500.00	3.78	230.31	3,495.80	-83.13	-100.17	364,104.87	644,195.84	32.00057044	-104.00151826	
3,600.00	3.78	230.31	3,595.58	-87.34	-105.24	364,100.66	644,190.76	32.00055891	-104.00153467	
3,700.00	3.78	230.31	3,695.36	-91.55	-110.32	364,096.45	644,185.69	32.00054738	-104.00155108	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 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:	From: Map	Northing: 364,189.00 usft Easting: 644,371.00 usft	Latitude: 32.00080022 Longitude: -104.00095235
Position Uncertainty:	0.00 ft	Slot Radius: 13-3/16 "	Grid Convergence: 0.18 °

Well	Money Graham Fed Com Well No. 246 H, Surf loc: 250 FSL 929 FEL Section 32-T26S-R29E		
Well Position	+N/-S 0.00 ft	Northing: 364,188.00 usft	Latitude: 32.00079811
	+E/-W 0.00 ft	Easting: 644,296.00 usft	Longitude: -104.00119430
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	47,607.57730043

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	358.59

Plan Survey Tool Program	Date	12/28/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,891.06 rev0 (Original Hole)	MWD	
			OWSG MWD - Standard	

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	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,652.06	3.78	230.31	1,651.88	-5.31	-6.40	1.50	1.50	0.00	230.31	
6,158.11	3.78	230.31	6,148.12	-195.06	-235.05	0.00	0.00	0.00	0.00	
6,410.17	0.00	0.00	6,400.00	-200.37	-241.45	1.50	-1.50	0.00	180.00	Money Graham 246H
10,207.22	0.00	0.00	10,197.05	-200.37	-241.45	0.00	0.00	0.00	0.00	
11,103.85	89.66	0.51	10,770.00	369.19	-236.38	10.00	10.00	0.06	0.51	
17,891.06	89.66	0.51	10,810.00	7,156.01	-176.00	0.00	0.00	0.00	0.00	Money Graham 246H



Planning Report

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Money Graham Fed Com Well No. 246 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. 246 H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
507.00	507.00	Rustler Anhydrite		0.34	0.51
682.00	682.00	Top Salt		0.34	0.51
2,393.58	2,391.78	Base Salt		0.34	0.51
2,734.23	2,731.69	Delaware Mountain Gp		0.34	0.51
2,849.45	2,846.67	Bell Canyon		0.34	0.51
2,849.45	2,846.67	Lamar		0.34	0.51
2,889.53	2,886.66	Ramsey Sand		0.34	0.51
3,866.41	3,861.41	Cherry Canyon		0.34	0.51
4,843.29	4,836.16	Brushy Canyon		0.34	0.51
6,435.97	6,425.80	Bone Spring Lime		0.34	0.51
7,360.97	7,350.80	1st Bone Spring Sand		0.34	0.51
7,940.97	7,930.80	2nd Bone Spring Sand		0.34	0.51
9,172.97	9,162.80	3rd Bone Spring Sand		0.34	0.51
9,430.97	9,420.80	3rd BS W Sand		0.34	0.51
9,520.97	9,510.80	Wolfcamp A		0.34	0.51
9,630.97	9,620.80	Wolfcamp A Y Sand		0.34	0.51
9,760.97	9,750.80	Wolfcamp A Fat		0.34	0.51
10,020.97	10,010.80	Wolfcamp B		0.34	0.51
10,552.00	10,521.40	Wolfcamp B2		0.34	0.51

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,400.00	1,400.00	0.00	0.00	KOP Begin 1.5°/100' build
1,652.06	1,651.88	-5.31	-6.40	Begin 3.78° tangent
6,158.11	6,148.12	-195.06	-235.05	Begin 1.5°/100' drop
6,410.17	6,400.00	-200.37	-241.45	Begin vertical hold
10,207.22	10,197.05	-200.37	-241.45	Begin 10°/100' build
11,103.85	10,770.00	369.19	-236.38	Begin 89.66° lateral
17,891.06	10,810.00	7,156.01	-176.00	PBHL/TD 17891.06 MD/10810.00 TVD



Planning Report

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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. 246 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)
16,600.00	89.66	0.51	10,802.39	5,865.03	-187.49	5,867.87	0.00	0.00	0.00
16,700.00	89.66	0.51	10,802.98	5,965.02	-186.60	5,967.81	0.00	0.00	0.00
16,800.00	89.66	0.51	10,803.57	6,065.02	-185.71	6,067.75	0.00	0.00	0.00
16,900.00	89.66	0.51	10,804.16	6,165.01	-184.82	6,167.69	0.00	0.00	0.00
17,000.00	89.66	0.51	10,804.75	6,265.01	-183.93	6,267.63	0.00	0.00	0.00
17,100.00	89.66	0.51	10,805.34	6,365.00	-183.04	6,367.58	0.00	0.00	0.00
17,200.00	89.66	0.51	10,805.93	6,464.99	-182.15	6,467.52	0.00	0.00	0.00
17,300.00	89.66	0.51	10,806.52	6,564.99	-181.26	6,567.46	0.00	0.00	0.00
17,400.00	89.66	0.51	10,807.11	6,664.98	-180.37	6,667.40	0.00	0.00	0.00
17,500.00	89.66	0.51	10,807.70	6,764.98	-179.48	6,767.35	0.00	0.00	0.00
17,600.00	89.66	0.51	10,808.28	6,864.97	-178.59	6,867.29	0.00	0.00	0.00
17,700.00	89.66	0.51	10,808.87	6,964.97	-177.70	6,967.23	0.00	0.00	0.00
17,800.00	89.66	0.51	10,809.46	7,064.96	-176.81	7,067.17	0.00	0.00	0.00
17,891.06	89.66	0.51	10,810.00	7,156.01	-176.00	7,158.18	0.00	0.00	0.00
PBHL/TD 17891.06 MD/10810.00 TVD									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Money Graham 246H V1	0.00	0.00	6,400.00	-200.37	-241.45	363,987.63	644,054.55	32.00024934	-104.00197518
- hit/miss target									
- plan hits target center									
- Point									
Money Graham 246H PI	0.00	0.00	10,810.00	7,156.01	-176.00	371,344.00	644,120.00	32.02047111	-104.00169123
- hit/miss target									
- plan hits target center									
- Point									