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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUN 20 2019

APPLICATION FOR PERMIT TO DRILL ON FEDERAL LANDS

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM085891
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. CYPRESS 34 FEDERAL 246H 319943
3a. Address 602 Park Point Drive Suite 200 Golden CO 80401	3b. Phone No. (include area code) (720)460-3316	9. API Well No. 30-015-46121
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 1 / 241 FNL / 1146 FEL / LAT 32.253336 / LONG -103.9675953 At proposed prod. zone NWNE / 5 FNL / 1590 FEL / LAT 32.268578 / LONG -103.9691609		10. Field and Pool, or Exploratory PURPLE SAGE WOLFCAMP
11. Sec., T. R. M. or Blk. and Survey or Area SEC 3 / T24S / R29E / NMP		
14. Distance in miles and direction from nearest town or post office* 6 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) 240 feet	16. No of acres in lease 318.62	17. Spacing Unit dedicated to this well 320
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 25 feet	19. Proposed Depth 11280 feet / 16652 feet	20. BLM/BIA Bond No. in file FED: NMB001443
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3093 feet	22. Approximate date work will start* 01/02/2019	23. Estimated duration 30 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 10/29/2018
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 06/11/2019
Title Assistant Field Manager Lands & Minerals Office CARLSBAD		

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

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

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 06/11/2019

Rw 6-2519

NSL Required

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 1 / 241 FNL / 1146 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.253336 / LONG: -103.9675953 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 1 / 241 FNL / 1146 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.253336 / LONG: -103.9675953 (TVD: 0 feet, MD: 0 feet)
PPP: SWSE / 0 FSL / 1586 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.254019 / LONG: -103.96907 (TVD: 11220 feet, MD: 11377 feet)
BHL: NWNE / 5 FNL / 1590 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.268578 / LONG: -103.9691609 (TVD: 11280 feet, MD: 16652 feet)

BLM Point of Contact

Name: Candy Vigil
Title: Admin Support Assistant
Phone: 5752345982
Email: cvigil@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.:	NMNM085891
WELL NAME & NO.:	246H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'/N & 1146'/E
BOTTOM HOLE FOOTAGE:	5'/N & 1590'/E
LOCATION:	SECTION 03, T24S, 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

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 **350** feet (a minimum of 70 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8 inch 1st** intermediate casing is which setting depth is at **3100ft**:
- 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.
3. The minimum required fill of cement behind the **7-5/8 inch 2nd** intermediate casing is: Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Casing that will be used will be 7 5/8" Wedge 513 for the 2nd intermediate casing. Additional cement maybe required. Excess calculates to 0%.**

Variance for annular spacing between 7 5/8" x 5 1/2" casing is approved with 5 1/2" casing set at 9300 ft.

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

If a Multibowl system is used, Annular preventer will be tested 250 low and 50% of the working pressure for the surface and both intermediate casings. Rams will be tested to per Onshore Order 2.

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

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. 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.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
- 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. 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.
- f. 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. This test shall be performed prior to the test at full stack pressure.
- g. 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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

ZS 051019

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM 085891
WELL NAME & NO.:	233H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1171'E
BOTTOM HOLE FOOTAGE	5'N & 2010'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY
OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM 085891
WELL NAME & NO.:	243H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1196'E
BOTTOM HOLE FOOTAGE	5'N & 2430'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY
OPERATOR'S NAME:	TAP ROCK OPERATING LLC
LEASE NO.:	NMNM 085891
WELL NAME & NO.:	246H – CYPRESS 34 FEDERAL
SURFACE HOLE FOOTAGE:	241'N & 1146'E
BOTTOM HOLE FOOTAGE	5'N & 1590'E
LOCATION:	SECTION 03, T24S, R29E, NMPM
COUNTY:	EDDY

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☐ **Special Requirements**
 - SSPS Habitat
 - Hydrology
 - Cave/Karst
- ☐ **Construction**

Notification
Topsoil
Closed Loop System
Federal Mineral Material Pits
Well Pads
Roads

☐ **Road Section Diagram**

☐ **Production (Post Drilling)**

Well Structures & Facilities

Pipelines

☐ **Interim Reclamation**

☐ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult

with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Hydrology:

The entire well pad(s) will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

When crossing ephemeral drainages the pipeline(s) will be buried to a minimum depth of 48 inches from the top of pipe to ground level. Erosion control methods such as gabions and/or rock aprons should be placed on both up and downstream sides of the pipeline crossing. In addition, curled (weed free) wood/straw fiber wattles/logs and/or silt fences should be placed on the downstream side for sediment control during construction and maintained until soils and vegetation have stabilized. Water bars should be placed within the ROW to divert and dissipate surface runoff. A pipeline access road is not permitted to cross these ephemeral drainages. Traffic should be diverted to a preexisting route. Additional seeding may be required in floodplains and drainages to restore energy dissipating vegetation.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion. A power pole should not be placed in drainages, playas, wetlands, riparian areas, or floodplains and must span across the features at a distance away that would not promote further erosion.

Cave and Karst Conditions of Approval for APDs

****** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production:

Construction:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.

- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Tank Battery Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- All tank battery locations and facilities will be lined and bermed.
- The liner should be at least 20 mil in thickness and installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures.
- Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to alter the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of the feature(s) as well as the possibility of leaks/spills entering the karst drainage system.

Powerline Construction:

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.

- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

Surface Flowlines Installation:

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Leak Detection System:

- A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present.
- A leak detection plan will be submitted to BLM that incorporates an automatic shut off system (see below) to minimize the effects of an undesirable event that could negatively sensitive cave/karst resources.
- Well heads, pipelines (surface and buried), storage tanks, and all supporting equipment should be monitored regularly after installation to promptly identify and fix leaks.

Automatic Shut-off Systems:

- Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and groundwater concerns:

Closed Loop System:

- A closed loop system using steel tanks will be utilized during drilling – no pits
- All fluids and cuttings will be hauled off-site and disposed of properly at an authorized site

Rotary Drilling with Fresh Water:

- Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

- The kick off point for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

- ALL lost circulation zones between surface and the base of the cave occurrence zone will be logged and reported in the drilling report.
- If a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, regardless of the type of drilling machinery used, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

- Additional plugging conditions of approval may be required upon well abandonment in high and medium karst potential occurrence zones.
- The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

- The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice.
- If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

Special Status Plant Species (SSPS) Habitat

Vehicles and equipment will be kept on existing roads and approved surfaces only, and will avoid travel across undisturbed surfaces; workers will be instructed not to park off the roads or ROW in undisturbed areas. Alterations to project design and additions of project components will require SSPS surveys and re-analysis of impacts if those project elements intersect SSPS suitable habitat.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the .

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which

creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

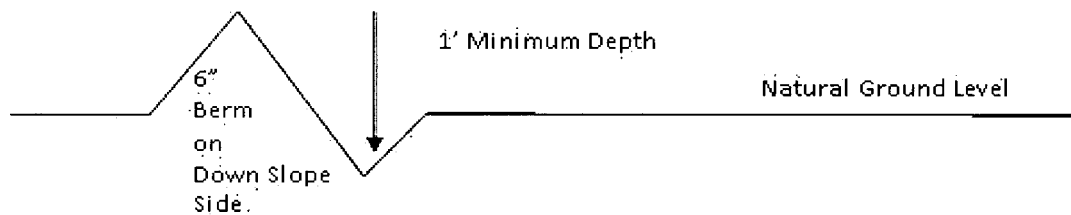
Turnouts

Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill out sloping and insloping, leadoff ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

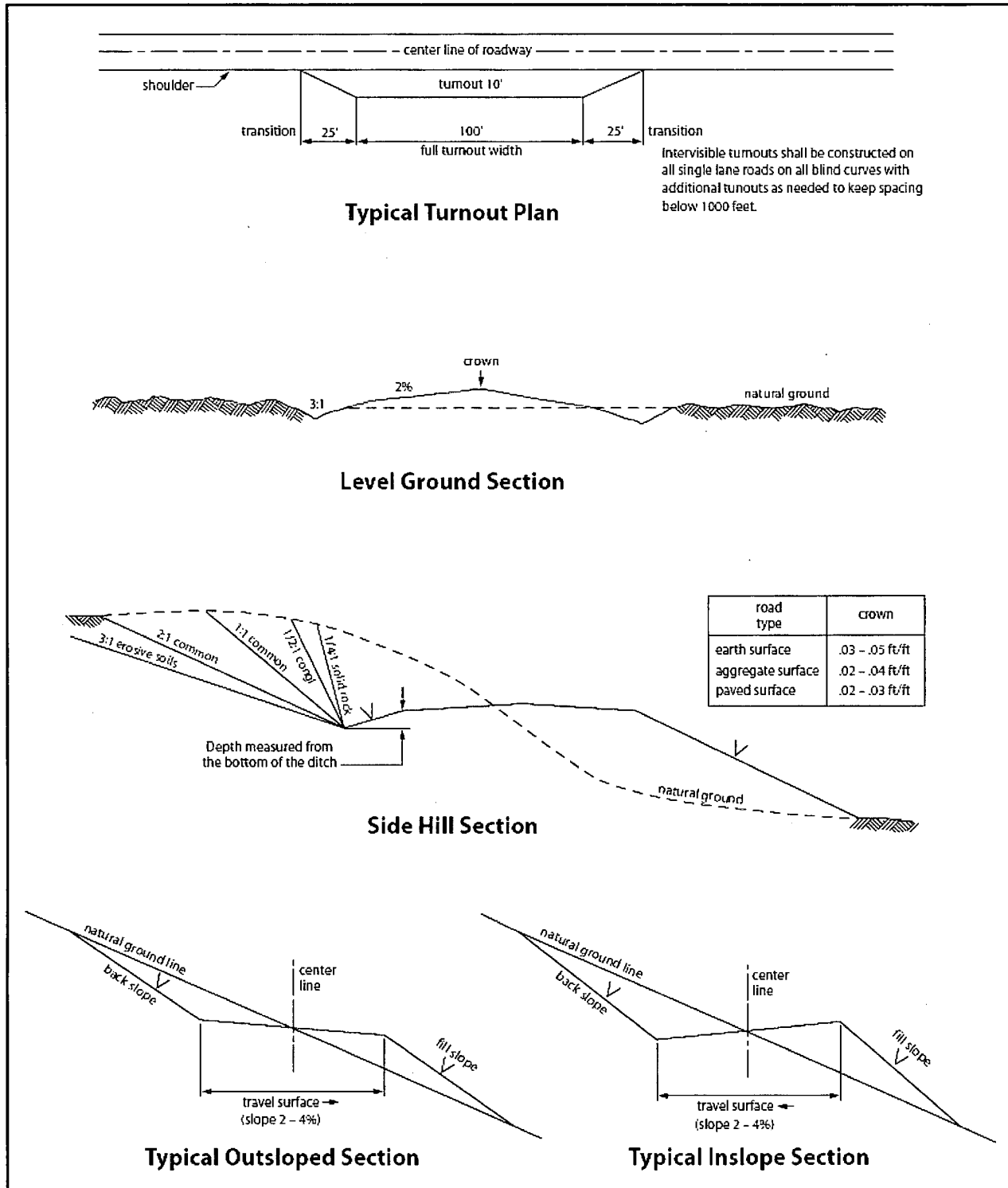


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way.

This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.

7. The maximum allowable disturbance^N for construction in this right-of-way will be 30 feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 30 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

☒ seed mixture 1	☐ seed mixture 3
☐ seed mixture 2	☐ seed mixture 4
☐ seed mixture 2/LPC	☐ Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for

production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 1 for Loamy Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre shall be doubled. The seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

<u>Species</u>	<u>lb/acre</u>
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed



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

Operator Certification Data Report

06/17/2019

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: 10/29/2018

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

06/17/2019

APD ID: 10400035688

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400035688

Tie to previous NOS?

Submission Date: 10/29/2018

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: NMNM085891

Lease Acres: 318.62

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: CYPRESS 34 FEDERAL

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? POTASH

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

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: 233H

Well Class: HORIZONTAL

CYPRESS 34 FEDERAL

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: 6 Miles

Distance to nearest well: 25 FT

Distance to lease line: 240 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Cypress_246H_C102_etal_102518_20181029104522.pdf

Well work start Date: 01/02/2019

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 19642

	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	241	FNL	114 6	FEL	24S	29E	3	Lot 1	32.25333 6	- 103.9675 953	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0
KOP Leg #1	474	FNL	158 6	FEL	24S	29E	3	Lot 2	32.25270 1	- 103.9690 26	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	- 761 4	107 34	107 07
PPP Leg #1	241	FNL	114 6	FEL	24S	29E	3	Lot 1	32.25333 6	- 103.9675 953	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0

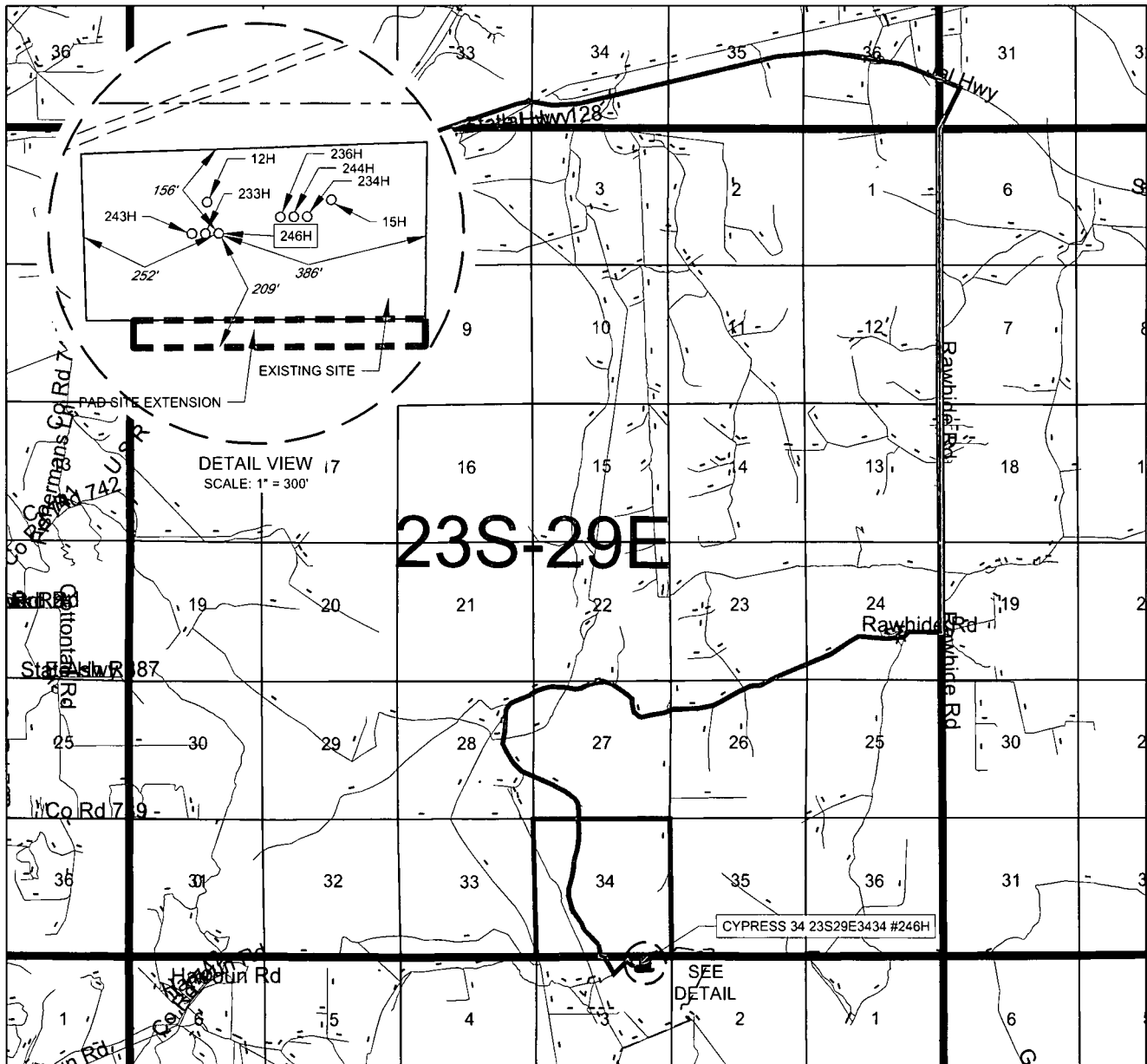
Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

	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
PPP Leg #1	0	FSL	158 6	FEL	23S	29E	34	Aliquot SWSE	32.25401 9	- 103.9690 7	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 812 7	113 77	112 20
EXIT Leg #1	5	FNL	159 0	FEL	23S	29E	34	Aliquot NWNE	32.26857 8	- 103.9691 609	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 818 7	166 52	112 80
BHL Leg #1	5	FNL	159 0	FEL	23S	29E	34	Aliquot NWNE	32.26857 8	- 103.9691 609	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 818 7	166 52	112 80

EXHIBIT 2
VICINITY MAP



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #246H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 241' FNL & 1146' FEL

DISTANCE & DIRECTION

FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ± 4.5
MILES, THENCE SOUTH (RIGHT) ON RAWHIDE ROAD ± 4.1 MILES,
THENCE WEST, (RIGHT) ON MAIN ROAD ± 3.5 MILES, THENCE SOUTH
CONTINUING ON MAIN ROAD ± 2.6 MILES TO A POINT ± 470 FEET
SOUTHWEST 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.



SCALE: 1" = 10000'
0' 5000' 10000'

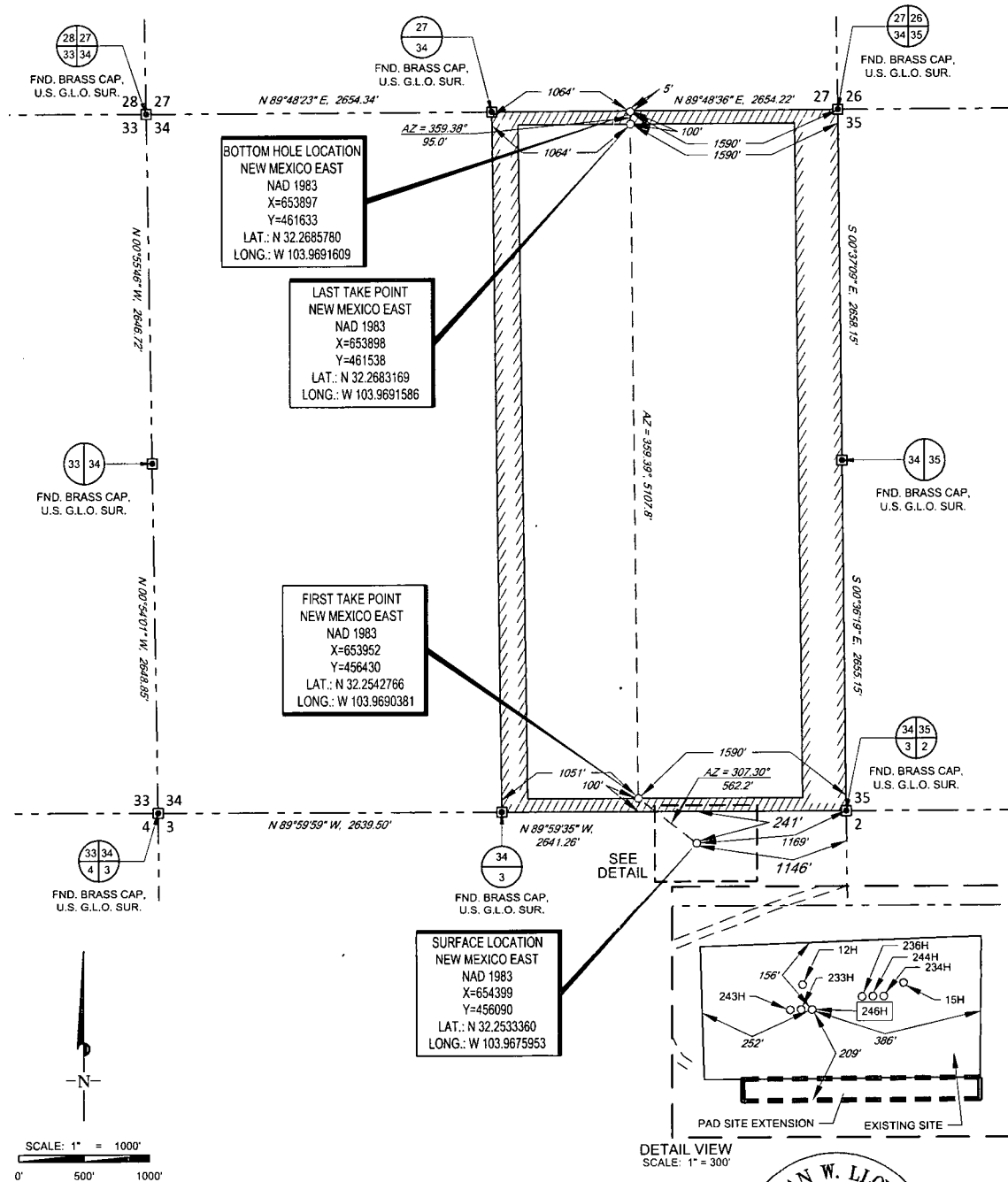


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TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
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TAP ROCK EXHIBIT 2A

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #246H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 241' FNL & 1146' FEL

DISTANCE & DIRECTION
FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ±4.5
MILES, THENCE SOUTH (RIGHT) ON RAWHIDE ROAD ±4.1 MILES,
THENCE WEST, (RIGHT) ON MAIN ROAD ±3.5 MILES, THENCE SOUTH
CONTINUING ON MAIN ROAD ± 2.6 MILES TO A POINT ±470 FEET
SOUTHWEST OF THE LOCATION.

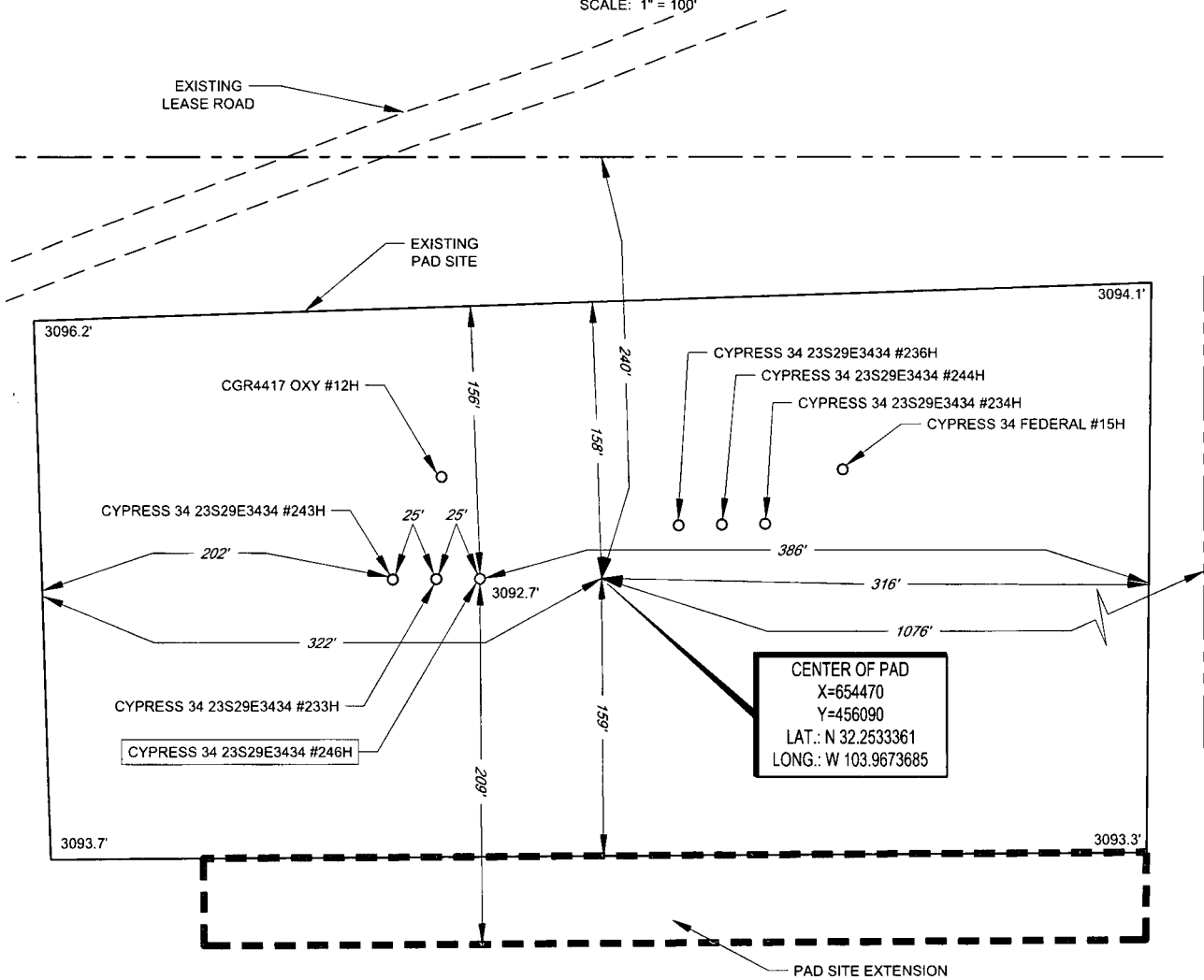
ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID
BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY
FEET
THIS EASEMENT/SEMPITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND
UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT 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.

EXHIBIT 2B



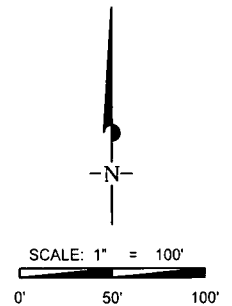
SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #246H
246H LATITUDE N 32.2533360 246H LONGITUDE W 103.9675953

CENTER OF PAD IS 240' FNL & 1076' FEL



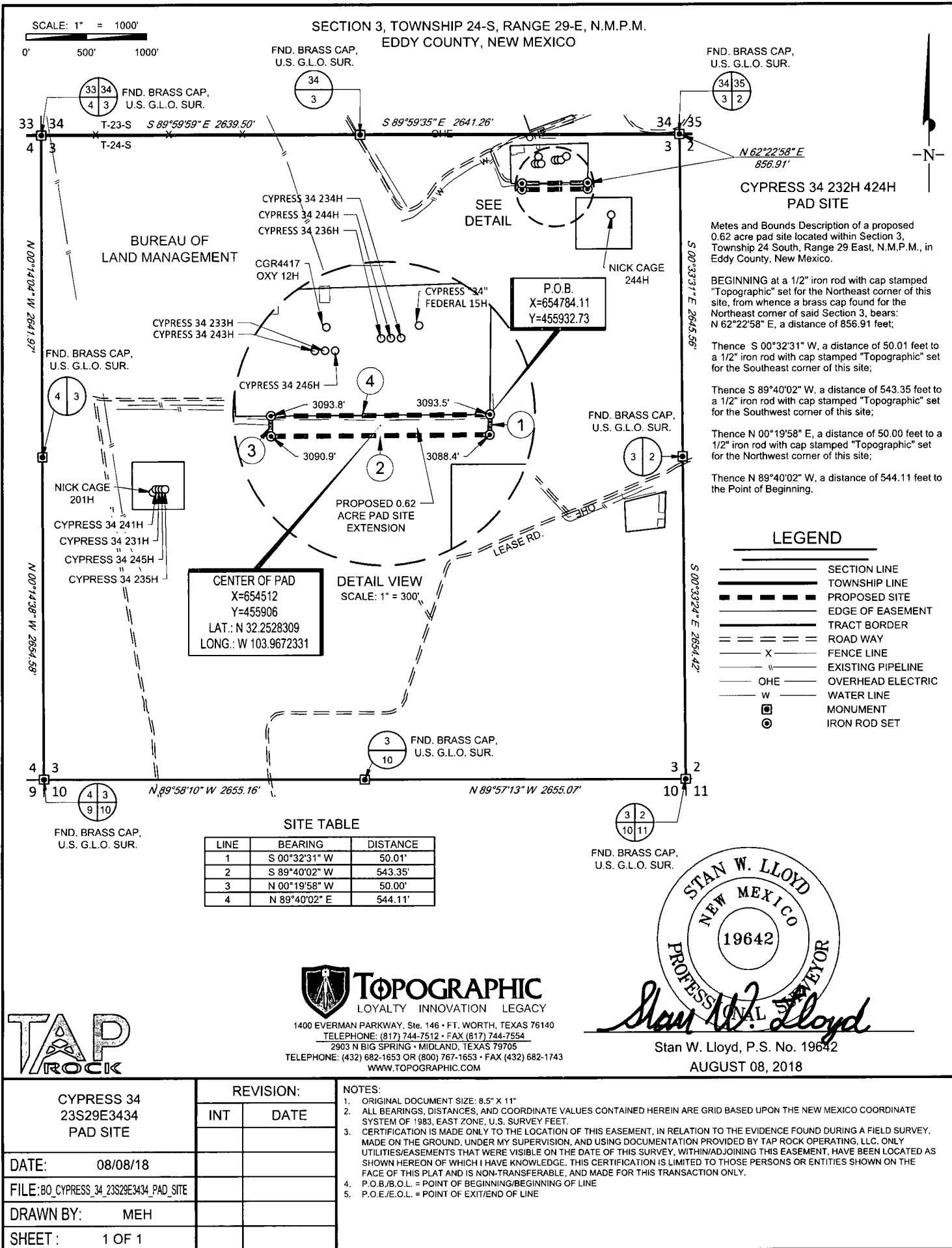
ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED
UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET

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, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO
THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS
SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.



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

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

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: 10/23/2018

☒ Original Operator & OGRID No.: 372043
☐ Amended - Reason for Amendment: _____

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

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

Well(s)/Production Facility – Name of facility

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Cypress 34 Federal #246H		1-3-24S-29E	241' FNL & 1146' FEL	+/- 3,750	21 days	Gas will be flared for ~21 days on flowback before turning into TB. Time est depends on sales connect and well cleanup.

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to Lucid Energy Group, LLC and will be connected to Lucid Energy Group, LLC low/high pressure gathering system located in Eddy County, New Mexico. It will require ~5,000' of pipeline to connect the facility to low/high pressure gathering system. Tap Rock Operating, LLC provides (periodically) to Lucid Energy Group, LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Tap Rock Operating, LLC and Lucid Energy Group, LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Lucid Energy Group, LLC's Red Hills Processing Plant located in Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on the midstream side at that time. Based on current information, it is Tap Rock's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines

- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines



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

Drilling Plan Data Report

06/17/2019

APD ID: 10400035688

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

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	3093	0	0	OTHER : Caliche	USEABLE WATER,OTHER : Salt	No
2	RUSTLER ANHYDRITE	2781	312	312		OTHER : Salt	No
3	SALADO	2466	627	627	SALT	OTHER : Salt	No
4	BASE OF SALT	-44	3137	3153		OTHER : Salt	No
5	DELAWARE	-64	3157	3173	OTHER : Mountain Group	NATURAL GAS,OIL	No
6	BELL CANYON	-84	3177	3193	SANDSTONE	NATURAL GAS,OIL	No
7	BRUSHY CANYON	-2194	5287	5314	SANDSTONE	NATURAL GAS,OIL	No
8	BONE SPRING	-3789	6882	6909	LIMESTONE	NATURAL GAS,OIL	No
9	BONE SPRING 1ST	-4809	7902	7929	SANDSTONE	NATURAL GAS,OIL	No
10	BONE SPRING 2ND	-5509	8602	8629	SANDSTONE	NATURAL GAS,OIL	No
11	BONE SPRING 3RD	-6734	9827	9854	SANDSTONE	NATURAL GAS,OIL	No
12	WOLFCAMP	-7099	10192	10219	OTHER : A	NATURAL GAS,OIL	No
13	WOLFCAMP	-7279	10372	10399	OTHER : A Fat	NATURAL GAS,OIL	No
14	WOLFCAMP	-7439	10532	10559	OTHER : B	NATURAL GAS,OIL	No
15	WOLFCAMP	-8144	11237	11405	OTHER : B2	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC**Well Name:** CYPRESS 34 FEDERAL**Well Number:** 246H**Pressure Rating (PSI):** 10M**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:

Cypress_246H_Choke_032918_20181029110046.pdf

BOP Diagram Attachment:

Cypress_246H_BOP_20181029110107.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	350	0	350	3093		350	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	3100	0	3085	3093		3100	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	3300	0	3283	3093		3300	J-55	40	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
4	PRODUCTION	6.75	5.5	NEW	API	Y	0	9734	0	9703	3093		9734	P-110	20	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
5	INTERMEDIATE	8.75	7.625	NEW	API	N	3100	9734	3085	9703			6634	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	9734	16652	9703	11280			6918	P-105	18	OTHER - Flush	1.13	1.15	DRY	1.51	DRY	1.51

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110306.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110412.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110340.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Casing Attachments

Casing ID: 4 **String Type:**INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110449.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_246H_5.5in_Casing_Spec_20181029110546.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110553.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_246H_5in_Casing_Spec_20181029110647.pdf

Casing Design Assumptions and Worksheet(s):

Cypress_246H_Casing_Design_Assumptions_20181029110654.pdf

Section 4 - Cement

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	350	270	1.8	13.5	486	100	Class C	5% Bentonite + 2% CaCl + LCM

INTERMEDIATE	Lead		0	3100	222	3.36	11.5	746	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		0	3100	190	1.39	13.2	264	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Lead		0	3300	755	2.19	12.7	1653	100	Class C	bentonite + 1% CaCl ₂ + 8% NaCl + LCM
INTERMEDIATE	Tail		0	3300	311	1.33	14.8	414	100	Class C	5% NaCl + LCM
PRODUCTION	Lead		0	9734	0	0	0	0	0	None	None
PRODUCTION	Tail		0	9734	0	0	0	0	0	None	None
INTERMEDIATE	Lead		3100	9734	222	3.36	11.5	746	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		3100	9734	190	1.39	13.2	264	35	TXI	fluid loss + dispersant + retarder + LCM
PRODUCTION	Lead		9734	16652	0	0	0	0	0	None	None
PRODUCTION	Tail		9734	16652	950	1.24	14.2	1178	10	Class H	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: CYPRESS 34 FEDERAL

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
3300	9734	OTHER : Fresh water & cut brine	9	9							
350	3300	OTHER : Brine water	10	10							
9734	1665 2	OIL-BASED MUD	12.5	12.5							
0	350	OTHER : Fresh water spud	8.3	8.3							

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: 6765

Anticipated Surface Pressure: 4283.39

Anticipated Bottom Hole Temperature(F): 160

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:

Cypress_246H_H2S_Plan_20181029111341.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cypress_246H_Horizontal_Plan_20181029111357.pdf

Other proposed operations facets description:

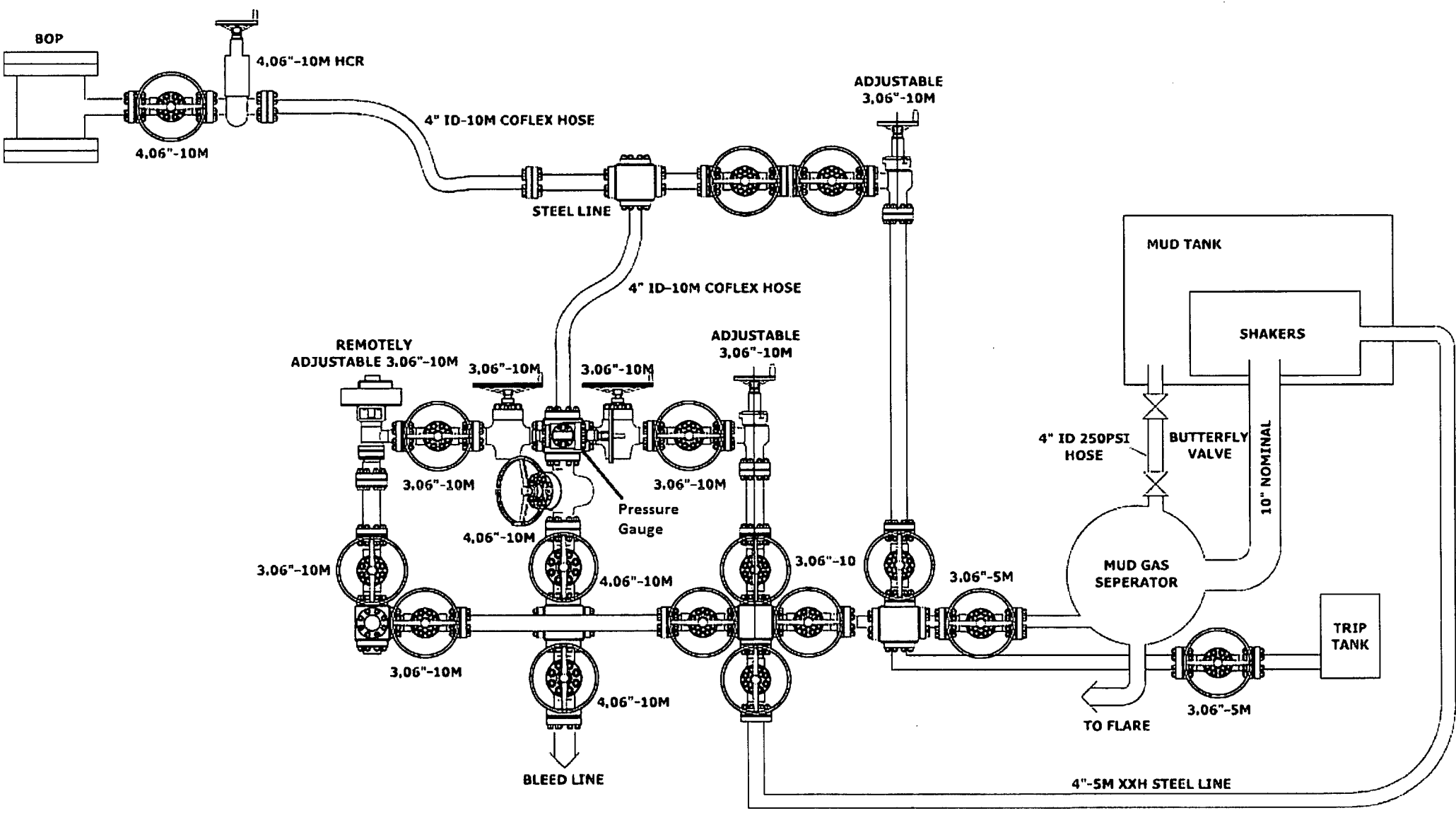
Other proposed operations facets attachment:

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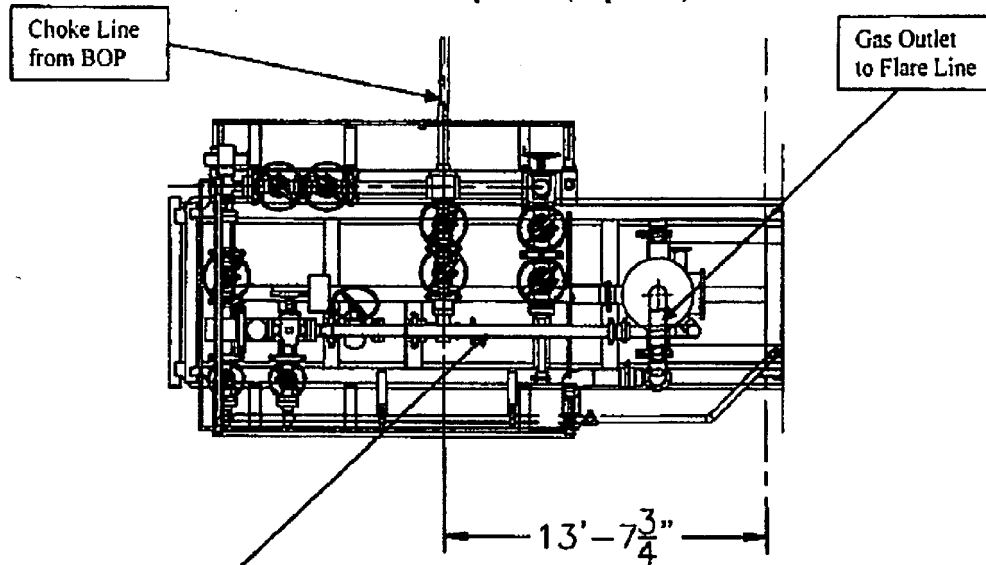
Cypress_246H_Speedhead_Specs_033018_20181029111419.pdf

Other Variance attachment:

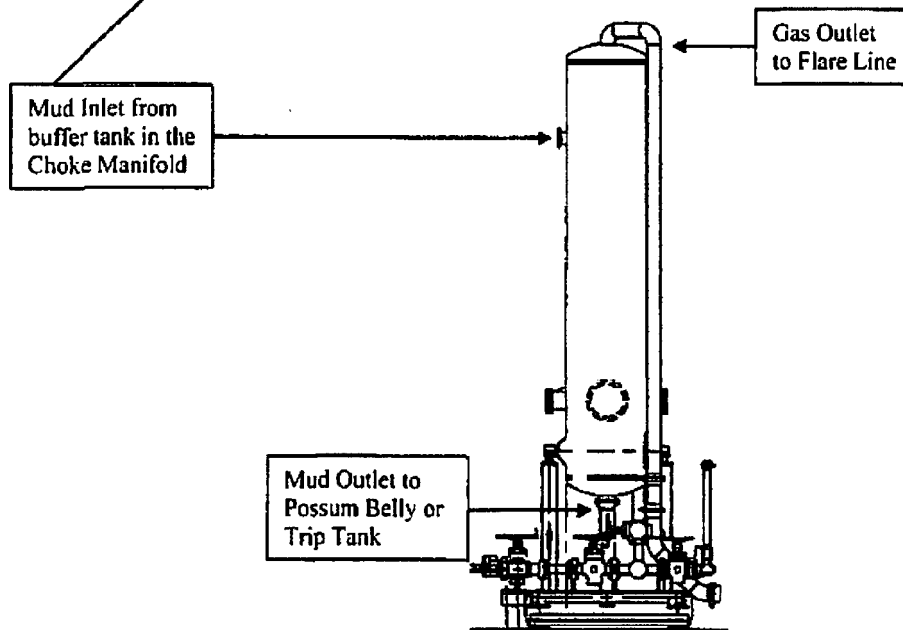
Cypress_246H_Casing_Cementing_Variance_20181029111428.pdf



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)

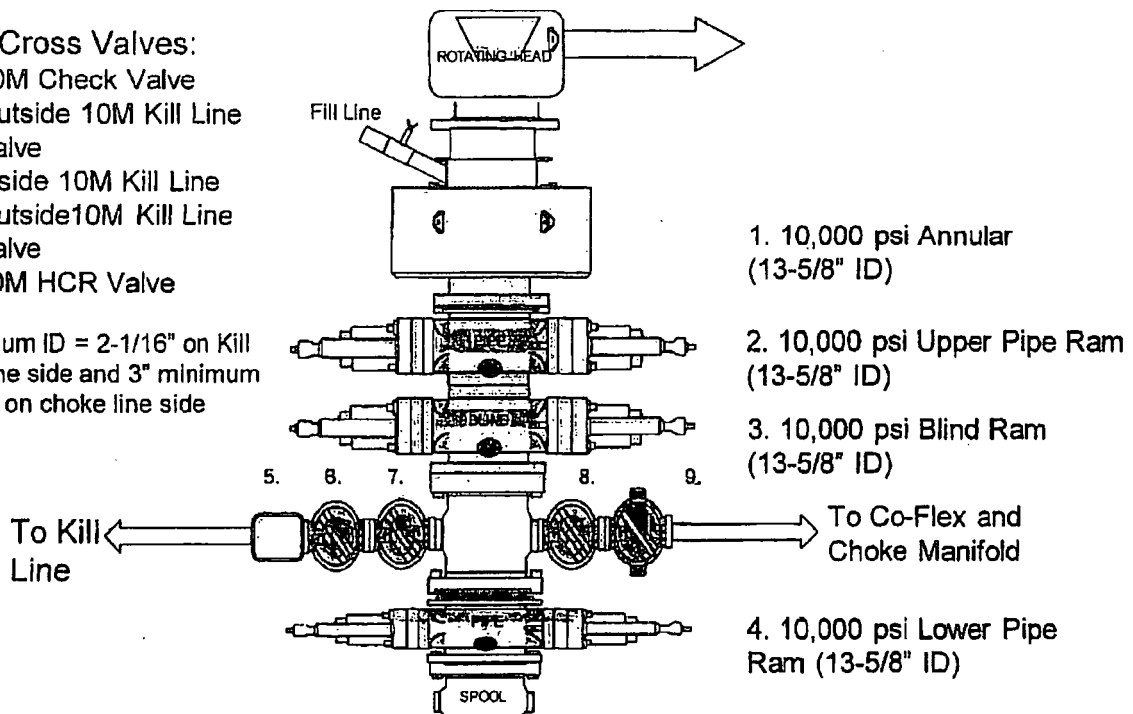


10,000 psi BOP Stack

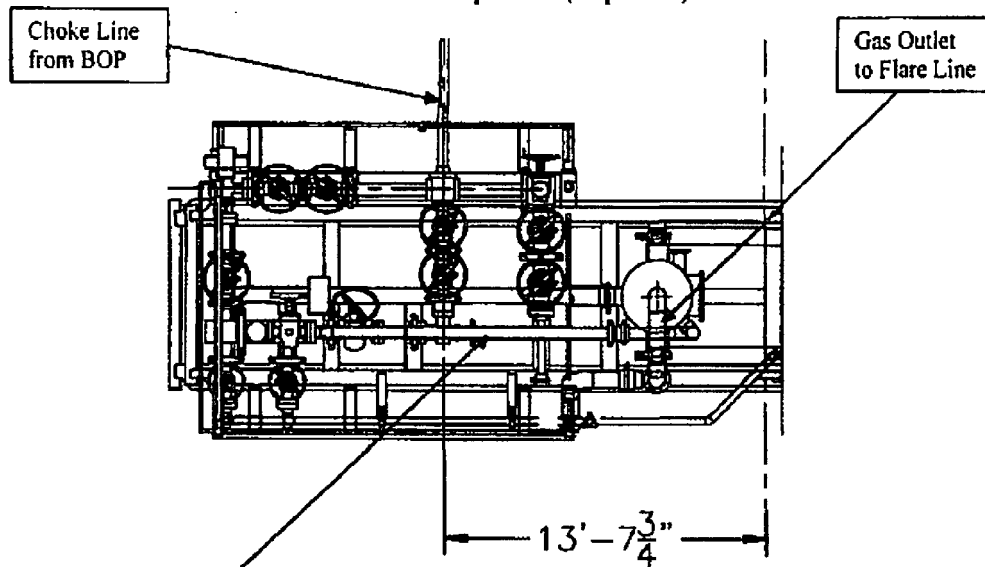
Mud Cross Valves:

- 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

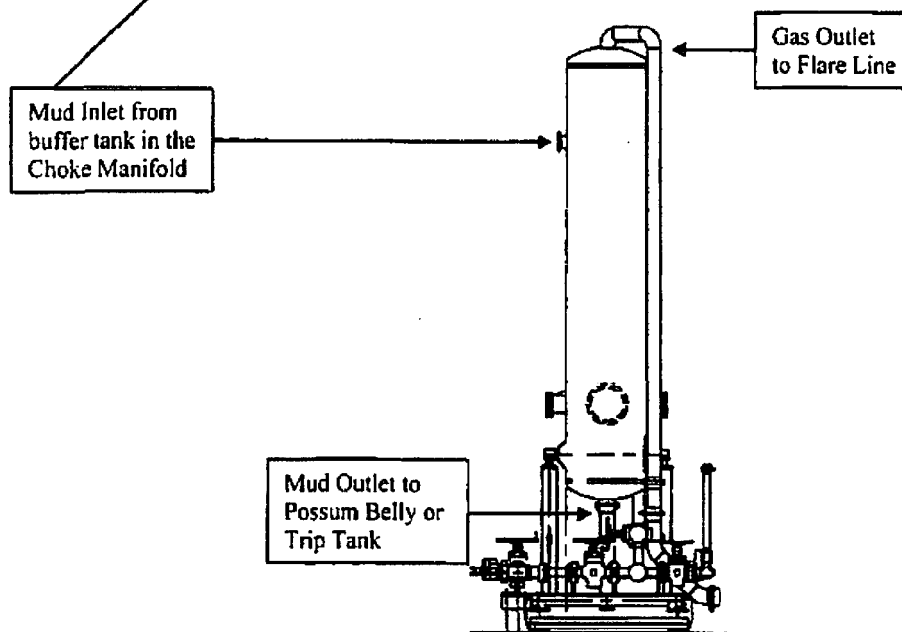
*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)



Hydrostatic Test Certificate



ContiTech

Certificate Number 938562	COM Order Reference 938562	Customer Name & Address HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No:	740043386	
Project:	HOW	
Test Center Address ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Accepted by COM Inspection Signed: Roger Suarez Date: 3/13/17	Accepted by Client Inspection

We certify that the goods detailed hereon have been inspected as described below by our Quality Management System, and to the best of our knowledge are found to conform the requirements of the above referenced purchase order as issued to ContiTech Oil & Marine Corporation.

Item	Part No.	Description	Qty	Serial Number	Work Press.	Test Press.	Test Time (minutes)
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	10,000 psi	15,000 psi	60
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	10,000 psi	15,000 psi	60
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56838	10,000 psi	15,000 psi	60
50		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56489	10,000 psi	15,000 psi	60
60		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	61475	10,000 psi	15,000 psi	60
80		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60197	10,000 psi	15,000 psi	60
90		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	39474	10,000 psi	15,000 psi	60
100		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60687	10,000 psi	15,000 psi	60

Certificate of Conformity

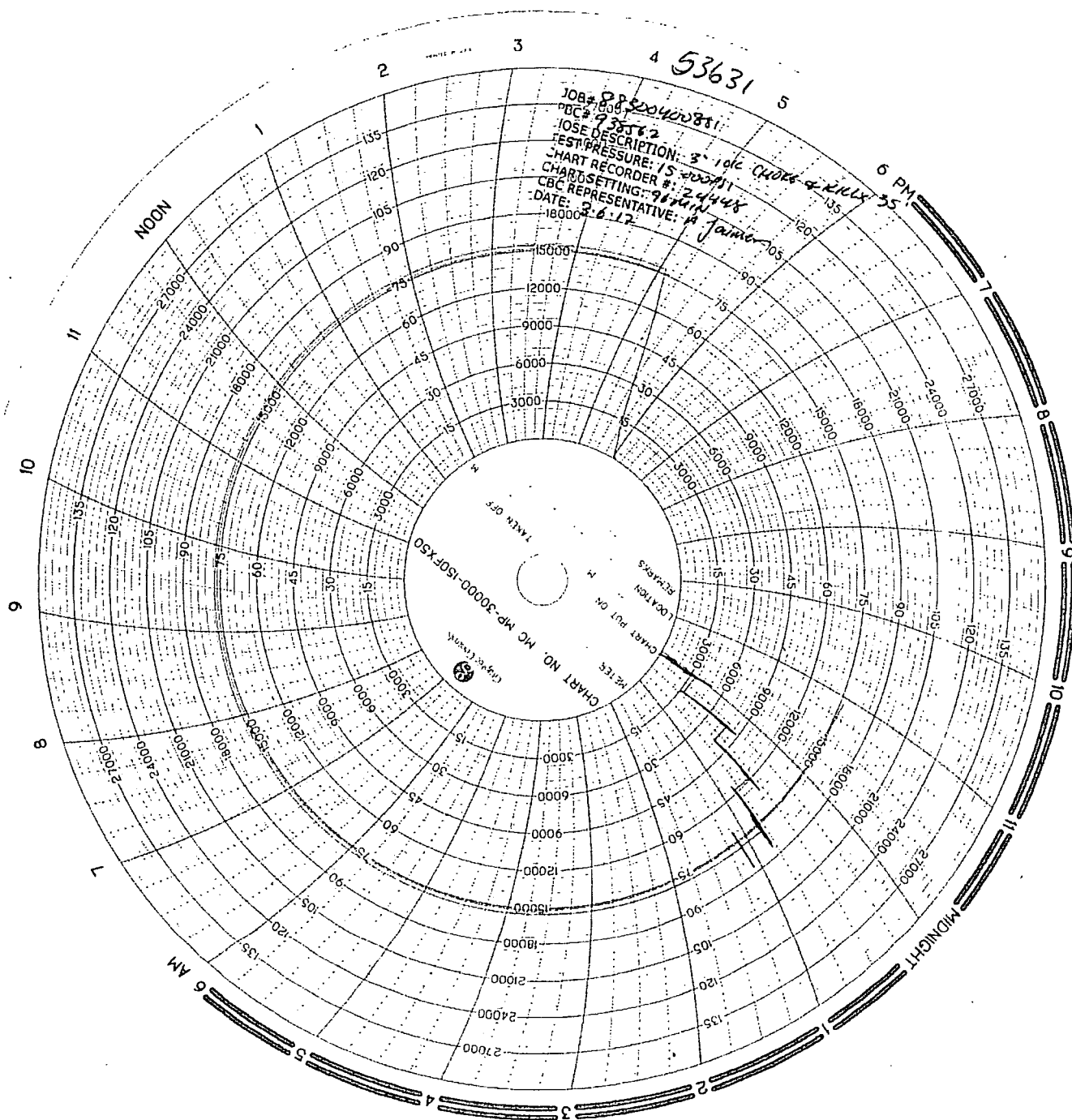


ContiTech

Certificate Number 938562	COM Order Reference 938562	Customer Name & Address HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No: 740043386		
Project: HOW		
Test Center/Address: ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Accepted by COM Inspection: Signed: Date: 3/13/17	Accepted by Client Inspection:

We certify that the items detailed below meet the requirements of the customer's Purchase Order referenced above, and are in conformance with the specifications given below.

Item	Part No.	Description	Qty	Serial Number	Specifications
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	ContiTech Standard
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	ContiTech Standard
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56838	ContiTech Standard
50		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56489	ContiTech Standard
60		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	61475	ContiTech Standard
80		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60197	ContiTech Standard
90		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	39474	ContiTech Standard
100		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60887	ContiTech Standard



JOB# 882040081
PDC# 93342
TEST DESCRIPTION: 3' 10c (Hole & 216L 35)
TEST PRESSURE: 15
CHART RECORDER #: 24448
CHART SETTING: 96
CBC REPRESENTATIVE: A. J. JAMES
DATE: 2-6-12

CHART NO. MC MP-3000-150FK30
TAKEN OFF
LOCATED PUT ON
METERS
FOOT

NOON

6 PM

MIDNIGHT

6 AM

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/06/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	53631	Date of Manufacture	08/2008
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

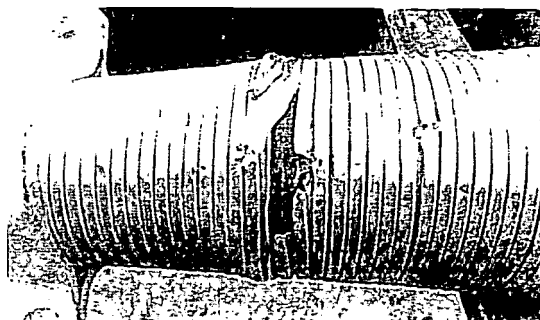
Conclusion: Hose #53631 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #53631 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #53631 is suitable for continued service.

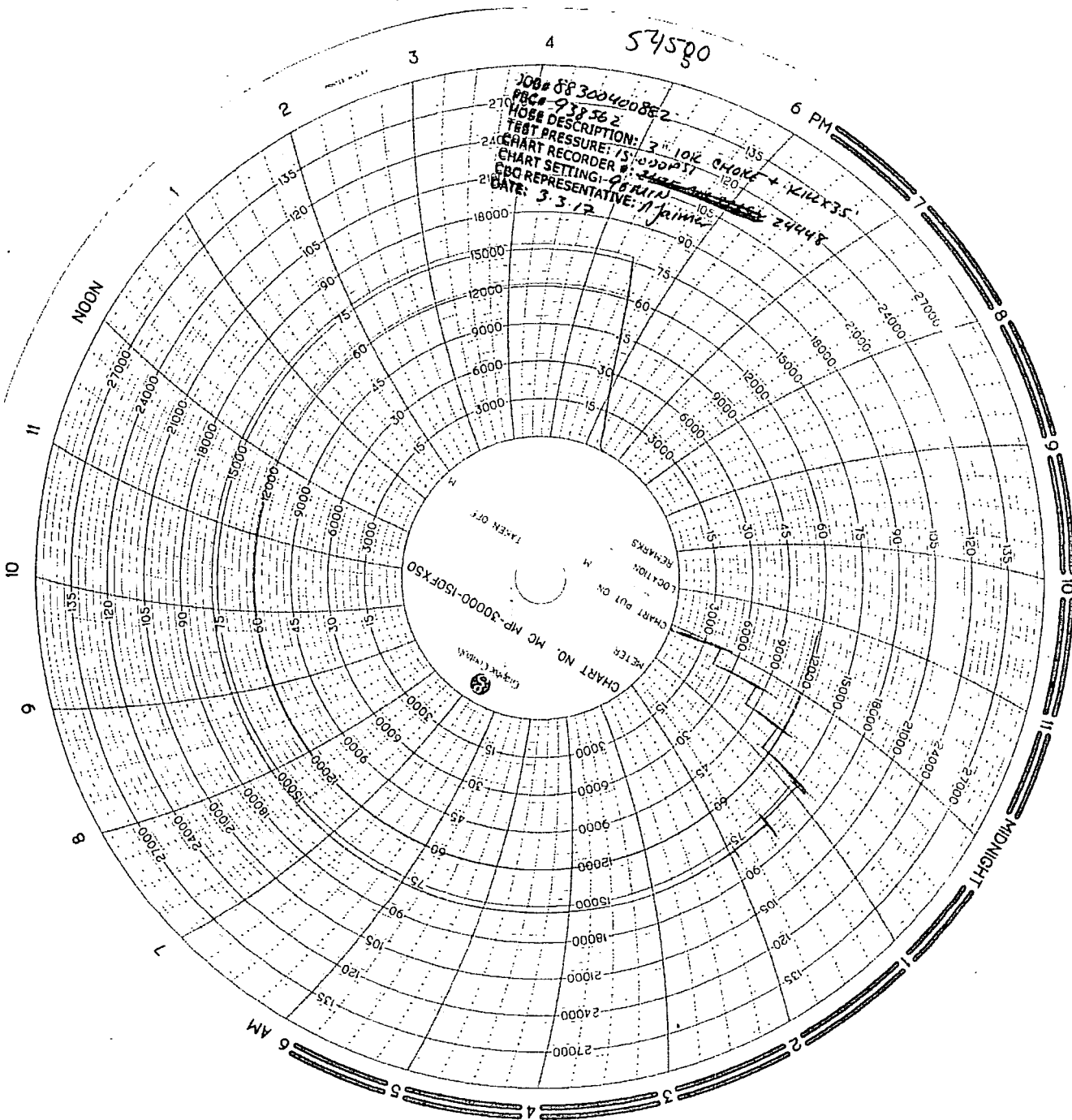
Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	3'
Width	8"
Length	3"
Depth	To hose body
Notes	Broken armor





Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/03/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	54500	Date of Manufacture	01/2009
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

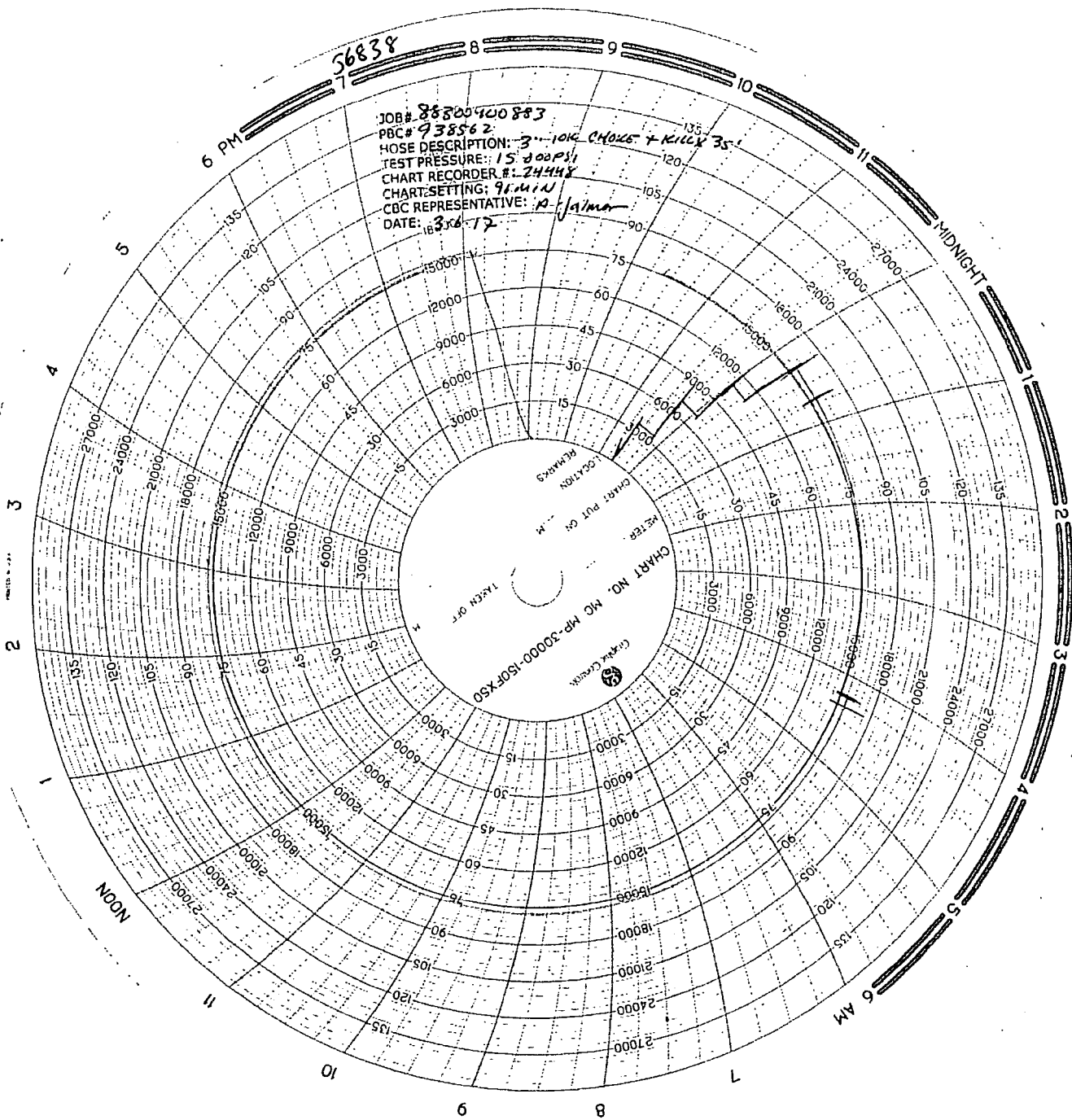
End A: 3.1/8" 5Kpsi API Spec 6A Type 6BX Flange	End B: 3.1/8" 5Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #54500 passed the external inspection with no notable damages to the hose armor. Internal borescope of the hose showed no damage to the liner. ~~Hose #54500 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes.~~ Hose #54500 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/06/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	56838	Date of Manufacture	11/2010
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

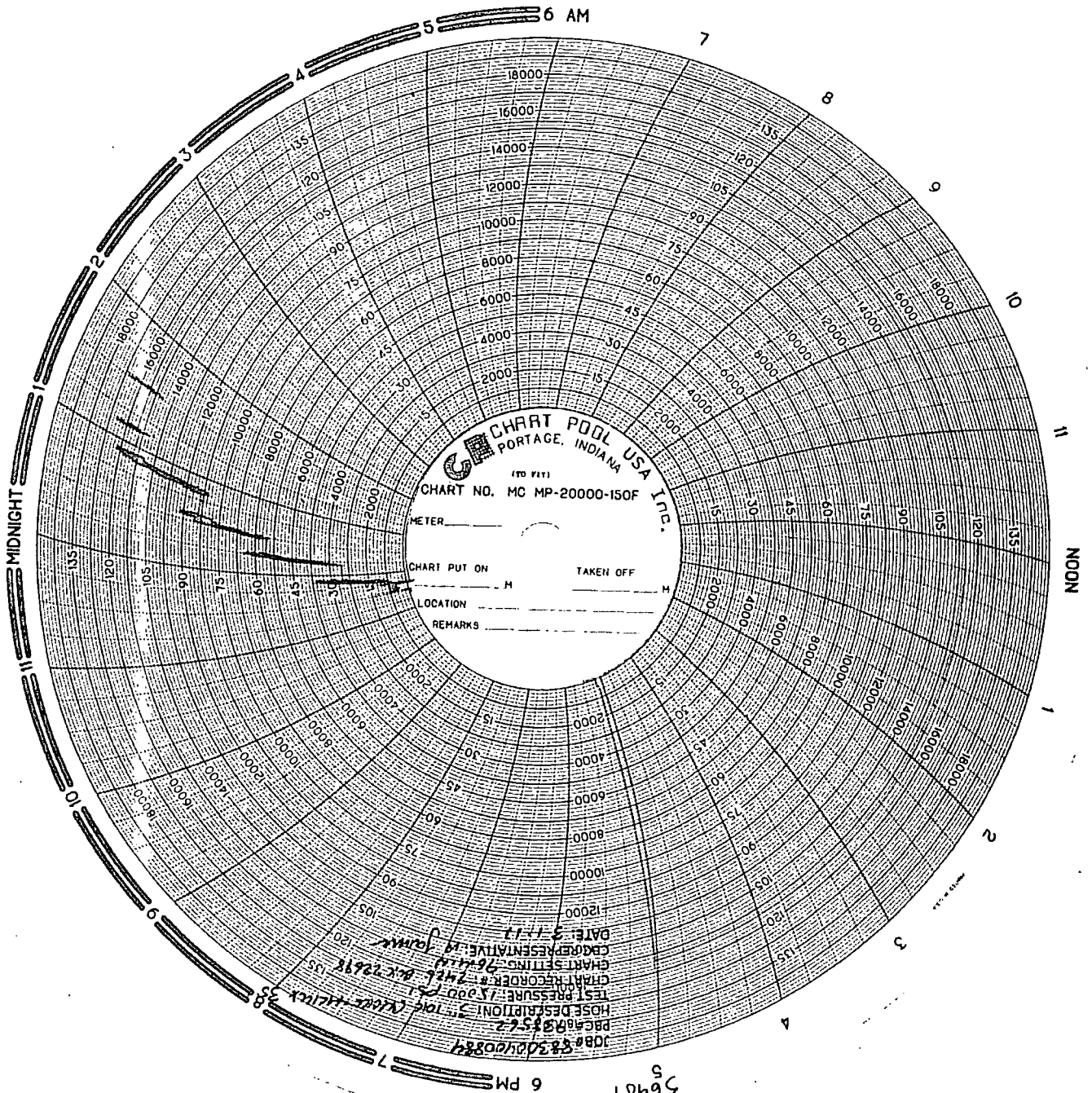
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #56838 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #56838 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #56838 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/01/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	56489	Date of Manufacture	08/2010
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

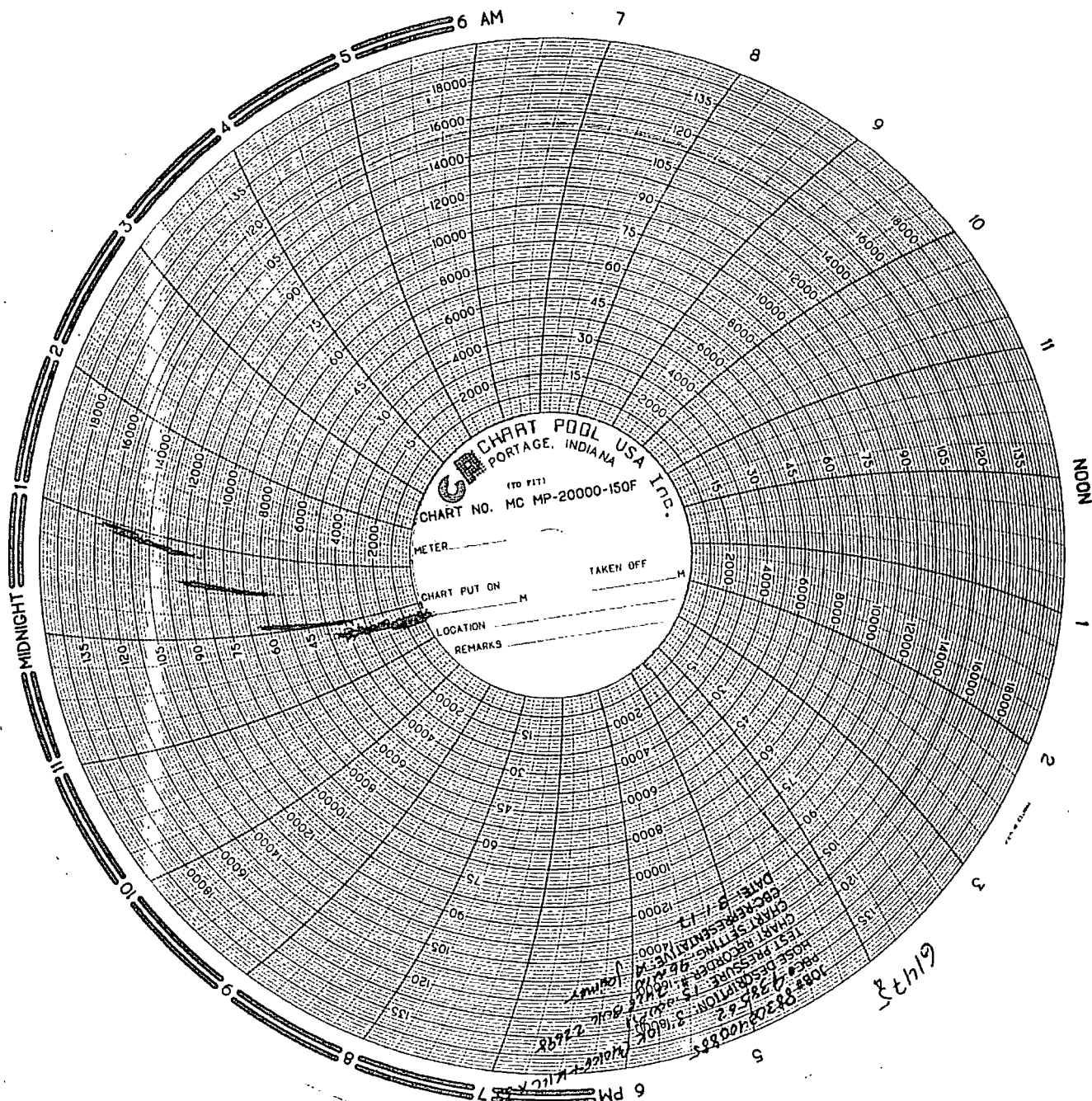
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #56489 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #56489 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #56489 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/01/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	61475	Date of Manufacture	01/2012
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

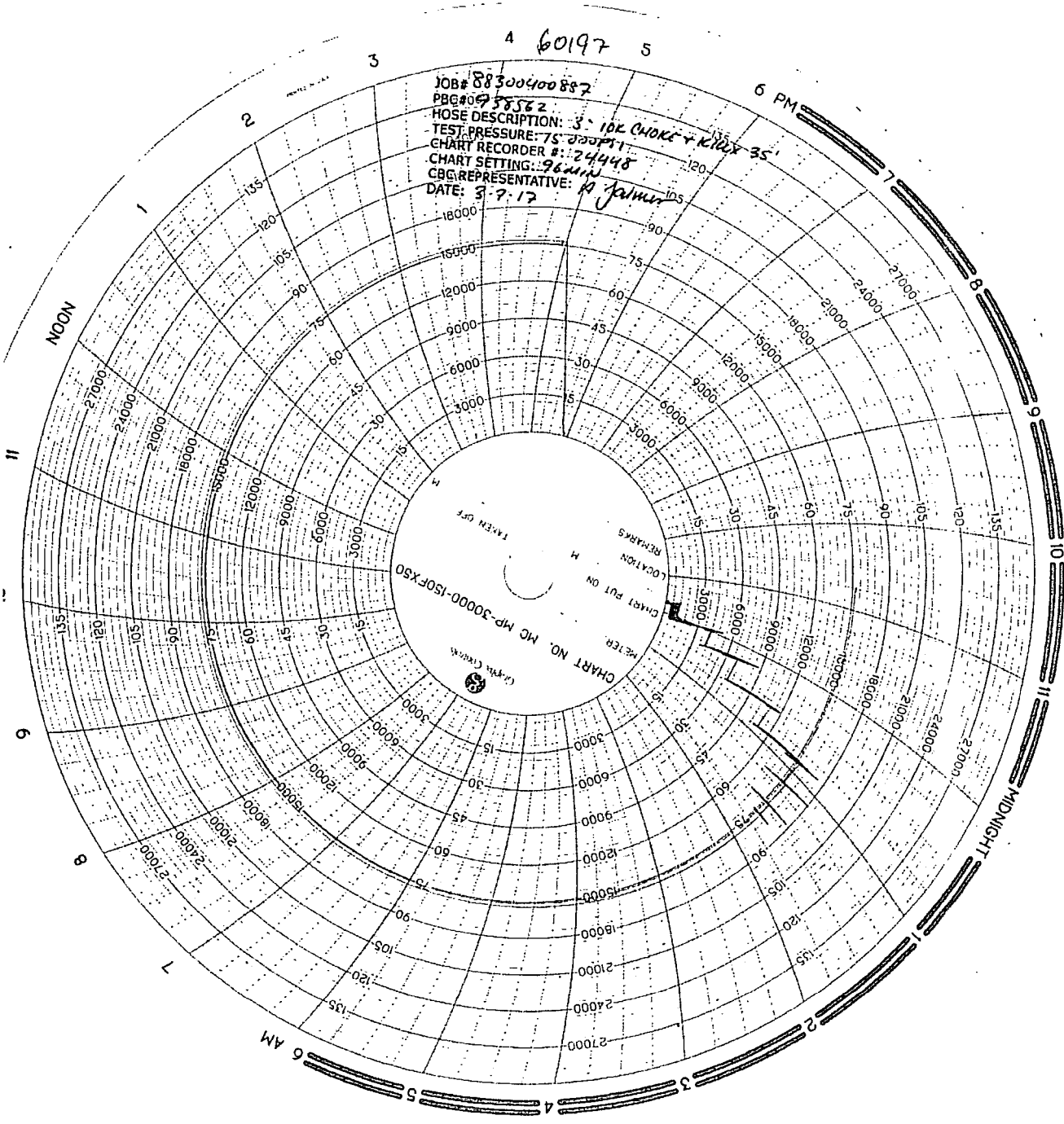
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

Conclusion: Hose #61475 passed the external inspection with no notable damage to the hose armor. Internal borescope of the hose showed no damage to the liner. Hose #61475 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #61475 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual Inspection: Every 3 to 6 months (or during installation/removal)
Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
Initial 5 years service: Major inspection
2nd Major inspection: Following subsequent 3 year life cycle
(Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.



JOB# 88300400887
PBG# 0938562
HOSE DESCRIPTION: 3" 10K CHOKER + KILDEX 35'
TEST PRESSURE: 75000 PSI
CHART RECORDER #: 24448
CBG REPRESENTATIVE: K. Palmer
DATE: 3-7-12

CHART NO. MC MP-30000-150FX50
CHART PUT ON _____
LOCATION _____
REMARKS _____
TAKEN OFF _____
METER _____

Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	60197	Date of Manufacture	01/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

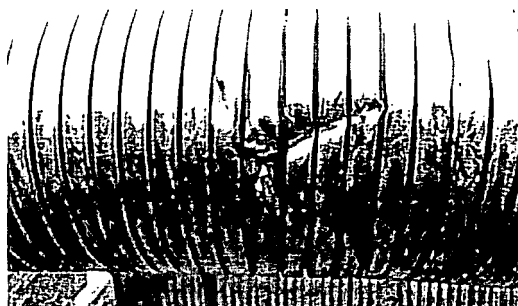
Conclusion: Hose #60197 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60197 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60197 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	6'
Width	1"
Length	1"
Depth	On armor
Notes	Crack on armor

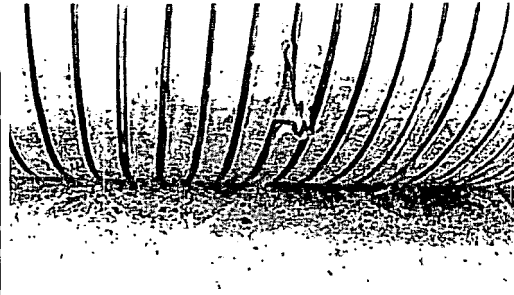


Hose Inspection Report

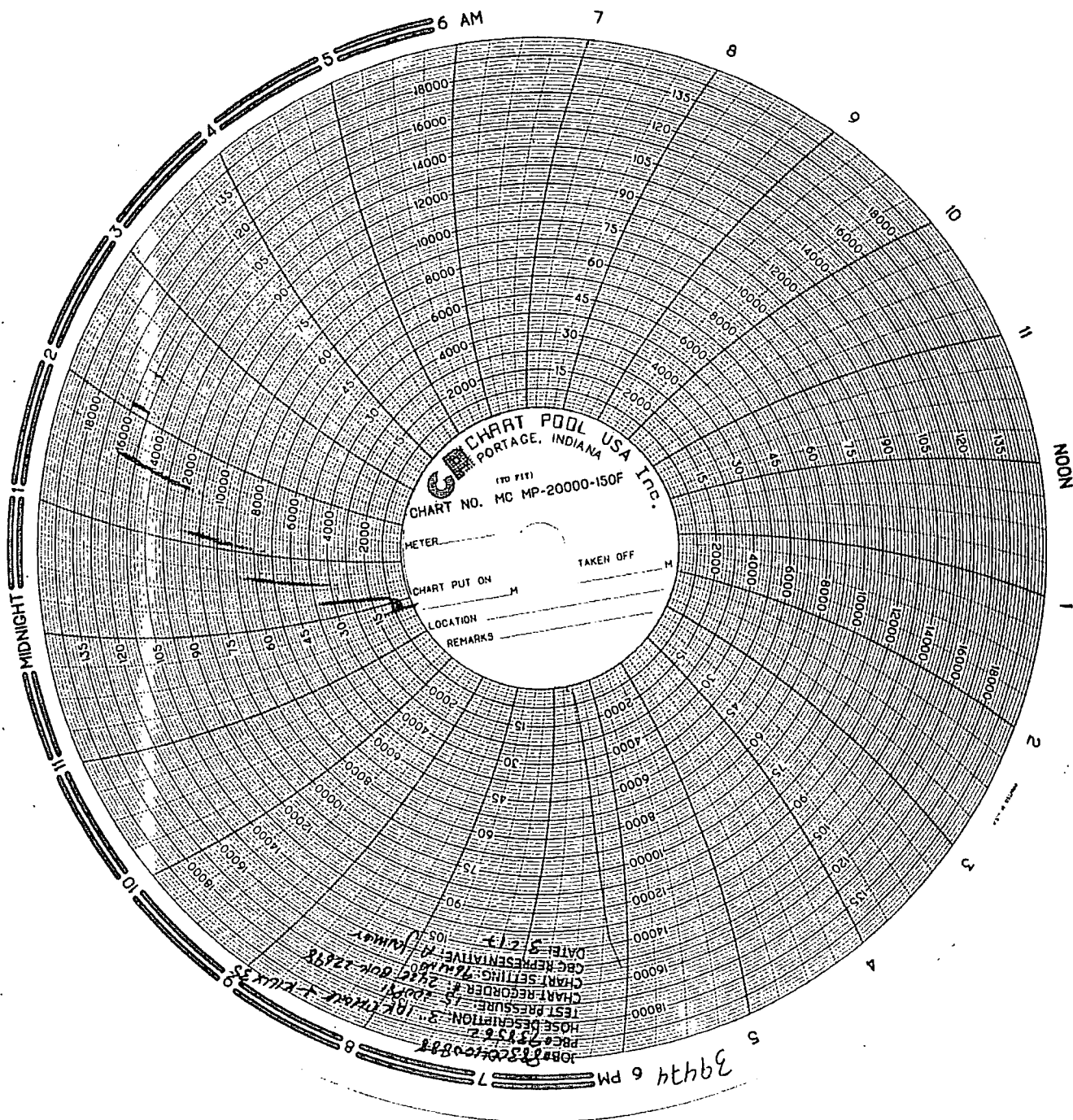
ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

External Damage Post – Hydro test	
Approx. Distance from End A	20'
Width	1"
Length	1"
Depth	On armor
Notes	Crack on armor



PASS



Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/02/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	39474	Date of Manufacture	08/2003
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

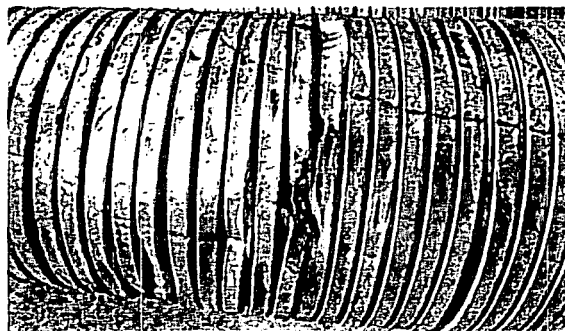
Conclusion: Hose #39474 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #39474 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #39474 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	15'
Width	1"
Length	1"
Depth	To hose body
Notes	Cracked armor



5 60887 6 PM

JOB# 16300400887
PBC# 938562
HOSE DESCRIPTION: 5" 10K CHOKER #1414x35'
TEST PRESSURE: 15,000 PSI
CHART RECORDER #: 24448
CHART SETTING: 7.084 in
CBC REPRESENTATIVE: A. Janner
DATE: 3-7-17

NOON

MIDNIGHT

6 AM

CHART NO. MC MP-30000-150FX50

Graphic Controls

CHART PUT ON

LOCATION

REMARKS

TAKEN OFF

H

H

H

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H

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Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

Hose Manufacturer	Contitech Rubber Industrial
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Hose Serial #	60887	Date of Manufacture	10/2011
Hose I.D.	3"	Working Pressure	10000PSI
Hose Type	Choke and Kill	Test Pressure	15000PSI
Manufacturing Standard	API 16C		

Connections

End A: 4.1/16" 5Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

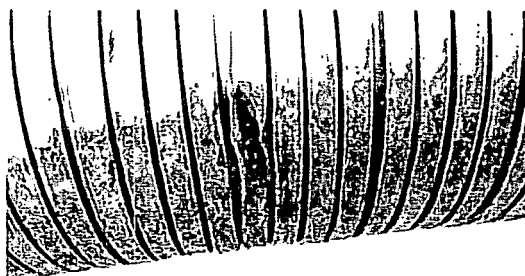
Conclusion: Hose #60887 passed the external inspection with minimal damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60887 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60887 is suitable for continued service.

Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available upon request, QCP 206-1)

****NOTE:** There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life, in particular maximums and peak conditions.

External Damage Post – Hydro test	
Approx. Distance from End A	10'
Width	1"
Length	1"
Depth	To hose body
Notes	Crack on armor

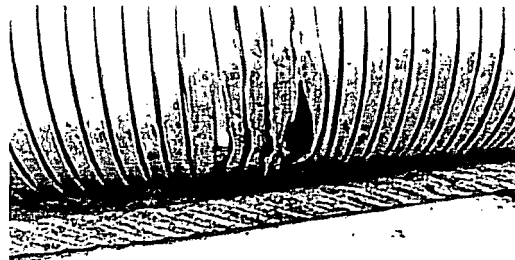


Hose Inspection Report

ContiTech Oil & Marine

Customer	Customer Reference #	CBC Reference #	CBC Inspector	Date of Inspection
H&P Drilling	740043386	COM938562	A. Jaimes	03/07/2017

External Damage Post – Hydro test	
Approx. Distance from End A	4'
Width	4"
Length	4"
Depth	To hose body
Notes	Rubber exposed



PASS

Wedge 521®

Printed on: 05/22/2018



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

Operating Torque	17300 ft-lbs	Yield Torque	26000 ft-lbs
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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
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OPERATION LIMIT TORQUES

Operating Torque	21500 ft-lbs	Yield Torque	23900 ft-lbs
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Casing Design Assumptions

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

Casing Design Assumptions

- Gas gravity 0.7
- Pore pressure gradient .468 psi/ft above the Wolfcamp, .676 psi/ft Wolfcamp and below
- .676 psi/ft fracture gradient above the Wolfcamp, .832 psi/ft Wolfcamp and below.
- 60°F average surface temperature and 1.5°/100ft temperature gradient
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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.
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- Strings landed at neutral weight
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Casing Design Assumptions

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

Casing Design Assumptions

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

Casing Design Assumptions

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



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

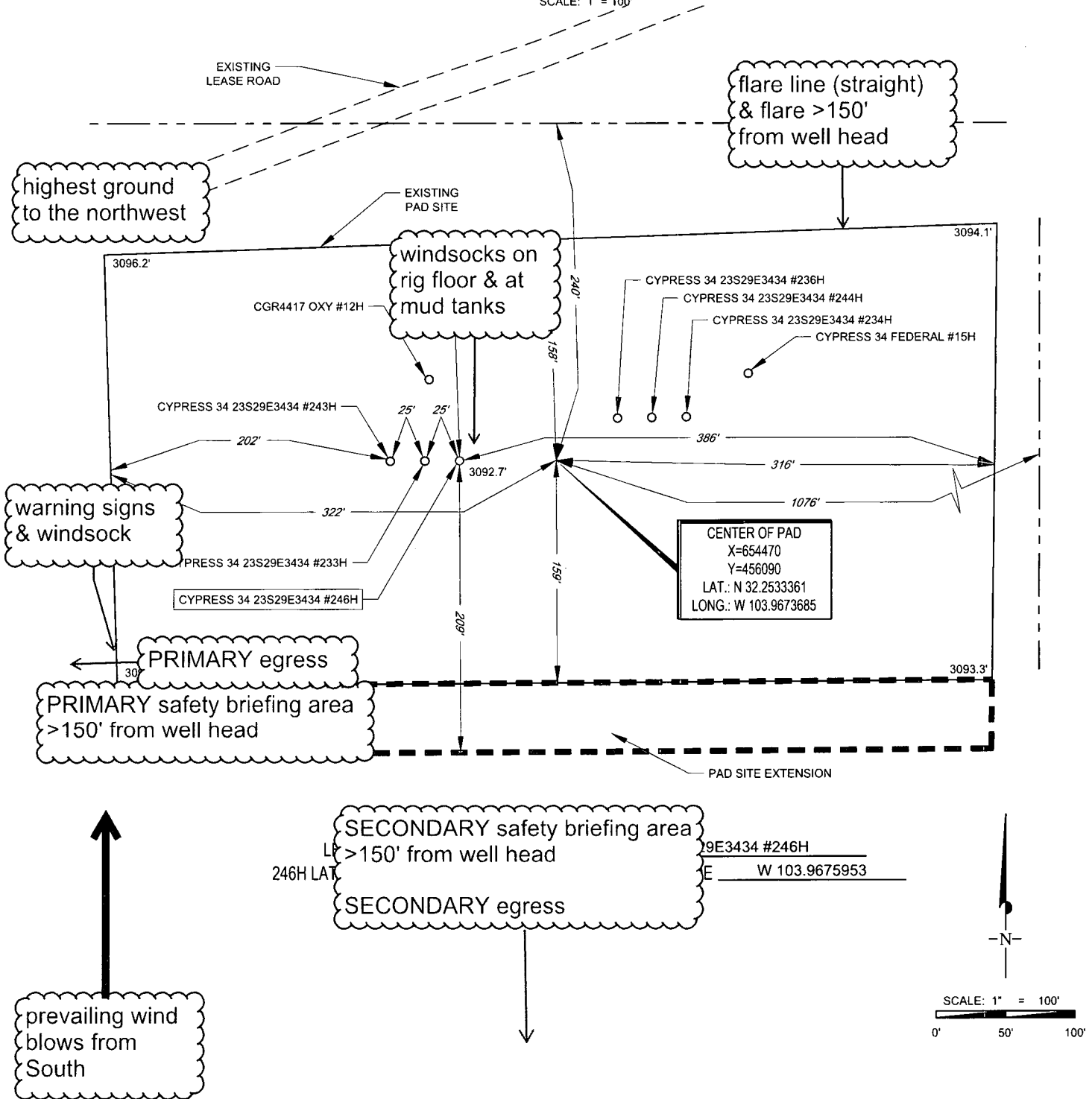
Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911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

EXHIBIT 2B



SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
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.

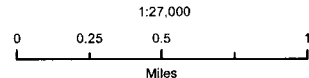
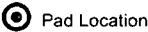


1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

Tap Rock Operating
LLC

Cypress 34 Federal Well Pad
H₂S Contingency Plan:
2 Mile Radius Map

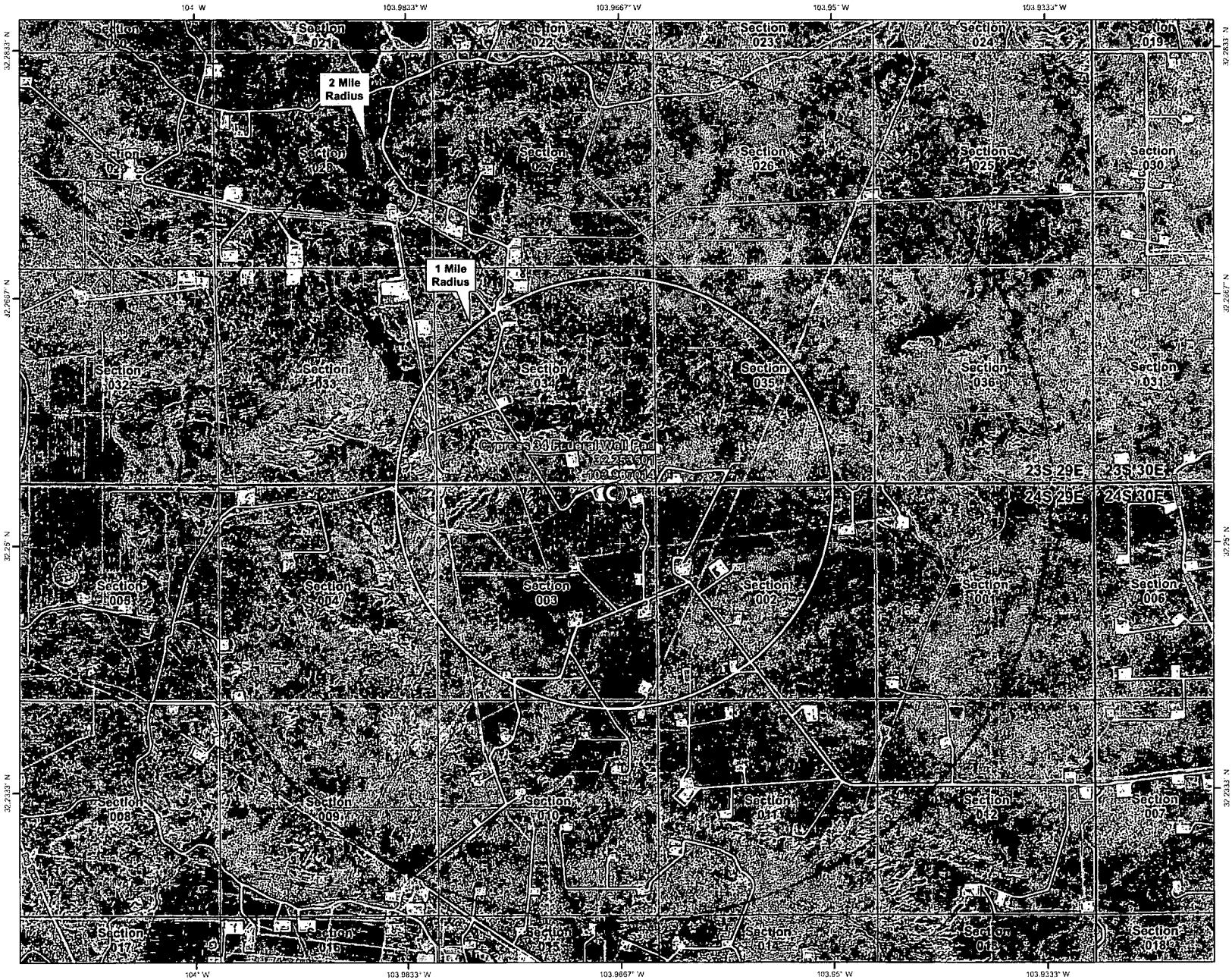
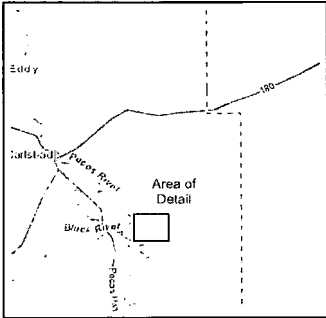
Sec. 3, Township 24S, Range 29E
Eddy County, New Mexico



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



Prepared by Permits West, Inc., May 31, 2018
for Tap Rock Operating, LLC

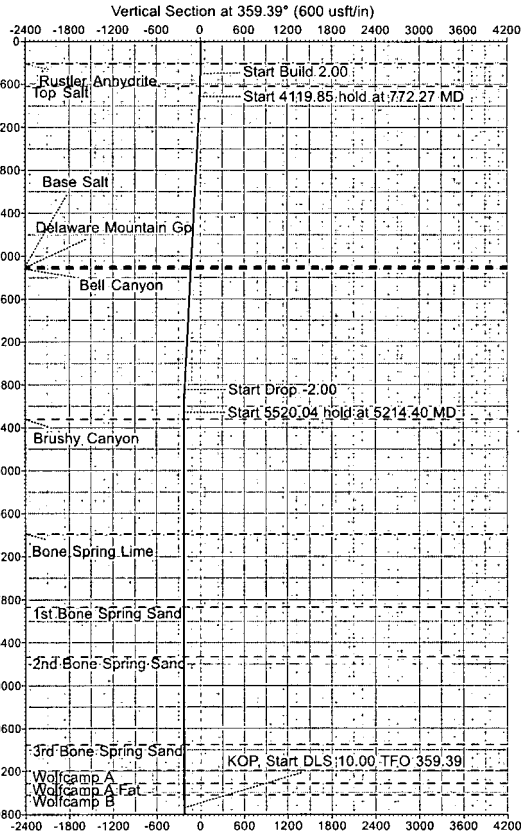




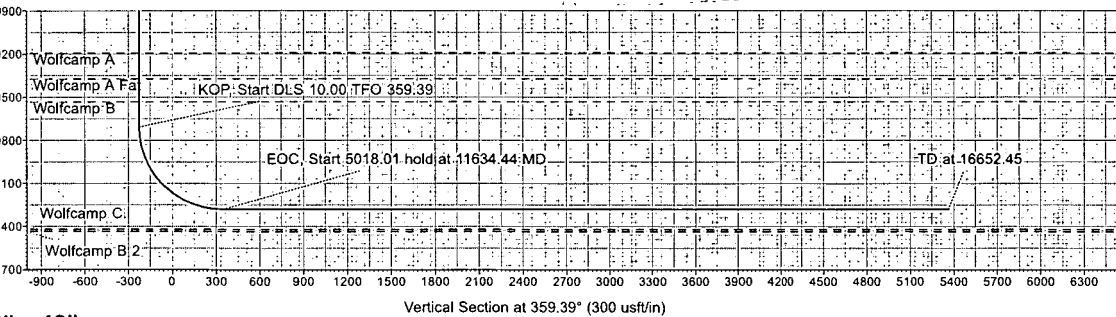
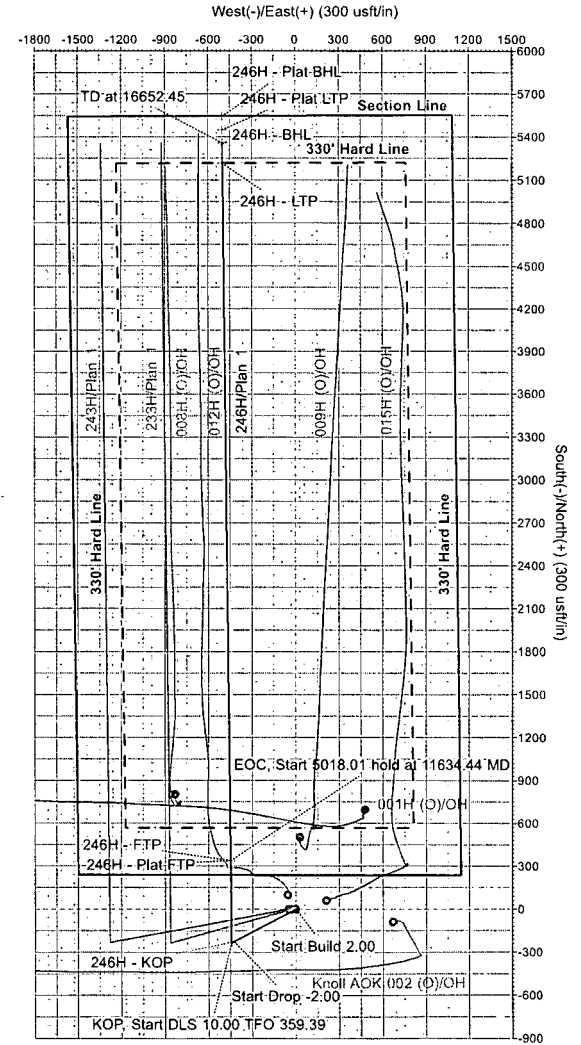
Tap Rock Operating, LLC
Eddy County, NM (NAD 83)
Cypress 34
246H
Plan 1
GL: 3093' + Est. KB: 26.5'

US State Plane 1983
North American Datum 1983
GRS 1980
New Mexico Eastern Zone
Mean Sea Level

*Note: Pro Directional is not responsible for any collision issues against unknown offset wells.
The offset well information shown in this drawing was obtained from a public site;
Which could be missing or have inaccurate data.



+N/-S		+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.00		0.00	456090.00	654399.00	32.253337	-103.967597		
SECTION DETAILS								
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00
3	772.27	6.45	242.15	771.59	-8.46	-16.01	2.00	-8.29
4	4892.13	6.45	242.15	4865.41	-224.50	-424.93	0.00	-219.96
5	5214.40	0.00	0.00	5187.00	-232.96	-440.94	2.00	-228.25
6	10734.44	0.00	0.00	10707.04	-232.96	-440.94	0.00	-228.25
7	11634.44	90.00	359.39	11280.00	339.97	-447.00	10.00	344.71
8	16652.45	90.00	359.39	11280.00	5357.70	-500.04	0.00	5362.72
TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape		
246H - Plat FTP	0.00	340.00	-447.00	456430.00	653952.00	Point		
246H - Plat LTP	0.00	5448.00	-501.00	461538.00	653898.00	Point		
246H - KOP	10707.04	-232.96	-440.94	455857.04	653958.06	Point		
246H - FTP	11280.00	339.97	-447.00	456429.97	653952.00	Point		
246H - LTP	11280.00	5216.64	-498.55	461306.64	653900.45	Point		
246H - BHL	11280.00	5357.70	-500.04	461447.70	653898.96	Point		
246H - Plat BHL	11280.00	5543.00	-502.00	461633.00	653897.00	Point		



Azimuths to Grid North
True North: -0.20°
Magnetic North: 6.87°
Magnetic Field
Strength: 47994.0nT
Dip Angle: 60.03°
Date: 8/19/2018
Model: HDGM

Azimuth Corrections
Total Magnetic Corr. (M to G): 6.87°
Declination (M to T): 7.07° East



Tap Rock Operating, LLC

Eddy County, NM (NAD 83)

Cypress 34

246H

OH

Plan: Plan 1

Standard Survey Report

28 August, 2018





Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	246H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan 1	Database:	WellPlanner1

Project	Eddy County, NM (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Cypress 34		
Site Position:		Northing:	456,089.00 usft
From:	Map	Easting:	654,374.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.253335
		Longitude:	-103.967678
		Grid Convergence:	0.20 °

Well	246H		
Well Position	+N/-S	0.00 usft	Northing: 456,090.00 usft
	+E/-W	0.00 usft	Easting: 654,399.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.253337
		Longitude:	-103.967597
		Ground Level:	3,093.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/19/2018	7.07	60.03	47,994.00

Design	Plan 1				
Audit Notes:					
Version:	Phase:	PROTOTYPE			Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.39	

Survey Tool Program	Date 8/23/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	16,652.45	Plan 1 (OH)	MWD+HDGM	OWSG MWD + HRGM	

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
312.00	0.00	0.00	312.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler Anhydrite									
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
500.00	1.00	242.15	500.00	-0.20	-0.39	-0.20	2.00	2.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	246H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan 1	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
600.00	3.00	242.15	599.93	-1.83	-3.47	-1.80	2.00	2.00	0.00
627.11	3.54	242.15	627.00	-2.56	-4.84	-2.51	2.00	2.00	0.00
Top Salt									
700.00	5.00	242.15	699.68	-5.09	-9.64	-4.99	2.00	2.00	0.00
772.27	6.45	242.15	771.59	-8.46	-16.01	-8.29	2.00	2.00	0.00
Start 4119.85 hold at 772.27 MD									
800.00	6.45	242.15	799.15	-9.91	-18.76	-9.71	0.00	0.00	0.00
900.00	6.45	242.15	898.51	-15.16	-28.69	-14.85	0.00	0.00	0.00
1,000.00	6.45	242.15	997.88	-20.40	-38.61	-19.99	0.00	0.00	0.00
1,100.00	6.45	242.15	1,097.25	-25.64	-48.54	-25.13	0.00	0.00	0.00
1,200.00	6.45	242.15	1,196.62	-30.89	-58.47	-30.26	0.00	0.00	0.00
1,300.00	6.45	242.15	1,295.99	-36.13	-68.39	-35.40	0.00	0.00	0.00
1,400.00	6.45	242.15	1,395.35	-41.38	-78.32	-40.54	0.00	0.00	0.00
1,500.00	6.45	242.15	1,494.72	-46.62	-88.24	-45.68	0.00	0.00	0.00
1,600.00	6.45	242.15	1,594.09	-51.86	-98.17	-50.82	0.00	0.00	0.00
1,700.00	6.45	242.15	1,693.46	-57.11	-108.09	-55.95	0.00	0.00	0.00
1,800.00	6.45	242.15	1,792.82	-62.35	-118.02	-61.09	0.00	0.00	0.00
1,900.00	6.45	242.15	1,892.19	-67.60	-127.94	-66.23	0.00	0.00	0.00
2,000.00	6.45	242.15	1,991.56	-72.84	-137.87	-71.37	0.00	0.00	0.00
2,100.00	6.45	242.15	2,090.93	-78.08	-147.80	-76.51	0.00	0.00	0.00
2,200.00	6.45	242.15	2,190.30	-83.33	-157.72	-81.64	0.00	0.00	0.00
2,300.00	6.45	242.15	2,289.66	-88.57	-167.65	-86.78	0.00	0.00	0.00
2,400.00	6.45	242.15	2,389.03	-93.82	-177.57	-91.92	0.00	0.00	0.00
2,500.00	6.45	242.15	2,488.40	-99.06	-187.50	-97.06	0.00	0.00	0.00
2,600.00	6.45	242.15	2,587.77	-104.30	-197.42	-102.20	0.00	0.00	0.00
2,700.00	6.45	242.15	2,687.14	-109.55	-207.35	-107.33	0.00	0.00	0.00
2,800.00	6.45	242.15	2,786.50	-114.79	-217.28	-112.47	0.00	0.00	0.00
2,900.00	6.45	242.15	2,885.87	-120.04	-227.20	-117.61	0.00	0.00	0.00
3,000.00	6.45	242.15	2,985.24	-125.28	-237.13	-122.75	0.00	0.00	0.00
3,100.00	6.45	242.15	3,084.61	-130.52	-247.05	-127.89	0.00	0.00	0.00
3,152.73	6.45	242.15	3,137.00	-133.29	-252.29	-130.59	0.00	0.00	0.00
Base Salt									
3,172.85	6.45	242.15	3,157.00	-134.34	-254.28	-131.63	0.00	0.00	0.00
Delaware Mountain Gp									
3,192.98	6.45	242.15	3,177.00	-135.40	-256.28	-132.66	0.00	0.00	0.00
Bell Canyon									
3,200.00	6.45	242.15	3,183.98	-135.77	-256.98	-133.02	0.00	0.00	0.00
3,300.00	6.45	242.15	3,283.34	-141.01	-266.90	-138.16	0.00	0.00	0.00
3,400.00	6.45	242.15	3,382.71	-146.26	-276.83	-143.30	0.00	0.00	0.00
3,500.00	6.45	242.15	3,482.08	-151.50	-286.76	-148.44	0.00	0.00	0.00
3,600.00	6.45	242.15	3,581.45	-156.74	-296.68	-153.58	0.00	0.00	0.00
3,700.00	6.45	242.15	3,680.82	-161.99	-306.61	-158.71	0.00	0.00	0.00
3,800.00	6.45	242.15	3,780.18	-167.23	-316.53	-163.85	0.00	0.00	0.00
3,900.00	6.45	242.15	3,879.55	-172.47	-326.46	-168.99	0.00	0.00	0.00



Pro Directional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 246H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,000.00	6.45	242.15	3,978.92	-177.72	-336.38	-174.13	0.00	0.00	0.00
4,100.00	6.45	242.15	4,078.29	-182.96	-346.31	-179.27	0.00	0.00	0.00
4,200.00	6.45	242.15	4,177.65	-188.21	-356.23	-184.40	0.00	0.00	0.00
4,300.00	6.45	242.15	4,277.02	-193.45	-366.16	-189.54	0.00	0.00	0.00
4,400.00	6.45	242.15	4,376.39	-198.69	-376.09	-194.68	0.00	0.00	0.00
4,500.00	6.45	242.15	4,475.76	-203.94	-386.01	-199.82	0.00	0.00	0.00
4,600.00	6.45	242.15	4,575.13	-209.18	-395.94	-204.96	0.00	0.00	0.00
4,700.00	6.45	242.15	4,674.49	-214.43	-405.86	-210.09	0.00	0.00	0.00
4,800.00	6.45	242.15	4,773.86	-219.67	-415.79	-215.23	0.00	0.00	0.00
4,892.13	6.45	242.15	4,865.41	-224.50	-424.93	-219.96	0.00	0.00	0.00
Start Drop -2.00									
4,900.00	6.29	242.15	4,873.23	-224.91	-425.70	-220.36	2.00	-2.00	0.00
5,000.00	4.29	242.15	4,972.80	-229.21	-433.85	-224.58	2.00	-2.00	0.00
5,100.00	2.29	242.15	5,072.63	-231.89	-438.92	-227.21	2.00	-2.00	0.00
5,200.00	0.29	242.15	5,172.60	-232.94	-440.91	-228.24	2.00	-2.00	0.00
5,214.40	0.00	0.01	5,187.00	-232.96	-440.94	-228.25	2.00	-2.00	0.00
Start 5520.04 hold at 5214.40 MD									
5,300.00	0.00	0.00	5,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,314.40	0.00	0.00	5,287.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
Brushy Canyon									
5,400.00	0.00	0.00	5,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,500.00	0.00	0.00	5,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,600.00	0.00	0.00	5,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,700.00	0.00	0.00	5,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,800.00	0.00	0.00	5,772.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
5,900.00	0.00	0.00	5,872.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,000.00	0.00	0.00	5,972.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,100.00	0.00	0.00	6,072.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,200.00	0.00	0.00	6,172.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,300.00	0.00	0.00	6,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,400.00	0.00	0.00	6,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,500.00	0.00	0.00	6,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,600.00	0.00	0.00	6,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,700.00	0.00	0.00	6,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,800.00	0.00	0.00	6,772.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,900.00	0.00	0.00	6,872.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
6,909.40	0.00	0.00	6,882.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
Bone Spring Lime									
7,000.00	0.00	0.00	6,972.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,100.00	0.00	0.00	7,072.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,200.00	0.00	0.00	7,172.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,300.00	0.00	0.00	7,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,400.00	0.00	0.00	7,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,500.00	0.00	0.00	7,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	246H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan 1	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,600.00	0.00	0.00	7,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,700.00	0.00	0.00	7,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,800.00	0.00	0.00	7,772.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,900.00	0.00	0.00	7,872.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
7,929.40	0.00	0.00	7,902.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
1st Bone Spring Sand									
8,000.00	0.00	0.00	7,972.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,100.00	0.00	0.00	8,072.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,200.00	0.00	0.00	8,172.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,300.00	0.00	0.00	8,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,400.00	0.00	0.00	8,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,500.00	0.00	0.00	8,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,600.00	0.00	0.00	8,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,629.40	0.00	0.00	8,602.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
2nd Bone Spring Sand									
8,700.00	0.00	0.00	8,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,800.00	0.00	0.00	8,772.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
8,900.00	0.00	0.00	8,872.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,000.00	0.00	0.00	8,972.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,100.00	0.00	0.00	9,072.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,200.00	0.00	0.00	9,172.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,300.00	0.00	0.00	9,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,400.00	0.00	0.00	9,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,500.00	0.00	0.00	9,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,600.00	0.00	0.00	9,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,700.00	0.00	0.00	9,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,800.00	0.00	0.00	9,772.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
9,854.40	0.00	0.00	9,827.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
3rd Bone Spring Sand									
9,900.00	0.00	0.00	9,872.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,000.00	0.00	0.00	9,972.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,100.00	0.00	0.00	10,072.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,200.00	0.00	0.00	10,172.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,219.40	0.00	0.00	10,192.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
Wolfcamp A									
10,300.00	0.00	0.00	10,272.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,399.40	0.00	0.00	10,372.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
Wolfcamp A Fat									
10,400.00	0.00	0.00	10,372.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,500.00	0.00	0.00	10,472.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,559.40	0.00	0.00	10,532.00	-232.96	-440.94	-228.25	0.00	0.00	0.00
Wolfcamp B									
10,600.00	0.00	0.00	10,572.60	-232.96	-440.94	-228.25	0.00	0.00	0.00
10,700.00	0.00	0.00	10,672.60	-232.96	-440.94	-228.25	0.00	0.00	0.00



Pro Directional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 246H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Built Rate (°/100usft)	Turn Rate (°/100usft)
10,734.44	0.00	0.00	10,707.04	-232.96	-440.94	-228.25	0.00	0.00	0.00
KOP, Start DLS 10.00 TFO 359.39									
10,750.00	1.56	359.39	10,722.60	-232.75	-440.95	-228.04	10.00	10.00	0.00
10,800.00	6.56	359.39	10,772.46	-229.21	-440.98	-224.51	10.00	10.00	0.00
10,850.00	11.56	359.39	10,821.82	-221.35	-441.07	-216.64	10.00	10.00	0.00
10,900.00	16.56	359.39	10,870.31	-209.21	-441.19	-204.50	10.00	10.00	0.00
10,950.00	21.56	359.39	10,917.55	-192.89	-441.37	-188.18	10.00	10.00	0.00
11,000.00	26.56	359.39	10,963.19	-172.51	-441.58	-167.80	10.00	10.00	0.00
11,050.00	31.56	359.39	11,006.89	-148.24	-441.84	-143.53	10.00	10.00	0.00
11,100.00	36.56	359.39	11,048.30	-120.25	-442.13	-115.54	10.00	10.00	0.00
11,150.00	41.56	359.39	11,087.11	-88.76	-442.47	-84.04	10.00	10.00	0.00
11,200.00	46.56	359.39	11,123.03	-54.00	-442.84	-49.29	10.00	10.00	0.00
11,250.00	51.56	359.39	11,155.79	-16.25	-443.23	-11.53	10.00	10.00	0.00
11,300.00	56.56	359.39	11,185.13	24.21	-443.66	28.94	10.00	10.00	0.00
11,350.00	61.56	359.39	11,210.83	67.08	-444.12	71.81	10.00	10.00	0.00
11,400.00	66.56	359.39	11,232.70	112.03	-444.59	116.75	10.00	10.00	0.00
11,450.00	71.56	359.39	11,250.57	158.71	-445.08	163.43	10.00	10.00	0.00
11,500.00	76.56	359.39	11,264.30	206.76	-445.59	211.50	10.00	10.00	0.00
11,550.00	81.56	359.39	11,273.79	255.84	-446.11	260.57	10.00	10.00	0.00
11,600.00	86.56	359.39	11,278.96	305.55	-446.64	310.29	10.00	10.00	0.00
11,634.44	90.00	359.39	11,280.00	339.97	-447.00	344.71	10.00	10.00	0.00
EOC, Start 5018.01 hold at 11634.44 MD									
11,700.00	90.00	359.39	11,280.00	405.52	-447.69	410.27	0.00	0.00	0.00
11,800.00	90.00	359.39	11,280.00	505.52	-448.75	510.27	0.00	0.00	0.00
11,900.00	90.00	359.39	11,280.00	605.51	-449.81	610.27	0.00	0.00	0.00
12,000.00	90.00	359.39	11,280.00	705.51	-450.86	710.27	0.00	0.00	0.00
12,100.00	90.00	359.39	11,280.00	805.50	-451.92	810.27	0.00	0.00	0.00
12,200.00	90.00	359.39	11,280.00	905.49	-452.98	910.27	0.00	0.00	0.00
12,300.00	90.00	359.39	11,280.00	1,005.49	-454.03	1,010.27	0.00	0.00	0.00
12,400.00	90.00	359.39	11,280.00	1,105.48	-455.09	1,110.27	0.00	0.00	0.00
12,500.00	90.00	359.39	11,280.00	1,205.48	-456.15	1,210.27	0.00	0.00	0.00
12,600.00	90.00	359.39	11,280.00	1,305.47	-457.21	1,310.27	0.00	0.00	0.00
12,700.00	90.00	359.39	11,280.00	1,405.47	-458.26	1,410.27	0.00	0.00	0.00
12,800.00	90.00	359.39	11,280.00	1,505.46	-459.32	1,510.27	0.00	0.00	0.00
12,900.00	90.00	359.39	11,280.00	1,605.46	-460.38	1,610.27	0.00	0.00	0.00
13,000.00	90.00	359.39	11,280.00	1,705.45	-461.43	1,710.27	0.00	0.00	0.00
13,100.00	90.00	359.39	11,280.00	1,805.44	-462.49	1,810.27	0.00	0.00	0.00
13,200.00	90.00	359.39	11,280.00	1,905.44	-463.55	1,910.27	0.00	0.00	0.00
13,300.00	90.00	359.39	11,280.00	2,005.43	-464.60	2,010.27	0.00	0.00	0.00
13,400.00	90.00	359.39	11,280.00	2,105.43	-465.66	2,110.27	0.00	0.00	0.00
13,500.00	90.00	359.39	11,280.00	2,205.42	-466.72	2,210.27	0.00	0.00	0.00
13,600.00	90.00	359.39	11,280.00	2,305.42	-467.78	2,310.27	0.00	0.00	0.00
13,700.00	90.00	359.39	11,280.00	2,405.41	-468.83	2,410.27	0.00	0.00	0.00
13,800.00	90.00	359.39	11,280.00	2,505.41	-469.89	2,510.27	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	246H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan 1	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,900.00	90.00	359.39	11,280.00	2,605.40	-470.95	2,610.27	0.00	0.00	0.00
14,000.00	90.00	359.39	11,280.00	2,705.39	-472.00	2,710.27	0.00	0.00	0.00
14,100.00	90.00	359.39	11,280.00	2,805.39	-473.06	2,810.27	0.00	0.00	0.00
14,200.00	90.00	359.39	11,280.00	2,905.38	-474.12	2,910.27	0.00	0.00	0.00
14,300.00	90.00	359.39	11,280.00	3,005.38	-475.18	3,010.27	0.00	0.00	0.00
14,400.00	90.00	359.39	11,280.00	3,105.37	-476.23	3,110.27	0.00	0.00	0.00
14,500.00	90.00	359.39	11,280.00	3,205.37	-477.29	3,210.27	0.00	0.00	0.00
14,600.00	90.00	359.39	11,280.00	3,305.36	-478.35	3,310.27	0.00	0.00	0.00
14,700.00	90.00	359.39	11,280.00	3,405.36	-479.40	3,410.27	0.00	0.00	0.00
14,800.00	90.00	359.39	11,280.00	3,505.35	-480.46	3,510.27	0.00	0.00	0.00
14,900.00	90.00	359.39	11,280.00	3,605.34	-481.52	3,610.27	0.00	0.00	0.00
15,000.00	90.00	359.39	11,280.00	3,705.34	-482.57	3,710.27	0.00	0.00	0.00
15,100.00	90.00	359.39	11,280.00	3,805.33	-483.63	3,810.27	0.00	0.00	0.00
15,200.00	90.00	359.39	11,280.00	3,905.33	-484.69	3,910.27	0.00	0.00	0.00
15,300.00	90.00	359.39	11,280.00	4,005.32	-485.75	4,010.27	0.00	0.00	0.00
15,400.00	90.00	359.39	11,280.00	4,105.32	-486.80	4,110.27	0.00	0.00	0.00
15,500.00	90.00	359.39	11,280.00	4,205.31	-487.86	4,210.27	0.00	0.00	0.00
15,600.00	90.00	359.39	11,280.00	4,305.30	-488.92	4,310.27	0.00	0.00	0.00
15,700.00	90.00	359.39	11,280.00	4,405.30	-489.97	4,410.27	0.00	0.00	0.00
15,800.00	90.00	359.39	11,280.00	4,505.29	-491.03	4,510.27	0.00	0.00	0.00
15,900.00	90.00	359.39	11,280.00	4,605.29	-492.09	4,610.27	0.00	0.00	0.00
16,000.00	90.00	359.39	11,280.00	4,705.28	-493.14	4,710.27	0.00	0.00	0.00
16,100.00	90.00	359.39	11,280.00	4,805.28	-494.20	4,810.27	0.00	0.00	0.00
16,200.00	90.00	359.39	11,280.00	4,905.27	-495.26	4,910.27	0.00	0.00	0.00
16,300.00	90.00	359.39	11,280.00	5,005.27	-496.32	5,010.27	0.00	0.00	0.00
16,400.00	90.00	359.39	11,280.00	5,105.26	-497.37	5,110.27	0.00	0.00	0.00
16,500.00	90.00	359.39	11,280.00	5,205.25	-498.43	5,210.27	0.00	0.00	0.00
16,600.00	90.00	359.39	11,280.00	5,305.25	-499.49	5,310.27	0.00	0.00	0.00
16,652.45	90.00	359.39	11,280.00	5,357.70	-500.04	5,362.72	0.00	0.00	0.00
TD at 16652.45									



Pro Directional Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Cypress 34
Well: 246H
Wellbore: OH
Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
246H - Plat FTP - plan misses target center by 561.61usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.01	0.00	340.00	-447.00	456,430.00	653,952.00	32.254276	-103.969039
246H - Plat LTP - plan misses target center by 5470.99usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.01	0.00	5,448.00	-501.00	461,538.00	653,898.00	32.268318	-103.969158
246H - KOP - plan hits target center - Point	0.00	0.00	10,707.0 4	-232.96	-440.94	455,857.04	653,958.06	32.252701	-103.969026
246H - Plat BHL - plan misses target center by 185.32usft at 16652.45usft MD (11280.00 TVD, 5357.70 N, -500.04 E) - Point	0.00	0.01	11,280.00	5,543.00	-502.00	461,633.00	653,897.00	32.268579	-103.969160
246H - FTP - plan hits target center - Point	0.00	0.00	11,280.00	339.97	-447.00	456,429.97	653,952.01	32.254276	-103.969039
246H - BHL - plan hits target center - Point	0.00	0.01	11,280.00	5,357.70	-500.04	461,447.70	653,898.96	32.268070	-103.969156
246H - LTP - plan hits target center - Point	0.00	0.00	11,280.00	5,216.64	-498.55	461,306.64	653,900.45	32.267682	-103.969152

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
312.00	312.00	Rustler Anhydrite			
627.11	627.00	Top Salt			
3,152.73	3,137.00	Base Salt			
3,172.85	3,157.00	Delaware Mountain Gp			
3,192.98	3,177.00	Bell Canyon			
5,314.40	5,287.00	Brushy Canyon			
6,909.40	6,882.00	Bone Spring Lime			
7,929.40	7,902.00	1st Bone Spring Sand			
8,629.40	8,602.00	2nd Bone Spring Sand			
9,854.40	9,827.00	3rd Bone Spring Sand			
10,219.40	10,192.00	Wolfcamp A			
10,399.40	10,372.00	Wolfcamp A Fat			
10,559.40	10,532.00	Wolfcamp B			



Pro Directional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Well:	246H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan 1	Database:	WellPlanner1

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
450	450	0	0	Start Build 2.00
772	772	-8	-16	Start 4119.85 hold at 772.27 MD
4892	4865	-225	-425	Start Drop -2.00
5214	5187	-233	-441	Start 5520.04 hold at 5214.40 MD
10,734	10,707	-233	-441	KOP, Start DLS 10.00 TFO 359.39'
11,634	11,280	340	-447	EOC, Start 5018.01 hold at 11634.44 MD
16,652	11,280	5358	-500	TD at 16652.45

Checked By: _____ Approved By: _____ Date: _____



Tap Rock Operating, LLC

Eddy County, NM (NAD 83)

Cypress 34

246H

OH

Plan 1

Anticollision Report

23 August, 2018





Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference	Plan 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	3.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 8/23/2018	
From (usft)	To (usft)	Survey (Wellbore)
0.00	16,652.45	Plan 1 (OH)
		Tool Name
		MWD+HDGM
		Description
		OWSG MWD + HRGM

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Cypress 34						
001H (O) - OH - OH	501.99	493.04	843.76	839.06	179.669	CC
001H (O) - OH - OH	8,059.40	8,542.56	911.12	822.91	10.329	ES, SF
008H (O) - OH - OH	3,932.25	3,858.18	1,015.09	977.04	26.677	CC
008H (O) - OH - OH	8,234.22	8,155.15	1,026.09	951.07	13.677	ES
008H (O) - OH - OH	8,400.00	8,238.63	1,032.64	956.58	13.576	SF
009H (O) - OH - OH	546.59	560.35	501.06	496.85	119.022	CC
009H (O) - OH - OH	600.00	615.07	501.25	496.47	104.948	ES
009H (O) - OH - OH	8,400.00	8,311.67	978.98	892.76	11.355	SF
012H (O) - OH - OH	721.80	724.73	110.18	103.95	17.684	CC
012H (O) - OH - OH	800.00	802.78	110.55	103.47	15.631	ES
012H (O) - OH - OH	9,000.00	9,006.80	523.56	428.88	5.530	SF
015H (O) - OH - OH	433.93	408.44	217.08	213.10	54.544	CC
015H (O) - OH - OH	450.00	423.67	217.11	212.96	52.385	ES
015H (O) - OH - OH	16,400.00	14,857.00	1,414.73	1,209.97	6.909	SF
233H - OH - Plan 1	450.00	450.00	25.02	20.86	6.016	CC
233H - OH - Plan 1	772.27	769.52	26.41	18.94	3.534	ES
233H - OH - Plan 1	16,652.45	16,476.45	483.73	240.46	1.988	SF
243H - OH - Plan 1	450.00	450.00	50.01	45.85	12.024	CC
243H - OH - Plan 1	772.27	766.74	51.65	44.18	6.922	ES
243H - OH - Plan 1	16,652.45	16,770.20	840.00	577.67	3.202	SF
Knoll AOK 002 (O) - OH - OH	8,008.73	9,102.25	198.64	99.27	1.999	CC, ES, SF

Offset Design	Cypress 34 - 001H (O) - OH - OH										Offset Site Error:	0.00 usft
Survey Program:	100-MWD+HDGM, 7420-MWD+HDGM										Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	34.24	698.33	475.34	845.06			
100.00	100.00	74.16	74.16	0.20	0.20	34.24	698.47	475.40	844.91	844.51	0.40	2,125.170
200.00	200.00	174.47	174.46	0.74	0.67	34.23	698.89	475.58	845.36	843.96	1.40	601.833
300.00	300.00	279.27	279.27	1.27	1.22	34.20	699.26	475.25	845.48	842.98	2.50	338.581
400.00	400.00	387.60	387.58	1.81	1.79	34.09	699.60	473.44	844.80	841.20	3.60	234.515

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offshot Design Cypress 34 - 001H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
450.00	450.00	439.65	439.62	2.08	2.07	34.01	699.63	472.15	844.13	839.99	4.15	203.637	CC	
500.00	500.00	490.99	490.94	2.34	2.34	151.80	699.63	470.77	843.76	839.08	4.68	180.474		
501.99	501.99	493.04	492.98	2.35	2.35	151.80	699.63	470.71	843.76	839.06	4.70	179.669		
600.00	599.93	587.83	587.74	2.85	2.85	151.74	699.78	468.04	845.40	839.70	5.70	148.285		
700.00	699.68	686.66	686.53	3.38	3.38	151.73	700.32	465.23	850.41	843.65	6.76	125.892		
772.27	771.59	761.69	761.53	3.76	3.79	151.79	700.58	463.17	855.87	848.33	7.54	113.486		
800.00	799.15	790.75	790.58	3.91	3.94	151.86	700.51	462.48	858.19	850.35	7.85	109.380		
900.00	898.51	890.52	890.32	4.47	4.47	152.12	699.90	460.43	866.46	857.55	8.91	97.255		
1,000.00	997.88	985.37	985.17	5.03	4.98	152.40	699.24	459.03	875.00	865.05	9.95	87.939		
1,100.00	1,097.25	1,081.89	1,081.68	5.60	5.49	152.70	698.67	458.27	884.05	873.05	11.00	80.367		
1,200.00	1,196.62	1,168.41	1,168.20	6.17	5.94	152.99	698.56	458.16	893.88	881.89	11.99	74.552		
1,300.00	1,295.99	1,252.43	1,252.21	6.74	6.37	153.27	699.55	458.95	905.41	892.45	12.96	69.869		
1,400.00	1,395.35	1,342.62	1,342.36	7.32	6.83	153.56	701.78	460.57	918.48	904.52	13.96	65.799		
1,500.00	1,494.72	1,446.90	1,446.58	7.90	7.37	153.88	704.49	462.52	931.76	916.71	15.04	61.932		
1,600.00	1,594.09	1,556.54	1,556.19	8.48	7.94	154.20	706.43	463.82	943.97	927.80	16.17	58.390		
1,700.00	1,693.46	1,662.98	1,662.63	9.06	8.49	154.52	707.48	464.61	955.33	938.06	17.27	55.313		
1,800.00	1,792.82	1,766.34	1,765.99	9.64	9.03	154.84	707.78	465.26	966.10	947.74	18.36	52.630		
1,900.00	1,892.19	1,866.92	1,866.56	10.22	9.55	155.15	707.73	465.93	976.64	957.22	19.42	50.280		
2,000.00	1,991.56	1,963.43	1,963.07	10.80	10.05	155.46	707.58	466.76	987.26	966.79	20.47	48.230		
2,100.00	2,090.93	2,062.39	2,062.02	11.39	10.56	155.76	707.77	467.66	998.20	976.66	21.53	46.355		
2,200.00	2,190.30	2,162.67	2,162.30	11.97	11.09	156.05	707.99	468.31	1,009.02	986.41	22.61	44.631		
2,300.00	2,289.66	2,258.72	2,258.35	12.55	11.59	156.32	708.20	469.03	1,019.94	996.28	23.66	43.112		
2,400.00	2,389.03	2,355.77	2,355.39	13.14	12.10	156.59	708.74	469.96	1,031.27	1,006.56	24.72	41.725		
2,500.00	2,488.40	2,455.75	2,455.37	13.72	12.63	156.85	709.36	470.88	1,042.65	1,016.85	25.79	40.424		
2,600.00	2,587.77	2,557.31	2,556.91	14.31	13.17	157.13	709.65	472.01	1,053.91	1,027.03	26.88	39.210		
2,700.00	2,687.14	2,659.48	2,659.08	14.89	13.71	157.43	709.49	473.24	1,064.92	1,036.96	27.97	38.078		
2,800.00	2,786.50	2,763.73	2,763.32	15.48	14.25	157.75	708.83	474.57	1,075.64	1,046.58	29.07	37.008		
2,900.00	2,885.87	2,867.01	2,866.58	16.07	14.79	158.09	707.45	475.96	1,085.90	1,055.74	30.16	36.009		
3,000.00	2,985.24	2,971.59	2,971.13	16.65	15.34	158.45	705.37	477.60	1,095.84	1,064.59	31.25	35.063		
3,100.00	3,084.61	3,077.91	3,077.40	17.24	15.89	158.84	702.55	479.11	1,105.24	1,072.88	32.36	34.153		
3,200.00	3,183.98	3,179.48	3,178.92	17.82	16.42	159.19	699.59	480.15	1,114.22	1,080.78	33.44	33.319		
3,300.00	3,283.34	3,279.32	3,278.72	18.41	16.94	159.51	696.85	480.86	1,123.15	1,088.64	34.51	32.546		
3,400.00	3,382.71	3,377.15	3,376.52	19.00	17.45	159.81	694.36	481.39	1,132.16	1,096.59	35.57	31.830		
3,500.00	3,482.08	3,477.08	3,476.42	19.58	17.98	160.10	692.08	481.77	1,141.29	1,104.65	36.64	31.149		
3,600.00	3,581.45	3,577.64	3,576.96	20.17	18.50	160.37	689.86	481.93	1,150.35	1,112.63	37.72	30.500		
3,700.00	3,680.82	3,676.40	3,675.69	20.76	19.02	160.63	687.73	481.98	1,159.39	1,120.61	38.78	29.896		
3,800.00	3,780.18	3,772.45	3,771.73	21.34	19.53	160.87	685.88	482.03	1,168.63	1,128.80	39.83	29.340		
3,900.00	3,879.55	3,871.17	3,870.43	21.93	20.05	161.11	684.15	482.25	1,178.13	1,137.23	40.90	28.807		
4,000.00	3,978.92	3,967.95	3,967.19	22.52	20.56	161.34	682.65	482.34	1,187.71	1,145.76	41.95	28.312		
4,100.00	4,078.29	4,063.53	4,062.77	23.10	21.06	161.55	681.49	482.52	1,197.62	1,154.62	43.00	27.852		
4,200.00	4,177.65	4,160.47	4,159.71	23.69	21.57	161.75	680.64	482.77	1,207.82	1,163.77	44.06	27.416		
4,300.00	4,277.02	4,258.38	4,257.61	24.28	22.09	161.94	679.99	483.00	1,218.19	1,173.07	45.12	26.999		
4,400.00	4,376.39	4,357.51	4,356.74	24.86	22.62	162.12	679.53	483.15	1,228.65	1,182.45	46.19	26.598		
4,500.00	4,475.76	4,457.32	4,456.55	25.45	23.15	162.30	679.07	483.26	1,239.09	1,191.82	47.27	26.213		
4,600.00	4,575.13	4,556.68	4,555.91	26.04	23.67	162.48	678.57	483.38	1,249.53	1,201.19	48.34	25.847		
4,700.00	4,674.49	4,655.81	4,655.04	26.63	24.20	162.65	678.13	483.47	1,260.00	1,210.58	49.42	25.497		
4,800.00	4,773.86	4,757.02	4,756.25	27.21	24.73	162.81	677.71	483.50	1,270.44	1,219.94	50.50	25.156		
4,892.13	4,865.41	4,850.91	4,850.14	27.75	25.23	162.96	677.24	483.32	1,279.88	1,228.38	51.51	24.849		
4,900.00	4,873.23	4,858.87	4,858.10	27.80	25.27	162.98	677.19	483.30	1,280.67	1,229.08	51.59	24.823		
5,000.00	4,972.80	4,958.91	4,958.13	28.37	25.80	163.16	676.64	482.99	1,288.88	1,236.22	52.66	24.475		
5,100.00	5,072.63	5,061.34	5,060.56	28.92	26.33	163.26	676.16	482.51	1,293.72	1,239.98	53.74	24.075		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 001H (O) - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
5,200.00	5,172.60	5,164.65	5,163.86	29.44	26.88	163.30	675.48	481.79	1,294.92	1,240.11	54.81	23.625		
5,214.40	5,187.00	5,179.41	5,178.62	29.51	26.95	45.45	675.36	481.69	1,294.80	1,239.83	54.96	23.558		
5,300.00	5,272.60	5,265.09	5,264.30	29.91	27.40	45.45	674.66	481.04	1,293.84	1,238.01	55.83	23.173		
5,400.00	5,372.60	5,370.14	5,369.35	30.38	27.95	45.44	673.88	480.02	1,292.63	1,235.74	56.88	22.724		
5,500.00	5,472.60	5,473.12	5,472.31	30.85	28.49	45.42	673.04	478.45	1,290.97	1,233.05	57.92	22.288		
5,600.00	5,572.60	5,573.66	5,572.83	31.33	29.02	45.40	672.16	476.84	1,289.22	1,230.28	58.94	21.872		
5,700.00	5,672.60	5,673.12	5,672.28	31.81	29.54	45.37	671.37	475.18	1,287.47	1,227.51	59.96	21.471		
5,800.00	5,772.60	5,774.62	5,773.75	32.29	30.07	45.35	670.51	473.52	1,285.71	1,224.72	61.00	21.079		
5,900.00	5,872.60	5,874.35	5,873.47	32.77	30.60	45.32	669.58	471.83	1,283.86	1,221.84	62.02	20.701		
6,000.00	5,972.60	5,973.88	5,972.99	33.25	31.12	45.31	668.51	470.38	1,282.06	1,219.02	63.04	20.336		
6,100.00	6,072.60	6,072.91	6,072.00	33.74	31.65	45.30	667.47	468.96	1,280.31	1,216.24	64.07	19.984		
6,200.00	6,172.60	6,171.84	6,170.91	34.23	32.17	45.29	666.46	467.64	1,278.64	1,213.55	65.09	19.643		
6,300.00	6,272.60	6,271.04	6,270.10	34.71	32.69	45.29	665.32	466.54	1,277.05	1,210.92	66.12	19.314		
6,400.00	6,372.60	6,372.87	6,371.91	35.20	33.23	45.30	664.06	465.49	1,275.44	1,208.27	67.17	18.989		
6,500.00	6,472.60	6,472.51	6,471.54	35.69	33.76	45.31	662.62	464.49	1,273.71	1,205.50	68.20	18.675		
6,600.00	6,572.60	6,572.29	6,571.30	36.19	34.30	45.33	661.19	463.57	1,272.05	1,202.80	69.24	18.371		
6,700.00	6,672.60	6,670.06	6,669.07	36.68	34.82	45.35	659.83	462.70	1,270.44	1,200.17	70.27	18.080		
6,800.00	6,772.60	6,768.63	6,767.63	37.18	35.34	45.37	658.55	462.01	1,269.02	1,197.72	71.30	17.799		
6,900.00	6,872.60	6,873.79	6,872.77	37.67	35.90	45.40	656.92	461.38	1,267.51	1,195.14	72.37	17.513		
7,000.00	6,972.60	6,972.47	6,971.43	38.17	36.43	45.44	655.06	460.68	1,265.69	1,192.28	73.41	17.242		
7,100.00	7,072.60	7,066.50	7,065.44	38.67	36.93	45.47	653.55	460.23	1,264.22	1,189.80	74.41	16.989		
7,200.00	7,172.60	8,581.02	8,007.70	39.17	45.97	8.05	669.97	-313.29	1,251.82	1,183.86	67.96	18.419		
7,300.00	7,272.60	8,576.70	8,007.88	39.67	45.89	8.32	669.20	-309.05	1,185.55	1,114.74	70.81	16.742		
7,400.00	7,372.60	8,572.30	8,008.07	40.17	45.82	8.59	668.41	-304.72	1,124.25	1,050.48	73.78	15.239		
7,500.00	7,472.60	8,568.14	8,008.26	40.67	45.74	8.86	667.65	-300.63	1,068.80	992.00	76.80	13.917		
7,600.00	7,572.60	8,564.13	8,008.44	41.17	45.67	9.11	666.93	-296.69	1,020.14	940.37	79.77	12.788		
7,700.00	7,672.60	8,559.88	8,008.63	41.68	45.60	9.37	666.16	-292.51	979.28	896.74	82.54	11.864		
7,800.00	7,772.60	8,555.35	8,008.85	42.18	45.52	9.66	665.34	-288.06	947.24	862.30	84.94	11.152		
7,900.00	7,872.60	8,550.52	8,009.09	42.69	45.43	9.96	664.46	-283.32	924.93	838.15	86.78	10.658		
8,000.00	7,972.60	8,545.37	8,009.35	43.19	45.34	10.29	663.53	-278.26	913.06	825.14	87.91	10.386		
8,059.40	8,032.00	8,542.56	8,009.50	43.50	45.29	10.46	663.02	-275.51	911.12	822.91	88.21	10.329 ES, SF		
8,100.00	8,072.60	8,540.02	8,009.64	43.70	45.25	10.62	662.56	-273.01	912.03	823.78	88.24	10.335		
8,200.00	8,172.60	8,533.65	8,009.98	44.21	45.14	11.02	661.40	-266.76	921.87	834.12	87.75	10.505		
8,300.00	8,272.60	8,527.14	8,010.34	44.72	45.03	11.43	660.21	-260.37	942.25	855.71	86.54	10.889		
8,400.00	8,372.60	8,520.48	8,010.71	45.23	44.92	11.85	658.98	-253.83	972.50	887.75	84.74	11.476		
8,500.00	8,472.60	8,513.66	8,011.10	45.74	44.80	12.28	657.72	-247.14	1,011.73	929.17	82.56	12.255		
8,600.00	8,572.60	8,506.67	8,011.50	46.25	44.69	12.71	656.42	-240.28	1,058.94	978.79	80.15	13.212		
8,700.00	8,672.60	8,500.90	8,011.83	46.76	44.59	13.08	655.34	-234.63	1,113.12	1,035.42	77.70	14.326		
8,800.00	8,772.60	8,495.38	8,012.14	47.27	44.50	13.42	654.31	-229.21	1,173.31	1,098.01	75.30	15.581		
8,900.00	8,872.60	8,489.96	8,012.45	47.78	44.42	13.76	653.30	-223.90	1,238.64	1,165.61	73.03	16.961		
9,000.00	8,972.60	8,484.64	8,012.74	48.30	44.33	14.09	652.30	-218.68	1,308.33	1,237.40	70.93	18.445		
9,100.00	9,072.60	8,479.42	8,013.03	48.81	44.25	14.42	651.32	-213.56	1,381.72	1,312.69	69.03	20.016		
9,200.00	9,172.60	8,474.29	8,013.31	49.32	44.16	14.74	650.36	-208.53	1,458.27	1,390.93	67.33	21.657		
9,300.00	9,272.60	8,470.01	8,013.54	49.84	44.10	15.01	649.55	-204.33	1,537.49	1,471.65	65.85	23.350		
9,400.00	9,372.60	8,466.07	8,013.75	50.35	44.04	15.25	648.80	-200.47	1,619.00	1,554.45	64.55	25.081		
9,500.00	9,472.60	8,462.41	8,013.93	50.87	43.98	15.48	648.10	-196.88	1,702.48	1,639.05	63.43	26.840		
9,600.00	9,572.60	8,458.99	8,014.09	51.38	43.93	15.70	647.44	-193.53	1,787.64	1,725.16	62.47	28.614		
9,700.00	9,672.60	8,455.80	8,014.24	51.90	43.88	15.90	646.82	-190.40	1,874.25	1,812.59	61.66	30.394		
9,800.00	9,772.60	8,452.80	8,014.38	52.42	43.83	16.08	646.24	-187.47	1,962.14	1,901.15	60.99	32.173		
9,900.00	9,872.60	8,449.99	8,014.50	52.93	43.79	16.26	645.69	-184.71	2,051.13	1,990.70	60.43	33.943		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 001H (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)				Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)		
10,000.00	9,972.60	8,447.35	8,014.61	53.45	43.75	16.42	645.17	-182.12	2,141.08	2,081.11	59.98	35.699			
10,100.00	10,072.60	8,442.00	8,014.83	53.97	43.66	16.76	644.11	-176.88	2,231.89	2,172.29	59.60	37.448			
10,200.00	10,172.60	8,442.00	8,014.83	54.49	43.66	16.76	644.11	-176.88	2,323.44	2,264.10	59.34	39.154			
10,300.00	10,272.60	8,442.00	8,014.83	55.01	43.66	16.76	644.11	-176.88	2,415.67	2,356.51	59.16	40.835			
10,400.00	10,372.60	8,442.00	8,014.83	55.53	43.66	16.76	644.11	-176.88	2,508.49	2,449.45	59.04	42.488			
10,500.00	10,472.60	8,442.00	8,014.83	56.05	43.66	16.76	644.11	-176.88	2,601.84	2,542.85	58.98	44.112			
10,600.00	10,572.60	8,442.00	8,014.83	56.57	43.66	16.76	644.11	-176.88	2,695.66	2,636.69	58.98	45.707			
10,700.00	10,672.60	8,442.00	8,014.83	57.09	43.66	16.76	644.11	-176.88	2,789.92	2,730.90	59.02	47.270			
10,734.44	10,707.04	8,442.00	8,014.83	57.27	43.66	16.76	644.11	-176.88	2,822.47	2,763.43	59.05	47.801			
10,750.00	10,722.60	8,442.00	8,014.83	57.35	43.66	16.10	644.11	-176.88	2,837.13	2,778.07	59.06	48.041			
10,800.00	10,772.46	8,442.00	8,014.83	57.60	43.66	13.07	644.11	-176.88	2,883.30	2,824.24	59.06	48.819			
10,850.00	10,821.82	8,442.00	8,014.83	57.85	43.66	11.02	644.11	-176.88	2,927.84	2,868.81	59.03	49.601			
10,900.00	10,870.31	8,442.00	8,014.83	58.08	43.66	9.56	644.11	-176.88	2,970.49	2,911.53	58.96	50.381			
10,950.00	10,917.55	8,442.00	8,014.83	58.31	43.66	8.48	644.11	-176.88	3,011.02	2,952.15	58.86	51.152			
11,000.00	10,963.19	8,442.00	8,014.83	58.51	43.66	7.65	644.11	-176.88	3,049.21	2,990.47	58.74	51.911			
11,050.00	11,006.89	8,442.00	8,014.83	58.70	43.66	7.00	644.11	-176.88	3,084.85	3,026.26	58.59	52.651			
11,100.00	11,048.30	8,442.00	8,014.83	58.87	43.66	6.48	644.11	-176.88	3,117.78	3,059.36	58.42	53.367			
11,150.00	11,087.11	8,442.00	8,014.83	59.02	43.66	6.07	644.11	-176.88	3,147.83	3,089.60	58.23	54.054			
11,200.00	11,123.03	8,442.00	8,014.83	59.15	43.66	5.74	644.11	-176.88	3,174.85	3,116.82	58.04	54.705			
11,250.00	11,155.79	8,442.00	8,014.83	59.25	43.66	5.48	644.11	-176.88	3,198.73	3,140.90	57.83	55.313			
11,300.00	11,185.13	8,442.00	8,014.83	59.34	43.66	5.26	644.11	-176.88	3,219.34	3,161.72	57.62	55.872			
11,350.00	11,210.83	8,451.93	8,014.41	59.41	43.82	4.92	646.07	-186.61	3,236.56	3,179.11	57.45	56.336			
11,400.00	11,232.70	8,455.47	8,014.26	59.45	43.87	4.73	646.76	-190.08	3,250.35	3,193.09	57.26	56.762			
11,450.00	11,250.57	8,459.16	8,014.08	59.49	43.93	4.58	647.48	-193.70	3,260.64	3,203.56	57.09	57.118			
11,500.00	11,264.30	8,462.98	8,013.90	59.54	43.99	4.46	648.21	-197.44	3,267.38	3,210.46	56.93	57.397			
11,550.00	11,273.79	8,474.00	8,013.33	59.70	44.16	4.25	650.30	-208.24	3,270.56	3,213.75	56.81	57.570			
11,600.00	11,278.96	8,474.00	8,013.33	59.87	44.16	4.25	650.30	-208.24	3,270.11	3,213.43	56.68	57.692			
11,634.44	11,280.00	8,474.00	8,013.33	59.98	44.16	4.27	650.30	-208.24	3,267.71	3,211.10	56.61	57.722			
11,700.00	11,280.00	8,483.37	8,012.82	60.21	44.31	4.10	652.06	-217.43	3,262.17	3,205.62	56.55	57.683			
11,800.00	11,280.00	8,498.46	8,011.97	60.63	44.55	3.84	654.89	-232.24	3,256.17	3,199.56	56.61	57.521			
11,900.00	11,280.00	8,520.69	8,010.70	61.11	44.92	3.46	659.02	-254.04	3,253.13	3,196.27	56.86	57.210			
11,958.03	11,280.00	11,958.03	8,008.91	61.43	115.18	2.87	665.26	-287.67	3,252.66	3,181.08	71.58	45.439			
12,000.00	11,280.00	8,585.10	8,007.52	61.67	46.05	2.35	670.71	-317.30	3,252.90	3,195.45	57.45	56.622			
12,100.00	11,280.00	12,100.00	8,006.05	62.29	118.26	1.68	677.41	-355.16	3,255.41	3,181.14	74.28	43.829			
12,200.00	11,280.00	8,663.62	8,004.79	62.97	47.52	0.99	683.97	-394.64	3,260.77	3,201.73	59.04	55.231			
12,300.00	11,280.00	8,681.54	8,004.28	63.73	47.89	0.68	686.78	-412.33	3,269.05	3,209.05	60.00	54.481			
12,400.00	11,280.00	8,697.78	8,003.84	64.54	48.21	0.39	689.21	-428.38	3,280.29	3,219.17	61.12	53.671			
12,500.00	11,280.00	8,712.80	8,003.44	65.41	48.52	0.13	691.37	-443.24	3,294.44	3,232.07	62.37	52.820			
12,600.00	11,280.00	8,726.72	8,003.08	66.34	48.80	-0.11	693.28	-457.02	3,311.49	3,247.75	63.75	51.948			
12,700.00	11,280.00	8,737.51	8,002.81	67.33	49.02	-0.30	694.72	-467.71	3,331.40	3,266.19	65.22	51.082			
12,800.00	11,280.00	8,747.13	8,002.56	68.37	49.23	-0.47	695.97	-477.25	3,354.14	3,287.36	66.77	50.231			
12,900.00	11,280.00	8,756.38	8,002.31	69.47	49.42	-0.63	697.15	-486.42	3,379.64	3,311.23	68.41	49.406			
13,000.00	11,280.00	8,765.27	8,002.06	70.61	49.61	-0.78	698.26	-495.24	3,407.85	3,337.75	70.10	48.617			
13,100.00	11,280.00	8,773.83	8,001.82	71.80	49.79	-0.93	699.31	-503.73	3,438.70	3,366.87	71.83	47.873			
13,200.00	11,280.00	8,782.08	8,001.58	73.03	49.97	-1.08	700.29	-511.91	3,472.13	3,398.54	73.59	47.181			
13,300.00	11,280.00	8,792.00	8,001.29	74.30	50.18	-1.25	701.46	-521.76	3,508.06	3,432.67	75.39	46.531			
13,400.00	11,280.00	8,792.00	8,001.29	75.62	50.18	-1.25	701.46	-521.76	3,546.43	3,469.33	77.10	46.000			
13,500.00	11,280.00	8,804.18	8,000.92	76.97	50.45	-1.46	702.84	-533.86	3,587.14	3,508.21	78.93	45.446			
13,600.00	11,280.00	8,810.82	8,000.71	78.36	50.60	-1.58	703.57	-540.46	3,630.13	3,549.43	80.70	44.985			
13,700.00	11,280.00	8,817.24	8,000.51	79.79	50.74	-1.69	704.27	-546.83	3,675.32	3,592.88	82.44	44.583			
13,800.00	11,280.00	8,823.43	8,000.31	81.24	50.88	-1.80	704.93	-552.99	3,722.62	3,638.47	84.15	44.236			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 001H (O) - OH - OH											Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7420-MWD+HDGM											Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)	Minlmm Separation (usft)	Separation Factor		
13,900.00	11,280.00	8,829.42	8,000.11	82.73	51.01	-1.90	705.55	-558.94	3,771.97	3,686.13	85.84	43.944
14,000.00	11,280.00	8,835.21	7,999.91	84.25	51.14	-2.00	706.15	-564.70	3,823.28	3,735.80	87.48	43.703
14,100.00	11,280.00	8,840.82	7,999.72	85.79	51.26	-2.10	706.71	-570.27	3,876.47	3,787.38	89.09	43.512
14,200.00	11,280.00	8,856.00	7,999.18	87.36	51.60	-2.36	708.19	-585.37	3,931.50	3,840.70	90.80	43.299
14,300.00	11,280.00	8,856.00	7,999.18	88.96	51.60	-2.36	708.19	-585.37	3,988.21	3,895.97	92.24	43.236
14,400.00	11,280.00	8,858.23	7,999.10	90.58	51.65	-2.40	708.40	-587.59	4,046.61	3,952.93	93.68	43.198
14,500.00	11,280.00	8,875.87	7,998.53	92.22	52.05	-2.71	710.02	-605.15	4,106.58	4,011.26	95.32	43.082
14,600.00	11,280.00	8,891.97	7,998.10	93.88	52.42	-2.99	711.43	-621.18	4,168.04	4,071.14	96.91	43.011
14,700.00	11,280.00	8,906.71	7,997.78	95.56	52.76	-3.25	712.65	-635.87	4,230.94	4,132.51	98.43	42.983
14,800.00	11,280.00	8,920.26	7,997.55	97.27	53.07	-3.48	713.73	-649.37	4,295.22	4,195.32	99.90	42.994
14,900.00	11,280.00	8,932.75	7,997.40	98.99	53.36	-3.70	714.67	-661.82	4,360.82	4,259.50	101.32	43.041
15,000.00	11,280.00	8,920.00	7,997.56	100.72	53.07	-3.48	713.71	-649.11	4,427.73	4,325.51	102.22	43.316
15,100.00	11,280.00	8,934.05	7,997.35	102.48	53.40	-3.72	714.77	-663.12	4,495.82	4,392.23	103.59	43.400
15,200.00	11,280.00	8,938.45	7,997.28	104.24	53.51	-3.80	715.09	-667.50	4,565.09	4,460.36	104.73	43.588
15,300.00	11,280.00	8,942.72	7,997.22	106.03	53.61	-3.87	715.40	-671.77	4,635.48	4,529.64	105.83	43.800
15,400.00	11,280.00	8,946.89	7,997.15	107.82	53.71	-3.95	715.69	-675.92	4,706.93	4,600.03	106.89	44.034
15,500.00	11,280.00	8,950.94	7,997.09	109.63	53.80	-4.02	715.97	-679.96	4,779.40	4,671.48	107.92	44.288
15,600.00	11,280.00	8,954.88	7,997.03	111.46	53.90	-4.09	716.25	-683.90	4,852.84	4,743.94	108.90	44.562
15,700.00	11,280.00	8,958.73	7,996.97	113.29	53.99	-4.15	716.51	-687.73	4,927.20	4,817.36	109.85	44.854
15,800.00	11,280.00	8,962.48	7,996.91	115.14	54.08	-4.22	716.76	-691.47	5,002.46	4,891.70	110.76	45.164
15,900.00	11,280.00	8,966.13	7,996.86	117.00	54.16	-4.28	717.00	-695.12	5,078.57	4,966.92	111.64	45.489
16,000.00	11,280.00	8,969.69	7,996.80	118.86	54.25	-4.34	717.23	-698.67	5,155.48	5,042.99	112.49	45.829
16,100.00	11,280.00	8,984.00	7,996.57	120.74	54.59	-4.59	718.12	-712.95	5,233.20	5,119.64	113.55	46.086
16,200.00	11,280.00	8,984.00	7,996.57	122.63	54.59	-4.59	718.12	-712.95	5,311.62	5,197.35	114.27	46.483
16,300.00	11,280.00	8,984.00	7,996.57	124.53	54.59	-4.59	718.12	-712.95	5,390.75	5,275.79	114.96	46.894
16,400.00	11,280.00	8,984.00	7,996.57	126.43	54.59	-4.59	718.12	-712.95	5,470.57	5,354.95	115.62	47.315
16,500.00	11,280.00	8,984.00	7,996.57	128.34	54.59	-4.59	718.12	-712.95	5,551.04	5,434.78	116.26	47.748
16,600.00	11,280.00	8,984.00	7,996.57	130.26	54.59	-4.59	718.12	-712.95	5,632.14	5,515.27	116.87	48.191
16,652.45	11,280.00	8,993.53	7,996.42	131.27	54.82	-4.76	718.69	-722.46	5,674.90	5,557.49	117.41	48.334



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 246H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - 008H (O) - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-45.96	804.13	-831.56	1,158.05					
100.00	100.00	45.50	45.50	0.20	0.12	-45.96	804.13	-831.56	1,156.77	1,156.46	0.31	3,698.821		
200.00	200.00	145.50	145.50	0.74	0.37	-45.96	804.13	-831.56	1,156.77	1,155.67	1.10	1,048.287		
300.00	300.00	245.50	245.50	1.27	0.62	-45.96	804.13	-831.56	1,156.77	1,154.88	1.89	610.680		
400.00	400.00	345.50	345.50	1.81	0.87	-45.96	804.13	-831.56	1,156.77	1,154.09	2.68	430.830		
450.00	450.00	395.50	395.50	2.08	1.00	-45.96	804.13	-831.56	1,156.77	1,153.69	3.08	375.532		
500.00	500.00	465.24	465.24	2.34	1.33	71.92	803.62	-831.26	1,156.23	1,152.56	3.67	315.317		
600.00	599.93	565.83	565.81	2.85	1.85	72.11	802.05	-830.35	1,153.41	1,148.72	4.70	245.650		
700.00	699.68	666.23	666.19	3.38	2.37	72.49	800.40	-829.44	1,149.49	1,143.75	5.74	200.344		
772.27	771.59	738.68	738.63	3.76	2.75	72.88	799.11	-828.82	1,145.99	1,139.48	6.51	176.072		
800.00	799.15	766.45	766.40	3.91	2.89	73.02	798.57	-828.62	1,144.54	1,137.74	6.81	168.144		
900.00	898.51	866.18	866.10	4.47	3.42	73.50	796.42	-828.05	1,139.35	1,131.46	7.89	144.465		
1,000.00	997.88	964.55	964.44	5.03	3.95	73.97	794.19	-827.66	1,134.28	1,125.31	8.97	126.455		
1,100.00	1,097.25	1,063.92	1,063.78	5.60	4.48	74.45	791.89	-827.42	1,129.36	1,119.30	10.06	112.209		
1,200.00	1,196.62	1,164.87	1,164.70	6.17	5.02	74.91	789.27	-827.36	1,124.44	1,113.26	11.17	100.634		
1,300.00	1,295.99	1,265.30	1,265.09	6.74	5.56	75.36	786.32	-827.46	1,119.46	1,107.17	12.28	91.135		
1,400.00	1,395.35	1,364.96	1,364.70	7.32	6.10	75.81	783.28	-827.65	1,114.51	1,101.12	13.39	83.218		
1,500.00	1,494.72	1,464.32	1,464.02	7.90	6.63	76.25	780.19	-827.90	1,109.62	1,095.12	14.50	76.511		
1,600.00	1,594.09	1,563.32	1,562.97	8.48	7.17	76.69	777.09	-828.21	1,104.84	1,089.23	15.61	70.763		
1,700.00	1,693.46	1,661.56	1,661.16	9.06	7.70	77.14	774.09	-828.54	1,100.19	1,083.47	16.72	65.795		
1,800.00	1,792.82	1,759.13	1,758.69	9.64	8.22	77.60	771.47	-828.68	1,095.77	1,077.94	17.83	61.465		
1,900.00	1,892.19	1,855.08	1,854.62	10.22	8.74	78.08	769.31	-828.66	1,091.65	1,072.72	18.93	57.680		
2,000.00	1,991.56	1,949.88	1,949.40	10.80	9.25	78.58	767.68	-828.62	1,088.01	1,067.99	20.02	54.349		
2,100.00	2,090.93	2,047.35	2,046.86	11.39	9.78	79.10	766.46	-828.58	1,084.82	1,063.70	21.13	51.349		
2,200.00	2,190.30	2,146.68	2,146.19	11.97	10.31	79.65	765.34	-828.46	1,081.77	1,059.53	22.24	48.632		
2,300.00	2,289.66	2,244.23	2,243.73	12.55	10.83	80.20	764.34	-828.30	1,078.89	1,055.54	23.35	46.200		
2,400.00	2,389.03	2,340.96	2,340.46	13.14	11.35	80.74	763.53	-828.29	1,076.34	1,051.89	24.46	44.010		
2,500.00	2,488.40	2,447.18	2,446.67	13.72	11.92	81.35	762.61	-828.16	1,073.82	1,048.21	25.61	41.929		
2,600.00	2,587.77	2,556.41	2,555.89	14.31	12.51	81.99	761.05	-827.24	1,070.52	1,043.74	26.78	39.978		
2,700.00	2,687.14	2,661.34	2,660.79	14.89	13.07	82.60	758.88	-825.99	1,066.62	1,038.70	27.92	38.198		
2,800.00	2,786.50	2,766.65	2,766.06	15.48	13.64	83.20	756.02	-824.72	1,062.29	1,033.22	29.07	36.542		
2,900.00	2,885.87	2,872.60	2,871.93	16.07	14.22	83.80	752.55	-823.19	1,057.47	1,027.25	30.22	34.991		
3,000.00	2,985.24	2,973.67	2,972.92	16.65	14.76	84.38	748.82	-821.42	1,052.24	1,020.89	31.35	33.565		
3,100.00	3,084.61	3,071.57	3,070.74	17.24	15.24	84.95	745.35	-819.72	1,047.26	1,014.85	32.41	32.315		
3,200.00	3,183.98	3,167.14	3,166.24	17.82	15.47	85.52	742.21	-818.13	1,042.63	1,009.41	33.23	31.381		
3,300.00	3,283.34	3,268.20	3,267.24	18.41	15.50	86.12	738.93	-816.49	1,038.17	1,004.34	33.84	30.681		
3,400.00	3,382.71	3,368.61	3,367.58	19.00	15.55	86.73	735.54	-814.76	1,033.67	999.21	34.46	29.996		
3,500.00	3,482.08	3,467.10	3,466.00	19.58	15.61	87.33	732.25	-813.02	1,029.29	994.18	35.11	29.317		
3,600.00	3,581.45	3,566.13	3,564.96	20.17	15.69	87.95	729.03	-811.27	1,025.10	989.33	35.77	28.659		
3,700.00	3,680.82	3,666.27	3,665.03	20.76	15.80	88.57	725.74	-809.45	1,020.98	984.53	36.45	28.009		
3,800.00	3,780.18	3,756.25	3,754.95	21.34	15.90	89.15	722.92	-807.78	1,017.13	979.98	37.14	27.384		
3,900.00	3,879.55	3,833.36	3,832.04	21.93	15.99	89.69	722.19	-806.23	1,015.21	977.38	37.83	26.834		
3,932.25	3,911.59	3,858.18	3,856.86	22.12	16.03	89.88	722.38	-805.71	1,015.09	977.04	38.05	26.677 CC		
4,000.00	3,978.92	3,911.00	3,909.65	22.52	16.09	90.30	723.45	-804.55	1,015.63	977.13	38.51	26.375		
4,100.00	4,078.29	4,007.49	4,006.07	23.10	16.24	91.09	726.31	-802.44	1,017.43	978.19	39.23	25.932		
4,200.00	4,177.65	4,105.08	4,103.60	23.69	16.38	91.88	729.29	-800.44	1,019.56	979.60	39.96	25.512		
4,300.00	4,277.02	4,204.61	4,203.06	24.28	16.56	92.68	732.36	-798.43	1,021.94	981.21	40.73	25.092		
4,400.00	4,376.39	4,304.12	4,302.51	24.86	16.74	93.48	735.38	-796.36	1,024.45	982.96	41.49	24.691		
4,500.00	4,475.76	4,401.43	4,399.74	25.45	16.94	94.26	738.41	-794.35	1,027.24	984.96	42.28	24.297		
4,600.00	4,575.13	4,499.20	4,497.44	26.04	17.15	95.04	741.56	-792.37	1,030.35	987.28	43.07	23.923		
4,700.00	4,674.49	4,597.74	4,595.91	26.63	17.38	95.82	744.80	-790.41	1,033.72	989.84	43.88	23.557		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 008H (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)										
4,800.00	4,773.86	4,698.63	4,696.73	27.21	17.62	96.60	748.08	-788.51	1,037.29	992.58	44.71	23.201			
4,892.13	4,865.41	4,797.24	4,795.31	27.75	17.87	97.30	750.36	-787.63	1,040.26	994.76	45.50	22.861			
4,900.00	4,873.23	4,805.69	4,803.75	27.80	17.89	97.36	750.50	-787.61	1,040.49	994.92	45.57	22.832			
5,000.00	4,972.80	4,909.80	4,907.86	28.37	18.17	97.93	751.64	-787.96	1,042.86	996.44	46.42	22.465			
5,100.00	5,072.63	5,010.94	5,009.00	28.92	18.45	98.28	752.52	-788.30	1,044.61	997.37	47.24	22.111			
5,200.00	5,172.60	5,112.01	5,110.06	29.44	18.74	98.43	753.34	-788.46	1,045.76	997.70	48.06	21.760			
5,214.40	5,187.00	5,126.55	5,124.60	29.51	18.79	-19.41	753.46	-788.47	1,045.87	997.70	48.17	21.711			
5,300.00	5,272.60	5,212.99	5,211.04	29.91	19.04	-19.40	754.10	-788.51	1,046.49	997.65	48.84	21.428			
5,400.00	5,372.60	5,313.69	5,311.74	30.38	19.36	-19.39	754.77	-788.53	1,047.12	997.50	49.63	21.099			
5,500.00	5,472.60	5,414.33	5,412.37	30.85	19.68	-19.38	755.35	-788.63	1,047.70	997.28	50.43	20.777			
5,600.00	5,572.60	5,514.15	5,512.20	31.33	20.01	-19.39	755.85	-788.87	1,048.25	997.02	51.24	20.459			
5,700.00	5,672.60	5,613.88	5,611.92	31.81	20.34	-19.40	756.30	-789.31	1,048.83	996.78	52.05	20.151			
5,800.00	5,772.60	5,713.45	5,711.49	32.29	20.68	-19.43	756.71	-789.98	1,049.44	996.56	52.88	19.848			
5,900.00	5,872.60	5,813.24	5,811.27	32.77	21.03	-19.47	757.07	-790.90	1,050.09	996.38	53.71	19.553			
6,000.00	5,972.60	5,915.27	5,913.30	33.25	21.39	-19.51	757.34	-791.84	1,050.64	996.08	54.56	19.257			
6,100.00	6,072.60	6,016.74	6,014.76	33.74	21.76	-19.55	757.47	-792.60	1,051.01	995.60	55.41	18.967			
6,200.00	6,172.60	6,116.40	6,114.42	34.23	22.13	-19.58	757.56	-793.34	1,051.34	995.07	56.27	18.683			
6,300.00	6,272.60	6,216.72	6,214.74	34.71	22.50	-19.62	757.65	-794.15	1,051.70	994.56	57.14	18.406			
6,400.00	6,372.60	6,316.39	6,316.41	35.20	22.89	-19.66	757.65	-794.86	1,051.94	993.92	58.02	18.130			
6,500.00	6,472.60	6,420.37	6,418.39	35.69	23.29	-19.69	757.53	-795.42	1,052.01	993.10	58.91	17.858			
6,600.00	6,572.60	6,522.70	6,520.72	36.19	23.69	-19.72	757.20	-795.93	1,051.87	992.07	59.80	17.589			
6,700.00	6,672.60	6,623.45	6,621.47	36.68	24.08	-19.76	756.69	-796.42	1,051.56	990.86	60.70	17.324			
6,800.00	6,772.60	6,723.22	6,721.23	37.18	24.48	-19.80	756.16	-796.98	1,051.25	989.66	61.59	17.068			
6,900.00	6,872.60	6,823.91	6,821.92	37.67	24.89	-19.84	755.57	-797.66	1,050.93	988.43	62.50	16.815			
7,000.00	6,972.60	6,924.96	6,922.96	38.17	25.31	-19.90	754.84	-798.48	1,050.52	987.11	63.41	16.566			
7,100.00	7,072.60	7,030.13	7,028.11	38.67	25.75	-19.98	753.65	-799.64	1,049.84	985.49	64.35	16.314			
7,200.00	7,172.60	7,135.98	7,133.93	39.17	26.19	-20.11	751.62	-801.42	1,048.61	983.32	65.30	16.060			
7,300.00	7,272.60	7,241.62	7,239.53	39.67	26.64	-20.25	748.98	-803.15	1,046.83	980.59	66.24	15.803			
7,400.00	7,372.60	7,350.01	7,347.86	40.17	27.11	-20.37	745.80	-804.37	1,044.48	977.28	67.20	15.542			
7,500.00	7,472.60	7,465.80	7,463.55	40.67	27.61	-20.51	741.02	-805.23	1,040.87	972.69	68.18	15.266			
7,600.00	7,572.60	7,557.80	7,555.43	41.17	28.01	-20.62	736.45	-805.80	1,036.47	967.37	69.10	15.000			
7,700.00	7,672.60	7,636.28	7,633.86	41.68	28.36	-20.73	733.91	-806.85	1,033.91	963.94	69.97	14.776			
7,800.00	7,772.60	7,722.96	7,720.51	42.18	28.74	-20.85	732.72	-808.68	1,033.34	962.48	70.86	14.583			
7,900.00	7,872.60	7,837.44	7,834.94	42.69	29.26	-21.02	730.60	-811.25	1,032.40	960.53	71.88	14.363			
8,000.00	7,972.60	7,942.72	7,940.15	43.19	29.73	-21.21	727.36	-813.62	1,030.33	957.47	72.86	14.142			
8,100.00	8,072.60	8,041.23	8,038.55	43.70	30.18	-21.43	724.03	-816.55	1,028.27	954.45	73.81	13.931			
8,200.00	8,172.60	8,132.00	8,129.21	44.21	30.59	-21.67	720.85	-819.89	1,026.39	951.65	74.74	13.733			
8,234.22	8,206.82	8,155.15	8,152.32	44.38	30.70	-21.74	720.16	-820.97	1,026.09	951.07	75.02	13.677 ES			
8,300.00	8,272.60	8,188.27	8,185.38	44.72	30.85	-21.84	719.94	-822.93	1,027.13	951.66	75.47	13.609			
8,400.00	8,372.60	8,238.63	8,235.54	45.23	31.08	-22.04	721.18	-827.14	1,032.64	956.58	76.07	13.576 SF			
8,500.00	8,472.60	8,280.34	8,276.86	45.74	31.27	-22.23	724.00	-832.01	1,043.39	966.94	76.44	13.649			
8,600.00	8,572.60	8,321.00	8,316.81	46.25	31.45	-22.41	729.08	-837.58	1,059.89	983.23	76.66	13.826			
8,700.00	8,672.60	8,353.00	8,347.92	46.76	31.59	-22.52	734.99	-842.21	1,082.10	1,005.51	76.59	14.128			
8,800.00	8,772.60	8,392.11	8,385.46	47.27	31.76	-22.62	744.24	-848.03	1,109.64	1,033.13	76.51	14.503			
8,900.00	8,872.60	8,448.22	8,438.60	47.78	31.99	-22.65	760.56	-855.60	1,141.51	1,064.83	76.68	14.886			
9,000.00	8,972.60	8,510.00	8,496.60	48.30	32.25	-22.47	781.25	-860.35	1,175.67	1,098.73	76.94	15.281			
9,100.00	9,072.60	8,543.00	8,527.07	48.81	32.39	-22.28	793.83	-861.75	1,213.46	1,136.89	76.57	15.848			
9,200.00	9,172.60	8,574.00	8,555.11	49.32	32.53	-22.08	807.01	-862.79	1,255.56	1,179.45	76.11	16.496			
9,300.00	9,272.60	8,606.00	8,582.96	49.84	32.66	-21.83	822.71	-863.77	1,302.54	1,226.90	75.65	17.219			
9,400.00	9,372.60	8,620.34	8,595.02	50.35	32.73	-21.71	830.46	-864.24	1,353.84	1,279.08	74.76	18.109			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 008H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,500.00	9,472.60	8,637.00	8,608.73	50.87	32.80	-21.56	839.90	-864.82	1,409.18	1,335.24	73.94	19.059		
9,600.00	9,572.60	8,669.00	8,634.37	51.38	32.94	-21.26	859.02	-865.86	1,467.64	1,394.13	73.51	19.965		
9,700.00	9,672.60	8,700.00	8,658.37	51.90	33.07	-20.95	878.63	-866.58	1,529.01	1,455.92	73.10	20.918		
9,800.00	9,772.60	8,718.86	8,672.45	52.42	33.16	-20.75	891.18	-866.81	1,593.25	1,520.81	72.44	21.993		
9,900.00	9,872.60	8,732.00	8,681.96	52.93	33.22	-20.60	900.23	-866.88	1,660.22	1,588.50	71.72	23.148		
10,000.00	9,972.60	8,763.00	8,703.36	53.45	33.36	-20.22	922.65	-866.61	1,729.80	1,658.34	71.46	24.207		
10,100.00	10,072.60	8,763.00	8,703.36	53.97	33.36	-20.22	922.65	-866.61	1,801.43	1,730.85	70.58	25.522		
10,200.00	10,172.60	8,777.78	8,712.95	54.49	33.42	-20.03	933.89	-866.23	1,875.33	1,805.23	70.10	26.753		
10,300.00	10,272.60	8,795.00	8,723.52	55.01	33.50	-19.78	947.47	-865.54	1,951.28	1,881.55	69.73	27.984		
10,400.00	10,372.60	8,795.00	8,723.52	55.53	33.50	-19.78	947.47	-865.54	2,028.89	1,959.80	69.09	29.367		
10,500.00	10,472.60	8,826.00	8,741.39	56.05	33.65	-19.32	972.72	-863.72	2,108.02	2,038.92	69.10	30.506		
10,600.00	10,572.60	8,837.94	8,748.03	56.57	33.71	-19.14	982.61	-862.87	2,188.33	2,119.51	68.82	31.799		
10,700.00	10,672.60	8,858.00	8,759.01	57.09	33.80	-18.84	999.33	-861.37	2,269.69	2,200.96	68.73	33.023		
10,734.44	10,707.04	8,858.00	8,759.01	57.27	33.80	-18.84	999.33	-861.37	2,297.99	2,229.39	68.60	33.501		
10,750.00	10,722.60	8,869.16	8,765.01	57.35	33.86	-17.40	1,008.70	-860.50	2,310.62	2,241.90	68.72	33.623		
10,800.00	10,772.46	8,877.99	8,769.68	57.60	33.90	-15.49	1,016.16	-859.80	2,349.93	2,281.29	68.64	34.234		
10,850.00	10,821.82	8,890.00	8,775.91	57.85	33.96	-13.97	1,026.38	-858.82	2,386.85	2,318.27	68.58	34.803		
10,900.00	10,870.31	8,890.00	8,775.91	58.08	33.96	-12.88	1,026.38	-858.82	2,421.21	2,352.92	68.29	35.452		
10,950.00	10,917.55	8,905.47	8,783.72	58.31	34.04	-11.89	1,039.68	-857.51	2,452.76	2,384.53	68.23	35.949		
11,000.00	10,963.19	8,921.00	8,791.26	58.51	34.13	-11.10	1,053.18	-856.14	2,481.47	2,413.34	68.13	36.422		
11,050.00	11,008.89	8,921.00	8,791.26	58.70	34.13	-10.54	1,053.18	-856.14	2,507.10	2,439.33	67.77	36.995		
11,100.00	11,048.30	8,937.46	8,798.97	58.87	34.22	-10.01	1,067.64	-854.64	2,529.53	2,461.90	67.63	37.400		
11,150.00	11,087.11	8,953.00	8,806.00	59.02	34.30	-9.60	1,081.42	-853.16	2,548.68	2,481.22	67.46	37.779		
11,200.00	11,123.03	8,953.00	8,806.00	59.15	34.30	-9.32	1,081.42	-853.16	2,564.49	2,497.44	67.05	38.250		
11,250.00	11,155.79	8,984.00	8,819.35	59.25	34.48	-9.02	1,109.24	-850.18	2,576.74	2,509.68	67.06	38.424		
11,300.00	11,185.13	8,984.00	8,819.35	59.34	34.48	-8.88	1,109.24	-850.18	2,585.45	2,518.83	66.62	38.809		
11,350.00	11,210.83	9,001.48	8,826.46	59.41	34.58	-8.75	1,125.12	-848.53	2,590.61	2,524.20	66.42	39.005		
11,400.00	11,232.70	9,016.00	8,832.14	59.45	34.66	-8.69	1,138.42	-847.20	2,592.21	2,526.05	66.17	39.176		
11,450.00	11,250.57	9,016.00	8,832.14	59.49	34.66	-8.72	1,138.42	-847.20	2,590.31	2,524.58	65.72	39.411		
11,500.00	11,264.30	9,035.29	8,839.29	59.54	34.78	-8.77	1,156.26	-845.49	2,584.72	2,519.17	65.54	39.436		
11,550.00	11,273.79	9,047.00	8,843.39	59.70	34.85	-8.89	1,167.18	-844.49	2,575.68	2,510.42	65.27	39.464		
11,600.00	11,278.96	9,047.00	8,843.39	59.87	34.85	-9.09	1,167.18	-844.49	2,563.24	2,498.39	64.86	39.522		
11,634.44	11,280.00	9,062.72	8,848.59	59.98	34.95	-9.25	1,181.95	-843.15	2,552.56	2,487.78	64.78	39.404		
11,700.00	11,280.00	9,079.00	8,853.62	60.21	35.06	-9.24	1,197.37	-841.76	2,531.43	2,466.96	64.48	39.262		
11,800.00	11,280.00	9,093.73	8,857.80	60.63	35.15	-9.22	1,211.44	-840.48	2,501.55	2,437.59	63.97	39.108		
11,900.00	11,280.00	9,110.00	8,861.98	61.11	35.26	-9.20	1,227.09	-839.02	2,474.69	2,411.10	63.58	38.921		
12,000.00	11,280.00	9,129.50	8,866.37	61.67	35.39	-9.17	1,246.01	-837.23	2,450.90	2,387.55	63.35	38.690		
12,100.00	11,280.00	9,142.00	8,868.83	62.29	35.48	-9.14	1,258.21	-836.04	2,430.31	2,367.13	63.18	38.466		
12,200.00	11,280.00	9,166.96	8,872.94	62.97	35.65	-9.10	1,282.72	-833.79	2,412.85	2,349.60	63.24	38.151		
12,300.00	11,280.00	9,189.00	8,875.72	63.73	35.80	-9.06	1,304.51	-832.03	2,398.70	2,335.28	63.42	37.823		
12,400.00	11,280.00	9,220.00	8,878.81	64.54	36.03	-9.03	1,335.31	-830.41	2,387.60	2,323.83	63.77	37.439		
12,500.00	11,280.00	9,252.00	8,881.34	65.41	36.27	-9.02	1,367.21	-829.98	2,379.28	2,315.03	64.26	37.027		
12,600.00	11,280.00	9,315.00	8,885.74	66.34	36.78	-9.03	1,430.05	-830.43	2,372.61	2,307.63	64.98	36.514		
12,700.00	11,280.00	9,378.85	8,889.34	67.33	37.35	-9.05	1,493.79	-831.20	2,367.39	2,301.60	65.79	35.987		
12,800.00	11,280.00	9,448.49	8,891.28	68.37	38.00	-9.06	1,563.40	-832.00	2,364.49	2,297.82	66.68	35.462		
12,900.00	11,280.00	9,571.61	8,894.89	69.47	39.26	-9.03	1,686.46	-831.52	2,361.37	2,293.54	67.83	34.815		
13,000.00	11,280.00	9,654.05	8,897.64	70.61	40.19	-9.02	1,768.86	-831.57	2,357.95	2,289.06	68.90	34.225		
13,100.00	11,280.00	9,715.18	8,899.09	71.80	40.90	-9.03	1,829.96	-832.68	2,355.80	2,285.86	69.94	33.681		
13,155.01	11,280.00	9,741.77	8,899.30	72.47	41.23	-9.04	1,856.54	-833.28	2,355.47	2,284.95	70.53	33.399		
13,200.00	11,280.00	9,763.52	8,899.24	73.03	41.50	-9.05	1,878.28	-833.77	2,355.69	2,284.69	71.01	33.175		
13,300.00	11,280.00	9,841.36	8,897.95	74.30	42.49	-9.07	1,956.09	-835.73	2,357.47	2,285.23	72.24	32.634		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 008H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 408-MWD+HDGM, 3154-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)						
13,400.00	11,280.00	9,974.92	8,896.43	75.62	44.27	-9.12	2,089.60	-839.23	2,358.89	2,285.14	73.75	31.984		
13,500.00	11,280.00	10,084.98	8,896.38	76.97	45.83	-9.15	2,199.62	-841.98	2,359.16	2,283.92	75.24	31.354		
13,600.00	11,280.00	10,181.44	8,896.59	78.36	47.26	-9.21	2,296.01	-845.50	2,359.36	2,282.61	76.74	30.744		
13,700.00	11,280.00	10,285.30	8,896.96	79.79	48.85	-9.30	2,399.77	-850.24	2,359.58	2,281.24	78.34	30.119		
13,800.00	11,280.00	10,393.70	8,897.79	81.24	50.57	-9.39	2,508.06	-854.70	2,359.30	2,279.29	80.01	29.486		
13,863.67	11,280.00	10,450.64	8,897.94	82.19	51.48	-9.40	2,565.00	-855.68	2,359.21	2,278.20	81.01	29.121		
13,900.00	11,280.00	10,482.69	8,897.89	82.73	52.01	-9.39	2,597.05	-855.91	2,359.24	2,277.66	81.59	28.917		
14,000.00	11,280.00	10,577.95	8,897.50	84.25	53.58	-9.39	2,692.29	-856.86	2,359.63	2,276.41	83.23	28.352		
14,100.00	11,280.00	10,692.24	8,897.37	85.79	55.51	-9.39	2,806.58	-857.90	2,359.73	2,274.71	85.02	27.756		
14,200.00	11,280.00	10,795.27	8,897.54	87.36	57.28	-9.35	2,909.61	-857.63	2,359.34	2,272.58	86.76	27.193		
14,253.81	11,280.00	10,840.81	8,897.57	88.22	58.07	-9.34	2,955.15	-857.49	2,359.20	2,271.54	87.66	26.914		
14,300.00	11,280.00	10,870.20	8,897.40	88.96	58.59	-9.33	2,984.55	-857.42	2,359.37	2,270.99	88.37	26.698		
14,400.00	11,280.00	10,936.65	8,896.26	90.58	59.77	-9.31	3,050.98	-857.32	2,360.84	2,270.88	89.96	26.244		
14,500.00	11,280.00	11,019.00	8,893.99	92.22	61.24	-9.27	3,133.30	-857.22	2,363.36	2,271.70	91.65	25.786		
14,600.00	11,280.00	11,078.93	8,891.64	93.88	62.33	-9.25	3,193.19	-857.35	2,367.09	2,273.85	93.24	25.387		
14,700.00	11,280.00	11,236.58	8,885.33	95.56	65.22	-9.20	3,350.69	-857.79	2,371.20	2,275.75	95.45	24.842		
14,800.00	11,280.00	11,348.78	8,883.08	97.27	67.30	-9.18	3,462.87	-858.39	2,373.09	2,275.66	97.43	24.358		
14,900.00	11,280.00	11,438.62	8,881.60	98.99	68.99	-9.17	3,552.69	-859.17	2,374.71	2,275.43	99.28	23.919		
15,000.00	11,280.00	11,610.46	8,879.89	100.72	72.25	-9.19	3,724.48	-862.30	2,376.22	2,274.48	101.74	23.356		
15,100.00	11,280.00	11,697.29	8,880.51	102.48	73.92	-9.19	3,811.30	-863.25	2,375.53	2,271.89	103.63	22.922		
15,175.82	11,280.00	11,763.13	8,880.65	103.82	75.19	-9.19	3,877.14	-863.98	2,375.37	2,270.29	105.08	22.606		
15,200.00	11,280.00	11,783.28	8,880.64	104.24	75.58	-9.20	3,897.28	-864.21	2,375.39	2,269.85	105.53	22.508		
15,300.00	11,280.00	11,862.02	8,880.28	106.03	77.10	-9.21	3,976.01	-865.86	2,376.00	2,268.59	107.41	22.121		
15,400.00	11,280.00	11,937.76	8,879.31	107.82	78.58	-9.24	4,051.71	-868.10	2,377.57	2,268.28	109.29	21.755		
15,500.00	11,280.00	12,057.66	8,877.33	109.63	80.94	-9.29	4,171.54	-871.70	2,379.58	2,268.07	111.51	21.340		
15,600.00	11,280.00	12,202.26	8,877.60	111.46	83.80	-9.33	4,316.09	-874.90	2,379.44	2,265.51	113.92	20.887		
15,700.00	11,280.00	12,388.15	8,882.30	113.29	87.49	-9.39	4,501.87	-878.31	2,377.13	2,260.50	116.63	20.382		
15,800.00	11,280.00	12,485.27	8,886.59	115.14	89.44	-9.41	4,598.89	-879.82	2,372.85	2,254.12	118.73	19.985		
15,900.00	11,280.00	12,573.97	8,890.17	117.00	91.22	-9.44	4,687.51	-881.33	2,368.98	2,248.19	120.79	19.612		
16,000.00	11,280.00	12,662.19	8,893.37	118.86	93.00	-9.48	4,775.65	-883.16	2,365.57	2,242.70	122.86	19.254		
16,100.00	11,280.00	12,761.25	8,896.52	120.74	95.00	-9.52	4,874.63	-885.37	2,362.62	2,237.60	125.02	18.897		
16,200.00	11,280.00	12,888.06	8,901.65	122.63	97.58	-9.59	5,001.28	-889.07	2,358.94	2,231.53	127.41	18.515		
16,300.00	11,280.00	12,975.63	8,905.46	124.53	99.36	-9.65	5,088.73	-891.74	2,354.98	2,225.45	129.53	18.180		
16,400.00	11,280.00	13,073.00	8,909.58	126.43	101.35	-9.70	5,185.98	-894.06	2,351.04	2,219.31	131.72	17.848		
16,484.91	11,280.00	13,073.00	8,909.58	128.05	101.35	-9.70	5,185.98	-894.06	2,349.51	2,216.53	132.98	17.668		
16,500.00	11,280.00	13,073.00	8,909.58	128.34	101.35	-9.70	5,185.98	-894.06	2,349.55	2,216.36	133.19	17.640		
16,600.00	11,280.00	13,073.00	8,909.58	130.26	101.35	-9.70	5,185.98	-894.06	2,352.32	2,217.77	134.56	17.482		
16,652.45	11,280.00	13,073.00	8,909.58	131.27	101.35	-9.70	5,185.98	-894.06	2,355.47	2,220.24	135.23	17.419		



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 009H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance				Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
0.00	0.00	5.07	5.07	0.00	0.01	3.20	503.89	28.16	504.67					
100.00	100.00	106.53	106.53	0.20	0.27	3.20	503.73	28.15	504.52	504.05	0.47	1,073.035		
200.00	200.00	207.99	207.99	0.74	0.53	3.20	503.27	28.12	504.07	502.80	1.27	397.812		
300.00	300.00	309.45	309.45	1.27	0.79	3.20	502.52	28.07	503.33	501.26	2.06	243.859		
400.00	400.00	410.90	410.89	1.81	1.05	3.20	501.48	27.99	502.30	499.44	2.86	175.576		
450.00	450.00	461.63	461.61	2.08	1.18	3.19	500.85	27.95	501.68	498.42	3.26	153.922		
500.00	500.00	512.60	512.58	2.34	1.38	121.09	500.14	27.90	501.20	497.49	3.72	134.901		
546.59	546.58	560.35	560.33	2.58	1.64	121.22	499.36	27.86	501.06	496.85	4.21	119.022 CC		
600.00	599.93	615.07	615.04	2.85	1.93	121.45	498.33	27.83	501.25	496.47	4.78	104.948 ES		
700.00	699.68	715.61	715.55	3.38	2.48	122.11	496.15	27.75	502.75	496.91	5.84	86.074		
772.27	771.59	786.85	786.78	3.76	2.86	122.74	494.67	27.58	505.11	498.50	6.61	76.394		
800.00	799.15	814.16	814.08	3.91	3.01	123.03	494.13	27.49	506.26	499.35	6.91	73.270		
900.00	898.51	912.56	912.46	4.47	3.54	124.04	492.34	27.02	510.62	502.64	7.98	63.955		
1,000.00	997.88	1,010.93	1,010.82	5.03	4.07	125.01	490.78	26.44	515.36	506.30	9.06	56.863		
1,100.00	1,097.25	1,112.60	1,112.48	5.60	4.62	125.98	489.15	25.63	520.21	510.05	10.16	51.187		
1,200.00	1,196.62	1,215.22	1,215.07	6.17	5.17	126.90	486.99	24.39	524.64	513.37	11.27	46.551		
1,300.00	1,295.99	1,317.64	1,317.43	6.74	5.72	127.84	484.19	23.46	528.63	516.25	12.38	42.710		
1,400.00	1,395.35	1,419.84	1,419.58	7.32	6.27	128.91	480.64	23.74	532.25	518.76	13.48	39.474		
1,500.00	1,494.72	1,521.38	1,521.03	7.90	6.83	130.02	476.57	24.42	535.61	521.02	14.59	36.717		
1,600.00	1,594.09	1,622.53	1,622.09	8.48	7.38	131.11	472.13	25.01	538.77	523.08	15.69	34.340		
1,700.00	1,693.46	1,722.19	1,721.63	9.06	7.92	132.19	467.55	25.81	541.97	525.19	16.78	32.291		
1,800.00	1,792.82	1,820.00	1,819.33	9.64	8.45	133.27	462.99	26.90	545.39	527.52	17.87	30.524		
1,900.00	1,892.19	1,914.47	1,913.72	10.22	8.96	134.30	459.26	28.03	549.71	530.77	18.93	29.036		
2,000.00	1,991.56	2,009.40	2,008.60	10.80	9.47	135.29	456.36	29.20	555.08	535.08	20.00	27.760		
2,100.00	2,090.93	2,105.23	2,104.39	11.39	9.99	136.26	454.09	30.50	561.31	540.25	21.06	26.653		
2,200.00	2,190.30	2,201.74	2,200.87	11.97	10.50	137.21	452.37	31.94	568.31	546.18	22.13	25.686		
2,300.00	2,289.66	2,299.45	2,298.56	12.55	11.02	138.15	450.93	33.51	575.80	552.61	23.19	24.825		
2,400.00	2,389.03	2,403.24	2,402.33	13.14	11.57	139.11	449.46	35.14	583.49	559.19	24.30	24.007		
2,500.00	2,488.40	2,515.06	2,514.10	13.72	12.17	140.07	446.28	35.67	589.60	564.13	25.46	23.155		
2,600.00	2,587.77	2,611.11	2,610.08	14.31	12.69	140.89	442.49	35.84	594.73	568.20	26.53	22.419		
2,700.00	2,687.14	2,701.39	2,700.27	14.89	13.17	141.82	439.39	38.11	601.38	573.83	27.55	21.827		
2,800.00	2,786.50	2,802.53	2,801.26	15.48	13.72	142.99	436.07	42.53	609.13	580.49	28.64	21.265		
2,900.00	2,885.87	2,909.59	2,908.11	16.07	14.30	144.24	431.22	47.14	615.99	586.21	29.77	20.689		
3,000.00	2,985.24	3,006.97	3,005.27	16.65	14.83	145.37	426.20	51.23	622.50	591.65	30.84	20.182		
3,100.00	3,084.61	3,103.17	3,101.29	17.24	15.35	146.45	421.70	55.30	629.68	597.77	31.91	19.734		
3,200.00	3,183.98	3,197.80	3,195.75	17.82	15.86	147.45	417.92	59.20	637.64	604.69	32.96	19.348		
3,300.00	3,283.34	3,285.00	3,282.85	18.41	16.33	148.30	415.41	62.76	646.77	612.83	33.95	19.053		
3,400.00	3,382.71	3,363.75	3,361.49	19.00	16.74	149.00	415.40	66.64	658.88	624.04	34.83	18.916		
3,500.00	3,482.08	3,452.16	3,449.78	19.58	17.18	149.59	418.19	70.38	673.41	637.63	35.78	18.823		
3,600.00	3,581.45	3,538.04	3,535.48	20.17	17.60	149.95	423.17	72.75	689.48	652.80	36.68	18.797		
3,700.00	3,680.82	3,623.19	3,620.31	20.76	18.01	150.18	430.29	74.83	707.52	669.95	37.56	18.836		
3,800.00	3,780.18	3,715.06	3,711.65	21.34	18.46	150.31	439.83	76.84	727.09	688.58	38.52	18.877		
3,900.00	3,879.55	3,813.12	3,809.13	21.93	18.93	150.44	450.26	78.98	746.91	707.36	39.54	18.888		
4,000.00	3,978.92	3,912.17	3,907.61	22.52	19.42	150.56	460.74	81.11	766.65	726.06	40.59	18.889		
4,100.00	4,078.29	4,002.78	3,997.66	23.10	19.87	150.65	470.58	82.95	786.59	745.06	41.53	18.939		
4,200.00	4,177.65	4,095.90	4,090.07	23.69	20.34	150.70	481.86	85.08	807.67	765.16	42.51	18.999		
4,300.00	4,277.02	4,196.07	4,189.48	24.28	20.84	150.76	493.93	87.39	828.72	785.14	43.58	19.018		
4,400.00	4,376.39	4,293.62	4,286.32	24.86	21.34	150.80	505.57	89.42	849.54	804.93	44.61	19.043		
4,500.00	4,475.76	4,390.79	4,382.77	25.45	21.84	150.86	517.16	91.69	870.51	824.86	45.65	19.071		
4,600.00	4,575.13	4,484.52	4,475.80	26.04	22.33	150.93	528.31	94.21	891.64	845.00	46.64	19.116		
4,700.00	4,674.49	4,576.36	4,566.92	26.63	22.81	151.07	539.09	97.93	913.38	865.76	47.62	19.182		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 009H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)				Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	
4,800.00	4,773.86	4,675.86	4,665.64	27.21	23.33	151.30	550.31	103.25	935.46	886.78	48.69	19.214		
4,892.13	4,865.41	4,771.30	4,760.41	27.75	23.83	151.59	559.92	109.16	955.34	905.62	49.72	19.215		
4,900.00	4,873.23	4,779.46	4,768.52	27.80	23.88	151.63	560.69	109.70	957.00	907.20	49.81	19.215		
5,000.00	4,972.80	4,899.79	4,888.18	28.37	24.51	152.20	570.33	117.83	975.53	924.42	51.11	19.088		
5,100.00	5,072.63	5,026.86	5,014.81	28.92	25.18	152.72	576.61	126.21	988.44	936.00	52.44	18.849		
5,200.00	5,172.60	5,160.18	5,147.95	29.44	25.89	153.04	579.86	132.42	995.11	941.32	53.79	18.501		
5,214.40	5,187.00	5,179.45	5,167.20	29.51	25.99	35.22	580.08	133.03	995.53	941.56	53.97	18.445		
5,300.00	5,272.60	5,280.40	5,268.12	29.91	26.52	35.31	580.61	135.33	997.03	942.07	54.96	18.140		
5,400.00	5,372.60	5,398.99	5,386.71	30.38	27.15	35.36	580.09	136.10	997.05	940.94	56.11	17.770		
5,500.00	5,472.60	5,495.71	5,483.43	30.85	27.66	35.40	579.40	136.37	996.62	939.51	57.11	17.451		
5,600.00	5,572.60	5,596.66	5,584.37	31.33	28.19	35.43	578.53	136.46	995.97	937.83	58.14	17.131		
5,700.00	5,672.60	5,695.97	5,683.68	31.81	28.71	35.46	577.68	136.52	995.31	936.15	59.16	16.825		
5,800.00	5,772.60	5,798.46	5,786.16	32.29	29.25	35.48	576.97	136.37	994.66	934.47	60.20	16.524		
5,900.00	5,872.60	5,904.32	5,892.02	32.77	29.81	35.49	575.91	135.76	993.51	932.25	61.25	16.220		
6,000.00	5,972.60	5,999.61	5,987.30	33.25	30.30	35.49	574.87	134.97	992.15	929.91	62.24	15.940		
6,100.00	6,072.60	6,091.17	6,078.86	33.74	30.77	35.48	574.56	134.54	991.60	928.40	63.20	15.689		
6,114.90	6,087.50	6,104.82	6,092.50	33.81	30.84	35.47	574.58	134.50	991.59	928.24	63.35	15.653		
6,200.00	6,172.60	6,190.95	6,178.63	34.23	31.28	35.46	574.74	134.33	991.62	927.40	64.22	15.441		
6,300.00	6,272.60	6,294.69	6,282.38	34.71	31.82	35.45	574.58	134.02	991.33	926.06	65.26	15.190		
6,400.00	6,372.60	6,396.36	6,384.04	35.20	32.35	35.45	574.13	133.63	990.74	924.45	66.30	14.944		
6,500.00	6,472.60	6,497.66	6,485.34	35.69	32.88	35.44	573.57	133.17	990.03	922.69	67.34	14.703		
6,600.00	6,572.60	6,598.01	6,585.69	36.19	33.41	35.45	572.86	132.78	989.23	920.86	68.37	14.469		
6,700.00	6,672.60	6,698.34	6,686.02	36.68	33.93	35.47	571.96	132.60	988.39	918.99	69.40	14.241		
6,800.00	6,772.60	6,796.27	6,783.94	37.18	34.45	35.49	571.16	132.49	987.66	917.23	70.43	14.024		
6,900.00	6,872.60	6,895.09	6,882.76	37.67	34.97	35.51	570.58	132.36	987.11	915.65	71.46	13.814		
7,000.00	6,972.60	6,997.01	6,984.68	38.17	35.51	35.51	570.02	132.06	986.49	913.98	72.51	13.606		
7,100.00	7,072.60	7,099.15	7,086.81	38.67	36.05	35.51	569.38	131.52	985.67	912.11	73.56	13.400		
7,200.00	7,172.60	7,201.74	7,189.40	39.17	36.59	35.51	568.48	130.88	984.60	909.99	74.61	13.197		
7,300.00	7,272.60	7,304.29	7,291.94	39.67	37.12	35.51	567.36	130.11	983.27	907.61	75.66	12.996		
7,400.00	7,372.60	7,406.80	7,394.43	40.17	37.66	35.46	566.52	128.49	981.68	904.98	76.71	12.797		
7,500.00	7,472.60	7,510.86	7,498.46	40.67	38.20	35.38	565.75	126.17	979.79	902.02	77.77	12.599		
7,600.00	7,572.60	7,615.81	7,603.38	41.17	38.75	35.35	563.96	124.37	977.41	898.58	78.83	12.399		
7,700.00	7,672.60	7,707.04	7,694.58	41.68	39.23	35.36	562.11	123.33	975.10	895.28	79.82	12.216		
7,800.00	7,772.60	7,799.42	7,786.96	42.18	39.72	35.36	561.20	122.52	973.80	892.98	80.82	12.049		
7,897.25	7,869.86	7,887.32	7,874.86	42.67	40.17	35.31	561.31	121.57	973.29	891.53	81.76	11.904		
7,900.00	7,872.60	7,889.78	7,877.31	42.69	40.19	35.30	561.33	121.55	973.29	891.50	81.79	11.900		
8,000.00	7,972.60	7,986.48	7,974.00	43.19	40.68	35.22	562.45	120.51	973.61	890.81	82.80	11.759		
8,100.00	8,072.60	8,087.29	8,074.79	43.70	41.20	35.11	563.79	119.19	973.95	890.11	83.83	11.618		
8,200.00	8,172.60	8,190.96	8,178.45	44.21	41.73	35.01	564.81	117.96	974.07	889.18	84.89	11.474		
8,259.63	8,232.23	8,249.74	8,237.23	44.51	42.03	34.97	565.07	117.26	973.88	888.38	85.50	11.390		
8,300.00	8,272.60	8,272.38	8,259.86	44.72	42.15	34.95	565.39	117.06	974.19	888.40	85.79	11.356		
8,400.00	8,372.60	8,311.67	8,299.09	45.23	42.35	34.88	567.58	117.06	978.98	892.76	86.22	11.355 SF		
8,500.00	8,472.60	8,354.00	8,341.07	45.74	42.57	34.77	572.75	118.41	990.29	903.84	86.45	11.455		
8,600.00	8,572.60	8,397.93	8,384.22	46.25	42.81	34.58	580.77	120.00	1,007.08	920.56	86.52	11.640		
8,700.00	8,672.60	8,440.93	8,425.92	46.76	43.03	34.30	591.16	121.32	1,028.91	942.51	86.41	11.908		
8,800.00	8,772.60	8,480.00	8,463.10	47.27	43.24	33.99	603.02	122.80	1,056.21	970.15	86.06	12.273		
8,900.00	8,872.60	8,521.90	8,502.12	47.78	43.47	33.60	618.19	124.52	1,088.66	1,003.00	85.66	12.709		
9,000.00	8,972.60	8,575.00	8,550.69	48.30	43.76	33.04	639.54	126.54	1,124.97	1,039.46	85.51	13.157		
9,100.00	9,072.60	8,619.68	8,590.50	48.81	44.00	32.50	659.78	127.69	1,165.16	1,080.08	85.08	13.695		
9,200.00	9,172.60	8,670.00	8,634.26	49.32	44.28	31.79	684.61	127.66	1,208.50	1,123.70	84.80	14.251		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 009H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance			Minimum		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)					
9,300.00	9,272.60	8,701.00	8,660.36	49.84	44.45	31.31	701.33	127.44	1,255.77	1,171.83	83.94	14.961		
9,400.00	9,372.60	8,733.00	8,686.56	50.35	44.63	30.82	719.70	127.49	1,306.99	1,223.88	83.11	15.726		
9,500.00	9,472.60	8,765.00	8,712.00	50.87	44.81	30.32	739.11	127.48	1,361.68	1,279.37	82.31	16.543		
9,600.00	9,572.60	8,810.00	8,746.89	51.38	45.07	29.56	767.50	126.52	1,418.81	1,336.87	81.94	17.314		
9,700.00	9,672.60	8,828.00	8,760.45	51.90	45.17	29.25	779.33	126.07	1,478.99	1,398.18	80.81	18.302		
9,800.00	9,772.60	8,859.00	8,783.21	52.42	45.35	28.74	800.37	125.62	1,541.94	1,461.80	80.14	19.241		
9,900.00	9,872.60	8,891.00	8,805.82	52.93	45.55	28.21	823.01	125.49	1,607.68	1,528.11	79.56	20.206		
10,000.00	9,972.60	8,902.93	8,813.97	53.45	45.62	28.01	831.73	125.50	1,675.85	1,597.37	78.48	21.354		
10,100.00	10,072.60	8,922.00	8,826.65	53.97	45.73	27.71	845.97	125.66	1,746.42	1,668.73	77.69	22.479		
10,200.00	10,172.60	8,937.66	8,836.75	54.49	45.83	27.46	857.93	125.89	1,819.13	1,742.23	76.89	23.658		
10,300.00	10,272.60	8,954.00	8,846.97	55.01	45.93	27.20	870.68	126.21	1,893.78	1,817.57	76.20	24.852		
10,400.00	10,372.60	8,985.00	8,865.73	55.53	46.13	26.72	895.34	126.96	1,970.11	1,894.13	75.98	25.929		
10,500.00	10,472.60	9,001.35	8,875.40	56.05	46.23	26.47	908.52	127.42	2,047.70	1,972.25	75.45	27.140		
10,600.00	10,572.60	9,016.00	8,883.94	56.57	46.33	26.25	920.41	127.88	2,126.57	2,051.62	74.95	28.372		
10,700.00	10,672.60	9,032.58	8,893.34	57.09	46.44	26.01	934.06	128.42	2,206.74	2,132.16	74.58	29.589		
10,734.44	10,707.04	9,048.00	8,901.70	57.27	46.54	25.78	947.00	128.91	2,234.81	2,160.11	74.70	29.919		
10,750.00	10,722.60	9,048.00	8,901.70	57.35	46.54	25.46	947.00	128.91	2,247.32	2,172.74	74.58	30.132		
10,800.00	10,772.46	9,048.00	8,901.70	57.60	46.54	22.93	947.00	128.91	2,286.20	2,212.02	74.19	30.817		
10,850.00	10,821.82	9,048.00	8,901.70	57.85	46.54	20.91	947.00	128.91	2,322.93	2,249.17	73.75	31.496		
10,900.00	10,870.31	9,061.17	8,908.61	58.08	46.63	19.20	958.21	129.37	2,357.18	2,283.60	73.58	32.035		
10,950.00	10,917.55	9,080.00	8,918.21	58.31	46.75	17.82	974.39	130.20	2,388.85	2,315.36	73.49	32.504		
11,000.00	10,963.19	9,080.00	8,918.21	58.51	46.75	16.77	974.39	130.20	2,417.60	2,344.64	72.96	33.137		
11,050.00	11,006.89	9,080.00	8,918.21	58.70	46.75	15.92	974.39	130.20	2,443.57	2,371.17	72.40	33.752		
11,100.00	11,048.30	9,094.27	8,925.16	58.87	46.85	15.20	986.83	130.99	2,466.39	2,394.27	72.12	34.201		
11,150.00	11,087.11	9,111.00	8,932.82	59.02	46.96	14.64	1,001.65	132.17	2,486.31	2,414.46	71.86	34.600		
11,200.00	11,123.03	9,111.00	8,932.82	59.15	46.96	14.20	1,001.65	132.17	2,502.80	2,431.56	71.24	35.133		
11,250.00	11,155.79	9,111.00	8,932.82	59.25	46.96	13.87	1,001.65	132.17	2,516.16	2,445.55	70.61	35.635		
11,300.00	11,185.13	9,124.55	8,938.65	59.34	47.06	13.64	1,013.83	133.30	2,526.14	2,455.90	70.24	35.963		
11,350.00	11,210.83	9,143.00	8,946.12	59.41	47.18	13.52	1,030.60	135.07	2,532.87	2,462.90	69.97	36.201		
11,400.00	11,232.70	9,143.00	8,946.12	59.45	47.18	13.44	1,030.60	135.07	2,535.97	2,466.63	69.34	36.575		
11,450.00	11,250.57	9,157.49	8,951.71	59.49	47.28	13.49	1,043.88	136.64	2,535.68	2,466.70	68.99	36.755		
11,500.00	11,264.30	9,174.00	8,957.92	59.54	47.40	13.64	1,059.05	138.62	2,531.83	2,463.14	68.69	36.858		
11,550.00	11,273.79	9,174.00	8,957.92	59.70	47.40	13.81	1,059.05	138.62	2,524.58	2,456.47	68.11	37.067		
11,600.00	11,278.96	9,206.00	8,969.04	59.87	47.63	14.22	1,088.80	142.51	2,513.85	2,445.72	68.13	36.900		
11,634.44	11,280.00	9,206.00	8,969.04	59.98	47.63	14.46	1,088.80	142.51	2,504.38	2,436.62	67.76	36.961		
11,700.00	11,280.00	9,206.00	8,969.04	60.21	47.63	14.46	1,088.80	142.51	2,485.73	2,418.63	67.10	37.048		
11,800.00	11,280.00	9,237.00	8,978.43	60.63	47.85	14.60	1,118.16	145.76	2,459.47	2,392.78	66.70	36.875		
11,900.00	11,280.00	9,255.79	8,983.38	61.11	47.99	14.68	1,136.21	147.42	2,436.34	2,370.13	66.22	36.793		
12,000.00	11,280.00	9,269.00	8,986.43	61.67	48.09	14.72	1,149.02	148.46	2,416.47	2,350.67	65.80	36.724		
12,100.00	11,280.00	9,300.00	8,992.45	62.29	48.32	14.82	1,179.35	150.60	2,399.70	2,333.94	65.76	36.492		
12,200.00	11,280.00	9,314.74	8,994.75	62.97	48.43	14.86	1,193.88	151.54	2,386.18	2,320.50	65.67	36.334		
12,300.00	11,280.00	9,332.00	8,996.90	63.73	48.55	14.90	1,210.96	152.71	2,376.08	2,310.29	65.79	36.118		
12,400.00	11,280.00	9,363.00	8,999.40	64.54	48.78	14.97	1,241.78	154.83	2,369.50	2,303.33	66.17	35.809		
12,500.00	11,280.00	9,380.37	9,000.21	65.41	48.92	15.01	1,259.10	155.91	2,365.96	2,299.35	66.61	35.522		
12,600.00	11,280.00	9,446.20	9,001.95	66.34	49.43	15.11	1,324.83	159.12	2,364.86	2,297.43	67.42	35.074		
12,635.46	11,280.00	9,468.85	9,002.34	66.69	49.61	15.14	1,347.46	160.08	2,364.75	2,297.02	67.73	34.913		
12,700.00	11,280.00	9,506.55	9,002.64	67.33	49.92	15.19	1,385.13	161.59	2,365.12	2,296.83	68.29	34.633		
12,800.00	11,280.00	9,567.34	9,002.18	68.37	50.45	15.25	1,445.87	163.84	2,367.10	2,297.87	69.23	34.192		
12,900.00	11,280.00	9,625.37	9,000.69	69.47	50.99	15.30	1,503.84	165.83	2,370.76	2,300.53	70.23	33.757		
13,000.00	11,280.00	9,706.74	8,997.35	70.61	51.79	15.37	1,585.09	168.70	2,375.89	2,304.52	71.38	33.286		
13,100.00	11,280.00	9,825.18	8,992.82	71.80	53.02	15.49	1,703.34	173.74	2,381.03	2,308.28	72.75	32.731		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 009H (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 489-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
13,200.00	11,280.00	9,890.81	8,990.37	73.03	53.76	15.56	1,768.85	176.84	2,386.22	2,312.25	73.97	32.260	
13,300.00	11,280.00	13,300.00	8,983.26	74.30	95.69	15.74	1,958.83	184.73	2,392.03	2,294.10	97.94	24.425	
13,400.00	11,280.00	10,212.00	8,984.19	75.62	57.66	15.92	2,089.54	190.62	2,392.63	2,314.96	77.66	30.808	
13,500.00	11,280.00	10,320.14	8,985.20	76.97	59.09	16.08	2,197.53	196.14	2,393.43	2,314.06	79.37	30.157	
13,600.00	11,280.00	10,389.37	8,985.70	78.36	60.03	16.19	2,266.64	200.28	2,394.70	2,313.87	80.83	29.625	
13,700.00	11,280.00	10,537.54	8,987.92	79.79	62.13	16.44	2,414.52	209.09	2,395.05	2,312.04	83.01	28.854	
13,707.84	11,280.00	10,543.45	8,988.04	79.90	62.21	16.45	2,420.42	209.44	2,395.04	2,311.91	83.13	28.810	
13,800.00	11,280.00	10,625.90	8,989.43	81.24	63.42	16.60	2,502.71	214.42	2,395.40	2,310.66	84.74	28.268	
13,900.00	11,280.00	10,719.69	8,991.06	82.73	64.82	16.75	2,596.33	219.79	2,395.70	2,309.14	86.56	27.677	
14,000.00	11,280.00	10,813.47	8,991.74	84.25	66.25	16.91	2,689.95	225.18	2,396.95	2,308.53	88.42	27.109	
14,100.00	11,280.00	10,938.25	8,994.08	85.79	68.20	17.09	2,814.55	231.36	2,396.79	2,306.19	90.61	26.453	
14,112.62	11,280.00	10,949.17	8,994.27	85.99	68.37	17.11	2,825.46	231.86	2,396.79	2,305.95	90.84	26.385	
14,200.00	11,280.00	11,026.72	8,995.43	87.36	69.62	17.22	2,902.92	235.38	2,396.98	2,304.49	92.49	25.916	
14,300.00	11,280.00	11,115.15	8,996.37	88.96	71.05	17.34	2,991.25	239.39	2,397.63	2,303.23	94.41	25.397	
14,400.00	11,280.00	11,186.51	8,996.71	90.58	72.22	17.43	3,062.54	242.75	2,398.97	2,302.78	96.19	24.939	
14,500.00	11,280.00	11,252.00	8,995.70	92.22	73.31	17.51	3,127.95	245.80	2,402.03	2,304.09	97.94	24.525	
14,600.00	11,280.00	11,354.43	8,993.55	93.88	75.04	17.64	3,230.22	251.00	2,405.89	2,305.82	100.07	24.041	
14,700.00	11,280.00	11,461.96	8,992.18	95.56	76.87	17.79	3,337.58	256.99	2,409.13	2,306.82	102.31	23.548	
14,800.00	11,280.00	11,588.45	8,991.14	97.27	79.06	17.99	3,463.82	264.80	2,412.25	2,307.45	104.79	23.019	
14,900.00	11,280.00	11,718.64	8,992.70	98.99	81.34	18.21	3,593.75	272.87	2,413.26	2,305.89	107.38	22.474	
15,000.00	11,280.00	11,837.79	8,994.92	100.72	83.46	18.41	3,712.68	279.75	2,413.63	2,303.75	109.88	21.966	
15,100.00	11,280.00	11,937.97	8,997.05	102.48	85.26	18.57	3,812.69	285.15	2,413.67	2,301.46	112.20	21.511	
15,101.96	11,280.00	11,939.94	8,997.09	102.51	85.30	18.58	3,814.65	285.25	2,413.67	2,301.42	112.25	21.503	
15,200.00	11,280.00	12,028.24	8,999.04	104.24	86.90	18.73	3,902.79	290.29	2,413.75	2,299.30	114.45	21.090	
15,300.00	11,280.00	12,092.57	8,999.77	106.03	88.07	18.83	3,967.00	294.13	2,414.94	2,298.51	116.43	20.742	
15,400.00	11,280.00	12,176.80	8,999.72	107.82	89.61	18.97	4,051.08	299.17	2,417.27	2,298.63	118.64	20.375	
15,500.00	11,280.00	12,316.70	9,000.21	109.63	92.19	19.18	4,190.75	307.13	2,419.20	2,297.69	121.50	19.911	
15,600.00	11,280.00	12,449.08	9,002.79	111.46	94.66	19.40	4,322.90	314.58	2,419.58	2,295.26	124.33	19.461	
15,693.77	11,280.00	12,533.96	9,005.13	113.18	96.25	19.54	4,407.62	319.12	2,419.17	2,292.62	126.55	19.116	
15,700.00	11,280.00	12,538.53	9,005.24	113.29	96.34	19.55	4,412.18	319.37	2,419.17	2,292.49	126.69	19.096	
15,800.00	11,280.00	12,600.36	9,006.29	115.14	97.51	19.65	4,473.91	322.88	2,419.91	2,291.17	128.74	18.797	
15,900.00	11,280.00	12,649.51	9,006.18	117.00	98.44	19.73	4,522.96	326.00	2,422.62	2,291.98	130.64	18.545	
16,000.00	11,280.00	12,728.18	9,004.64	118.86	99.93	19.85	4,601.42	331.40	2,427.08	2,294.18	132.90	18.263	
16,100.00	11,280.00	12,839.49	9,002.43	120.74	102.05	20.02	4,712.46	338.72	2,431.56	2,295.99	135.58	17.935	
16,200.00	11,280.00	12,982.48	9,001.25	122.63	104.79	20.24	4,855.19	347.49	2,434.80	2,296.14	138.67	17.559	
16,300.00	11,280.00	13,085.34	9,000.92	124.53	106.78	20.37	4,957.93	352.18	2,437.05	2,295.81	141.24	17.255	
16,400.00	11,280.00	13,177.83	9,000.12	126.43	108.57	20.46	5,050.35	355.77	2,439.57	2,295.90	143.68	16.980	
16,500.00	11,280.00	13,278.09	8,999.14	128.34	110.52	20.56	5,150.54	359.56	2,442.19	2,295.97	146.22	16.703	
16,600.00	11,280.00	13,333.00	8,998.61	130.26	111.59	20.61	5,205.40	361.63	2,445.22	2,297.00	148.22	16.497	
16,652.45	11,280.00	13,333.00	8,998.61	131.27	111.59	20.61	5,205.40	361.63	2,448.11	2,299.22	148.89	16.442	



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 012H (O) - OH - OH											Offset Site Error: 0.00 usft		
Survey Program: 404-MWD+HDGM											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
0.00	0.00	2.01	2.01	0.00	0.01	-29.54	99.39	-56.33	114.24				
100.00	100.00	102.27	102.27	0.20	0.26	-29.50	99.33	-56.19	114.12	113.67	0.45	250.936	
200.00	200.00	202.52	202.52	0.74	0.51	-29.37	99.16	-55.79	113.78	112.53	1.24	91.432	
300.00	300.00	302.78	302.78	1.27	0.76	-29.14	98.87	-55.13	113.21	111.17	2.03	55.656	
400.00	400.00	403.03	403.02	1.81	1.01	-28.83	98.47	-54.20	112.41	109.59	2.82	39.811	
450.00	450.00	453.01	453.00	2.08	1.28	-28.64	98.26	-53.66	111.96	108.60	3.36	33.337	
500.00	500.00	502.99	502.97	2.34	1.55	89.65	98.06	-53.09	111.51	107.63	3.89	28.693	
600.00	599.93	602.92	602.89	2.85	2.09	91.96	97.75	-51.85	110.71	105.78	4.93	22.442	
700.00	699.68	702.97	702.93	3.38	2.63	96.08	97.22	-50.56	110.20	104.21	6.00	18.380	
721.80	721.39	724.73	724.70	3.49	2.74	97.21	97.06	-50.28	110.18	103.95	6.23	17.684 CC	
772.27	771.59	775.10	775.06	3.76	3.01	100.13	96.62	-49.62	110.33	103.56	6.77	16.292	
800.00	799.15	802.78	802.74	3.91	3.16	101.85	96.33	-49.26	110.55	103.47	7.07	15.631 ES	
900.00	898.51	902.67	902.60	4.47	3.70	107.90	94.93	-48.01	111.78	103.63	8.16	13.702	
1,000.00	997.88	1,002.66	1,002.57	5.03	4.24	113.73	92.95	-46.78	113.68	104.43	9.25	12.293	
1,100.00	1,097.25	1,102.72	1,102.58	5.60	4.77	119.39	90.35	-45.44	116.09	105.75	10.34	11.230	
1,200.00	1,196.62	1,202.45	1,202.26	6.17	5.31	124.91	87.21	-43.81	119.06	107.64	11.42	10.422	
1,300.00	1,295.99	1,301.21	1,300.95	6.74	5.85	130.27	84.05	-41.78	123.13	110.63	12.50	9.847	
1,400.00	1,395.35	1,398.50	1,398.21	7.32	6.35	134.58	82.19	-40.81	129.14	115.58	13.56	9.526	
1,500.00	1,494.72	1,497.35	1,497.05	7.90	6.85	137.70	82.04	-41.36	136.93	122.33	14.60	9.380	
1,600.00	1,594.09	1,596.48	1,596.18	8.48	7.34	140.49	82.05	-41.82	145.29	129.65	15.64	9.291	
1,700.00	1,693.46	1,695.73	1,695.43	9.06	7.84	142.96	82.23	-42.27	154.11	137.43	16.68	9.240	
1,800.00	1,792.82	1,795.18	1,794.88	9.64	8.34	145.18	82.42	-42.66	163.21	145.49	17.72	9.209	
1,900.00	1,892.19	1,894.26	1,893.96	10.22	8.85	147.21	82.55	-42.89	172.56	153.79	18.77	9.194	
2,000.00	1,991.56	1,992.80	1,992.50	10.80	9.35	149.02	83.01	-42.93	182.50	162.69	19.81	9.211	
2,100.00	2,090.93	2,091.60	2,091.30	11.39	9.86	150.63	83.79	-42.83	192.93	172.07	20.86	9.249	
2,200.00	2,190.30	2,190.54	2,190.23	11.97	10.37	152.07	84.77	-42.60	203.75	181.83	21.91	9.298	
2,300.00	2,289.66	2,289.88	2,289.56	12.55	10.89	153.39	85.76	-42.31	214.72	191.75	22.97	9.347	
2,400.00	2,389.03	2,388.94	2,388.62	13.14	11.40	154.61	86.69	-41.90	225.83	201.79	24.03	9.397	
2,500.00	2,488.40	2,487.54	2,487.21	13.72	11.92	155.88	87.33	-40.80	237.22	212.13	25.09	9.455	
2,600.00	2,587.77	2,587.07	2,586.71	14.31	12.45	157.42	87.16	-38.32	248.97	222.81	26.16	9.518	
2,700.00	2,687.14	2,689.64	2,689.25	14.89	12.99	158.87	86.32	-36.24	260.09	232.83	27.25	9.543	
2,800.00	2,786.50	2,793.03	2,792.62	15.48	13.54	160.02	84.86	-35.91	269.76	241.41	28.35	9.515	
2,900.00	2,885.87	2,895.94	2,895.49	16.07	14.08	161.34	81.56	-35.59	278.24	248.80	29.44	9.451	
3,000.00	2,985.24	2,993.92	2,993.40	16.65	14.60	162.46	78.21	-35.93	286.22	255.73	30.49	9.386	
3,100.00	3,084.61	3,092.20	3,091.67	17.24	15.11	163.14	76.82	-37.06	295.14	263.60	31.55	9.355	
3,200.00	3,183.98	3,190.47	3,189.93	17.82	15.62	163.75	75.72	-38.19	304.32	271.72	32.60	9.334	
3,300.00	3,283.34	3,287.03	3,286.48	18.41	16.13	164.31	75.14	-38.74	314.29	280.65	33.64	9.342	
3,400.00	3,382.71	3,385.15	3,384.60	19.00	16.64	164.85	75.03	-38.77	325.02	290.33	34.70	9.368	
3,500.00	3,482.08	3,484.43	3,483.88	19.58	17.16	165.34	75.13	-38.77	335.94	300.19	35.76	9.395	
3,600.00	3,581.45	3,583.88	3,583.33	20.17	17.67	165.80	75.18	-38.76	346.86	310.05	36.82	9.421	
3,700.00	3,680.82	3,683.10	3,682.55	20.76	18.19	166.24	75.22	-38.72	357.81	319.93	37.88	9.445	
3,800.00	3,780.18	3,782.30	3,781.76	21.34	18.71	166.66	75.26	-38.63	368.83	329.88	38.95	9.470	
3,900.00	3,879.55	3,882.12	3,881.58	21.93	19.23	167.05	75.31	-38.60	379.82	339.80	40.02	9.492	
4,000.00	3,978.92	3,981.54	3,980.99	22.52	19.75	167.41	75.35	-38.65	390.75	349.68	41.07	9.513	
4,100.00	4,078.29	4,080.77	4,080.22	23.10	20.26	167.75	75.40	-38.69	401.72	359.59	42.13	9.534	
4,200.00	4,177.65	4,180.18	4,179.63	23.69	20.78	168.08	75.39	-38.67	412.71	369.51	43.20	9.553	
4,300.00	4,277.02	4,279.38	4,278.83	24.28	21.31	168.40	75.36	-38.61	423.73	379.46	44.27	9.571	
4,400.00	4,376.39	4,378.65	4,378.10	24.86	21.83	168.70	75.38	-38.55	434.79	389.45	45.34	9.590	
4,500.00	4,475.76	4,478.09	4,477.54	25.45	22.35	168.98	75.47	-38.54	445.87	399.47	46.41	9.608	
4,600.00	4,575.13	4,577.72	4,577.17	26.04	22.87	169.24	75.51	-38.55	456.92	409.44	47.47	9.625	
4,700.00	4,674.49	4,677.15	4,676.61	26.63	23.39	169.50	75.45	-38.54	467.93	419.38	48.54	9.640	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 012H (O) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)					
4,800.00	4,773.86	4,776.35	4,775.80	27.21	23.92	169.76	75.40	-38.51	478.97	429.36	49.61	9.655	
4,892.13	4,865.41	4,867.74	4,867.19	27.75	24.40	169.98	75.38	-38.46	489.17	438.58	50.59	9.668	
4,900.00	4,873.23	4,875.55	4,875.00	27.80	24.44	170.00	75.38	-38.45	490.04	439.36	50.68	9.669	
5,000.00	4,972.80	4,975.32	4,974.77	28.37	24.96	170.22	75.38	-38.40	499.16	447.41	51.75	9.646	
5,100.00	5,072.63	5,075.64	5,075.09	28.92	25.49	170.35	75.33	-38.41	504.77	451.96	52.81	9.558	
5,200.00	5,172.60	5,175.27	5,174.72	29.44	26.01	170.40	75.27	-38.47	506.91	453.05	53.86	9.412	
5,214.40	5,187.00	5,189.57	5,189.02	29.51	26.08	170.40	75.28	-38.48	506.94	452.94	54.00	9.387	
5,300.00	5,272.60	5,275.53	5,274.98	29.91	26.53	170.40	75.31	-38.54	506.92	452.04	54.87	9.238	
5,400.00	5,372.60	5,375.70	5,375.15	30.38	27.05	170.40	75.30	-38.66	506.82	450.93	55.89	9.069	
5,500.00	5,472.60	5,475.60	5,475.05	30.85	27.57	170.40	75.27	-38.76	506.72	449.81	56.90	8.905	
5,600.00	5,572.60	5,575.47	5,574.92	31.33	28.09	170.40	75.22	-38.81	506.64	448.72	57.92	8.747	
5,661.94	5,634.54	5,637.09	5,636.54	31.63	28.41	170.40	75.21	-38.83	506.62	448.07	58.55	8.653	
5,700.00	5,672.60	5,674.96	5,674.41	31.81	28.61	170.40	75.22	-38.83	506.63	447.69	58.93	8.596	
5,800.00	5,772.60	5,774.81	5,774.26	32.29	29.13	170.40	75.29	-38.82	506.68	446.72	59.95	8.451	
5,900.00	5,872.60	5,871.99	5,871.44	32.77	29.64	170.40	75.58	-38.77	506.90	445.95	60.95	8.317	
6,000.00	5,972.60	5,958.89	5,958.29	33.25	30.09	170.40	78.24	-38.72	508.82	446.99	61.82	8.230	
6,100.00	6,072.60	6,046.01	6,045.19	33.74	30.54	170.40	84.47	-38.67	513.28	450.61	62.67	8.190	
6,200.00	6,172.60	6,143.17	6,141.73	34.23	31.05	170.40	95.26	-39.82	519.34	455.68	63.65	8.159	
6,300.00	6,272.60	6,239.46	6,236.85	34.71	31.55	170.40	109.66	-43.54	526.06	461.44	64.62	8.140	
6,400.00	6,372.60	6,345.88	6,341.37	35.20	32.10	170.40	128.33	-50.74	532.81	467.06	65.76	8.103	
6,500.00	6,472.60	6,458.34	6,451.74	35.69	32.69	170.40	147.28	-61.04	537.99	471.01	66.98	8.032	
6,600.00	6,572.60	6,567.58	6,558.37	36.19	33.27	170.40	166.21	-75.25	541.60	473.45	68.14	7.948	
6,700.00	6,672.60	6,683.00	6,669.80	36.68	33.89	170.40	187.64	-96.31	543.78	474.40	69.38	7.838	
6,800.00	6,772.60	6,804.49	6,785.11	37.18	34.55	170.40	210.24	-127.01	543.22	472.56	70.66	7.688	
6,900.00	6,872.60	6,958.03	6,929.49	37.67	35.40	170.40	230.57	-174.87	537.28	465.32	71.96	7.466	
7,000.00	6,972.60	7,087.25	7,051.97	38.17	36.12	170.40	234.15	-215.74	524.30	451.31	72.99	7.183	
7,100.00	7,072.60	7,169.22	7,130.88	38.67	36.57	170.40	232.97	-237.87	511.37	437.15	74.22	6.890	
7,200.00	7,172.60	7,263.24	7,222.61	39.17	37.09	170.40	231.45	-258.37	501.31	425.96	75.35	6.653	
7,300.00	7,272.60	7,336.74	7,294.96	39.67	37.49	170.40	230.65	-271.28	494.10	417.66	76.44	6.464	
7,390.11	7,362.71	7,407.33	7,364.71	40.12	37.88	170.40	233.27	-281.78	492.65	415.34	77.31	6.372	
7,400.00	7,372.60	7,416.26	7,373.53	40.17	37.93	170.40	233.72	-283.06	492.66	415.25	77.41	6.364	
7,500.00	7,472.60	7,497.12	7,453.42	40.67	38.39	170.40	238.75	-294.44	494.39	416.09	78.30	6.314	
7,600.00	7,572.60	7,567.44	7,522.88	41.17	38.78	170.40	246.50	-302.09	501.84	422.96	78.88	6.362	
7,700.00	7,672.60	7,665.96	7,620.10	41.68	39.34	170.40	259.90	-310.75	512.67	432.73	79.94	6.413	
7,800.00	7,772.60	7,811.53	7,764.03	42.18	40.16	170.40	272.81	-327.81	518.38	436.64	81.74	6.342	
7,900.00	7,872.60	7,917.79	7,869.21	42.69	40.76	170.40	276.86	-342.32	519.30	436.41	82.90	6.265	
8,000.00	7,972.60	8,010.22	7,960.81	43.19	41.28	170.40	280.60	-354.11	521.03	437.11	83.91	6.209	
8,100.00	8,072.60	8,113.85	8,063.42	43.70	41.86	170.40	285.53	-367.81	523.74	438.69	85.05	6.158	
8,200.00	8,172.60	8,222.96	8,171.49	44.21	42.48	170.40	288.88	-382.43	525.12	438.90	86.22	6.091	
8,300.00	8,272.60	8,331.37	8,279.08	44.72	43.09	170.40	290.06	-395.60	525.00	437.64	87.36	6.010	
8,400.00	8,372.60	8,431.58	8,378.67	45.23	43.64	170.40	290.22	-406.78	524.31	435.87	88.44	5.928	
8,500.00	8,472.60	8,533.36	8,479.43	45.74	44.21	170.40	290.11	-421.07	523.47	433.93	89.54	5.846	
8,600.00	8,572.60	8,636.43	8,581.16	46.25	44.79	170.40	289.40	-437.62	522.41	431.76	90.65	5.763	
8,700.00	8,672.60	8,742.49	8,686.37	46.76	45.38	170.40	287.55	-450.83	520.74	428.99	91.75	5.675	
8,800.00	8,772.60	8,834.51	8,777.90	47.27	45.88	170.40	285.30	-460.08	518.62	425.83	92.79	5.589	
8,815.87	8,788.47	8,847.14	8,790.47	47.35	45.95	170.40	285.21	-461.24	518.57	425.62	92.95	5.579	
8,900.00	8,872.60	8,917.66	8,860.74	47.78	46.34	170.40	286.05	-467.10	519.85	426.11	93.74	5.546	
9,000.00	8,972.60	9,006.80	8,949.72	48.30	46.82	170.40	289.14	-471.20	523.56	428.88	94.68	5.530 SF	
9,100.00	9,072.60	9,097.57	9,040.34	48.81	47.30	170.40	294.34	-471.85	529.31	433.71	95.60	5.537	
9,200.00	9,172.60	9,191.60	9,134.13	49.32	47.79	170.40	300.87	-470.55	536.18	439.63	96.55	5.553	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 012H (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
9,300.00	9,272.60	9,278.04	9,220.22	49.84	48.25	-3.33	308.23	-472.44	544.83	447.46	97.37	5.595			
9,400.00	9,372.60	9,357.96	9,299.43	50.35	48.69	-3.84	317.29	-477.85	556.59	458.56	98.03	5.678			
9,500.00	9,472.60	9,454.72	9,394.84	50.87	49.25	-4.77	329.80	-487.86	570.32	471.28	99.04	5.758			
9,600.00	9,572.60	9,542.87	9,481.51	51.38	49.77	-5.70	342.02	-498.37	585.29	485.44	99.85	5.861			
9,700.00	9,672.60	9,642.11	9,578.90	51.90	50.34	-6.69	357.05	-510.18	601.71	500.78	100.93	5.962			
9,800.00	9,772.60	9,738.32	9,673.56	52.42	50.91	-7.51	370.78	-520.55	617.29	515.35	101.94	6.056			
9,900.00	9,872.60	9,806.25	9,740.08	52.93	51.31	-8.11	381.86	-528.57	635.43	533.25	102.19	6.218			
10,000.00	9,972.60	9,856.02	9,788.01	53.45	51.61	-8.61	393.18	-535.70	660.18	558.49	101.69	6.492			
10,100.00	10,072.60	9,875.00	9,806.02	53.97	51.73	-8.81	398.36	-538.74	693.01	593.37	99.64	6.955			
10,200.00	10,172.60	9,934.74	9,861.15	54.49	52.10	-9.38	419.00	-548.62	731.37	632.20	99.17	7.375			
10,300.00	10,272.60	9,971.00	9,893.15	55.01	52.33	-9.66	434.96	-554.61	777.52	679.92	97.60	7.966			
10,400.00	10,372.60	9,971.00	9,893.15	55.53	52.33	-9.66	434.96	-554.61	831.16	736.99	94.17	8.826			
10,500.00	10,472.60	10,033.99	9,945.67	56.05	52.72	-10.05	468.02	-565.21	886.89	792.79	94.11	9.424			
10,600.00	10,572.60	10,062.87	9,968.32	56.57	52.90	-10.20	485.22	-570.19	948.71	856.27	92.44	10.262			
10,700.00	10,672.60	10,089.39	9,988.25	57.09	53.07	-10.32	502.08	-574.81	1,014.53	923.67	90.86	11.166			
10,734.44	10,707.04	10,098.00	9,994.54	57.27	53.12	-10.36	507.77	-576.32	1,038.03	947.70	90.34	11.491			
10,750.00	10,722.60	10,101.86	9,997.32	57.35	53.15	-9.52	510.35	-576.99	1,048.63	958.53	90.10	11.639			
10,800.00	10,772.46	10,160.00	10,036.90	57.60	53.53	-9.10	551.65	-587.26	1,084.04	992.60	91.45	11.854			
10,850.00	10,821.82	10,160.00	10,036.90	57.85	53.53	-8.56	551.65	-587.26	1,112.72	1,022.75	89.97	12.367			
10,900.00	10,870.31	10,160.00	10,036.90	58.08	53.53	-8.11	551.65	-587.26	1,139.36	1,050.91	88.45	12.881			
10,950.00	10,917.55	10,160.00	10,036.90	58.31	53.53	-7.72	551.65	-587.26	1,163.92	1,077.03	86.88	13.396			
11,000.00	10,963.19	10,160.00	10,036.90	58.51	53.53	-7.39	551.65	-587.26	1,186.33	1,101.05	85.28	13.911			
11,050.00	11,006.89	10,193.78	10,058.10	58.70	53.75	-7.31	577.36	-592.76	1,205.52	1,120.36	85.15	14.157			
11,100.00	11,048.30	10,215.30	10,071.15	58.87	53.89	-7.19	594.21	-595.77	1,221.80	1,137.37	84.43	14.471			
11,150.00	11,087.11	10,254.00	10,093.66	59.02	54.15	-7.16	625.37	-600.17	1,235.22	1,150.80	84.42	14.632			
11,200.00	11,123.03	10,263.07	10,098.78	59.15	54.21	-7.06	632.80	-601.01	1,244.96	1,161.87	83.09	14.983			
11,250.00	11,155.79	10,301.10	10,120.01	59.25	54.45	-7.06	664.25	-603.61	1,251.31	1,168.35	82.97	15.082			
11,300.00	11,185.13	10,339.44	10,140.99	59.34	54.70	-7.05	696.32	-604.72	1,253.82	1,170.99	82.82	15.138			
11,350.00	11,210.83	10,367.53	10,156.01	59.41	54.88	-7.06	720.05	-604.75	1,252.62	1,170.38	82.24	15.232			
11,400.00	11,232.70	10,392.59	10,168.96	59.45	55.04	-7.12	741.50	-604.71	1,248.07	1,166.54	81.53	15.308			
11,450.00	11,250.57	10,417.50	10,181.41	59.49	55.20	-7.23	763.08	-604.65	1,240.20	1,159.38	80.82	15.345			
11,500.00	11,264.30	10,443.00	10,193.71	59.54	55.37	-7.39	785.42	-604.56	1,229.05	1,148.89	80.16	15.332			
11,550.00	11,273.79	10,443.00	10,193.71	59.70	55.37	-7.58	785.42	-604.56	1,215.10	1,136.58	78.52	15.475			
11,600.00	11,278.96	10,443.00	10,193.71	59.87	55.37	-7.81	785.42	-604.56	1,198.89	1,121.95	76.94	15.582			
11,634.44	11,280.00	10,479.14	10,209.58	59.98	55.62	-8.07	817.88	-604.19	1,184.56	1,107.29	77.27	15.331			
11,700.00	11,280.00	10,496.98	10,216.51	60.21	55.74	-8.10	834.32	-603.86	1,159.11	1,083.14	75.97	15.258			
11,800.00	11,280.00	10,537.00	10,229.75	60.63	56.01	-8.12	872.05	-602.73	1,124.84	1,050.32	74.53	15.093			
11,900.00	11,280.00	10,563.02	10,236.98	61.11	56.20	-8.11	897.03	-601.86	1,095.52	1,022.74	72.78	15.052			
12,000.00	11,280.00	10,607.64	10,247.72	61.67	56.51	-8.10	940.31	-600.48	1,071.10	999.24	71.86	14.905			
12,100.00	11,280.00	10,632.00	10,252.70	62.29	56.69	-8.08	964.15	-599.80	1,051.90	981.12	70.77	14.863			
12,200.00	11,280.00	10,694.90	10,262.62	62.97	57.18	-8.15	1,026.23	-600.28	1,037.02	966.16	70.86	14.635			
12,300.00	11,280.00	10,726.00	10,265.93	63.73	57.42	-8.26	1,057.10	-602.12	1,028.10	957.29	70.81	14.518			
12,400.00	11,280.00	10,781.86	10,269.06	64.54	57.91	-8.53	1,112.63	-607.17	1,024.31	952.82	71.50	14.327			
12,415.44	11,280.00	10,788.58	10,269.19	64.67	57.97	-8.57	1,119.31	-607.89	1,024.25	952.63	71.62	14.301			
12,500.00	11,280.00	10,833.25	10,268.75	65.41	58.36	-8.83	1,163.66	-613.17	1,026.19	953.72	72.47	14.180			
12,600.00	11,280.00	10,957.60	10,267.46	66.34	59.55	-9.56	1,287.11	-627.94	1,028.96	955.11	73.86	13.932			
12,700.00	11,280.00	11,074.71	10,268.55	67.33	60.74	-10.12	1,403.67	-639.16	1,029.47	954.19	75.28	13.675			
12,764.74	11,280.00	11,139.58	10,269.09	68.01	61.42	-10.29	1,468.43	-642.81	1,029.46	953.36	76.10	13.528			
12,800.00	11,280.00	11,172.74	10,269.21	68.37	61.78	-10.34	1,501.58	-644.00	1,029.50	952.97	76.53	13.453			
12,900.00	11,280.00	11,273.10	10,268.99	69.47	62.87	-10.37	1,601.92	-645.68	1,029.82	952.09	77.73	13.249			
13,000.00	11,280.00	11,382.32	10,269.03	70.61	64.10	-10.29	1,711.14	-645.41	1,029.56	950.60	78.95	13.040			

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 012H (O) - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 404-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)					
13,100.00	11,280.00	11,487.13	10,269.73	71.80	65.34	-10.17	1,815.93	-644.15	1,028.50	948.31	80.19	12.826	
13,200.00	11,280.00	11,587.41	10,270.43	73.03	66.56	-10.00	1,916.19	-642.05	1,027.25	945.82	81.43	12.615	
13,300.00	11,280.00	11,687.46	10,271.11	74.30	67.83	-9.83	2,016.22	-639.89	1,026.03	943.31	82.72	12.404	
13,400.00	11,280.00	11,786.20	10,271.75	75.62	69.13	-9.66	2,114.93	-637.78	1,024.85	940.81	84.04	12.194	
13,500.00	11,280.00	11,883.68	10,272.18	76.97	70.44	-9.49	2,212.39	-635.58	1,023.87	938.46	85.40	11.989	
13,600.00	11,280.00	11,992.65	10,272.71	78.36	71.94	-9.21	2,321.27	-631.52	1,022.61	935.84	86.77	11.785	
13,700.00	11,280.00	12,082.55	10,273.06	79.79	73.24	-8.97	2,411.11	-628.20	1,021.47	933.32	88.15	11.588	
13,786.64	11,280.00	12,161.83	10,273.02	81.05	74.39	-8.86	2,490.38	-627.00	1,021.16	931.73	89.42	11.419	
13,800.00	11,280.00	12,174.06	10,272.99	81.24	74.56	-8.85	2,502.61	-626.96	1,021.16	931.54	89.63	11.394	
13,900.00	11,280.00	12,259.40	10,272.64	82.73	75.87	-8.98	2,587.86	-630.20	1,021.99	930.69	91.31	11.193	
14,000.00	11,280.00	12,368.13	10,272.05	84.25	77.57	-9.24	2,696.41	-636.21	1,023.25	930.06	93.19	10.981	
14,100.00	11,280.00	12,475.13	10,271.84	85.79	79.27	-9.36	2,803.36	-639.49	1,023.78	928.78	95.00	10.776	
14,200.00	11,280.00	12,586.91	10,273.52	87.36	81.08	-9.56	2,915.02	-644.07	1,022.74	925.81	96.94	10.551	
14,300.00	11,280.00	12,678.28	10,274.49	88.96	82.59	-9.72	3,006.32	-647.76	1,022.19	923.38	98.80	10.345	
14,400.00	11,280.00	12,781.91	10,275.07	90.58	84.30	-9.80	3,109.92	-650.16	1,021.85	921.17	100.68	10.150	
14,500.00	11,280.00	12,880.11	10,275.33	92.22	85.93	-9.62	3,208.09	-648.03	1,021.05	918.69	102.36	9.975	
14,538.17	11,280.00	12,913.76	10,275.33	92.85	86.49	-9.60	3,241.74	-647.96	1,020.97	917.94	103.03	9.909	
14,600.00	11,280.00	12,973.29	10,275.26	93.88	87.50	-9.61	3,301.26	-648.81	1,021.08	916.90	104.18	9.801	
14,700.00	11,280.00	13,067.63	10,274.97	95.56	89.12	-9.63	3,395.58	-650.22	1,021.46	915.40	106.06	9.631	
14,800.00	11,280.00	13,160.07	10,273.84	97.27	90.73	-9.63	3,488.01	-651.42	1,022.70	914.76	107.93	9.475	
14,900.00	11,280.00	13,267.16	10,272.46	98.99	92.61	-9.68	3,595.07	-653.55	1,024.14	914.24	109.90	9.318	
15,000.00	11,280.00	13,364.22	10,272.09	100.72	94.33	-9.74	3,692.10	-655.82	1,024.75	912.86	111.89	9.158	
15,100.00	11,280.00	13,458.32	10,270.69	102.48	96.02	-9.77	3,786.18	-657.49	1,026.32	912.47	113.85	9.014	
15,200.00	11,280.00	13,561.52	10,269.19	104.24	97.88	-9.80	3,889.35	-659.49	1,027.91	912.04	115.87	8.871	
15,300.00	11,280.00	13,664.64	10,268.11	106.03	99.76	-9.84	3,992.44	-661.56	1,029.11	911.19	117.91	8.728	
15,400.00	11,280.00	13,761.63	10,267.05	107.82	101.53	-9.86	4,089.42	-663.12	1,030.27	910.34	119.93	8.591	
15,500.00	11,280.00	13,861.07	10,265.65	109.63	103.37	-9.86	4,188.84	-664.38	1,031.69	909.74	121.95	8.460	
15,600.00	11,280.00	13,960.82	10,264.22	111.46	105.22	-9.85	4,288.57	-665.49	1,033.12	909.14	123.98	8.333	
15,700.00	11,280.00	14,065.94	10,262.82	113.29	107.17	-9.80	4,393.68	-665.97	1,034.33	908.33	126.00	8.209	
15,800.00	11,280.00	14,161.83	10,261.51	115.14	108.97	-9.73	4,489.56	-665.94	1,035.49	907.50	127.99	8.091	
15,900.00	11,280.00	14,266.77	10,260.06	117.00	110.94	-9.63	4,594.48	-665.46	1,036.59	906.61	129.98	7.975	
16,000.00	11,280.00	14,371.71	10,259.11	118.86	112.92	-9.53	4,699.42	-664.85	1,037.22	905.25	131.97	7.859	
16,100.00	11,280.00	14,471.46	10,258.54	120.74	114.82	-9.50	4,799.17	-665.41	1,037.70	903.66	134.04	7.742	
16,200.00	11,280.00	14,573.26	10,258.15	122.63	116.77	-9.48	4,900.97	-666.16	1,038.03	901.89	136.14	7.625	
16,300.00	11,280.00	14,670.56	10,257.80	124.53	118.64	-9.44	4,998.26	-666.51	1,038.27	900.06	138.21	7.512	
16,400.00	11,280.00	14,767.32	10,256.67	126.43	120.50	-9.33	5,095.01	-665.73	1,039.11	898.89	140.22	7.411	
16,500.00	11,280.00	14,874.24	10,255.83	128.34	122.56	-9.22	5,201.92	-664.90	1,039.59	897.34	142.25	7.308	
16,600.00	11,280.00	14,979.00	10,255.70	130.26	124.59	-9.13	5,306.68	-664.42	1,039.47	895.16	144.31	7.203	
16,652.45	11,280.00	15,033.18	10,255.78	131.27	125.64	-9.08	5,360.87	-664.16	1,039.27	893.87	145.40	7.148	



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 015H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	73.48	62.00	209.00	219.49					
100.00	100.00	74.76	74.76	0.20	0.20	73.50	61.90	208.98	217.96	217.56	0.40	546.648		
200.00	200.00	174.81	174.81	0.74	0.74	73.59	61.54	208.96	217.83	216.36	1.47	147.942		
300.00	300.00	275.25	275.25	1.27	1.28	73.74	60.92	208.88	217.58	215.03	2.55	85.321		
400.00	400.00	375.39	375.38	1.81	1.81	73.85	60.41	208.60	217.18	213.55	3.62	59.926		
433.93	433.93	408.44	408.43	1.99	1.99	73.86	60.35	208.52	217.08	213.10	3.98	54.544 CC		
450.00	450.00	423.67	423.67	2.08	2.06	73.85	60.39	208.54	217.11	212.96	4.14	52.385 ES		
500.00	500.00	471.08	471.07	2.34	2.31	-168.40	60.82	208.90	218.02	213.37	4.65	46.905		
600.00	599.93	568.86	568.82	2.85	2.80	-168.86	62.57	210.66	223.67	218.02	5.66	39.541		
700.00	699.68	669.52	669.44	3.38	3.32	-169.40	64.17	212.64	232.87	226.17	6.70	34.767		
772.27	771.59	736.26	736.15	3.76	3.67	-169.78	65.23	214.32	242.03	234.60	7.43	32.554		
800.00	799.15	761.32	761.19	3.91	3.80	-169.93	65.71	215.37	246.36	238.64	7.72	31.928		
900.00	898.51	845.38	844.99	4.47	4.25	-170.37	68.00	221.41	265.05	256.38	8.67	30.562		
1,000.00	997.88	943.89	942.90	5.03	4.78	-170.73	71.34	231.78	287.05	277.34	9.71	29.550		
1,100.00	1,097.25	1,041.76	1,040.25	5.60	5.32	-170.88	73.60	241.51	308.17	297.41	10.76	28.639		
1,200.00	1,196.62	1,147.14	1,145.18	6.17	5.90	-170.99	75.50	251.02	328.29	316.42	11.87	27.661		
1,300.00	1,295.99	1,251.24	1,249.03	6.74	6.47	-171.21	77.35	258.00	346.22	333.25	12.97	26.696		
1,400.00	1,395.35	1,348.13	1,345.72	7.32	7.00	-171.41	79.03	264.00	363.67	349.65	14.02	25.936		
1,500.00	1,494.72	1,447.81	1,445.17	7.90	7.54	-171.58	80.71	270.58	381.50	366.41	15.10	25.271		
1,600.00	1,594.09	1,557.48	1,554.71	8.48	8.14	-171.93	82.94	275.13	397.14	380.90	16.24	24.454		
1,700.00	1,693.46	1,657.00	1,654.16	9.06	8.67	-172.43	85.89	277.45	411.44	394.13	17.31	23.769		
1,800.00	1,792.82	1,750.51	1,747.59	9.64	9.17	-172.86	88.81	280.22	426.42	408.08	18.34	23.250		
1,900.00	1,892.19	1,843.12	1,840.05	10.22	9.67	-173.14	91.42	284.64	442.97	423.61	19.36	22.876		
2,000.00	1,991.56	1,939.48	1,936.22	10.80	10.20	-173.27	93.39	290.39	460.36	439.94	20.42	22.547		
2,100.00	2,090.93	2,036.73	2,033.26	11.39	10.74	-173.38	95.31	296.51	478.03	456.55	21.48	22.255		
2,200.00	2,190.30	2,135.52	2,131.81	11.97	11.28	-173.45	97.13	303.03	495.93	473.38	22.55	21.988		
2,300.00	2,289.66	2,236.34	2,232.42	12.55	11.83	-173.50	98.70	309.31	513.39	489.74	23.65	21.710		
2,400.00	2,389.03	2,336.40	2,332.30	13.14	12.38	-173.54	100.02	315.29	530.53	505.79	24.73	21.449		
2,500.00	2,488.40	2,432.74	2,428.47	13.72	12.91	-173.59	101.46	320.87	547.57	521.78	25.79	21.231		
2,600.00	2,587.77	2,527.64	2,523.15	14.31	13.44	-173.70	103.63	326.81	565.32	538.49	26.83	21.068		
2,700.00	2,687.14	2,624.84	2,620.12	14.89	13.97	-173.76	105.64	333.40	583.47	555.57	27.90	20.915		
2,800.00	2,786.50	2,724.09	2,719.11	15.48	14.52	-173.86	108.07	339.99	601.63	572.66	28.98	20.761		
2,900.00	2,885.87	2,826.31	2,821.10	16.07	15.09	-173.89	109.70	346.71	619.44	589.35	30.09	20.587		
3,000.00	2,985.24	2,927.28	2,921.85	16.65	15.64	-173.77	109.69	353.36	636.65	605.46	31.19	20.415		
3,100.00	3,084.61	3,020.33	3,014.69	17.24	16.15	-173.70	110.04	359.52	654.05	621.83	32.21	20.303		
3,200.00	3,183.98	3,119.88	3,114.01	17.82	16.70	-173.77	112.17	365.95	671.93	638.63	33.30	20.178		
3,300.00	3,283.34	3,212.64	3,206.57	18.41	17.22	-173.87	114.53	371.63	689.68	655.36	34.32	20.094		
3,400.00	3,382.71	3,295.72	3,289.34	19.00	17.68	-173.98	117.42	378.08	709.25	674.01	35.25	20.122		
3,500.00	3,482.08	3,383.73	3,376.88	19.58	18.18	-174.10	121.20	386.38	730.63	694.42	36.22	20.175		
3,600.00	3,581.45	3,460.61	3,453.21	20.17	18.62	-174.20	125.03	394.73	753.66	716.61	37.05	20.342		
3,700.00	3,680.82	3,537.28	3,528.96	20.76	19.07	-174.37	130.77	405.03	779.81	741.95	37.86	20.596		
3,800.00	3,780.18	3,621.61	3,612.08	21.34	19.57	-174.57	137.75	417.38	807.45	768.68	38.76	20.830		
3,900.00	3,879.55	3,696.00	3,685.08	21.93	20.02	-174.74	144.58	429.96	837.40	797.88	39.52	21.188		
4,000.00	3,978.92	3,790.99	3,778.06	22.52	20.60	-174.93	153.68	447.17	868.64	828.06	40.57	21.408		
4,100.00	4,078.29	3,884.65	3,869.76	23.10	21.18	-175.10	162.59	464.00	899.73	858.12	41.61	21.623		
4,200.00	4,177.65	3,990.65	3,973.65	23.69	21.83	-175.29	172.58	482.52	930.34	887.52	42.82	21.728		
4,300.00	4,277.02	4,097.50	4,078.62	24.28	22.49	-175.48	182.29	499.97	959.82	915.79	44.03	21.799		
4,400.00	4,376.39	4,200.29	4,179.76	24.86	23.12	-175.66	191.39	515.86	988.44	943.26	45.18	21.876		
4,500.00	4,475.76	4,297.11	4,275.14	25.45	23.72	-175.82	199.79	530.21	1,016.43	970.16	46.26	21.971		
4,600.00	4,575.13	4,382.62	4,359.29	26.04	24.24	-175.95	207.26	543.47	1,045.06	997.86	47.19	22.144		
4,700.00	4,674.49	4,471.66	4,446.75	26.63	24.80	-176.06	215.17	558.16	1,074.61	1,026.44	48.17	22.307		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 015H (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance			Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)						
4,800.00	4,773.86	4,580.31	4,553.57	27.21	25.47	-176.19	224.54	575.67	1,103.74	1,054.34	49.41	22.340		
4,892.13	4,865.41	4,675.75	4,647.58	27.75	26.06	-176.28	232.30	590.18	1,129.65	1,079.17	50.48	22.379		
4,900.00	4,873.23	4,683.17	4,654.89	27.80	26.11	-176.29	232.84	591.32	1,131.84	1,081.28	50.56	22.386		
5,000.00	4,972.80	4,777.92	4,748.24	28.37	26.70	-176.32	238.86	606.39	1,157.94	1,106.34	51.61	22.437		
5,100.00	5,072.63	4,865.55	4,834.50	28.92	27.25	-176.25	242.99	621.24	1,180.96	1,128.40	52.56	22.470		
5,200.00	5,172.60	4,942.68	4,910.23	29.44	27.74	-176.20	247.43	635.18	1,202.01	1,148.65	53.36	22.526		
5,214.40	5,187.00	4,953.79	4,921.12	29.51	27.81	65.95	248.17	637.26	1,204.91	1,151.43	53.47	22.534		
5,300.00	5,272.60	5,023.00	4,988.82	29.91	28.25	65.98	253.38	650.63	1,222.61	1,168.45	54.16	22.574		
5,400.00	5,372.60	5,121.90	5,085.47	30.38	28.90	66.01	261.50	670.02	1,243.86	1,188.64	55.22	22.527		
5,500.00	5,472.60	5,228.56	5,189.79	30.85	29.59	66.03	270.11	690.45	1,264.65	1,208.28	56.38	22.432		
5,600.00	5,572.60	5,357.85	5,316.68	31.33	30.42	66.06	279.58	713.34	1,283.80	1,225.98	57.82	22.203		
5,700.00	5,672.60	5,470.40	5,427.56	31.81	31.13	66.08	287.07	731.22	1,301.00	1,241.96	59.04	22.037		
5,800.00	5,772.60	5,574.68	5,530.37	32.29	31.78	66.03	295.00	746.70	1,317.66	1,257.51	60.15	21.906		
5,900.00	5,872.60	5,675.68	5,631.68	32.77	32.30	65.71	312.68	767.83	1,327.93	1,265.34	62.59	21.217		
6,000.00	5,972.60	5,790.28	5,744.12	33.25	34.05	65.48	319.24	769.64	1,330.58	1,266.59	63.99	20.793		
6,100.00	6,072.60	6,101.68	6,055.50	33.74	34.57	65.39	321.31	768.89	1,330.78	1,265.75	65.03	20.464		
6,200.00	6,172.60	6,210.15	6,163.96	34.23	35.07	65.34	321.79	767.36	1,329.68	1,263.82	66.05	20.130		
6,300.00	6,272.60	6,312.39	6,266.18	34.71	35.54	65.32	321.61	765.93	1,328.33	1,261.28	67.05	19.812		
6,400.00	6,372.60	6,413.55	6,367.34	35.20	36.00	65.32	320.97	764.57	1,326.84	1,258.80	68.04	19.502		
6,500.00	6,472.60	6,514.52	6,468.30	35.69	36.47	65.34	319.96	763.29	1,325.28	1,256.25	69.03	19.200		
6,600.00	6,572.60	6,611.84	6,565.60	36.19	36.91	65.37	318.77	762.24	1,323.78	1,253.77	70.01	18.909		
6,700.00	6,672.60	6,709.28	6,663.03	36.68	37.37	65.40	317.49	761.43	1,322.48	1,251.49	70.99	18.629		
6,800.00	6,772.60	6,807.75	6,761.49	37.18	37.83	65.44	316.11	760.82	1,321.33	1,249.35	71.99	18.355		
6,900.00	6,872.60	6,906.09	6,859.81	37.67	38.29	65.49	314.68	760.36	1,320.30	1,247.32	72.98	18.091		
7,000.00	6,972.60	7,003.80	6,957.52	38.17	38.75	65.55	313.21	760.09	1,319.43	1,245.45	73.98	17.835		
7,100.00	7,072.60	7,100.50	7,054.20	38.67	39.21	65.60	311.73	760.03	1,318.74	1,243.76	74.98	17.588		
7,200.00	7,172.60	7,194.45	7,148.13	39.17	39.67	65.68	310.07	760.46	1,318.43	1,242.45	75.97	17.354		
7,216.95	7,189.55	7,210.37	7,164.05	39.25	39.75	65.69	309.76	760.59	1,318.42	1,242.28	76.14	17.316		
7,300.00	7,272.60	7,291.93	7,245.59	39.67	40.14	65.77	308.11	761.47	1,318.54	1,241.56	76.98	17.128		
7,400.00	7,372.60	7,399.05	7,352.70	40.17	40.66	65.84	306.68	761.93	1,318.39	1,240.36	78.03	16.896		
7,500.00	7,472.60	7,501.68	7,455.33	40.67	41.16	65.85	306.18	761.47	1,317.78	1,238.72	79.06	16.669		
7,600.00	7,572.60	7,599.73	7,553.38	41.17	41.63	65.87	305.53	761.17	1,317.23	1,237.16	80.06	16.452		
7,700.00	7,672.60	7,701.18	7,654.82	41.68	42.12	65.90	304.64	761.04	1,316.75	1,235.66	81.09	16.239		
7,800.00	7,772.60	7,805.10	7,758.74	42.18	42.63	65.91	304.14	760.42	1,316.01	1,233.89	82.12	16.025		
7,900.00	7,872.60	7,911.90	7,865.53	42.69	43.14	65.90	303.83	759.25	1,314.90	1,231.74	83.16	15.811		
8,000.00	7,972.60	8,019.53	7,973.15	43.19	43.66	65.91	303.04	757.61	1,313.20	1,229.00	84.20	15.596		
8,100.00	8,072.60	8,100.03	8,053.64	43.70	44.06	65.92	302.26	756.87	1,311.97	1,226.82	85.15	15.407		
8,133.76	8,106.36	8,127.25	8,080.86	43.87	44.20	65.93	302.01	756.91	1,311.88	1,226.42	85.47	15.349		
8,200.00	8,172.60	8,180.66	8,134.27	44.21	44.46	65.96	301.52	757.41	1,312.21	1,226.12	86.09	15.243		
8,300.00	8,272.60	8,269.45	8,223.03	44.72	44.92	66.02	300.85	759.20	1,313.72	1,226.66	87.07	15.089		
8,400.00	8,372.60	8,362.65	8,316.21	45.23	45.40	66.07	300.62	761.43	1,315.81	1,227.74	88.07	14.940		
8,500.00	8,472.60	8,492.28	8,445.81	45.74	46.06	66.10	300.86	763.65	1,317.58	1,228.30	89.27	14.759		
8,600.00	8,572.60	8,619.07	8,572.58	46.25	46.69	66.06	301.02	761.61	1,316.03	1,225.61	90.42	14.554		
8,700.00	8,672.60	8,700.92	8,654.41	46.76	47.10	66.00	301.90	760.11	1,314.78	1,223.41	91.37	14.389		
8,740.18	8,712.78	8,733.80	8,687.28	46.97	47.26	65.96	302.52	759.73	1,314.67	1,222.92	91.75	14.328		
8,800.00	8,772.60	8,783.25	8,736.72	47.27	47.51	65.91	303.76	759.40	1,314.92	1,222.60	92.32	14.244		
8,900.00	8,872.60	8,880.02	8,833.47	47.78	48.00	65.84	305.56	759.57	1,315.83	1,222.49	93.34	14.097		
9,000.00	8,972.60	8,978.11	8,931.55	48.30	48.50	65.86	305.61	760.79	1,316.99	1,222.61	94.38	13.955		
9,100.00	9,072.60	9,090.96	9,044.38	48.81	49.08	65.92	304.76	762.02	1,317.68	1,222.19	95.48	13.800		
9,200.00	9,172.60	9,208.72	9,162.13	49.32	49.66	65.96	303.60	762.06	1,317.32	1,220.72	96.60	13.637		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 015H (O) - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 76-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,300.00	9,272.60	9,333.56	9,286.93	49.84	50.28	66.06	300.42	760.63	1,315.24	1,217.52	97.72	13.459		
9,400.00	9,372.60	9,418.62	9,371.94	50.35	50.69	66.14	297.87	759.30	1,312.63	1,213.93	98.70	13.299		
9,500.00	9,472.60	9,516.71	9,470.01	50.87	51.18	66.18	296.53	758.23	1,311.07	1,211.35	99.72	13.148		
9,600.00	9,572.60	9,596.68	9,549.97	51.38	51.57	66.17	296.24	757.22	1,309.83	1,209.16	100.67	13.012		
9,609.93	9,582.53	9,603.74	9,557.03	51.44	51.61	66.17	296.29	757.18	1,309.82	1,209.06	100.76	13.000		
9,700.00	9,672.60	9,683.42	9,636.70	51.90	52.02	66.12	297.55	757.26	1,310.44	1,208.80	101.64	12.893		
9,800.00	9,772.60	9,793.96	9,747.18	52.42	52.58	65.96	301.03	756.29	1,310.92	1,208.19	102.73	12.760		
9,873.11	9,845.72	9,867.45	9,820.22	52.80	52.95	65.63	307.93	752.92	1,310.67	1,207.18	103.49	12.664		
9,900.00	9,872.60	9,880.95	9,833.48	52.93	53.01	65.52	310.21	751.96	1,310.81	1,207.11	103.70	12.640		
10,000.00	9,972.60	9,979.87	9,928.28	53.45	53.49	64.30	336.07	741.65	1,312.51	1,207.78	104.73	12.533		
10,100.00	10,072.60	10,039.49	9,983.04	53.97	53.76	63.28	357.81	732.62	1,315.43	1,209.95	105.48	12.471		
10,200.00	10,172.60	10,086.36	10,025.00	54.49	53.96	62.38	377.53	725.84	1,322.50	1,216.47	106.03	12.473		
10,300.00	10,272.60	10,151.49	10,080.33	55.01	54.24	60.92	410.14	715.25	1,333.48	1,226.85	106.63	12.506		
10,400.00	10,372.60	10,197.92	10,116.51	55.53	54.42	59.68	437.62	705.80	1,348.28	1,241.39	106.89	12.613		
10,500.00	10,472.60	10,236.00	10,143.81	56.05	54.56	58.57	462.72	697.22	1,367.99	1,261.12	106.87	12.800		
10,600.00	10,572.60	10,258.35	10,158.56	56.57	54.64	57.86	478.65	691.92	1,393.10	1,286.67	106.43	13.089		
10,700.00	10,672.60	10,280.62	10,172.29	57.09	54.71	57.14	495.33	686.52	1,423.73	1,317.95	105.78	13.459		
10,734.44	10,707.04	10,287.63	10,176.44	57.27	54.73	56.91	500.71	684.83	1,435.54	1,330.03	105.51	13.606		
10,750.00	10,722.60	10,300.00	10,183.59	57.35	54.77	56.62	510.37	681.87	1,441.06	1,335.53	105.53	13.656		
10,800.00	10,772.46	10,300.00	10,183.59	57.60	54.77	55.15	510.37	681.87	1,457.80	1,352.89	104.91	13.896		
10,850.00	10,821.82	10,300.00	10,183.59	57.85	54.77	53.78	510.37	681.87	1,473.72	1,369.49	104.23	14.139		
10,900.00	10,870.31	10,317.49	10,193.27	58.08	54.83	52.09	524.38	677.87	1,488.28	1,384.47	103.81	14.337		
10,950.00	10,917.55	10,331.00	10,200.37	58.31	54.88	50.68	535.50	674.99	1,501.74	1,398.46	103.28	14.540		
11,000.00	10,963.19	10,331.00	10,200.37	58.51	54.88	49.73	535.50	674.99	1,513.82	1,411.34	102.48	14.771		
11,050.00	11,006.89	10,344.24	10,207.03	58.70	54.92	48.64	546.64	672.37	1,524.45	1,422.55	101.90	14.960		
11,100.00	11,048.30	10,362.00	10,215.52	58.87	54.99	47.66	561.93	669.27	1,533.72	1,432.32	101.40	15.126		
11,150.00	11,087.11	10,362.00	10,215.52	59.02	54.99	47.10	561.93	669.27	1,541.18	1,440.61	100.57	15.325		
11,200.00	11,123.03	10,374.24	10,221.13	59.15	55.04	46.52	572.65	667.43	1,547.08	1,447.11	99.97	15.475		
11,250.00	11,155.79	10,394.00	10,229.91	59.25	55.12	46.04	590.18	665.03	1,551.35	1,451.80	99.55	15.583		
11,300.00	11,185.13	10,394.00	10,229.91	59.34	55.12	45.87	590.18	665.03	1,553.67	1,454.88	98.79	15.727		
11,350.00	11,210.83	10,407.46	10,235.64	59.41	55.18	45.76	602.30	663.79	1,554.29	1,455.96	98.33	15.806		
11,400.00	11,232.70	10,426.00	10,243.06	59.45	55.27	45.80	619.25	662.53	1,553.24	1,455.21	98.03	15.844		
11,450.00	11,250.57	10,426.00	10,243.06	59.49	55.27	46.02	619.25	662.53	1,550.24	1,452.79	97.45	15.908		
11,500.00	11,264.30	10,426.00	10,243.06	59.54	55.27	46.34	619.25	662.53	1,545.83	1,448.86	96.96	15.942		
11,550.00	11,273.79	10,454.59	10,253.23	59.70	55.42	46.90	645.93	661.21	1,538.98	1,441.91	97.08	15.853		
11,600.00	11,278.96	10,467.22	10,257.19	59.87	55.48	47.59	657.91	660.76	1,530.70	1,433.70	97.00	15.780		
11,634.44	11,280.00	10,489.00	10,263.25	59.98	55.60	48.25	678.82	660.16	1,524.21	1,426.99	97.22	15.678		
11,700.00	11,280.00	10,489.00	10,263.25	60.21	55.60	48.25	678.82	660.16	1,511.50	1,414.44	97.06	15.574		
11,800.00	11,280.00	10,521.00	10,270.32	60.63	55.78	48.47	710.02	660.23	1,496.75	1,399.35	97.41	15.366		
11,900.00	11,280.00	10,539.96	10,273.69	61.11	55.89	48.58	728.67	660.86	1,486.85	1,389.11	97.74	15.213		
12,000.00	11,280.00	10,585.00	10,280.57	61.67	56.17	48.86	773.11	663.32	1,481.38	1,382.85	98.53	15.035		
12,071.65	11,280.00	10,601.01	10,282.50	62.11	56.27	48.95	788.95	664.47	1,480.06	1,381.06	99.00	14.951		
12,100.00	11,280.00	10,616.00	10,283.76	62.29	56.36	49.02	803.84	665.72	1,480.36	1,381.09	99.27	14.912		
12,200.00	11,280.00	10,718.78	10,291.72	62.97	57.07	49.49	905.99	673.85	1,482.12	1,381.34	100.78	14.707		
12,300.00	11,280.00	10,821.87	10,299.71	63.73	57.84	49.91	1,008.57	680.09	1,482.52	1,380.15	102.37	14.482		
12,400.00	11,280.00	10,890.83	10,304.36	64.54	58.39	50.17	1,077.25	684.32	1,483.86	1,380.13	103.72	14.306		
12,500.00	11,280.00	10,939.12	10,306.43	65.41	58.80	50.34	1,125.33	688.33	1,488.31	1,383.35	104.97	14.179		
12,600.00	11,280.00	10,998.84	10,307.49	66.34	59.31	50.54	1,184.70	694.64	1,496.05	1,389.66	106.39	14.063		
12,700.00	11,280.00	11,070.10	10,307.68	67.33	59.95	50.77	1,255.45	703.09	1,505.89	1,397.92	107.97	13.947		
12,800.00	11,280.00	11,143.06	10,306.41	68.37	60.65	50.97	1,327.83	712.22	1,517.54	1,407.92	109.62	13.844		
12,900.00	11,280.00	11,267.50	10,302.90	69.47	61.91	51.24	1,451.38	726.61	1,529.12	1,417.34	111.78	13.679		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 015H (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 76-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,000.00	11,280.00	11,357.02	10,299.55	70.61	62.87	51.39	1,540.34	735.99	1,540.46	1,426.78	113.68	13.550	
13,100.00	11,280.00	11,504.12	10,294.58	71.80	64.54	51.60	1,686.66	750.14	1,551.14	1,434.91	116.23	13.346	
13,200.00	11,280.00	13,200.00	10,296.25	73.03	85.63	51.96	1,883.44	761.37	1,555.36	1,419.86	135.50	11.479	
13,300.00	11,280.00	11,859.56	10,299.67	74.30	68.94	52.07	2,041.65	760.47	1,553.64	1,431.32	122.32	12.701	
13,392.79	11,280.00	11,929.08	10,299.71	75.52	69.85	52.06	2,111.16	759.09	1,552.94	1,428.75	124.19	12.505	
13,400.00	11,280.00	11,934.36	10,299.66	75.62	69.92	52.06	2,116.44	758.99	1,552.94	1,428.61	124.33	12.490	
13,500.00	11,280.00	12,013.78	10,298.04	76.97	71.00	52.01	2,195.83	757.93	1,553.92	1,427.52	126.41	12.293	
13,600.00	11,280.00	12,174.42	10,298.49	78.36	73.25	51.97	2,356.42	754.27	1,552.40	1,423.03	129.37	12.000	
13,700.00	11,280.00	12,259.75	10,299.00	79.79	74.48	51.95	2,441.70	751.43	1,550.27	1,418.62	131.65	11.775	
13,800.00	11,280.00	12,340.16	10,298.10	81.24	75.67	51.88	2,522.06	748.99	1,549.40	1,415.50	133.90	11.571	
13,819.24	11,280.00	12,355.68	10,297.74	81.53	75.90	51.87	2,537.57	748.52	1,549.38	1,415.04	134.34	11.533	
13,900.00	11,280.00	12,436.40	10,295.25	82.73	77.12	51.75	2,618.21	745.92	1,549.55	1,413.25	136.29	11.369	
13,973.95	11,280.00	12,510.48	10,292.75	83.85	78.26	51.63	2,692.19	743.02	1,549.43	1,411.33	138.10	11.220	
14,000.00	11,280.00	12,533.08	10,291.93	84.25	78.61	51.59	2,714.76	742.16	1,549.46	1,410.76	138.70	11.171	
14,100.00	11,280.00	12,711.75	10,292.19	85.79	81.43	51.50	2,893.22	735.71	1,547.54	1,405.47	142.07	10.893	
14,200.00	11,280.00	12,804.99	10,296.16	87.36	82.94	51.55	2,986.30	732.00	1,542.62	1,397.83	144.79	10.654	
14,300.00	11,280.00	12,887.49	10,298.37	88.96	84.28	51.56	3,068.72	728.97	1,538.88	1,391.49	147.39	10.441	
14,400.00	11,280.00	12,978.50	10,300.45	90.58	85.79	51.58	3,159.65	726.10	1,535.83	1,385.71	150.12	10.231	
14,500.00	11,280.00	13,064.49	10,301.81	92.22	87.23	51.59	3,245.61	723.81	1,533.58	1,380.77	152.81	10.036	
14,600.00	11,280.00	13,149.65	10,303.10	93.88	88.66	51.61	3,330.74	722.45	1,532.23	1,376.69	155.54	9.851	
14,647.87	11,280.00	13,184.83	10,303.53	94.69	89.26	51.63	3,365.92	722.23	1,532.03	1,375.23	156.80	9.771	
14,700.00	11,280.00	13,223.15	10,303.75	95.56	89.92	51.65	3,404.24	722.23	1,532.27	1,374.10	158.16	9.688	
14,800.00	11,280.00	13,317.81	10,303.91	97.27	91.55	51.69	3,498.90	722.81	1,533.46	1,372.39	161.07	9.520	
14,900.00	11,280.00	13,389.88	10,303.84	98.99	92.80	51.73	3,570.96	723.83	1,535.51	1,371.80	163.71	9.379	
15,000.00	11,280.00	13,463.37	10,302.78	100.72	94.08	51.76	3,644.41	726.01	1,539.53	1,373.16	166.36	9.254	
15,100.00	11,280.00	13,544.97	10,300.24	102.48	95.52	51.77	3,725.92	728.83	1,544.98	1,375.88	169.10	9.136	
15,200.00	11,280.00	13,649.87	10,295.95	104.24	97.39	51.76	3,830.67	732.46	1,551.08	1,378.90	172.18	9.008	
15,300.00	11,280.00	13,767.81	10,293.89	106.03	99.51	51.82	3,948.52	736.59	1,555.67	1,380.07	175.60	8.859	
15,400.00	11,280.00	13,858.09	10,292.72	107.82	101.13	51.89	4,038.72	740.17	1,560.43	1,381.80	178.63	8.736	
15,500.00	11,280.00	14,235.79	10,286.29	109.63	108.08	51.32	4,414.67	719.33	1,561.59	1,377.96	183.63	8.504	
15,600.00	11,280.00	14,384.92	10,287.53	111.46	110.85	50.77	4,561.38	692.74	1,548.19	1,362.11	186.08	8.320	
15,700.00	11,280.00	14,708.73	10,308.12	113.29	116.91	49.44	4,873.31	611.05	1,525.42	1,339.02	186.40	8.183	
15,800.00	11,280.00	14,812.87	10,318.22	115.14	118.88	48.90	4,971.32	577.31	1,495.04	1,306.49	188.55	7.929	
15,900.00	11,280.00	14,857.00	10,322.53	117.00	119.71	48.66	5,012.83	562.98	1,465.55	1,273.84	191.70	7.645	
16,000.00	11,280.00	14,857.00	10,322.53	118.86	119.71	48.66	5,012.83	562.98	1,441.72	1,246.35	195.37	7.379	
16,100.00	11,280.00	14,857.00	10,322.53	120.74	119.71	48.66	5,012.83	562.98	1,424.53	1,225.93	198.60	7.173	
16,200.00	11,280.00	14,857.00	10,322.53	122.63	119.71	48.66	5,012.83	562.98	1,414.22	1,212.93	201.29	7.026	
16,296.37	11,280.00	14,857.00	10,322.53	124.46	119.71	48.66	5,012.83	562.98	1,410.93	1,207.63	203.29	6.940	
16,300.00	11,280.00	14,857.00	10,322.53	124.53	119.71	48.66	5,012.83	562.98	1,410.93	1,207.58	203.36	6.938	
16,400.00	11,280.00	14,857.00	10,322.53	126.43	119.71	48.66	5,012.83	562.98	1,414.73	1,209.97	204.76	6.909 SF	
16,500.00	11,280.00	14,857.00	10,322.53	128.34	119.71	48.66	5,012.83	562.98	1,425.55	1,220.07	205.48	6.938	
16,600.00	11,280.00	14,857.00	10,322.53	130.26	119.71	48.66	5,012.83	562.98	1,443.23	1,237.70	205.53	7.022	
16,652.45	11,280.00	14,857.00	10,322.53	131.27	119.71	48.66	5,012.83	562.98	1,455.17	1,249.86	205.30	7.088	



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 233H - OH - Plan 1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.00	0.00	0.00	0.00	0.00	0.00	-92.29	-1.00	-25.00	25.02						
100.00	100.00	100.00	100.00	0.20	0.20	-92.29	-1.00	-25.00	25.02	24.62	0.40	63.307			
200.00	200.00	200.00	200.00	0.74	0.74	-92.29	-1.00	-25.00	25.02	23.55	1.47	17.013			
300.00	300.00	300.00	300.00	1.27	1.27	-92.29	-1.00	-25.00	25.02	22.47	2.55	9.827			
400.00	400.00	400.00	400.00	1.81	1.81	-92.29	-1.00	-25.00	25.02	21.40	3.62	6.909			
450.00	450.00	450.00	450.00	2.08	2.08	-92.29	-1.00	-25.00	25.02	20.86	4.16	6.016 CC			
500.00	500.00	499.58	499.58	2.34	2.34	25.76	-1.12	-25.41	25.05	20.37	4.68	5.356			
600.00	599.93	598.73	598.66	2.85	2.85	27.35	-2.04	-28.72	25.28	19.59	5.69	4.442			
700.00	699.68	697.87	697.57	3.38	3.37	30.44	-3.88	-35.32	25.80	19.08	6.72	3.839			
772.27	771.59	769.52	768.85	3.76	3.76	33.50	-5.78	-42.15	26.41	18.94	7.47	3.534 ES			
800.00	799.15	797.00	796.15	3.91	3.91	34.67	-6.64	-45.22	26.83	19.06	7.76	3.455			
900.00	898.51	896.03	894.23	4.47	4.47	36.76	-10.30	-58.38	30.39	21.57	8.82	3.444			
1,000.00	997.88	994.75	991.47	5.03	5.05	36.07	-14.86	-74.74	37.11	27.22	9.88	3.754			
1,100.00	1,097.25	1,106.25	1,088.46	5.60	5.74	34.17	-20.20	-93.88	46.50	35.47	11.04	4.214			
1,200.00	1,196.62	1,206.74	1,185.88	6.17	6.38	32.78	-25.65	-113.43	56.25	44.10	12.14	4.631			
1,300.00	1,295.99	1,292.78	1,283.31	6.74	6.94	31.81	-31.10	-132.98	66.01	52.83	13.18	5.009			
1,400.00	1,395.35	1,407.70	1,380.73	7.32	7.69	31.08	-36.54	-152.53	75.79	61.41	14.38	5.269			
1,500.00	1,494.72	1,508.19	1,478.16	7.90	8.35	30.52	-41.99	-172.08	85.58	70.07	15.51	5.518			
1,600.00	1,594.09	1,591.33	1,575.58	8.48	8.91	30.08	-47.44	-191.63	95.38	78.84	16.54	5.766			
1,700.00	1,693.46	1,709.15	1,673.00	9.06	9.69	29.71	-52.89	-211.18	105.18	87.41	17.77	5.918			
1,800.00	1,792.82	1,790.36	1,770.43	9.64	10.24	29.41	-58.34	-230.73	114.99	96.19	18.80	6.118			
1,900.00	1,892.19	1,889.88	1,867.85	10.22	10.91	29.16	-63.79	-250.28	124.80	104.87	19.93	6.263			
2,000.00	1,991.56	1,989.40	1,965.28	10.80	11.58	28.94	-69.24	-269.84	134.60	113.55	21.06	6.392			
2,100.00	2,090.93	2,088.91	2,062.70	11.39	12.26	28.76	-74.69	-289.39	144.42	122.22	22.19	6.508			
2,200.00	2,190.30	2,188.43	2,160.13	11.97	12.93	28.59	-80.14	-308.94	154.23	130.90	23.33	6.612			
2,300.00	2,289.66	2,287.95	2,257.55	12.55	13.61	28.45	-85.59	-328.49	164.04	139.58	24.46	6.706			
2,400.00	2,389.03	2,387.46	2,354.98	13.14	14.29	28.32	-91.04	-348.04	173.86	148.26	25.60	6.792			
2,500.00	2,488.40	2,486.98	2,452.40	13.72	14.97	28.21	-96.49	-367.59	183.67	156.94	26.73	6.870			
2,600.00	2,587.77	2,586.49	2,549.83	14.31	15.65	28.11	-101.94	-387.14	193.49	165.62	27.87	6.942			
2,700.00	2,687.14	2,686.01	2,647.25	14.89	16.33	28.02	-107.39	-406.69	203.31	174.30	29.01	7.008			
2,800.00	2,786.50	2,785.53	2,744.68	15.48	17.01	27.93	-112.83	-426.24	213.12	182.97	30.15	7.069			
2,900.00	2,885.87	2,885.04	2,842.10	16.07	17.70	27.85	-118.28	-445.80	222.94	191.65	31.29	7.126			
3,000.00	2,985.24	2,984.56	2,939.53	16.65	18.38	27.78	-123.73	-465.35	232.76	200.33	32.43	7.178			
3,100.00	3,084.61	3,084.08	3,036.95	17.24	19.06	27.72	-129.18	-484.90	242.58	209.01	33.57	7.227			
3,200.00	3,183.98	3,183.59	3,134.38	17.82	19.74	27.66	-134.63	-504.45	252.39	217.69	34.71	7.272			
3,300.00	3,283.34	3,283.11	3,231.80	18.41	20.43	27.61	-140.08	-524.00	262.21	226.37	35.85	7.315			
3,400.00	3,382.71	3,382.63	3,329.23	19.00	21.11	27.56	-145.53	-543.55	272.03	235.05	36.99	7.355			
3,500.00	3,482.08	3,482.14	3,426.65	19.58	21.80	27.51	-150.98	-563.10	281.85	243.72	38.13	7.392			
3,600.00	3,581.45	3,581.66	3,524.08	20.17	22.48	27.46	-156.43	-582.65	291.67	252.40	39.27	7.428			
3,700.00	3,680.82	3,681.18	3,621.50	20.76	23.17	27.42	-161.88	-602.20	301.49	261.08	40.41	7.461			
3,800.00	3,780.18	3,780.69	3,718.93	21.34	23.85	27.38	-167.33	-621.75	311.31	269.76	41.55	7.492			
3,900.00	3,879.55	3,880.21	3,816.35	21.93	24.54	27.35	-172.78	-641.31	321.13	278.44	42.69	7.522			
4,000.00	3,978.92	3,979.73	3,913.78	22.52	25.22	27.31	-178.23	-660.86	330.95	287.12	43.83	7.550			
4,100.00	4,078.29	4,079.24	4,011.20	23.10	25.91	27.28	-183.67	-680.41	340.77	295.79	44.97	7.577			
4,200.00	4,177.65	4,178.76	4,108.63	23.69	26.59	27.25	-189.12	-699.96	350.59	304.47	46.12	7.602			
4,300.00	4,277.02	4,278.28	4,206.05	24.28	27.28	27.22	-194.57	-719.51	360.41	313.15	47.26	7.626			
4,400.00	4,376.39	4,377.79	4,303.48	24.86	27.97	27.20	-200.02	-739.06	370.23	321.83	48.40	7.649			
4,500.00	4,475.76	4,477.31	4,400.90	25.45	28.65	27.17	-205.47	-758.61	380.05	330.51	49.54	7.671			
4,600.00	4,575.13	4,576.82	4,498.32	26.04	29.34	27.14	-210.92	-778.16	389.87	339.18	50.69	7.692			
4,700.00	4,674.49	4,676.34	4,595.75	26.63	30.03	27.12	-216.37	-797.71	399.69	347.86	51.83	7.712			
4,800.00	4,773.86	4,787.53	4,704.84	27.21	30.78	27.14	-222.13	-818.38	408.47	355.37	53.10	7.692			

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 233H - OH - Plan 1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
4,892.13	4,865.41	4,894.32	4,810.31	27.75	31.45	27.30	-226.62	-834.48	413.24	358.97	54.27	7.615			
4,900.00	4,873.23	4,903.46	4,819.36	27.80	31.51	27.32	-226.95	-835.68	413.51	359.14	54.36	7.606			
5,000.00	4,972.80	5,019.65	4,934.78	28.37	32.17	27.55	-230.53	-848.53	416.42	360.89	55.53	7.499			
5,100.00	5,072.63	5,135.97	5,050.77	28.92	32.79	27.68	-232.86	-856.88	418.52	361.94	56.59	7.396			
5,200.00	5,172.60	5,252.38	5,167.11	29.44	33.34	27.71	-233.92	-860.68	419.80	362.27	57.53	7.297			
5,214.40	5,187.00	5,269.15	5,183.87	29.51	33.42	-90.14	-233.97	-860.85	419.92	362.27	57.65	7.284			
5,300.00	5,272.60	5,357.88	5,272.60	29.91	33.80	-90.14	-233.99	-860.93	419.99	361.55	58.44	7.187			
5,400.00	5,372.60	5,457.88	5,372.60	30.38	34.23	-90.14	-233.99	-860.93	419.99	360.59	59.40	7.071			
5,500.00	5,472.60	5,557.88	5,472.60	30.85	34.65	-90.14	-233.99	-860.93	419.99	359.63	60.36	6.958			
5,600.00	5,572.60	5,657.88	5,572.60	31.33	35.09	-90.14	-233.99	-860.93	419.99	358.67	61.32	6.849			
5,700.00	5,672.60	5,757.88	5,672.60	31.81	35.52	-90.14	-233.99	-860.93	419.99	357.70	62.29	6.743			
5,800.00	5,772.60	5,857.88	5,772.60	32.29	35.96	-90.14	-233.99	-860.93	419.99	356.73	63.26	6.639			
5,900.00	5,872.60	5,957.88	5,872.60	32.77	36.40	-90.14	-233.99	-860.93	419.99	355.75	64.23	6.538			
6,000.00	5,972.60	6,057.88	5,972.60	33.25	36.84	-90.14	-233.99	-860.93	419.99	354.78	65.21	6.440			
6,100.00	6,072.60	6,157.88	6,072.60	33.74	37.29	-90.14	-233.99	-860.93	419.99	353.80	66.19	6.345			
6,200.00	6,172.60	6,257.88	6,172.60	34.23	37.74	-90.14	-233.99	-860.93	419.99	352.81	67.18	6.252			
6,300.00	6,272.60	6,357.88	6,272.60	34.71	38.19	-90.14	-233.99	-860.93	419.99	351.83	68.16	6.162			
6,400.00	6,372.60	6,457.88	6,372.60	35.20	38.64	-90.14	-233.99	-860.93	419.99	350.84	69.15	6.074			
6,500.00	6,472.60	6,557.88	6,472.60	35.69	39.09	-90.14	-233.99	-860.93	419.99	349.85	70.14	5.988			
6,600.00	6,572.60	6,657.88	6,572.60	36.19	39.55	-90.14	-233.99	-860.93	419.99	348.85	71.14	5.904			
6,700.00	6,672.60	6,757.88	6,672.60	36.68	40.01	-90.14	-233.99	-860.93	419.99	347.86	72.13	5.822			
6,800.00	6,772.60	6,857.88	6,772.60	37.18	40.47	-90.14	-233.99	-860.93	419.99	346.86	73.13	5.743			
6,900.00	6,872.60	6,957.88	6,872.60	37.67	40.93	-90.14	-233.99	-860.93	419.99	345.86	74.13	5.665			
7,000.00	6,972.60	7,057.88	6,972.60	38.17	41.39	-90.14	-233.99	-860.93	419.99	344.85	75.13	5.590			
7,100.00	7,072.60	7,157.88	7,072.60	38.67	41.86	-90.14	-233.99	-860.93	419.99	343.85	76.14	5.516			
7,200.00	7,172.60	7,257.88	7,172.60	39.17	42.33	-90.14	-233.99	-860.93	419.99	342.84	77.15	5.444			
7,300.00	7,272.60	7,357.88	7,272.60	39.67	42.80	-90.14	-233.99	-860.93	419.99	341.83	78.15	5.374			
7,400.00	7,372.60	7,457.88	7,372.60	40.17	43.27	-90.14	-233.99	-860.93	419.99	340.82	79.16	5.305			
7,500.00	7,472.60	7,557.88	7,472.60	40.67	43.74	-90.14	-233.99	-860.93	419.99	339.81	80.18	5.238			
7,600.00	7,572.60	7,657.88	7,572.60	41.17	44.22	-90.14	-233.99	-860.93	419.99	338.80	81.19	5.173			
7,700.00	7,672.60	7,757.88	7,672.60	41.68	44.69	-90.14	-233.99	-860.93	419.99	337.78	82.20	5.109			
7,800.00	7,772.60	7,857.88	7,772.60	42.18	45.17	-90.14	-233.99	-860.93	419.99	336.77	83.22	5.047			
7,900.00	7,872.60	7,957.88	7,872.60	42.69	45.65	-90.14	-233.99	-860.93	419.99	335.75	84.24	4.986			
8,000.00	7,972.60	8,057.88	7,972.60	43.19	46.13	-90.14	-233.99	-860.93	419.99	334.73	85.26	4.926			
8,100.00	8,072.60	8,157.88	8,072.60	43.70	46.61	-90.14	-233.99	-860.93	419.99	333.71	86.28	4.868			
8,200.00	8,172.60	8,257.88	8,172.60	44.21	47.09	-90.14	-233.99	-860.93	419.99	332.69	87.30	4.811			
8,300.00	8,272.60	8,357.88	8,272.60	44.72	47.57	-90.14	-233.99	-860.93	419.99	331.66	88.32	4.755			
8,400.00	8,372.60	8,457.88	8,372.60	45.23	48.06	-90.14	-233.99	-860.93	419.99	330.64	89.35	4.701			
8,500.00	8,472.60	8,557.88	8,472.60	45.74	48.54	-90.14	-233.99	-860.93	419.99	329.61	90.37	4.647			
8,600.00	8,572.60	8,657.88	8,572.60	46.25	49.03	-90.14	-233.99	-860.93	419.99	328.59	91.40	4.595			
8,700.00	8,672.60	8,757.88	8,672.60	46.76	49.52	-90.14	-233.99	-860.93	419.99	327.56	92.43	4.544			
8,800.00	8,772.60	8,857.88	8,772.60	47.27	50.00	-90.14	-233.99	-860.93	419.99	326.53	93.46	4.494			
8,900.00	8,872.60	8,957.88	8,872.60	47.78	50.49	-90.14	-233.99	-860.93	419.99	325.50	94.49	4.445			
9,000.00	8,972.60	9,057.88	8,972.60	48.30	50.99	-90.14	-233.99	-860.93	419.99	324.47	95.52	4.397			
9,100.00	9,072.60	9,157.88	9,072.60	48.81	51.48	-90.14	-233.99	-860.93	419.99	323.44	96.55	4.350			
9,200.00	9,172.60	9,257.88	9,172.60	49.32	51.97	-90.14	-233.99	-860.93	419.99	322.40	97.58	4.304			
9,300.00	9,272.60	9,357.88	9,272.60	49.84	52.46	-90.14	-233.99	-860.93	419.99	321.37	98.62	4.259			
9,400.00	9,372.60	9,457.88	9,372.60	50.35	52.96	-90.14	-233.99	-860.93	419.99	320.33	99.65	4.214			
9,500.00	9,472.60	9,557.88	9,472.60	50.87	53.45	-90.14	-233.99	-860.93	419.99	319.30	100.69	4.171			
9,600.00	9,572.60	9,657.88	9,572.60	51.38	53.95	-90.14	-233.99	-860.93	419.99	318.26	101.73	4.129			

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 233H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis			Distance								Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,700.00	9,672.60	9,757.88	9,672.60	51.90	54.44	-90.14	-233.99	-860.93	419.99	317.23	102.76	4.087		
9,800.00	9,772.60	9,857.88	9,772.60	52.42	54.94	-90.14	-233.99	-860.93	419.99	316.19	103.80	4.046		
9,900.00	9,872.60	9,957.88	9,872.60	52.93	55.44	-90.14	-233.99	-860.93	419.99	315.15	104.84	4.006		
10,000.00	9,972.60	10,057.88	9,972.60	53.45	55.94	-90.14	-233.99	-860.93	419.99	314.11	105.88	3.967		
10,100.00	10,072.60	10,157.88	10,072.60	53.97	56.44	-90.14	-233.99	-860.93	419.99	313.07	106.92	3.928		
10,200.00	10,172.60	10,257.88	10,172.60	54.49	56.94	-90.14	-233.99	-860.93	419.99	312.03	107.96	3.890		
10,300.00	10,272.60	10,357.88	10,272.60	55.01	57.44	-90.14	-233.99	-860.93	419.99	310.99	109.00	3.853		
10,400.00	10,372.60	10,457.88	10,372.60	55.53	57.94	-90.14	-233.99	-860.93	419.99	309.94	110.04	3.817		
10,500.00	10,472.60	10,557.88	10,472.60	56.05	58.44	-90.14	-233.99	-860.93	419.99	308.90	111.09	3.781		
10,500.72	10,473.32	10,558.60	10,473.32	56.05	58.45	-90.14	-233.99	-860.93	419.99	308.89	111.09	3.780		
10,600.00	10,572.60	10,656.46	10,570.76	56.57	58.93	-89.09	-226.27	-861.01	420.13	307.95	112.17	3.745		
10,700.00	10,672.60	10,749.74	10,661.14	57.09	59.35	-86.01	-203.61	-861.25	421.49	308.13	113.36	3.718		
10,734.44	10,707.04	10,779.86	10,689.40	57.27	59.47	-84.60	-193.19	-861.36	422.66	308.89	113.77	3.715		
10,750.00	10,722.60	10,793.16	10,701.68	57.35	59.53	-83.26	-188.12	-861.42	423.35	309.39	113.96	3.715		
10,800.00	10,772.46	10,835.21	10,739.73	57.60	59.69	-80.97	-170.22	-861.60	426.00	311.51	114.48	3.721		
10,850.00	10,821.82	10,876.36	10,775.59	57.85	59.83	-78.76	-150.07	-861.82	429.24	314.34	114.90	3.736		
10,900.00	10,870.31	10,916.69	10,809.25	58.08	59.96	-76.65	-127.85	-862.05	432.98	317.78	115.19	3.759		
10,950.00	10,917.55	10,956.31	10,840.71	58.31	60.08	-74.66	-103.79	-862.31	437.07	321.73	115.34	3.789		
11,000.00	10,963.19	10,995.30	10,869.97	58.51	60.18	-72.78	-78.03	-862.58	441.42	326.07	115.35	3.827		
11,050.00	11,006.89	11,033.74	10,897.04	58.70	60.26	-71.03	-50.76	-862.87	445.91	330.68	115.23	3.870		
11,100.00	11,048.30	11,071.68	10,921.91	58.87	60.34	-69.42	-22.11	-863.17	450.42	335.42	115.00	3.917		
11,150.00	11,087.11	11,109.19	10,944.58	59.02	60.40	-67.95	7.76	-863.49	454.85	340.18	114.67	3.967		
11,200.00	11,123.03	11,146.33	10,965.05	59.15	60.45	-66.62	38.74	-863.81	459.11	344.83	114.29	4.017		
11,250.00	11,155.79	11,183.14	10,983.32	59.25	60.49	-65.44	70.69	-864.15	463.12	349.25	113.87	4.067		
11,300.00	11,185.13	11,219.68	10,999.38	59.34	60.53	-64.41	103.50	-864.50	466.79	353.34	113.45	4.114		
11,350.00	11,210.83	11,255.98	11,013.24	59.41	60.56	-63.52	137.04	-864.85	470.06	356.99	113.07	4.157		
11,400.00	11,232.70	11,292.09	11,024.89	59.45	60.58	-62.79	171.21	-865.22	472.88	360.13	112.75	4.194		
11,450.00	11,250.57	11,328.04	11,034.33	59.49	60.60	-62.20	205.89	-865.58	475.19	362.66	112.53	4.223		
11,500.00	11,264.30	11,363.87	11,041.56	59.54	60.62	-61.75	240.97	-865.95	476.95	364.55	112.41	4.243		
11,550.00	11,273.79	11,400.00	11,046.61	59.70	60.65	-61.46	276.74	-866.33	478.15	365.73	112.42	4.253		
11,600.00	11,278.96	11,435.31	11,049.36	59.87	60.68	-61.31	311.94	-866.70	478.76	366.18	112.58	4.253		
11,634.44	11,280.00	11,459.88	11,049.99	59.98	60.71	-61.29	336.50	-866.96	478.84	366.06	112.77	4.246		
11,635.80	11,280.00	11,467.11	11,050.00	59.98	60.72	-61.29	336.43	-866.96	478.83	366.02	112.81	4.245		
11,700.00	11,280.00	11,524.01	11,049.88	60.21	60.80	-61.28	400.62	-867.64	478.89	365.65	113.24	4.229		
11,800.00	11,280.00	11,624.01	11,049.68	60.63	61.04	-61.26	500.62	-868.70	478.99	364.93	114.06	4.199		
11,900.00	11,280.00	11,724.01	11,049.48	61.11	61.39	-61.24	600.61	-869.76	479.08	364.08	115.01	4.166		
12,000.00	11,280.00	11,824.01	11,049.28	61.67	61.85	-61.22	700.61	-870.81	479.18	363.10	116.08	4.128		
12,100.00	11,280.00	11,924.01	11,049.08	62.29	62.41	-61.20	800.60	-871.87	479.28	361.99	117.28	4.087		
12,200.00	11,280.00	12,024.01	11,048.88	62.97	63.05	-61.18	900.59	-872.93	479.37	360.77	118.60	4.042		
12,300.00	11,280.00	12,124.01	11,048.68	63.73	63.78	-61.15	1,000.59	-873.99	479.47	359.44	120.03	3.994		
12,400.00	11,280.00	12,224.01	11,048.48	64.54	64.57	-61.13	1,100.58	-875.04	479.57	357.99	121.58	3.944		
12,500.00	11,280.00	12,324.01	11,048.28	65.41	65.42	-61.11	1,200.58	-876.10	479.66	356.43	123.23	3.892		
12,600.00	11,280.00	12,424.01	11,048.08	66.34	66.34	-61.09	1,300.57	-877.16	479.76	354.77	124.99	3.838		
12,700.00	11,280.00	12,524.01	11,047.88	67.33	67.32	-61.07	1,400.56	-878.22	479.86	353.02	126.84	3.783		
12,800.00	11,280.00	12,624.01	11,047.68	68.37	68.35	-61.05	1,500.56	-879.27	479.95	351.17	128.79	3.727		
12,900.00	11,280.00	12,724.01	11,047.48	69.47	69.43	-61.03	1,600.55	-880.33	480.05	349.22	130.82	3.669		
13,000.00	11,280.00	12,824.01	11,047.29	70.61	70.56	-61.01	1,700.55	-881.39	480.15	347.20	132.95	3.612		
13,100.00	11,280.00	12,924.01	11,047.09	71.80	71.74	-60.99	1,800.54	-882.45	480.24	345.09	135.15	3.553		
13,200.00	11,280.00	13,024.01	11,046.89	73.03	72.97	-60.97	1,900.53	-883.50	480.34	342.91	137.43	3.495		
13,300.00	11,280.00	13,124.01	11,046.69	74.30	74.23	-60.95	2,000.53	-884.56	480.44	340.65	139.79	3.437		
13,400.00	11,280.00	13,224.01	11,046.49	75.62	75.54	-60.93	2,100.52	-885.62	480.53	338.32	142.21	3.379		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 233H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)						
13,500.00	11,280.00	13,324.01	11,046.29	76.97	76.89	-60.91	2,200.52	-886.67	480.63	335.93	144.71	3.321		
13,600.00	11,280.00	13,424.00	11,046.09	78.36	78.27	-60.88	2,300.51	-887.73	480.73	333.47	147.26	3.265		
13,700.00	11,280.00	13,524.00	11,045.89	79.79	79.69	-60.86	2,400.50	-888.79	480.83	330.95	149.87	3.208		
13,800.00	11,280.00	13,624.00	11,045.69	81.24	81.14	-60.84	2,500.50	-889.85	480.92	328.38	152.54	3.153		
13,900.00	11,280.00	13,724.00	11,045.49	82.73	82.62	-60.82	2,600.49	-890.90	481.02	325.76	155.27	3.098		
14,000.00	11,280.00	13,824.00	11,045.29	84.25	84.13	-60.80	2,700.49	-891.96	481.12	323.08	158.04	3.044		
14,100.00	11,280.00	13,924.00	11,045.09	85.79	85.67	-60.78	2,800.48	-893.02	481.22	320.36	160.86	2.992		
14,200.00	11,280.00	14,024.00	11,044.89	87.36	87.24	-60.76	2,900.47	-894.08	481.31	317.59	163.73	2.940		
14,300.00	11,280.00	14,124.00	11,044.70	88.96	88.83	-60.74	3,000.47	-895.13	481.41	314.77	166.64	2.889		
14,400.00	11,280.00	14,224.00	11,044.50	90.58	90.44	-60.72	3,100.46	-896.19	481.51	311.92	169.59	2.839		
14,500.00	11,280.00	14,324.00	11,044.30	92.22	92.08	-60.70	3,200.46	-897.25	481.61	309.03	172.58	2.791		
14,600.00	11,280.00	14,424.00	11,044.10	93.88	93.74	-60.68	3,300.45	-898.31	481.71	306.10	175.60	2.743		
14,700.00	11,280.00	14,524.00	11,043.90	95.56	95.41	-60.66	3,400.44	-899.36	481.80	303.14	178.66	2.697		
14,800.00	11,280.00	14,624.00	11,043.70	97.27	97.11	-60.64	3,500.44	-900.42	481.90	300.15	181.75	2.651		
14,900.00	11,280.00	14,724.00	11,043.50	98.99	98.83	-60.62	3,600.43	-901.48	482.00	297.12	184.88	2.607		
15,000.00	11,280.00	14,824.00	11,043.30	100.72	100.56	-60.60	3,700.43	-902.54	482.10	294.07	188.03	2.564		
15,100.00	11,280.00	14,924.00	11,043.10	102.48	102.31	-60.57	3,800.42	-903.59	482.20	290.99	191.21	2.522		
15,200.00	11,280.00	15,024.00	11,042.90	104.24	104.07	-60.55	3,900.41	-904.65	482.29	287.88	194.42	2.481		
15,300.00	11,280.00	15,124.00	11,042.70	106.03	105.85	-60.53	4,000.41	-905.71	482.39	284.75	197.65	2.441		
15,400.00	11,280.00	15,224.00	11,042.50	107.82	107.65	-60.51	4,100.40	-906.77	482.49	281.59	200.90	2.402		
15,500.00	11,280.00	15,324.00	11,042.30	109.63	109.45	-60.49	4,200.40	-907.82	482.59	278.41	204.18	2.364		
15,600.00	11,280.00	15,424.00	11,042.10	111.46	111.27	-60.47	4,300.39	-908.88	482.69	275.21	207.48	2.326		
15,700.00	11,280.00	15,524.00	11,041.91	113.29	113.10	-60.45	4,400.38	-909.94	482.79	271.99	210.80	2.290		
15,800.00	11,280.00	15,624.00	11,041.71	115.14	114.95	-60.43	4,500.38	-911.00	482.89	268.74	214.14	2.255		
15,900.00	11,280.00	15,724.00	11,041.51	117.00	116.80	-60.41	4,600.37	-912.05	482.98	265.49	217.50	2.221		
16,000.00	11,280.00	15,824.00	11,041.31	118.86	118.67	-60.39	4,700.37	-913.11	483.08	262.21	220.87	2.187		
16,100.00	11,280.00	15,924.00	11,041.11	120.74	120.54	-60.37	4,800.36	-914.17	483.18	258.91	224.27	2.154		
16,200.00	11,280.00	16,024.00	11,040.91	122.63	122.42	-60.35	4,900.35	-915.23	483.28	255.61	227.68	2.123		
16,300.00	11,280.00	16,124.00	11,040.71	124.53	124.32	-60.33	5,000.35	-916.28	483.38	252.28	231.10	2.092		
16,400.00	11,280.00	16,224.00	11,040.51	126.43	126.22	-60.31	5,100.34	-917.34	483.48	248.94	234.54	2.061		
16,500.00	11,280.00	16,324.00	11,040.31	128.34	128.13	-60.29	5,200.34	-918.40	483.58	245.59	237.99	2.032		
16,600.00	11,280.00	16,424.00	11,040.11	130.26	130.05	-60.27	5,300.33	-919.45	483.68	242.23	241.45	2.003		
16,652.45	11,280.00	16,476.45	11,040.01	131.27	131.06	-60.26	5,352.78	-920.01	483.73	240.46	243.27	1.988 SF		



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 243H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	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	126.539		
200.00	200.00	200.00	200.00	0.74	0.74	-91.15	-1.00	-50.00	50.01	48.54	1.47	34.006		
300.00	300.00	300.00	300.00	1.27	1.27	-91.15	-1.00	-50.00	50.01	47.46	2.55	19.642		
400.00	400.00	400.00	400.00	1.81	1.81	-91.15	-1.00	-50.00	50.01	46.39	3.62	13.809		
450.00	450.00	450.00	450.00	2.08	2.08	-91.15	-1.00	-50.00	50.01	45.85	4.16	12.024 CC		
500.00	500.00	499.15	499.15	2.34	2.34	26.84	-1.08	-50.41	50.04	45.37	4.68	10.704		
600.00	599.93	597.45	597.39	2.85	2.84	27.96	-1.70	-53.73	50.32	44.63	5.69	8.849		
700.00	699.68	695.73	695.43	3.38	3.36	30.15	-2.95	-60.35	50.93	44.22	6.71	7.588		
772.27	771.59	766.74	766.10	3.76	3.75	32.36	-4.24	-67.19	51.65	44.18	7.46	6.922 ES		
800.00	799.15	793.98	793.15	3.91	3.90	33.25	-4.82	-70.27	52.10	44.35	7.75	6.724		
900.00	898.51	892.12	890.37	4.47	4.45	35.63	-7.31	-83.46	55.93	47.13	8.80	6.356		
1,000.00	997.88	989.95	986.76	5.03	5.03	36.61	-10.39	-99.86	63.04	53.19	9.86	6.396		
1,100.00	1,097.25	1,087.23	1,081.99	5.60	5.63	36.49	-14.07	-119.36	73.36	62.45	10.91	6.723		
1,200.00	1,196.62	1,183.77	1,175.77	6.17	6.27	35.67	-18.31	-141.84	86.86	74.90	11.96	7.262		
1,300.00	1,295.99	1,281.56	1,270.14	6.74	6.94	34.62	-23.05	-167.03	102.81	89.76	13.05	7.879		
1,400.00	1,395.35	1,380.23	1,365.32	7.32	7.64	33.82	-27.87	-192.61	118.94	104.77	14.17	8.394		
1,500.00	1,494.72	1,478.91	1,460.51	7.90	8.36	33.21	-32.69	-218.19	135.09	119.80	15.30	8.831		
1,600.00	1,594.09	1,577.59	1,555.69	8.48	9.09	32.73	-37.51	-243.76	151.26	134.83	16.43	9.206		
1,700.00	1,693.46	1,676.27	1,650.87	9.06	9.82	32.34	-42.33	-269.34	167.43	149.86	17.57	9.531		
1,800.00	1,792.82	1,774.95	1,746.06	9.64	10.56	32.02	-47.15	-294.92	183.61	164.90	18.71	9.815		
1,900.00	1,892.19	1,873.62	1,841.24	10.22	11.31	31.76	-51.97	-320.50	199.79	179.94	19.85	10.065		
2,000.00	1,991.56	1,972.30	1,936.42	10.80	12.05	31.53	-56.79	-346.08	215.98	194.98	21.00	10.287		
2,100.00	2,090.93	2,070.98	2,031.61	11.39	12.81	31.33	-61.61	-371.65	232.17	210.02	22.14	10.485		
2,200.00	2,190.30	2,169.66	2,126.79	11.97	13.56	31.16	-66.43	-397.23	248.36	225.07	23.29	10.662		
2,300.00	2,289.66	2,268.34	2,221.97	12.55	14.32	31.01	-71.25	-422.81	264.55	240.11	24.44	10.823		
2,400.00	2,389.03	2,367.01	2,317.16	13.14	15.08	30.88	-76.07	-448.39	280.75	255.15	25.60	10.968		
2,500.00	2,488.40	2,465.69	2,412.34	13.72	15.84	30.76	-80.89	-473.96	296.95	270.20	26.75	11.101		
2,600.00	2,587.77	2,564.37	2,507.52	14.31	16.60	30.66	-85.71	-499.54	313.14	285.24	27.90	11.222		
2,700.00	2,687.14	2,663.05	2,602.71	14.89	17.37	30.56	-90.53	-525.12	329.34	300.28	29.06	11.334		
2,800.00	2,786.50	2,761.73	2,697.89	15.48	18.13	30.48	-95.35	-550.70	345.54	315.33	30.21	11.436		
2,900.00	2,885.87	2,860.40	2,793.07	16.07	18.90	30.40	-100.17	-576.27	361.74	330.37	31.37	11.531		
3,000.00	2,985.24	2,959.08	2,888.26	16.65	19.67	30.33	-104.99	-601.85	377.94	345.42	32.53	11.619		
3,100.00	3,084.61	3,057.76	2,983.44	17.24	20.43	30.26	-109.81	-627.43	394.15	360.46	33.69	11.701		
3,200.00	3,183.98	3,156.44	3,078.62	17.82	21.20	30.20	-114.63	-653.01	410.35	375.50	34.84	11.777		
3,300.00	3,283.34	3,255.11	3,173.81	18.41	21.97	30.14	-119.45	-678.59	426.55	390.55	36.00	11.848		
3,400.00	3,382.71	3,353.79	3,268.99	19.00	22.74	30.09	-124.27	-704.16	442.75	405.59	37.16	11.914		
3,500.00	3,482.08	3,452.47	3,364.17	19.58	23.51	30.04	-129.09	-729.74	458.96	420.63	38.32	11.977		
3,600.00	3,581.45	3,551.15	3,459.36	20.17	24.28	30.00	-133.91	-755.32	475.16	435.68	39.48	12.035		
3,700.00	3,680.82	3,649.83	3,554.54	20.76	25.05	29.96	-138.73	-780.90	491.36	450.72	40.64	12.090		
3,800.00	3,780.18	3,748.50	3,649.72	21.34	25.82	29.92	-143.55	-806.47	507.57	465.76	41.80	12.142		
3,900.00	3,879.55	3,847.18	3,744.91	21.93	26.60	29.88	-148.37	-832.05	523.77	480.81	42.96	12.191		
4,000.00	3,978.92	3,945.86	3,840.09	22.52	27.37	29.85	-153.19	-857.63	539.97	495.85	44.12	12.238		
4,100.00	4,078.29	4,044.54	3,935.27	23.10	28.14	29.81	-158.01	-883.21	556.18	510.89	45.28	12.282		
4,200.00	4,177.65	4,143.22	4,030.46	23.69	28.91	29.78	-162.83	-908.79	572.38	525.94	46.45	12.324		
4,300.00	4,277.02	4,241.89	4,125.64	24.28	29.69	29.75	-167.65	-934.36	588.59	540.98	47.61	12.363		
4,400.00	4,376.39	4,340.57	4,220.82	24.86	30.46	29.73	-172.47	-959.94	604.79	556.02	48.77	12.401		
4,500.00	4,475.76	4,439.25	4,316.01	25.45	31.23	29.70	-177.29	-985.52	621.00	571.07	49.93	12.437		
4,600.00	4,575.13	4,537.93	4,411.19	26.04	32.01	29.68	-182.11	-1,011.10	637.20	586.11	51.09	12.471		
4,700.00	4,674.49	4,636.60	4,506.37	26.63	32.78	29.65	-186.93	-1,036.67	653.41	601.15	52.26	12.504		
4,800.00	4,773.86	4,735.28	4,601.56	27.21	33.55	29.63	-191.75	-1,062.25	669.61	616.20	53.42	12.535		

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 243H - OH - Plan 1													Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)				Between Centres (usft)	Between Ellipses (usft)				
4,892.13	4,865.41	4,826.19	4,689.25	27.75	34.27	29.61	-196.19	-1,085.82	684.54	630.05	54.49	12.563		
4,900.00	4,873.23	4,833.96	4,696.74	27.80	34.33	29.62	-196.57	-1,087.83	685.83	631.25	54.58	12.566		
5,000.00	4,972.80	4,932.32	4,791.62	28.37	35.10	29.70	-201.37	-1,113.33	703.76	648.04	55.73	12.629		
5,100.00	5,072.63	5,030.06	4,885.90	28.92	35.87	29.67	-206.15	-1,138.66	724.68	667.84	56.84	12.749		
5,200.00	5,172.60	5,127.06	4,979.46	29.44	36.63	29.56	-210.89	-1,163.80	748.57	690.64	57.93	12.922		
5,214.40	5,187.00	5,140.96	4,992.87	29.51	36.74	-88.31	-211.57	-1,167.40	752.26	694.18	58.08	12.952		
5,300.00	5,272.60	5,234.04	5,082.72	29.91	37.46	-88.71	-216.06	-1,191.27	774.16	715.07	59.09	13.102		
5,400.00	5,372.60	5,367.20	5,212.37	30.38	38.43	-89.17	-221.68	-1,221.08	796.50	736.02	60.48	13.169		
5,500.00	5,472.60	5,503.00	5,345.89	30.85	39.32	-89.52	-226.25	-1,245.35	814.35	752.58	61.77	13.183		
5,600.00	5,572.60	5,640.90	5,482.52	31.33	40.12	-89.77	-229.69	-1,263.60	827.58	764.65	62.93	13.150		
5,700.00	5,672.60	5,780.29	5,621.38	31.81	40.84	-89.93	-231.93	-1,275.46	836.09	772.13	63.96	13.072		
5,800.00	5,772.60	5,920.54	5,761.51	32.29	41.47	-90.00	-232.91	-1,280.69	839.82	774.97	64.84	12.952		
5,900.00	5,872.60	6,031.63	5,872.60	32.77	41.90	-90.00	-232.96	-1,280.94	840.00	774.26	65.74	12.778		
6,000.00	5,972.60	6,131.63	5,972.60	33.25	42.29	-90.00	-232.96	-1,280.94	840.00	773.31	66.69	12.596		
6,100.00	6,072.60	6,231.63	6,072.60	33.74	42.68	-90.00	-232.96	-1,280.94	840.00	772.35	67.64	12.418		
6,200.00	6,172.60	6,331.63	6,172.60	34.23	43.07	-90.00	-232.96	-1,280.94	840.00	771.40	68.60	12.245		
6,300.00	6,272.60	6,431.63	6,272.60	34.71	43.47	-90.00	-232.96	-1,280.94	840.00	770.44	69.56	12.076		
6,400.00	6,372.60	6,531.63	6,372.60	35.20	43.87	-90.00	-232.96	-1,280.94	840.00	769.47	70.52	11.911		
6,500.00	6,472.60	6,631.63	6,472.60	35.69	44.27	-90.00	-232.96	-1,280.94	840.00	768.51	71.49	11.750		
6,600.00	6,572.60	6,731.63	6,572.60	36.19	44.68	-90.00	-232.96	-1,280.94	840.00	767.54	72.46	11.593		
6,700.00	6,672.60	6,831.63	6,672.60	36.68	45.08	-90.00	-232.96	-1,280.94	840.00	766.56	73.43	11.439		
6,800.00	6,772.60	6,931.63	6,772.60	37.18	45.49	-90.00	-232.96	-1,280.94	840.00	765.59	74.41	11.289		
6,900.00	6,872.60	7,031.63	6,872.60	37.67	45.91	-90.00	-232.96	-1,280.94	840.00	764.61	75.39	11.143		
7,000.00	6,972.60	7,131.63	6,972.60	38.17	46.32	-90.00	-232.96	-1,280.94	840.00	763.63	76.37	11.000		
7,100.00	7,072.60	7,231.63	7,072.60	38.67	46.74	-90.00	-232.96	-1,280.94	840.00	762.65	77.35	10.860		
7,200.00	7,172.60	7,331.63	7,172.60	39.17	47.16	-90.00	-232.96	-1,280.94	840.00	761.66	78.33	10.723		
7,300.00	7,272.60	7,431.63	7,272.60	39.67	47.58	-90.00	-232.96	-1,280.94	840.00	760.67	79.32	10.590		
7,400.00	7,372.60	7,531.63	7,372.60	40.17	48.01	-90.00	-232.96	-1,280.94	840.00	759.68	80.31	10.459		
7,500.00	7,472.60	7,631.63	7,472.60	40.67	48.44	-90.00	-232.96	-1,280.94	840.00	758.69	81.30	10.331		
7,600.00	7,572.60	7,731.63	7,572.60	41.17	48.87	-90.00	-232.96	-1,280.94	840.00	757.70	82.30	10.207		
7,700.00	7,672.60	7,831.63	7,672.60	41.68	49.30	-90.00	-232.96	-1,280.94	840.00	756.70	83.30	10.085		
7,800.00	7,772.60	7,931.63	7,772.60	42.18	49.73	-90.00	-232.96	-1,280.94	840.00	755.70	84.29	9.965		
7,900.00	7,872.60	8,031.63	7,872.60	42.69	50.17	-90.00	-232.96	-1,280.94	840.00	754.70	85.29	9.848		
8,000.00	7,972.60	8,131.63	7,972.60	43.19	50.60	-90.00	-232.96	-1,280.94	840.00	753.70	86.30	9.734		
8,100.00	8,072.60	8,231.63	8,072.60	43.70	51.04	-90.00	-232.96	-1,280.94	840.00	752.70	87.30	9.622		
8,200.00	8,172.60	8,331.63	8,172.60	44.21	51.49	-90.00	-232.96	-1,280.94	840.00	751.69	88.30	9.513		
8,300.00	8,272.60	8,431.63	8,272.60	44.72	51.93	-90.00	-232.96	-1,280.94	840.00	750.69	89.31	9.405		
8,400.00	8,372.60	8,531.63	8,372.60	45.23	52.37	-90.00	-232.96	-1,280.94	840.00	749.68	90.32	9.300		
8,500.00	8,472.60	8,631.63	8,472.60	45.74	52.82	-90.00	-232.96	-1,280.94	840.00	748.67	91.33	9.197		
8,600.00	8,572.60	8,731.63	8,572.60	46.25	53.27	-90.00	-232.96	-1,280.94	840.00	747.66	92.34	9.097		
8,700.00	8,672.60	8,831.63	8,672.60	46.76	53.72	-90.00	-232.96	-1,280.94	840.00	746.64	93.35	8.998		
8,800.00	8,772.60	8,931.63	8,772.60	47.27	54.17	-90.00	-232.96	-1,280.94	840.00	745.63	94.37	8.901		
8,900.00	8,872.60	9,031.63	8,872.60	47.78	54.62	-90.00	-232.96	-1,280.94	840.00	744.61	95.38	8.807		
9,000.00	8,972.60	9,131.63	8,972.60	48.30	55.08	-90.00	-232.96	-1,280.94	840.00	743.60	96.40	8.714		
9,100.00	9,072.60	9,231.63	9,072.60	48.81	55.54	-90.00	-232.96	-1,280.94	840.00	742.58	97.42	8.623		
9,200.00	9,172.60	9,331.63	9,172.60	49.32	55.99	-90.00	-232.96	-1,280.94	840.00	741.56	98.44	8.533		
9,300.00	9,272.60	9,431.63	9,272.60	49.84	56.45	-90.00	-232.96	-1,280.94	840.00	740.54	99.46	8.446		
9,400.00	9,372.60	9,531.63	9,372.60	50.35	56.91	-90.00	-232.96	-1,280.94	840.00	739.52	100.48	8.360		
9,500.00	9,472.60	9,631.63	9,472.60	50.87	57.38	-90.00	-232.96	-1,280.94	840.00	738.49	101.50	8.276		
9,600.00	9,572.60	9,731.63	9,572.60	51.38	57.84	-90.00	-232.96	-1,280.94	840.00	737.47	102.53	8.193		

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 243H - OH - Plan 1											Offset Site Error: 0.00 usft		
Survey Program: 0-MWD+HDGM											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
9,700.00	9,672.60	9,831.63	9,672.60	51.90	58.30	-90.00	-232.96	-1,280.94	840.00	736.45	103.55	8.112	
9,800.00	9,772.60	9,931.63	9,772.60	52.42	58.77	-90.00	-232.96	-1,280.94	840.00	735.42	104.58	8.032	
9,900.00	9,872.60	10,031.63	9,872.60	52.93	59.24	-90.00	-232.96	-1,280.94	840.00	734.39	105.60	7.954	
10,000.00	9,972.60	10,131.63	9,972.60	53.45	59.70	-90.00	-232.96	-1,280.94	840.00	733.37	106.63	7.878	
10,100.00	10,072.60	10,231.63	10,072.60	53.97	60.17	-90.00	-232.96	-1,280.94	840.00	732.34	107.66	7.802	
10,200.00	10,172.60	10,331.63	10,172.60	54.49	60.64	-90.00	-232.96	-1,280.94	840.00	731.31	108.69	7.728	
10,300.00	10,272.60	10,431.63	10,272.60	55.01	61.11	-90.00	-232.96	-1,280.94	840.00	730.28	109.72	7.656	
10,400.00	10,372.60	10,531.63	10,372.60	55.53	61.59	-90.00	-232.96	-1,280.94	840.00	729.25	110.75	7.585	
10,500.00	10,472.60	10,631.63	10,472.60	56.05	62.06	-90.00	-232.96	-1,280.94	840.00	728.21	111.78	7.514	
10,600.00	10,572.60	10,731.63	10,572.60	56.57	62.54	-90.00	-232.96	-1,280.94	840.00	727.18	112.82	7.446	
10,700.00	10,672.60	10,831.63	10,672.60	57.09	63.01	-90.00	-232.96	-1,280.94	840.00	726.15	113.85	7.378	
10,734.44	10,707.04	10,866.07	10,707.04	57.27	63.18	-90.00	-232.96	-1,280.94	840.00	725.79	114.21	7.355	
10,750.00	10,722.60	10,881.31	10,722.28	57.35	63.25	-89.38	-232.60	-1,280.94	840.00	725.63	114.37	7.345	
10,800.00	10,772.46	10,930.52	10,771.32	57.60	63.48	-89.36	-228.76	-1,280.98	840.00	725.13	114.88	7.312	
10,850.00	10,821.82	10,979.70	10,819.82	57.85	63.70	-89.34	-220.72	-1,281.07	840.01	724.64	115.37	7.281	
10,900.00	10,870.31	11,028.85	10,867.44	58.08	63.91	-89.32	-208.57	-1,281.20	840.01	724.17	115.84	7.252	
10,950.00	10,917.55	11,077.99	10,913.82	58.31	64.11	-89.31	-192.39	-1,281.37	840.01	723.72	116.29	7.224	
11,000.00	10,963.19	11,127.12	10,958.63	58.51	64.29	-89.31	-172.29	-1,281.58	840.01	723.29	116.72	7.197	
11,050.00	11,006.89	11,176.25	11,001.56	58.70	64.45	-89.31	-148.44	-1,281.83	840.01	722.89	117.12	7.172	
11,100.00	11,048.30	11,225.38	11,042.29	58.87	64.60	-89.31	-121.00	-1,282.12	840.01	722.50	117.51	7.148	
11,150.00	11,087.11	11,274.52	11,080.53	59.02	64.73	-89.32	-90.16	-1,282.45	840.01	722.13	117.88	7.126	
11,200.00	11,123.03	11,323.67	11,115.99	59.15	64.84	-89.34	-56.15	-1,282.81	840.01	721.78	118.23	7.105	
11,250.00	11,155.79	11,372.84	11,148.43	59.25	64.93	-89.36	-19.21	-1,283.20	840.00	721.44	118.57	7.085	
11,300.00	11,185.13	11,422.05	11,177.59	59.34	65.00	-89.38	20.40	-1,283.62	840.00	721.11	118.89	7.065	
11,350.00	11,210.83	11,471.28	11,203.26	59.41	65.06	-89.41	62.39	-1,284.06	840.00	720.79	119.21	7.046	
11,400.00	11,232.70	11,520.56	11,225.25	59.45	65.11	-89.44	106.47	-1,284.53	839.99	720.48	119.52	7.028	
11,450.00	11,250.57	11,569.87	11,243.39	59.49	65.14	-89.48	152.31	-1,285.01	839.99	720.17	119.82	7.011	
11,500.00	11,264.30	11,619.24	11,257.53	59.54	65.17	-89.52	199.59	-1,285.51	839.98	719.87	120.11	6.993	
11,550.00	11,273.79	11,668.66	11,267.56	59.70	65.20	-89.57	247.97	-1,286.03	839.98	719.57	120.40	6.976	
11,600.00	11,278.96	11,718.15	11,273.39	59.87	65.24	-89.62	297.08	-1,286.55	839.97	719.28	120.69	6.960	
11,634.44	11,280.00	11,752.26	11,274.93	59.98	65.26	-89.65	331.16	-1,286.91	839.97	719.08	120.89	6.948	
11,640.40	11,280.00	11,763.99	11,275.00	60.00	65.28	-89.66	337.04	-1,286.97	839.97	719.03	120.94	6.945	
11,700.00	11,280.00	11,817.75	11,275.00	60.21	65.33	-89.66	396.64	-1,287.60	839.97	718.67	121.30	6.925	
11,800.00	11,280.00	11,917.75	11,275.00	60.63	65.49	-89.66	496.63	-1,288.66	839.97	717.91	122.05	6.882	
11,900.00	11,280.00	12,017.75	11,275.00	61.11	65.72	-89.66	596.63	-1,289.71	839.97	717.01	122.95	6.832	
12,000.00	11,280.00	12,117.75	11,275.00	61.67	66.03	-89.66	696.62	-1,290.77	839.97	715.97	124.00	6.774	
12,100.00	11,280.00	12,217.75	11,275.00	62.29	66.43	-89.66	796.62	-1,291.83	839.97	714.78	125.19	6.710	
12,200.00	11,280.00	12,317.75	11,275.00	62.97	66.91	-89.66	896.61	-1,292.89	839.97	713.46	126.51	6.640	
12,300.00	11,280.00	12,417.75	11,275.00	63.73	67.48	-89.66	996.61	-1,293.94	839.97	712.01	127.97	6.564	
12,400.00	11,280.00	12,517.75	11,275.00	64.54	68.14	-89.66	1,096.60	-1,295.00	839.97	710.42	129.55	6.484	
12,500.00	11,280.00	12,617.75	11,275.00	65.41	68.87	-89.66	1,196.59	-1,296.06	839.97	708.72	131.26	6.399	
12,600.00	11,280.00	12,717.75	11,275.00	66.34	69.68	-89.66	1,296.59	-1,297.12	839.97	706.89	133.09	6.312	
12,700.00	11,280.00	12,817.75	11,275.00	67.33	70.56	-89.66	1,396.58	-1,298.18	839.97	704.95	135.03	6.221	
12,800.00	11,280.00	12,917.75	11,275.00	68.37	71.50	-89.66	1,496.58	-1,299.23	839.98	702.90	137.08	6.128	
12,900.00	11,280.00	13,017.75	11,275.00	69.47	72.50	-89.66	1,596.57	-1,300.29	839.98	700.74	139.23	6.033	
13,000.00	11,280.00	13,117.75	11,275.00	70.61	73.55	-89.66	1,696.57	-1,301.35	839.98	698.49	141.49	5.937	
13,100.00	11,280.00	13,217.75	11,275.00	71.80	74.66	-89.66	1,796.56	-1,302.41	839.98	696.14	143.84	5.840	
13,200.00	11,280.00	13,317.75	11,275.00	73.03	75.82	-89.66	1,896.56	-1,303.46	839.98	693.70	146.28	5.742	
13,300.00	11,280.00	13,417.75	11,275.00	74.30	77.02	-89.66	1,996.55	-1,304.52	839.98	691.18	148.80	5.645	
13,400.00	11,280.00	13,517.75	11,275.00	75.62	78.27	-89.66	2,096.54	-1,305.58	839.98	688.57	151.41	5.548	
13,500.00	11,280.00	13,617.75	11,275.00	76.97	79.56	-89.66	2,196.54	-1,306.64	839.98	685.89	154.09	5.451	

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



Pro Directional
Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - 243H - OH - Plan 1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,600.00	11,280.00	13,717.75	11,275.00	78.36	80.88	-89.66	2,296.53	-1,307.69	839.98	683.13	156.85	5.355		
13,700.00	11,280.00	13,817.75	11,275.00	79.79	82.24	-89.66	2,396.53	-1,308.75	839.98	680.30	159.68	5.260		
13,800.00	11,280.00	13,917.75	11,275.00	81.24	83.64	-89.66	2,496.52	-1,309.81	839.98	677.41	162.57	5.167		
13,900.00	11,280.00	14,017.75	11,275.00	82.73	85.07	-89.66	2,596.52	-1,310.87	839.98	674.45	165.53	5.074		
14,000.00	11,280.00	14,117.75	11,275.00	84.25	86.53	-89.66	2,696.51	-1,311.92	839.98	671.44	168.55	4.984		
14,100.00	11,280.00	14,217.75	11,275.00	85.79	88.02	-89.66	2,796.50	-1,312.98	839.98	668.36	171.62	4.894		
14,200.00	11,280.00	14,317.75	11,275.00	87.36	89.54	-89.66	2,896.50	-1,314.04	839.98	665.24	174.75	4.807		
14,300.00	11,280.00	14,417.75	11,275.00	88.96	91.08	-89.66	2,996.49	-1,315.10	839.98	662.06	177.92	4.721		
14,400.00	11,280.00	14,517.75	11,275.00	90.58	92.65	-89.66	3,096.49	-1,316.16	839.98	658.84	181.15	4.637		
14,500.00	11,280.00	14,617.75	11,275.00	92.22	94.25	-89.66	3,196.48	-1,317.21	839.99	655.57	184.41	4.555		
14,600.00	11,280.00	14,717.75	11,275.00	93.88	95.86	-89.66	3,296.48	-1,318.27	839.99	652.26	187.73	4.475		
14,700.00	11,280.00	14,817.75	11,275.00	95.56	97.50	-89.66	3,396.47	-1,319.33	839.99	648.91	191.08	4.396		
14,800.00	11,280.00	14,917.75	11,275.00	97.27	99.15	-89.66	3,496.47	-1,320.39	839.99	645.52	194.47	4.319		
14,900.00	11,280.00	15,017.75	11,275.00	98.99	100.83	-89.66	3,596.46	-1,321.44	839.99	642.09	197.90	4.245		
15,000.00	11,280.00	15,117.75	11,275.00	100.72	102.53	-89.66	3,696.45	-1,322.50	839.99	638.63	201.36	4.172		
15,100.00	11,280.00	15,217.75	11,275.00	102.48	104.24	-89.66	3,796.45	-1,323.56	839.99	635.13	204.86	4.100		
15,200.00	11,280.00	15,317.75	11,275.00	104.24	105.97	-89.66	3,896.44	-1,324.62	839.99	631.61	208.38	4.031		
15,300.00	11,280.00	15,417.75	11,275.00	106.03	107.71	-89.66	3,996.44	-1,325.67	839.99	628.05	211.94	3.963		
15,400.00	11,280.00	15,517.75	11,275.00	107.82	109.47	-89.66	4,096.43	-1,326.73	839.99	624.47	215.52	3.897		
15,500.00	11,280.00	15,617.75	11,275.00	109.63	111.24	-89.66	4,196.43	-1,327.79	839.99	620.86	219.14	3.833		
15,600.00	11,280.00	15,717.75	11,275.00	111.46	113.03	-89.66	4,296.42	-1,328.85	839.99	617.22	222.77	3.771		
15,700.00	11,280.00	15,817.75	11,275.00	113.29	114.83	-89.66	4,396.42	-1,329.90	839.99	613.56	226.43	3.710		
15,800.00	11,280.00	15,917.75	11,275.00	115.14	116.64	-89.66	4,496.41	-1,330.96	839.99	609.87	230.12	3.650		
15,900.00	11,280.00	16,017.75	11,275.00	117.00	118.47	-89.66	4,596.40	-1,332.02	839.99	606.17	233.83	3.592		
16,000.00	11,280.00	16,117.75	11,275.00	118.86	120.30	-89.66	4,696.40	-1,333.08	839.99	602.44	237.55	3.536		
16,100.00	11,280.00	16,217.75	11,275.00	120.74	122.15	-89.66	4,796.39	-1,334.13	840.00	598.69	241.30	3.481		
16,200.00	11,280.00	16,317.75	11,275.00	122.63	124.01	-89.66	4,896.39	-1,335.19	840.00	594.93	245.07	3.428		
16,300.00	11,280.00	16,417.75	11,275.00	124.53	125.87	-89.66	4,996.38	-1,336.25	840.00	591.14	248.85	3.375		
16,400.00	11,280.00	16,517.75	11,275.00	126.43	127.75	-89.66	5,096.38	-1,337.31	840.00	587.34	252.66	3.325		
16,500.00	11,280.00	16,617.75	11,275.00	128.34	129.63	-89.66	5,196.37	-1,338.37	840.00	583.52	256.48	3.275		
16,600.00	11,280.00	16,717.75	11,275.00	130.26	131.53	-89.66	5,296.36	-1,339.42	840.00	579.69	260.31	3.227		
16,652.45	11,280.00	16,770.20	11,275.00	131.27	132.52	-89.66	5,348.81	-1,339.98	840.00	577.67	262.33	3.202 SF		



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	97.60	-89.10	667.60	674.51				
100.00	100.00	66.30	66.30	0.20	0.18	97.60	-89.07	667.47	673.39	673.01	0.38	1,788.619	
200.00	200.00	168.29	168.29	0.74	0.64	97.59	-88.86	666.85	672.77	671.40	1.37	490.551	
300.00	300.00	266.40	266.39	1.27	1.16	97.55	-88.28	666.30	672.13	669.70	2.43	276.353	
352.11	352.11	315.62	315.61	1.55	1.42	97.50	-87.75	666.23	671.99	669.01	2.97	226.026	
400.00	400.00	358.58	358.56	1.81	1.65	97.44	-87.02	666.49	672.16	668.71	3.46	194.447	
450.00	450.00	403.41	403.37	2.08	1.88	97.34	-85.94	667.13	672.72	668.76	3.96	169.828	
500.00	500.00	447.81	447.75	2.34	2.12	-144.93	-84.69	668.15	674.04	669.59	4.46	151.294	
600.00	599.93	539.68	539.52	2.85	2.60	-145.28	-81.94	671.34	679.97	674.52	5.45	124.732	
700.00	699.68	638.79	638.52	3.38	3.13	-145.77	-79.31	675.31	689.40	682.90	6.50	106.043	
772.27	771.59	713.36	713.02	3.76	3.52	-146.18	-77.61	678.00	697.79	690.51	7.28	95.804	
800.00	799.15	741.22	740.86	3.91	3.67	-146.37	-77.08	678.93	701.25	693.67	7.58	92.495	
900.00	898.51	841.86	841.44	4.47	4.21	-147.01	-75.81	682.07	713.64	704.99	8.65	82.534	
1,000.00	997.88	940.20	939.73	5.03	4.73	-147.54	-75.36	684.90	725.92	716.22	9.70	74.811	
1,100.00	1,097.25	1,033.78	1,033.26	5.60	5.23	-147.99	-75.47	687.98	738.72	727.98	10.74	68.797	
1,200.00	1,196.62	1,126.62	1,126.02	6.17	5.72	-148.38	-76.16	691.86	752.46	740.70	11.77	63.939	
1,300.00	1,295.99	1,226.09	1,225.38	6.74	6.25	-148.74	-77.52	696.36	766.63	753.79	12.84	59.712	
1,400.00	1,395.35	1,330.51	1,329.70	7.32	6.81	-149.08	-79.24	700.48	780.26	766.32	13.94	55.971	
1,500.00	1,494.72	1,432.61	1,431.73	7.90	7.35	-149.40	-80.92	704.08	793.50	778.47	15.03	52.788	
1,600.00	1,594.09	1,537.84	1,536.90	8.48	7.91	-149.78	-81.77	707.14	806.13	789.98	16.15	49.929	
1,700.00	1,693.46	1,641.44	1,640.48	9.06	8.47	-150.21	-81.67	709.47	818.10	800.84	17.25	47.418	
1,800.00	1,792.82	1,741.37	1,740.40	9.64	9.00	-150.61	-81.56	711.38	829.77	811.43	18.34	45.246	
1,900.00	1,892.19	1,837.95	1,836.95	10.22	9.52	-150.96	-81.79	713.34	841.61	822.21	19.41	43.370	
2,000.00	1,991.56	1,933.04	1,932.01	10.80	10.03	-151.28	-82.25	715.68	853.92	833.45	20.46	41.732	
2,100.00	2,090.93	2,031.41	2,030.35	11.39	10.56	-151.59	-82.99	718.49	866.63	845.09	21.54	40.236	
2,200.00	2,190.30	2,136.78	2,135.68	11.97	11.12	-151.89	-84.03	721.04	878.95	856.29	22.66	38.791	
2,300.00	2,289.66	2,240.25	2,239.12	12.55	11.67	-152.16	-85.30	722.85	890.61	866.85	23.77	37.475	
2,400.00	2,389.03	2,337.63	2,336.48	13.14	12.19	-152.42	-86.48	724.40	902.14	877.31	24.83	36.327	
2,500.00	2,488.40	2,428.88	2,427.70	13.72	12.68	-152.63	-87.76	726.36	914.25	888.39	25.86	35.348	
2,600.00	2,587.77	2,517.03	2,515.77	14.31	13.15	-152.77	-90.09	729.28	927.50	900.63	26.87	34.515	
2,700.00	2,687.14	2,609.84	2,608.42	14.89	13.65	-152.83	-93.90	733.25	941.68	913.77	27.91	33.739	
2,800.00	2,786.50	2,712.36	2,710.72	15.48	14.21	-152.85	-98.67	737.70	955.92	926.90	29.02	32.942	
2,900.00	2,885.87	2,810.98	2,809.09	16.07	14.74	-152.81	-104.39	741.89	970.06	939.96	30.10	32.228	
3,000.00	2,985.24	2,914.31	2,912.03	16.65	15.29	-152.65	-112.34	746.05	983.95	952.73	31.22	31.521	
3,100.00	3,084.61	3,015.36	3,012.63	17.24	15.84	-152.44	-121.00	749.82	997.54	965.23	32.32	30.867	
3,200.00	3,183.98	3,115.69	3,112.58	17.82	16.38	-152.28	-129.13	753.37	1,010.97	977.55	33.42	30.254	
3,300.00	3,283.34	3,213.82	3,210.39	18.41	16.91	-152.17	-136.14	756.85	1,024.41	989.91	34.50	29.693	
3,400.00	3,382.71	3,313.82	3,310.11	19.00	17.46	-152.09	-142.68	760.39	1,037.85	1,002.25	35.60	29.154	
3,500.00	3,482.08	3,413.63	3,409.66	19.58	18.00	-152.03	-149.13	763.83	1,051.20	1,014.50	36.70	28.645	
3,600.00	3,581.45	3,511.90	3,507.67	20.17	18.54	-151.97	-155.41	767.23	1,064.56	1,026.78	37.78	28.174	
3,700.00	3,680.82	3,609.00	3,604.52	20.76	19.07	-151.92	-161.46	770.73	1,078.07	1,039.20	38.87	27.739	
3,800.00	3,780.18	3,708.22	3,703.47	21.34	19.61	-151.87	-167.66	774.38	1,091.65	1,051.69	39.96	27.317	
3,900.00	3,879.55	3,807.99	3,802.98	21.93	20.16	-151.82	-173.91	778.03	1,105.21	1,064.15	41.06	26.915	
4,000.00	3,978.92	3,912.34	3,907.08	22.52	20.73	-151.78	-180.22	781.55	1,118.50	1,076.30	42.20	26.505	
4,100.00	4,078.29	4,008.94	4,003.45	23.10	21.26	-151.74	-186.01	784.74	1,131.70	1,088.43	43.28	26.150	
4,200.00	4,177.65	4,107.96	4,102.24	23.69	21.80	-151.71	-191.84	788.09	1,144.99	1,100.61	44.37	25.803	
4,300.00	4,277.02	4,209.33	4,203.40	24.28	22.36	-151.70	-197.52	791.41	1,158.17	1,112.68	45.49	25.461	
4,400.00	4,376.39	4,308.19	4,302.06	24.86	22.90	-151.69	-202.97	794.58	1,171.28	1,124.70	46.58	25.144	
4,500.00	4,475.76	4,408.81	4,402.48	25.45	23.45	-151.69	-208.40	797.74	1,184.33	1,136.64	47.69	24.833	
4,600.00	4,575.13	4,507.89	4,501.38	26.04	23.99	-151.69	-213.62	800.80	1,197.33	1,148.54	48.79	24.541	
4,700.00	4,674.49	4,606.87	4,600.18	26.63	24.54	-151.70	-218.84	803.88	1,210.34	1,160.45	49.89	24.262	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,800.00	4,773.86	4,709.48	4,702.59	27.21	25.10	-151.70	-224.27	806.92	1,223.21	1,172.20	51.01	23.979		
4,892.13	4,865.41	4,803.12	4,796.08	27.75	25.61	-151.71	-229.04	809.47	1,234.85	1,182.81	52.04	23.729		
4,900.00	4,873.23	4,811.13	4,804.08	27.80	25.66	-151.72	-229.44	809.68	1,235.83	1,183.70	52.13	23.708		
5,000.00	4,972.80	4,912.50	4,905.29	28.37	26.21	-151.80	-234.39	812.26	1,246.51	1,193.28	53.23	23.416		
5,100.00	5,072.63	5,013.36	5,006.00	28.92	26.76	-151.77	-239.22	814.69	1,254.00	1,199.68	54.33	23.083		
5,200.00	5,172.60	5,113.19	5,105.70	29.44	27.31	-151.65	-243.87	817.06	1,258.39	1,202.99	55.40	22.715		
5,214.40	5,187.00	5,127.53	5,120.02	29.51	27.38	90.53	-244.53	817.40	1,258.77	1,203.22	55.55	22.660		
5,300.00	5,272.60	5,212.99	5,205.37	29.91	27.85	90.71	-248.47	819.44	1,260.85	1,204.42	56.43	22.343		
5,400.00	5,372.60	5,314.05	5,306.30	30.38	28.40	90.91	-252.95	821.78	1,263.23	1,205.76	57.47	21.979		
5,500.00	5,472.60	5,412.21	5,404.33	30.85	28.94	91.10	-257.35	824.11	1,265.68	1,207.19	58.49	21.638		
5,600.00	5,572.60	5,513.54	5,505.53	31.33	29.49	91.31	-261.90	826.50	1,268.14	1,208.60	59.54	21.298		
5,700.00	5,672.60	5,614.01	5,605.88	31.81	30.04	91.50	-266.25	828.79	1,270.53	1,209.95	60.58	20.972		
5,800.00	5,772.60	5,713.91	5,705.66	32.29	30.58	91.69	-270.45	831.05	1,272.91	1,211.29	61.62	20.657		
5,900.00	5,872.60	5,813.19	5,804.83	32.77	31.13	91.87	-274.62	833.33	1,275.34	1,212.68	62.66	20.354		
6,000.00	5,972.60	5,912.92	5,904.45	33.25	31.67	92.05	-278.75	835.65	1,277.81	1,214.11	63.70	20.061		
6,100.00	6,072.60	6,014.30	6,005.73	33.74	32.22	92.23	-282.78	837.95	1,280.22	1,215.47	64.75	19.772		
6,200.00	6,172.60	6,113.80	6,105.13	34.23	32.76	92.39	-286.52	840.20	1,282.64	1,216.85	65.79	19.496		
6,300.00	6,272.60	6,216.78	6,208.02	34.71	33.32	92.55	-290.11	842.39	1,284.91	1,218.06	66.85	19.220		
6,400.00	6,372.60	6,315.93	6,307.09	35.20	33.86	92.70	-293.65	844.44	1,287.14	1,219.25	67.89	18.959		
6,500.00	6,472.60	6,416.39	6,407.46	35.69	34.41	92.86	-297.20	846.50	1,289.36	1,220.42	68.94	18.703		
6,600.00	6,572.60	6,515.34	6,506.33	36.19	34.95	93.01	-300.71	848.58	1,291.64	1,221.67	69.98	18.457		
6,700.00	6,672.60	6,616.93	6,607.83	36.68	35.50	93.17	-304.41	850.64	1,293.87	1,222.83	71.04	18.214		
6,800.00	6,772.60	6,718.22	7,944.63	37.18	56.15	174.38	-431.29	-421.44	1,224.85	1,182.89	41.96	29.191		
6,900.00	6,872.60	9,087.69	7,944.64	37.67	56.19	174.80	-431.32	-422.91	1,126.30	1,083.64	42.65	26.407		
7,000.00	6,972.60	9,089.14	7,944.66	38.17	56.22	175.22	-431.34	-424.36	1,028.02	984.57	43.45	23.657		
7,100.00	7,072.60	9,090.57	7,944.68	38.67	56.25	175.63	-431.37	-425.79	930.12	885.70	44.42	20.941		
7,200.00	7,172.60	9,091.99	7,944.70	39.17	56.29	176.04	-431.39	-427.21	832.71	787.10	45.60	18.259		
7,300.00	7,272.60	9,093.40	7,944.72	39.67	56.32	176.45	-431.41	-428.62	735.99	688.85	47.13	15.615		
7,400.00	7,372.60	9,094.79	7,944.74	40.17	56.36	176.85	-431.44	-430.01	640.27	591.08	49.19	13.016		
7,500.00	7,472.60	9,096.17	7,944.75	40.67	56.39	177.25	-431.46	-431.39	546.10	494.00	52.10	10.482		
7,600.00	7,572.60	9,097.54	7,944.77	41.17	56.42	177.64	-431.48	-432.76	454.41	397.99	56.42	8.054		
7,700.00	7,672.60	9,098.51	7,944.78	41.68	56.45	177.92	-431.50	-433.73	367.09	303.94	63.15	5.813		
7,800.00	7,772.60	9,099.75	7,944.80	42.18	56.48	178.28	-431.53	-434.96	288.13	214.38	73.75	3.907		
7,900.00	7,872.60	9,100.96	7,944.81	42.69	56.51	178.62	-431.55	-436.18	226.45	137.98	88.46	2.560		
8,000.00	7,972.60	9,102.15	7,944.83	43.19	56.54	178.97	-431.57	-437.36	198.83	99.66	99.18	2.005		
8,008.73	7,981.33	9,102.25	7,944.83	43.24	56.54	179.00	-431.57	-437.47	198.64	99.27	99.37	1.999	CC, ES, SF	
8,100.00	8,072.60	9,103.31	7,944.84	43.70	56.57	179.30	-431.59	-438.53	218.60	125.28	93.32	2.342		
8,200.00	8,172.60	9,104.46	7,944.85	44.21	56.60	179.63	-431.61	-439.67	275.75	195.85	79.90	3.451		
8,300.00	8,272.60	9,105.58	7,944.87	44.72	56.63	179.96	-431.63	-440.80	352.54	283.15	69.40	5.080		
8,400.00	8,372.60	9,106.68	7,944.88	45.23	56.65	-179.72	-431.65	-441.90	438.79	376.04	62.74	6.993		
8,500.00	8,472.60	9,107.77	7,944.89	45.74	56.68	-179.41	-431.67	-442.98	529.88	471.23	58.65	9.035		
8,600.00	8,572.60	9,108.83	7,944.90	46.25	56.71	-179.11	-431.69	-444.05	623.71	567.60	56.11	11.116		
8,700.00	8,672.60	9,109.87	7,944.91	46.76	56.73	-178.80	-431.70	-445.09	719.20	664.70	54.51	13.194		
8,800.00	8,772.60	9,110.90	7,944.93	47.27	56.76	-178.51	-431.72	-446.12	815.78	762.27	53.50	15.247		
8,900.00	8,872.60	9,111.91	7,944.94	47.78	56.78	-178.22	-431.74	-447.13	913.09	860.20	52.89	17.264		
9,000.00	8,972.60	9,112.90	7,944.95	48.30	56.81	-177.93	-431.76	-448.12	1,010.92	958.38	52.54	19.242		
9,100.00	9,072.60	9,113.87	7,944.96	48.81	56.83	-177.65	-431.78	-449.09	1,109.14	1,056.77	52.37	21.180		
9,200.00	9,172.60	9,114.83	7,944.97	49.32	56.85	-177.38	-431.79	-450.05	1,207.65	1,155.32	52.33	23.077		
9,300.00	9,272.60	9,115.77	7,944.98	49.84	56.88	-177.11	-431.81	-450.99	1,306.38	1,253.99	52.39	24.934		
9,400.00	9,372.60	9,116.70	7,944.99	50.35	56.90	-176.84	-431.83	-451.91	1,405.30	1,352.77	52.53	26.752		

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



Pro Directional Anticollision Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 246H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH													Offset Site Error:
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM													0.00 usft
Reference Offset Semi Major Axis													Offset Well Error:
Distance													0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,500.00	9,472.60	9,117.61	7,945.00	50.87	56.92	-176.58	-431.84	-452.82	1,504.36	1,451.63	52.72	28.532	
9,600.00	9,572.60	9,118.50	7,945.01	51.38	56.94	-176.33	-431.86	-453.72	1,603.53	1,550.56	52.97	30.275	
9,700.00	9,672.60	9,119.38	7,945.02	51.90	56.97	-176.07	-431.87	-454.60	1,702.80	1,649.56	53.24	31.982	
9,800.00	9,772.60	9,120.25	7,945.02	52.42	56.99	-175.83	-431.89	-455.46	1,802.15	1,748.60	53.55	33.653	
9,900.00	9,872.60	9,121.10	7,945.03	52.93	57.01	-175.58	-431.90	-456.31	1,901.57	1,847.68	53.88	35.290	
10,000.00	9,972.60	9,121.94	7,945.04	53.45	57.03	-175.34	-431.92	-457.15	2,001.04	1,946.80	54.24	36.893	
10,100.00	10,072.60	9,122.76	7,945.05	53.97	57.05	-175.11	-431.94	-457.98	2,100.57	2,045.95	54.61	38.463	
10,200.00	10,172.60	9,123.57	7,945.06	54.49	57.07	-174.88	-431.95	-458.79	2,200.13	2,145.13	55.00	40.001	
10,300.00	10,272.60	9,124.37	7,945.07	55.01	57.09	-174.65	-431.96	-459.59	2,299.74	2,244.33	55.41	41.507	
10,400.00	10,372.60	9,125.16	7,945.07	55.53	57.11	-174.42	-431.98	-460.37	2,399.37	2,343.55	55.82	42.982	
10,500.00	10,472.60	9,125.94	7,945.08	56.05	57.13	-174.20	-431.99	-461.15	2,499.04	2,442.79	56.25	44.426	
10,600.00	10,572.60	9,126.70	7,945.09	56.57	57.15	-173.99	-432.01	-461.91	2,598.73	2,542.04	56.69	45.841	
10,700.00	10,672.60	9,127.45	7,945.09	57.09	57.17	-173.77	-432.02	-462.66	2,698.45	2,641.31	57.14	47.226	
10,734.44	10,707.04	9,127.71	7,945.10	57.27	57.17	-173.70	-432.02	-462.92	2,732.79	2,675.50	57.30	47.697	
10,750.00	10,722.60	9,127.82	7,945.10	57.35	57.17	-169.01	-432.03	-463.03	2,748.32	2,690.96	57.37	47.907	
10,800.00	10,772.46	9,128.17	7,945.10	57.60	57.18	-11.81	-432.03	-463.38	2,798.31	2,740.69	57.61	48.570	
10,850.00	10,821.82	9,128.48	7,945.10	57.85	57.19	-3.92	-432.04	-463.69	2,848.11	2,790.23	57.88	49.207	
10,900.00	10,870.31	9,128.76	7,945.11	58.08	57.20	-2.36	-432.04	-463.97	2,897.37	2,839.21	58.16	49.818	
10,950.00	10,917.55	9,129.00	7,945.11	58.31	57.20	-1.70	-432.05	-464.22	2,945.76	2,887.30	58.45	50.395	
11,000.00	10,963.19	9,129.21	7,945.11	58.51	57.21	-1.33	-432.05	-464.42	2,992.94	2,934.19	58.76	50.936	
11,050.00	11,006.89	9,129.38	7,945.11	58.70	57.21	-1.10	-432.06	-464.59	3,038.64	2,979.57	59.08	51.434	
11,100.00	11,048.30	9,129.50	7,945.11	58.87	57.22	-0.94	-432.06	-464.72	3,082.58	3,023.17	59.41	51.885	
11,150.00	11,087.11	9,129.59	7,945.11	59.02	57.22	-0.82	-432.06	-464.80	3,124.50	3,064.74	59.76	52.283	
11,200.00	11,123.03	9,129.64	7,945.12	59.15	57.22	-0.74	-432.06	-464.85	3,164.16	3,104.04	60.13	52.624	
11,250.00	11,155.79	9,129.64	7,945.12	59.25	57.22	-0.67	-432.06	-464.86	3,201.37	3,140.85	60.52	52.902	
11,300.00	11,185.13	9,129.61	7,945.11	59.34	57.22	-0.61	-432.06	-464.82	3,235.92	3,174.99	60.93	53.112	
11,350.00	11,210.83	9,129.54	7,945.11	59.41	57.22	-0.57	-432.06	-464.75	3,267.63	3,206.27	61.36	53.250	
11,400.00	11,232.70	9,129.43	7,945.11	59.45	57.21	-0.53	-432.06	-464.64	3,296.36	3,234.53	61.83	53.314	
11,450.00	11,250.57	9,129.28	7,945.11	59.49	57.21	-0.50	-432.05	-464.49	3,321.96	3,259.64	62.33	53.298	
11,500.00	11,264.30	9,129.10	7,945.11	59.54	57.21	-0.48	-432.05	-464.31	3,344.32	3,281.46	62.86	53.203	
11,550.00	11,273.79	9,128.88	7,945.11	59.70	57.20	-0.46	-432.05	-464.09	3,363.32	3,299.90	63.43	53.026	
11,600.00	11,278.96	9,128.63	7,945.11	59.87	57.19	-0.44	-432.04	-463.84	3,378.89	3,314.86	64.03	52.768	
11,634.44	11,280.00	9,128.43	7,945.10	59.98	57.19	-0.43	-432.04	-463.65	3,387.58	3,323.10	64.47	52.544	
11,700.00	11,280.00	9,128.06	7,945.10	60.21	57.18	-0.42	-432.03	-463.27	3,403.11	3,337.76	65.35	52.072	
11,800.00	11,280.00	9,127.48	7,945.09	60.63	57.17	-0.41	-432.02	-462.70	3,429.09	3,362.30	66.79	51.343	
11,900.00	11,280.00	9,126.91	7,945.09	61.11	57.15	-0.40	-432.01	-462.13	3,457.76	3,389.45	68.31	50.619	
12,000.00	11,280.00	9,126.34	7,945.08	61.67	57.14	-0.39	-432.00	-461.56	3,489.06	3,419.17	69.90	49.916	
12,100.00	11,280.00	9,125.78	7,945.08	62.29	57.12	-0.38	-431.99	-460.99	3,522.93	3,451.39	71.54	49.245	
12,200.00	11,280.00	9,125.21	7,945.07	62.97	57.11	-0.37	-431.98	-460.43	3,559.28	3,486.07	73.21	48.614	
12,300.00	11,280.00	9,124.65	7,945.07	63.73	57.10	-0.37	-431.97	-459.87	3,598.05	3,523.14	74.91	48.030	
12,400.00	11,280.00	9,124.09	7,945.06	64.54	57.08	-0.36	-431.96	-459.31	3,639.15	3,562.53	76.62	47.497	
12,500.00	11,280.00	9,123.54	7,945.06	65.41	57.07	-0.35	-431.95	-458.75	3,682.51	3,604.19	78.32	47.016	
12,600.00	11,280.00	9,122.98	7,945.05	66.34	57.06	-0.34	-431.94	-458.20	3,728.05	3,648.03	80.02	46.590	
12,700.00	11,280.00	9,122.43	7,945.05	67.33	57.04	-0.33	-431.93	-457.65	3,775.69	3,693.99	81.69	46.217	
12,800.00	11,280.00	9,121.88	7,945.04	68.37	57.03	-0.32	-431.92	-457.10	3,825.35	3,742.00	83.35	45.897	
12,900.00	11,280.00	9,121.34	7,945.04	69.47	57.01	-0.31	-431.91	-456.55	3,876.95	3,791.98	84.97	45.629	
13,000.00	11,280.00	9,120.79	7,945.03	70.61	57.00	-0.30	-431.90	-456.01	3,930.42	3,843.87	86.55	45.411	
13,100.00	11,280.00	9,120.25	7,945.02	71.80	56.99	-0.29	-431.89	-455.47	3,985.68	3,897.58	88.10	45.241	
13,200.00	11,280.00	9,119.71	7,945.02	73.03	56.97	-0.28	-431.88	-454.93	4,042.66	3,953.05	89.61	45.116	
13,300.00	11,280.00	9,119.17	7,945.01	74.30	56.96	-0.27	-431.87	-454.39	4,101.29	4,010.22	91.07	45.034	
13,400.00	11,280.00	9,118.64	7,945.01	75.62	56.95	-0.26	-431.86	-453.85	4,161.49	4,069.00	92.49	44.993	

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



Pro Directional Anticollision Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design Cypress 34 - Knoll AOK 002 (O) - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-MWD+HDGM, 7421-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
13,500.00	11,280.00	9,118.11	7,945.00	76.97	56.94	-0.25	-431.85	-453.32	4,223.21	4,129.34	93.87	44.991			
13,600.00	11,280.00	9,117.58	7,945.00	78.36	56.92	-0.24	-431.84	-452.79	4,286.36	4,191.17	95.20	45.026			
13,700.00	11,280.00	9,117.05	7,944.99	79.79	56.91	-0.23	-431.83	-452.26	4,350.90	4,254.42	96.48	45.094			
13,800.00	11,280.00	9,116.52	7,944.99	81.24	56.90	-0.22	-431.82	-451.74	4,416.77	4,319.04	97.73	45.195			
13,900.00	11,280.00	9,116.00	7,944.98	82.73	56.88	-0.21	-431.81	-451.22	4,483.89	4,384.97	98.92	45.327			
14,000.00	11,280.00	9,115.48	7,944.98	84.25	56.87	-0.21	-431.80	-450.69	4,552.22	4,452.14	100.08	45.486			
14,100.00	11,280.00	9,114.96	7,944.97	85.79	56.86	-0.20	-431.79	-450.18	4,621.71	4,520.52	101.19	45.673			
14,200.00	11,280.00	9,114.44	7,944.96	87.36	56.84	-0.19	-431.79	-449.66	4,692.29	4,590.03	102.26	45.885			
14,300.00	11,280.00	9,113.93	7,944.96	88.96	56.83	-0.18	-431.78	-449.14	4,763.93	4,660.64	103.29	46.120			
14,400.00	11,280.00	9,113.42	7,944.95	90.58	56.82	-0.17	-431.77	-448.63	4,836.58	4,732.29	104.29	46.377			
14,500.00	11,280.00	9,112.91	7,944.95	92.22	56.81	-0.16	-431.76	-448.12	4,910.19	4,804.95	105.24	46.655			
14,600.00	11,280.00	9,112.40	7,944.94	93.88	56.79	-0.15	-431.75	-447.61	4,984.72	4,878.55	106.16	46.953			
14,700.00	11,280.00	9,111.89	7,944.94	95.56	56.78	-0.14	-431.74	-447.11	5,060.12	4,953.07	107.05	47.268			
14,800.00	11,280.00	9,111.39	7,944.93	97.27	56.77	-0.13	-431.73	-446.60	5,136.37	5,028.47	107.90	47.602			
14,900.00	11,280.00	9,110.89	7,944.93	98.99	56.76	-0.13	-431.72	-446.10	5,213.42	5,104.70	108.72	47.951			
15,000.00	11,280.00	9,110.39	7,944.92	100.72	56.74	-0.12	-431.71	-445.60	5,291.24	5,181.72	109.51	48.315			
15,100.00	11,280.00	9,109.89	7,944.91	102.48	56.73	-0.11	-431.70	-445.11	5,369.79	5,259.51	110.28	48.694			
15,200.00	11,280.00	9,109.39	7,944.91	104.24	56.72	-0.10	-431.70	-444.61	5,449.04	5,338.03	111.01	49.086			
15,300.00	11,280.00	9,108.90	7,944.90	106.03	56.71	-0.09	-431.69	-444.12	5,528.97	5,417.25	111.72	49.491			
15,400.00	11,280.00	9,108.41	7,944.90	107.82	56.70	-0.08	-431.68	-443.63	5,609.54	5,497.14	112.40	49.908			
15,500.00	11,280.00	9,107.92	7,944.89	109.63	56.68	-0.07	-431.67	-443.14	5,690.73	5,577.67	113.05	50.336			
15,600.00	11,280.00	9,107.43	7,944.89	111.46	56.67	-0.07	-431.66	-442.65	5,772.51	5,658.82	113.69	50.775			
15,700.00	11,280.00	9,106.95	7,944.88	113.29	56.66	-0.06	-431.65	-442.16	5,854.85	5,740.55	114.30	51.223			
15,800.00	11,280.00	9,106.46	7,944.88	115.14	56.65	-0.05	-431.64	-441.68	5,937.74	5,822.84	114.89	51.681			
15,900.00	11,280.00	9,105.98	7,944.87	117.00	56.64	-0.04	-431.64	-441.20	6,021.14	5,905.68	115.46	52.148			
16,000.00	11,280.00	9,105.50	7,944.86	118.86	56.62	-0.03	-431.63	-440.72	6,105.05	5,989.03	116.01	52.624			
16,100.00	11,280.00	9,105.02	7,944.86	120.74	56.61	-0.02	-431.62	-440.24	6,189.43	6,072.88	116.55	53.107			
16,200.00	11,280.00	9,104.55	7,944.85	122.63	56.60	-0.02	-431.61	-439.77	6,274.27	6,157.21	117.06	53.598			
16,300.00	11,280.00	9,104.08	7,944.85	124.53	56.59	-0.01	-431.60	-439.29	6,359.55	6,241.99	117.56	54.096			
16,400.00	11,280.00	9,103.60	7,944.84	126.43	56.58	0.00	-431.59	-438.82	6,445.26	6,327.21	118.05	54.600			
16,500.00	11,280.00	9,103.13	7,944.84	128.34	56.57	0.01	-431.59	-438.35	6,531.37	6,412.85	118.51	55.111			
16,600.00	11,280.00	16,600.00	7,944.42	130.26	237.43	0.55	-430.93	-407.40	6,617.87	6,340.95	276.92	23.898			
16,652.45	11,280.00	16,652.45	7,944.41	131.27	238.70	0.56	-430.91	-406.67	6,663.39	6,384.80	278.59	23.918			



Pro Directional Anticollision Report



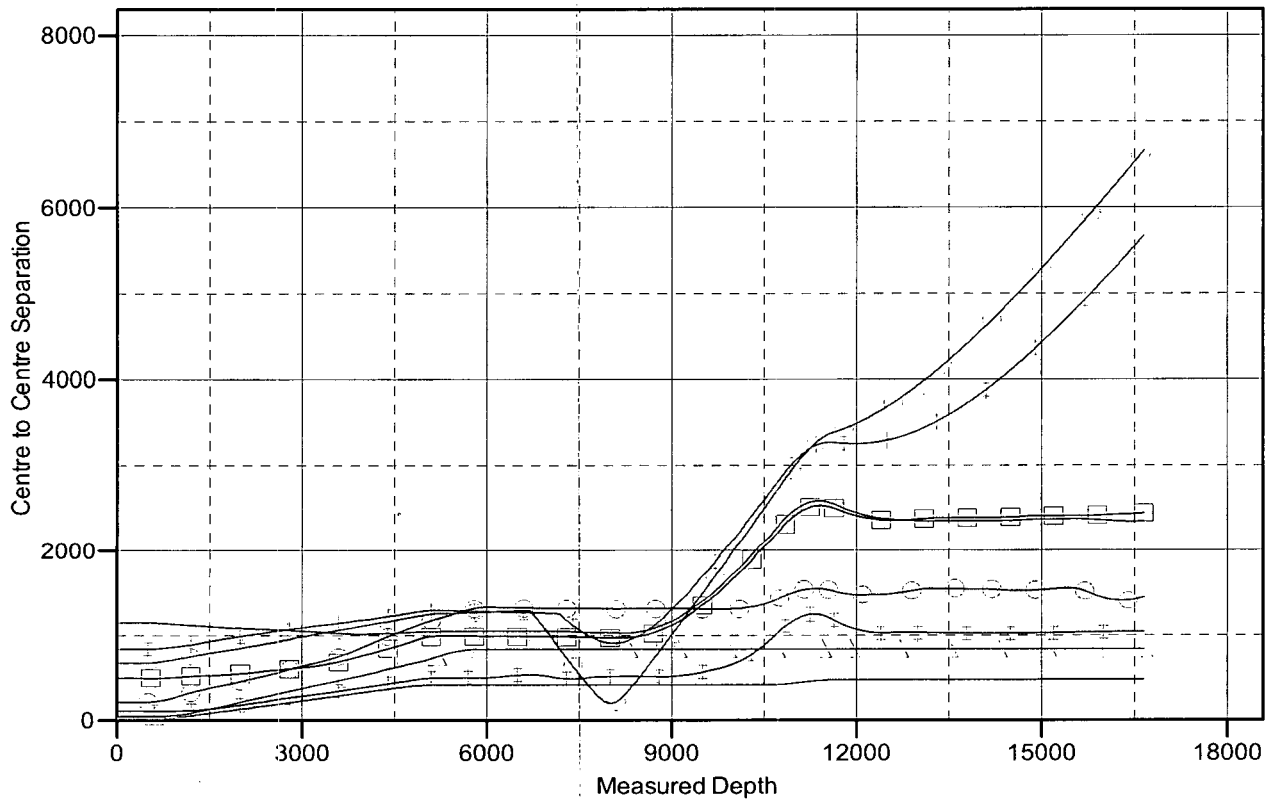
Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Reference Site: Cypress 34
Site Error: 0.00 usft
Reference Well: 246H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1

Local Co-ordinate Reference: Well 246H
TVD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
MD Reference: Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3119.50usft (GL: 3093' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: 246H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND



233H, OH, Plan 1 V0
243H, OH, Plan 1 V0
001H (O), OH, OH V0



009H (O), OH, OH V0
008H (O), OH, OH V0
012H (O), OH, OH V0



015H (O), OH, OH V0
Kodi AKK 002 (O), OH, OH V0



Pro Directional
Anticollision Report

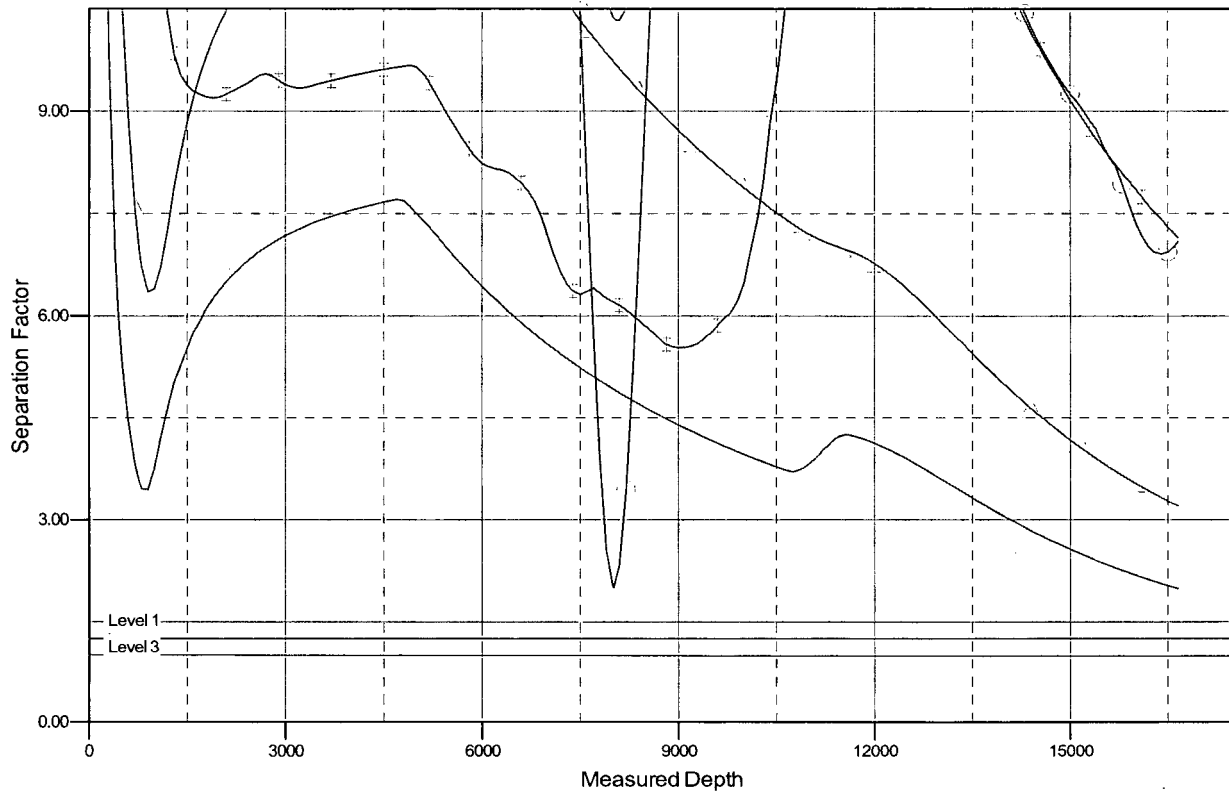


Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 246H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Reference Site:	Cypress 34	MD Reference:	Well @ 3119.50usft (GL: 3093' + Est. KB: 26.5')
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	246H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	3.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

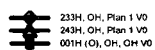
Reference Depths are relative to Well @ 3119.50usft (GL: 3093' + Est.
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: 246H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND



233H (O), OH, OH V0
243H (O), OH, OH V0
001H (O), OH, OH V0



009H (O), OH, OH V0
006H (O), OH, OH V0
012H (O), OH, OH V0



015H (O), OH, OH V0
Knoll ACK 002 (O), OH, OH V0

Tap Rock Operating, LLC
 Cypress 34 Federal #246H
 SHL 241' FNL & 1146' FEL, Sec. 3, 24S, 29E
 BHL 5' FNL & 1590' FEL, Sec. 34, 23S, 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	312	312	salt
Salado salt (top salt)	627	627	salt
Base salt	3153	3137	salt
Delaware Mountain Group	3173	3157	hydrocarbons
Bell Canyon sandstone	3193	3177	hydrocarbons
Brushy Canyon sandstone	5314	5287	hydrocarbons
Bone Spring limestone	6909	6882	hydrocarbons
1 st Bone Spring sandstone	7929	7902	hydrocarbons
2 nd Bone Spring sandstone	8629	8602	hydrocarbons
3 rd Bone Spring sandstone	9854	9827	hydrocarbons
Wolfcamp A	10219	10192	hydrocarbons
Wolfcamp A Fat	10399	10372	hydrocarbons
Wolfcamp B	10559	10532	hydrocarbons
(KOP	10734	10707	hydrocarbons)
Wolfcamp B2 (Goal)	11405	11237	hydrocarbons
TD	16652	11280	--

2. NOTABLE ZONES

Wolfcamp B2 is the goal. Closest water well (C 01627) in State Engineer records is 8,400' northwest. Well was drilled to 170'. Depth to water was not reported but OSE estimated ground water depth is 22'.

3. PRESSURE CONTROL

Pressure Control Equipment (See Schematics):

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

Tap Rock Operating, LLC
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BHL 5' FNL & 1590' FEL, Sec. 34, 23S, 29E
Eddy County, NM

DRILL PLAN PAGE 2

in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

BOP Test procedure will be as follows:

After surface casing is set and the BOP is 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 - 350	0 - 350	13.375" surface	54.5	J-55	BTC	1.13	1.15	1.51
12.25"	0 - 3300	0 - 3283	9.625" inter. 1	40.0	J-55	BTC	1.13	1.15	1.51
8.75"	0 - 3100	0 - 3085	7.625" inter. 2 top	29.7	P-110	BTC	1.13	1.15	1.51
8.75"	3100 - 9734	3085 - 9703	7.625" inter. 2 bottom	29.7	P-110	Flush	1.13	1.15	1.51
6.75"	0 - 9734	0 - 9703	5.5" product. top	20.0	P-110	BTC	1.13	1.15	1.51
6.75"	9734 - 16652	9703 - 11280	5" product. bottom	18.0	P-110	Flush	1.13	1.15	1.51

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 Eddy County, NM

DRILL PLAN PAGE 3

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. Wedge 513 will be run on the bottom of the 7 5/8" casing. Butress will be run on top.

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	270	1.8	486	13.5	Class C + 5% Bentonite + 2% CaCl + LCM
TOC = Surface		100% Excess			Centralizers per Onshore Order 2 III. B. 1f	
Intermediate 1	Lead	755	2.19	1653	12.7	Class C + bentonite + 1% CaCl ₂ + 8% NaCl + LCM
	Tail	311	1.33	414	14.8	Class C + 5% NaCl + LCM
TOC = Surface		100% Excess			2 on btm jt, 1 on 2nd jt, 1 every 4th jt to surface	
Intermediate 2	Lead	222	3.36	746	11.5	TXI + fluid loss + dispersant + retarder + LCM
	Tail	190	1.39	264	13.2	TXI + fluid loss + dispersant + retarder + LCM
TOC = 2300		35% Excess			2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement	
Production	Tail	950	1.24	1178	14.2	Class H + fluid loss + dispersant + retarder + LCM
TOC = 8734		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)	Mud Wt. (lb/gal)	Viscosity	Fluid Loss
Surface	17.5"	FW spud mud	0-350	8.3	28	NC
Inter. 1	12.25"	Brine water	350 – 3300	10.0	30-32	NC
Inter. 2	8.75"	FW & cut brine	3300 – 9734	9.0	30-32	NC
Production	6.75"	OBM	9734 – 16652	12.50	15-20	<10

Tap Rock Operating, LLC
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Eddy County, NM

DRILL PLAN PAGE 4

6. CORES, TESTS, & LOGS

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

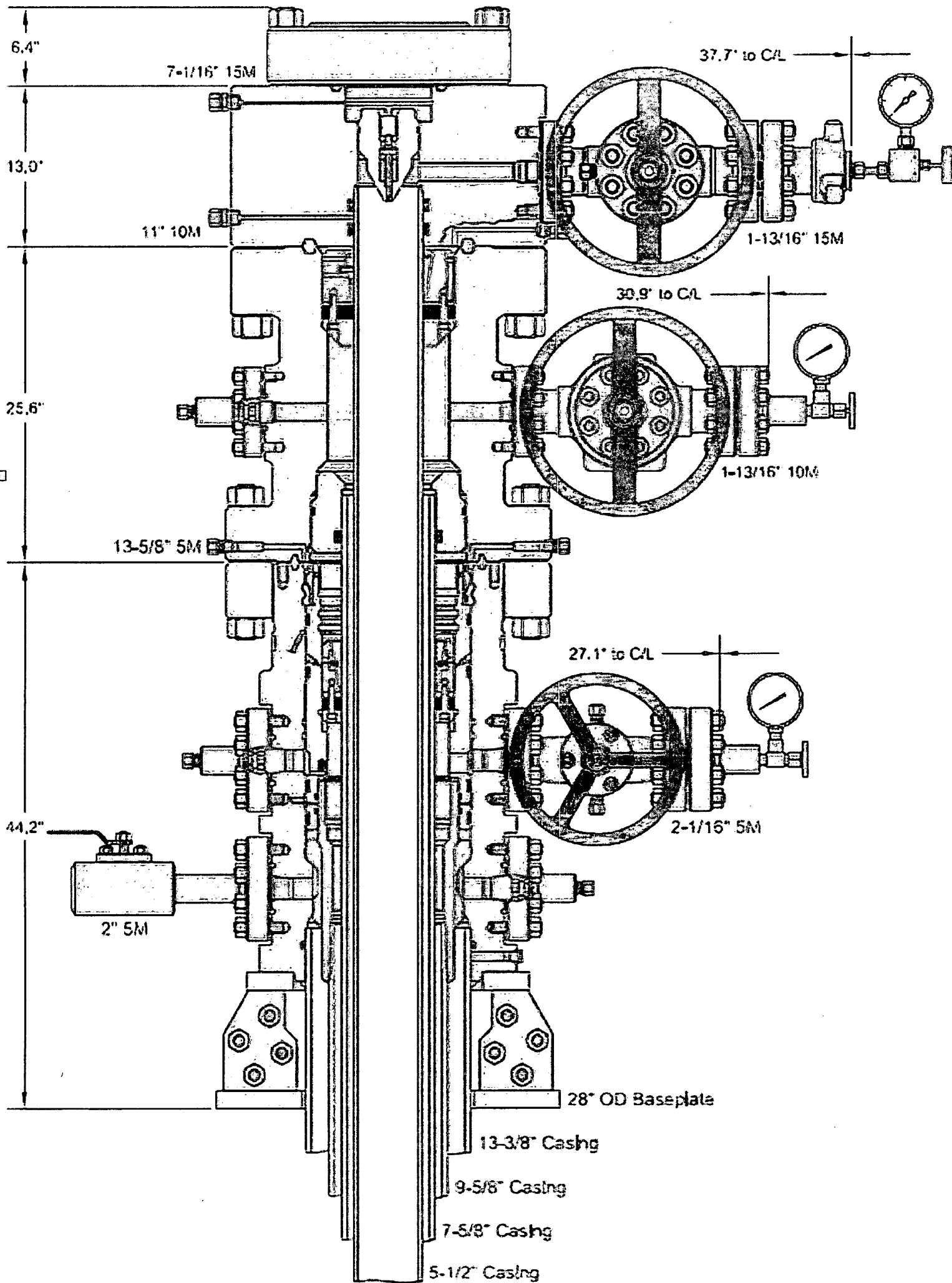
7. DOWN HOLE CONDITIONS

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Tap Rock Operating does not anticipate that there will be enough 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: 6,765 psi
Estimated BHT: 160°

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈3 months to drill and complete the well.





Tenaris

Casing and Tubing Performance Data

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

Size Wall Grade Connection Unit

Pipe Body Data

GEOMETRY

Nominal OD	13.375 in	Wall Thickness	0.380 in	API Drift Diameter	12.459 in
Nominal Weight	54.50 lbs/ft	Nominal ID	12.615 in	Alternate Drift Diameter	n.a.
Plain End Weight	52.79 lbs/ft	Nominal Cross Section	15.513 sq in		

PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Body Yield Strength	853,000 lbs	Internal Yield Pressure	2,730 psi	Collapse Pressure	1,130 psi

Connection Data

GEOMETRY

Regular OD	14.375 in	Threads Per Inch	5	Make-Up Thread Turns	1
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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		

Tenaris Hydril Premium Connections

Print

Contact Us

Ver 8.6



Tenaris

Casing and Tubing Performance Data

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

Size Wall Grade Connection Unit

Pipe Body Data

GEOMETRY

Nominal OD	9.625 in	Wall Thickness	0.395 in	API Drift Diameter	8.679 in
Nominal Weight	40.00 lbs/ft	Nominal ID	8.835 in	Alternate Drift Diameter	8.75 in
Plain End Weight	38.97 lbs/ft	Nominal Cross Section	11.454 sq in		

PERFORMANCE

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Body Yield Strength	630,000 lbs	Internal Yield Pressure	3,950 psi	Collapse Pressure	2,570 psi

Connection Data

GEOMETRY

Regular OD	10.625 in	Threads Per Inch	5	Make-Up Thread Turns	1
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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		

[Tenaris Hydril Premium Connections](#)

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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

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	7.000 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

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



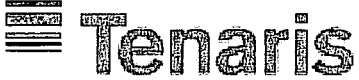
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Wall Thickness	0.361 in	Drift	API Standard	▼	Compare
Grade	P110	Type	Casing	▼	Request Info
		Connection OD Option	REGULAR	▼	CONNECTION INFORMATION
					> Blanking Dimensions
					> Connection's Page
					> Brochure
					> Datasheet Manual

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 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 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

Casing/Cementing Variance

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.

Wedge 513 will be run on the bottom of the 7 5/8" casing, Butress will be run on top



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

SUPO Data Report

06/17/2019

APD ID: 10400035688

Submission Date: 10/29/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

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:

Cypress_246H_Road_Map1_20181029111930.pdf

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? YES

Attach Well map:

Cypress_246H_Well_Map_v1_102418_20181029111954.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility currently serves the Cypress 34 Fed 15H, which has already been drilled and completed on the same pad, and will also be used for the recently accepted 234H, 236H, and 244H and the proposed 233H, 243H, and 246H wells once they have been drilled. The CTB and its associated infrastructure (road, power line, and flowlines) is located on the producing lease in Section 34, 23S 29E and was permitted with the previous group of Cypress 34 wells (234H, 236H, and 244H). An additional 3 flow lines will be constructed for the 3 additional wells (233H, 243H, and 246H) from the existing Cypress CTB to the existing well pad. These buried flowlines will be poly ~4" OD.

Production Facilities map:

Cypress_246H_Production_Facilities_Diagram_Plat_20190215103811.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

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

Water source type: GW WELL

Describe type:

Source longitude:

Source latitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: TRUCKING

Source transportation land ownership: FEDERAL

Water source volume (barrels): 18000

Source volume (acre-feet): 2.3200758

Source volume (gal): 756000

Water source and transportation map:

Cypress_246H_Water_Gravel_Source_Map_20181029112021.pdf

Water source comments: This well will be drilled using a combination of water mud systems. Water will be trucked from a private water well (C 03662) on private land in NWNE 23-24s-33e.

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

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.):

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

Construction Materials description: NM One Call (811) will be notified before construction starts. There will be no topsoil as fill will be brought in to extend the pad. No topsoil will be removed as it was previously removed and stockpiled to the side of the pad when the location was originally constructed by Oxy USA. If additional caliche is needed it will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on location.

Construction Materials source location attachment:

Cypress_246H_Construction_methods_FIG1_20181029112036.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings, mud, salts, and other chemicals

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel tanks

Safe containmant attachment:

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

Disposal type description:

Disposal location description: R360's state approved (NM1-6-0) disposal site at Halfway, NM

Reserve Pit

Reserve Pit being used? NO

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

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

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Steel tanks on pad

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:

Cypress_246H_Well_Site_Layout_20181029112125.pdf

Comments:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: CYPRESS 34 FEDERAL

Multiple Well Pad Number: 233H

Recontouring attachment:

Cypress_246H_InterimRec_Production_FIG1_20181029112137.pdf

Cypress_246H_PAD_EXTENSION_RECONTOUR_PLATS_20181029112150.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres): 0.63	Well pad interim reclamation (acres): 0.63	Well pad long term disturbance (acres): 0
Road proposed disturbance (acres): 0	Road interim reclamation (acres): 0	Road long term disturbance (acres): 0
Powerline proposed disturbance (acres): 0	Powerline interim reclamation (acres): 0	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 2.6	Pipeline interim reclamation (acres): 2.6	Pipeline long term disturbance (acres): 0
Other proposed disturbance (acres): 0	Other interim reclamation (acres): 0	Other long term disturbance (acres): 0
Total proposed disturbance: 3.23	Total interim reclamation: 3.23	Total long term disturbance: 0

Disturbance Comments:

Reconstruction method: Areas of the pad site not required for operations will be reclaimed. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

Topsoil redistribution: The original topsoil will be returned to the area of the drill pad not necessary to operate the well.

Soil treatment: None

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:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

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:

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

Total pounds/Acre:

Seed Type	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:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

Weed treatment plan description: To BLM standards

Weed treatment plan attachment:

Monitoring plan description: To BLM standards

Monitoring plan attachment:

Success standards: To BLM satisfaction

Pit closure description: No pit

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

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:

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 246H

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:

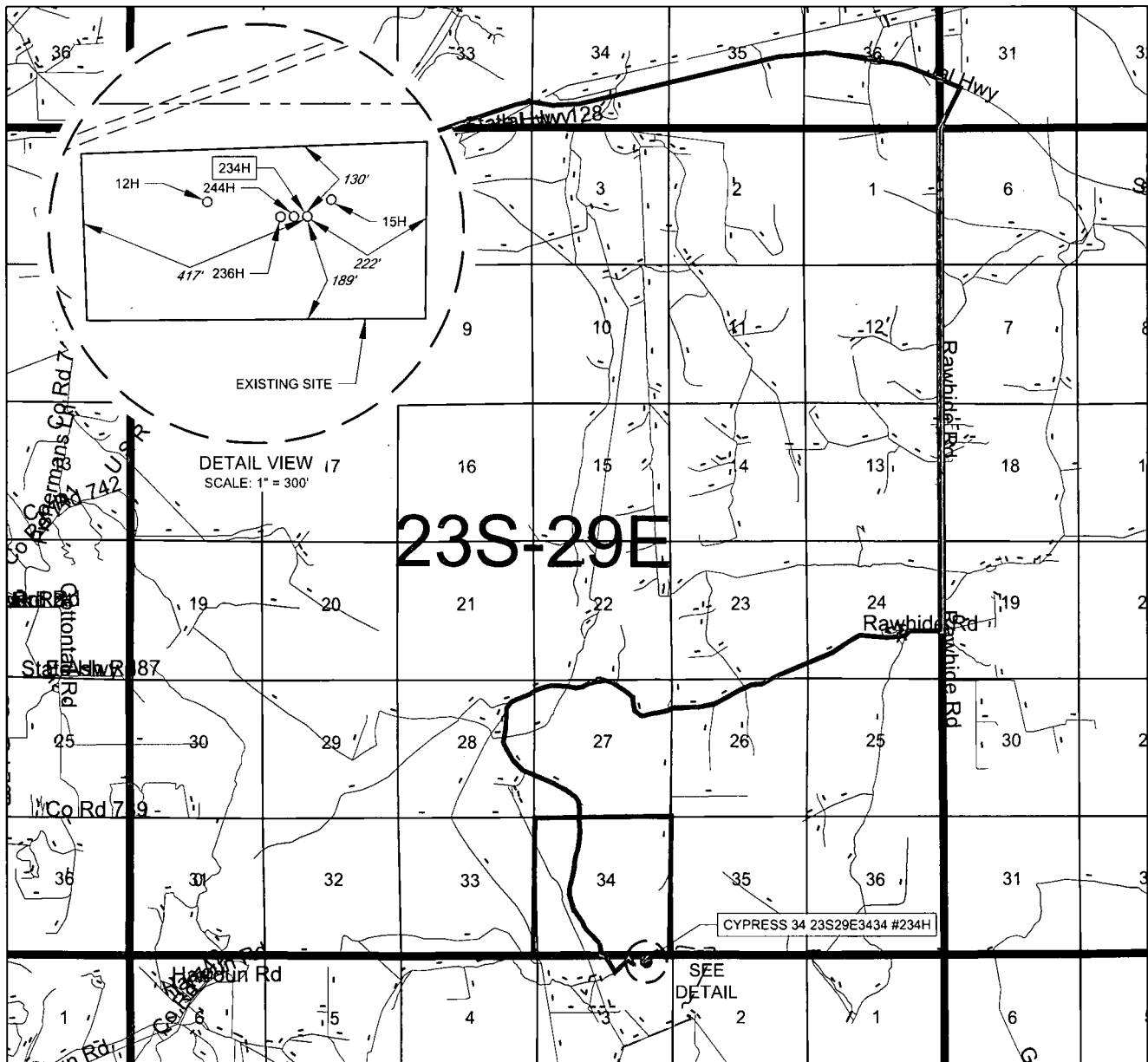
Use a previously conducted onsite? YES

Previous Onsite information: On-site inspection for the pad extension was held with Matt Wirth (BLM) on August 24th, 2018.

Other SUPO Attachment

Cypress_246H_SUPO_20181029112236.pdf

EXHIBIT 2 VICINITY MAP



LEASE NAME & WELL NO.: CYPRESS 34 23S29E3434 #234H

SECTION 3 TWP 24-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 209' FNL & 982' FEL

DISTANCE & DIRECTION

FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ± 4.5
MILES, THENCE SOUTH (RIGHT) ON RAWHIDE ROAD ± 4.1 MILES,
THENCE WEST, (RIGHT) ON MAIN ROAD ± 3.5 MILES, THENCE SOUTH
CONTINUING ON MAIN ROAD ± 2.6 MILES TO A POINT ± 500 FEET
SOUTHWEST 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.

Map 1-2



SCALE: 1" = 10000'
0' 5000' 10000'

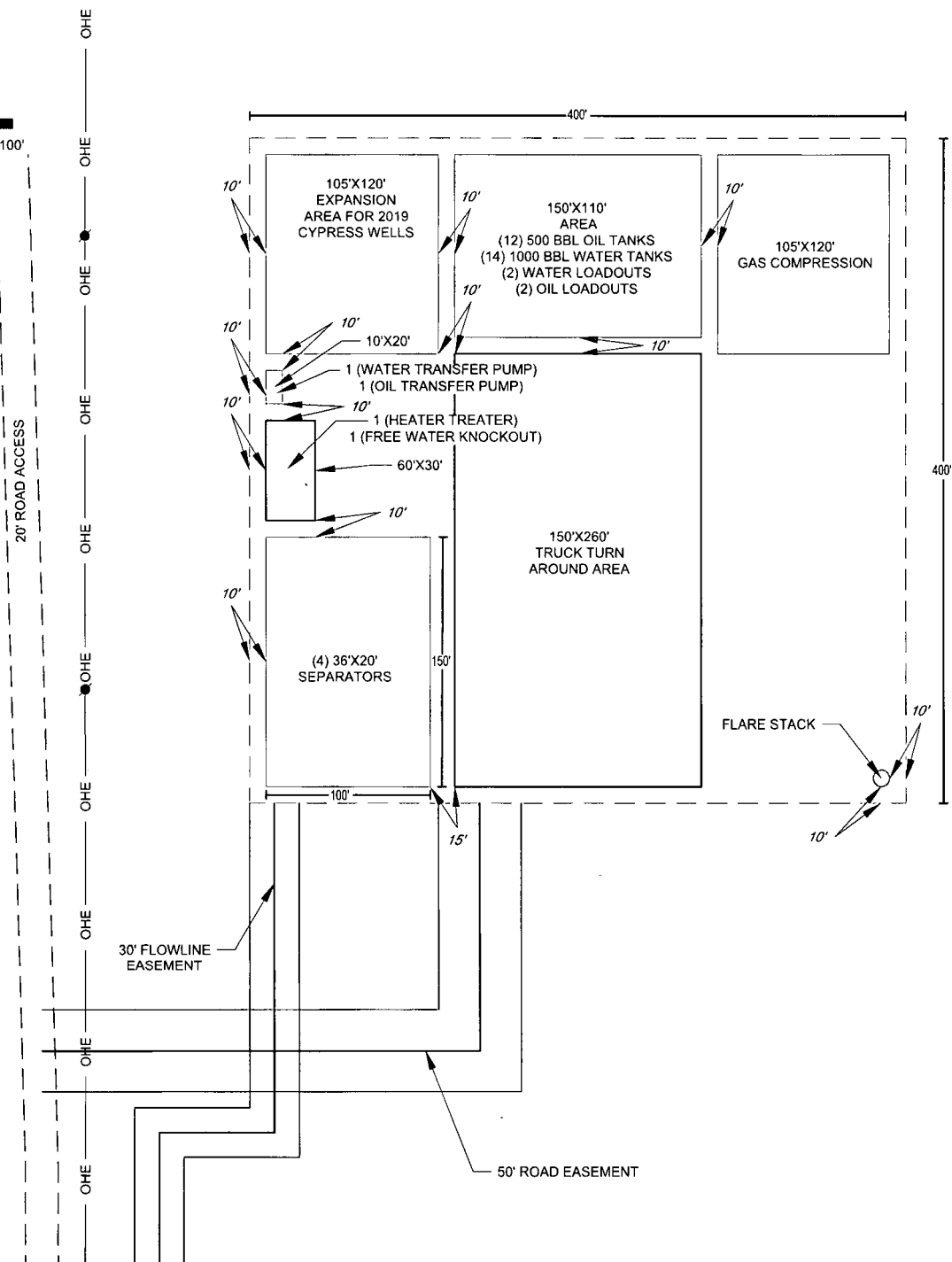
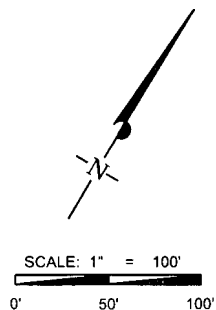


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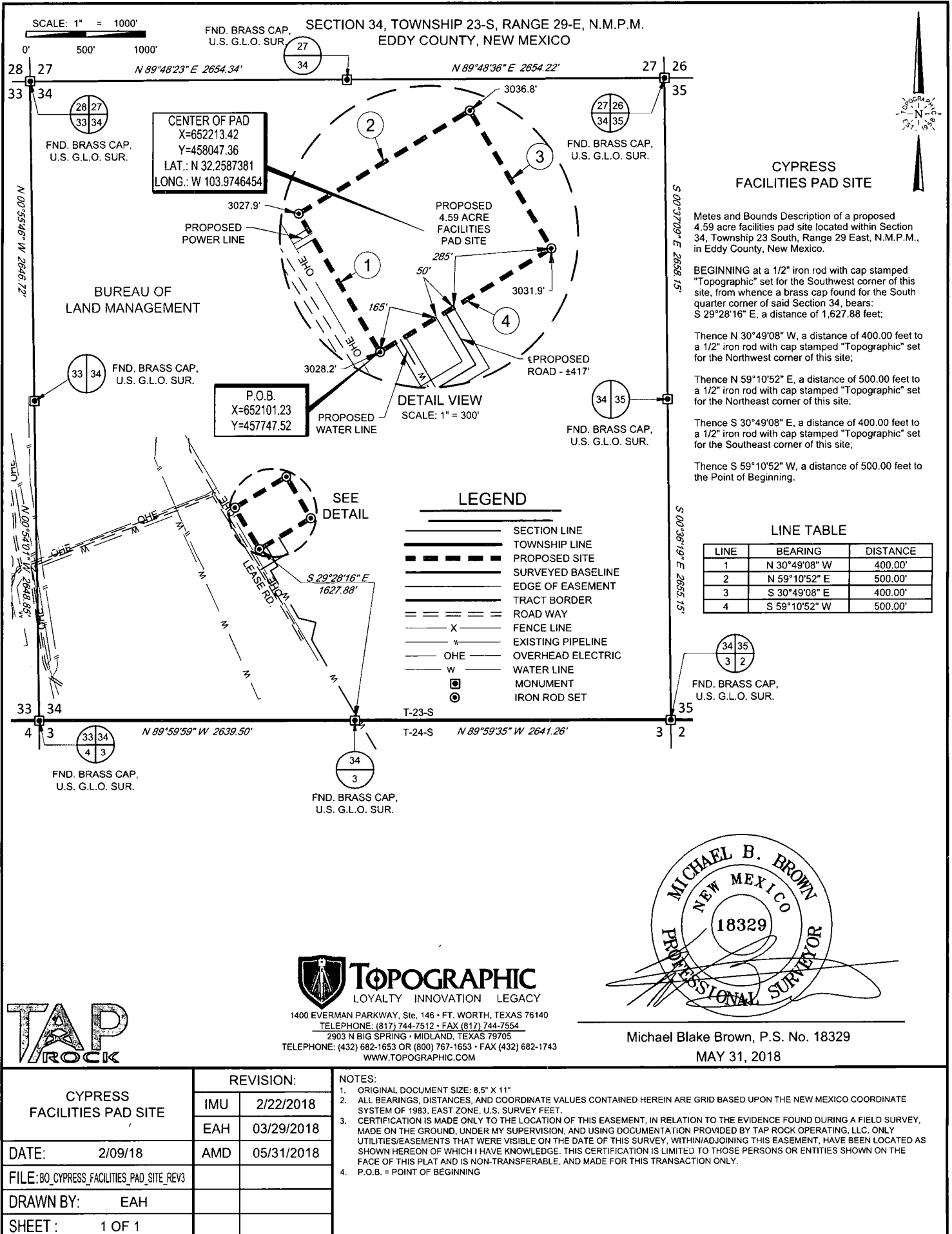
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SKETCH

SECTION 34, TOWNSHIP 23-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



CYPRESS FACILITIES PAD SITE SKETCH	REVISION:	
	INT	DATE
DATE: 04/02/18		
FILE: SK_CYPRESS_34_23S29E3434_AREA_REV		
DRAWN BY: AMD		
SHEET: 1 OF 1		

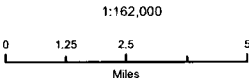


Tap Rock Operating LLC

Cypress 34 Federal Water & Caliche Source Map

Lea & Eddy County, New Mexico

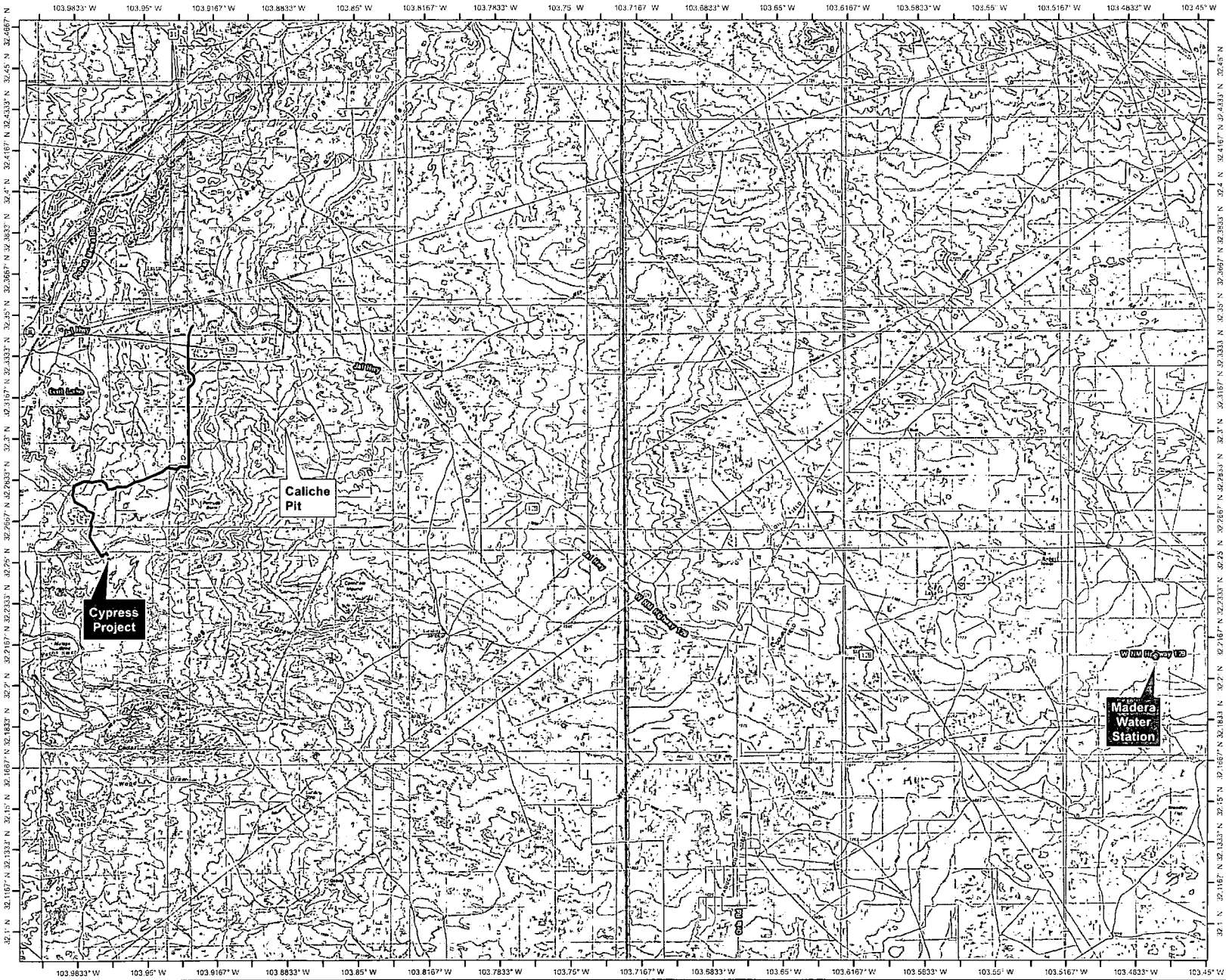
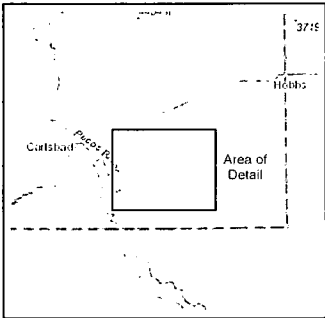
- Caliche Source
- Water Source



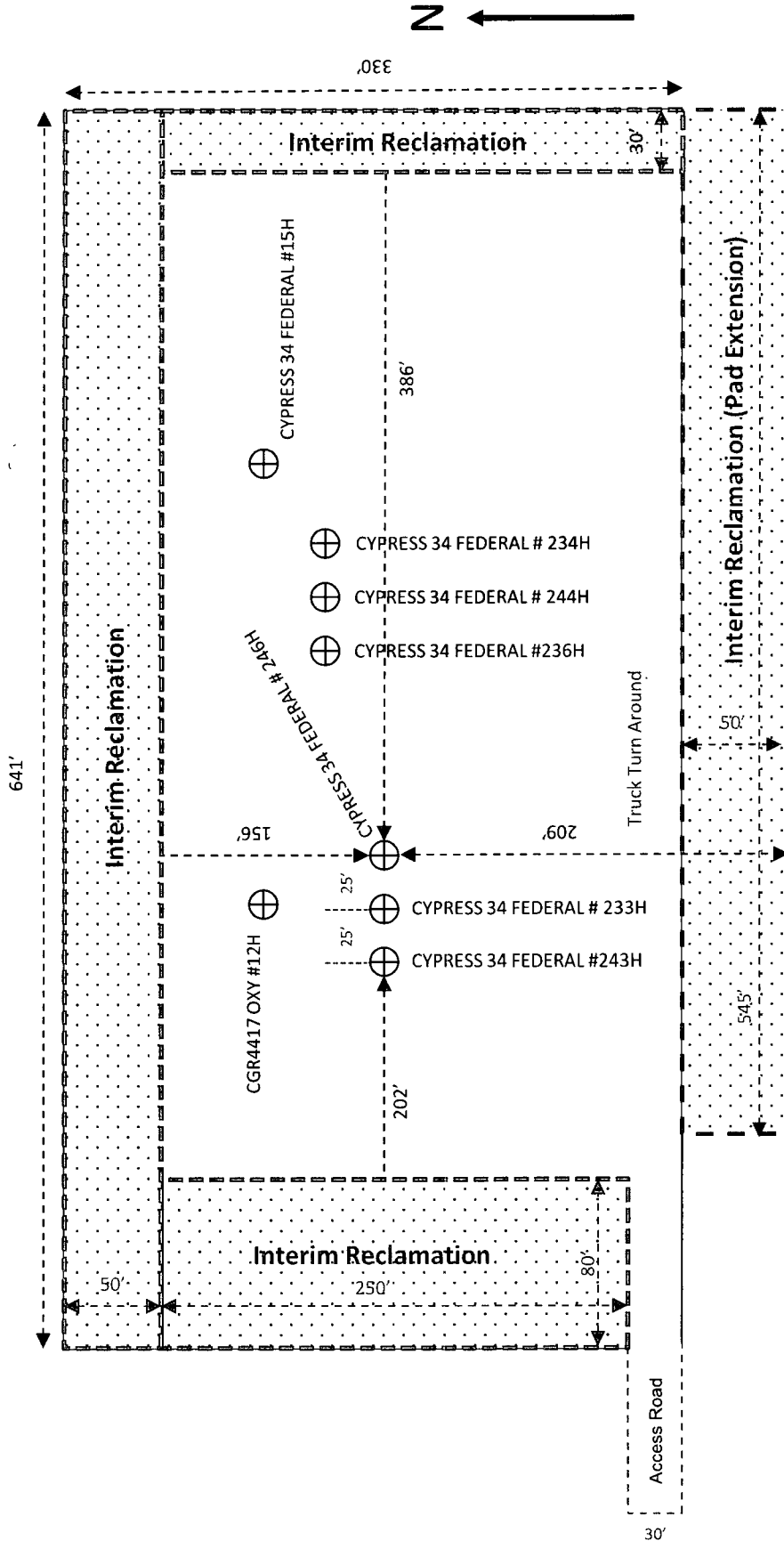
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



Prepared by Permits West, Inc., May 31, 2018
for Tap Rock Operating, LLC

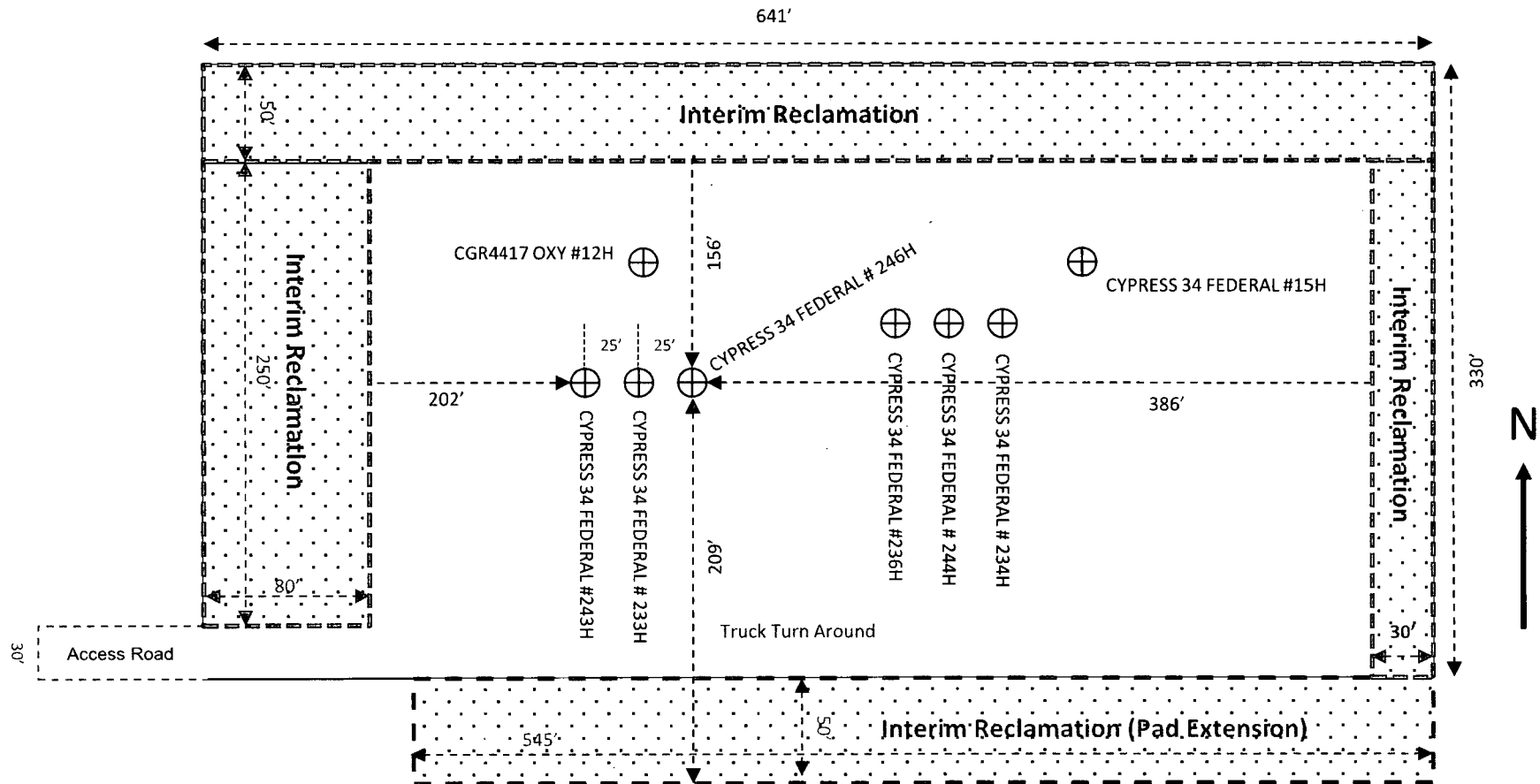


Tap Rock Operating LLC
 Cypress 34 Federal
 Well Pad Layout
 Sec. 3-24N-29W
 Eddy County, NM



Production Layout & Interim Reclamation Diagram

Tap Rock Operating LLC
Cypress 34 Federal
Well Pad Layout
Sec. 3-24N-29W
Eddy County, NM



Production Layout & Interim Reclamation Diagram

Rig Layout Diagram

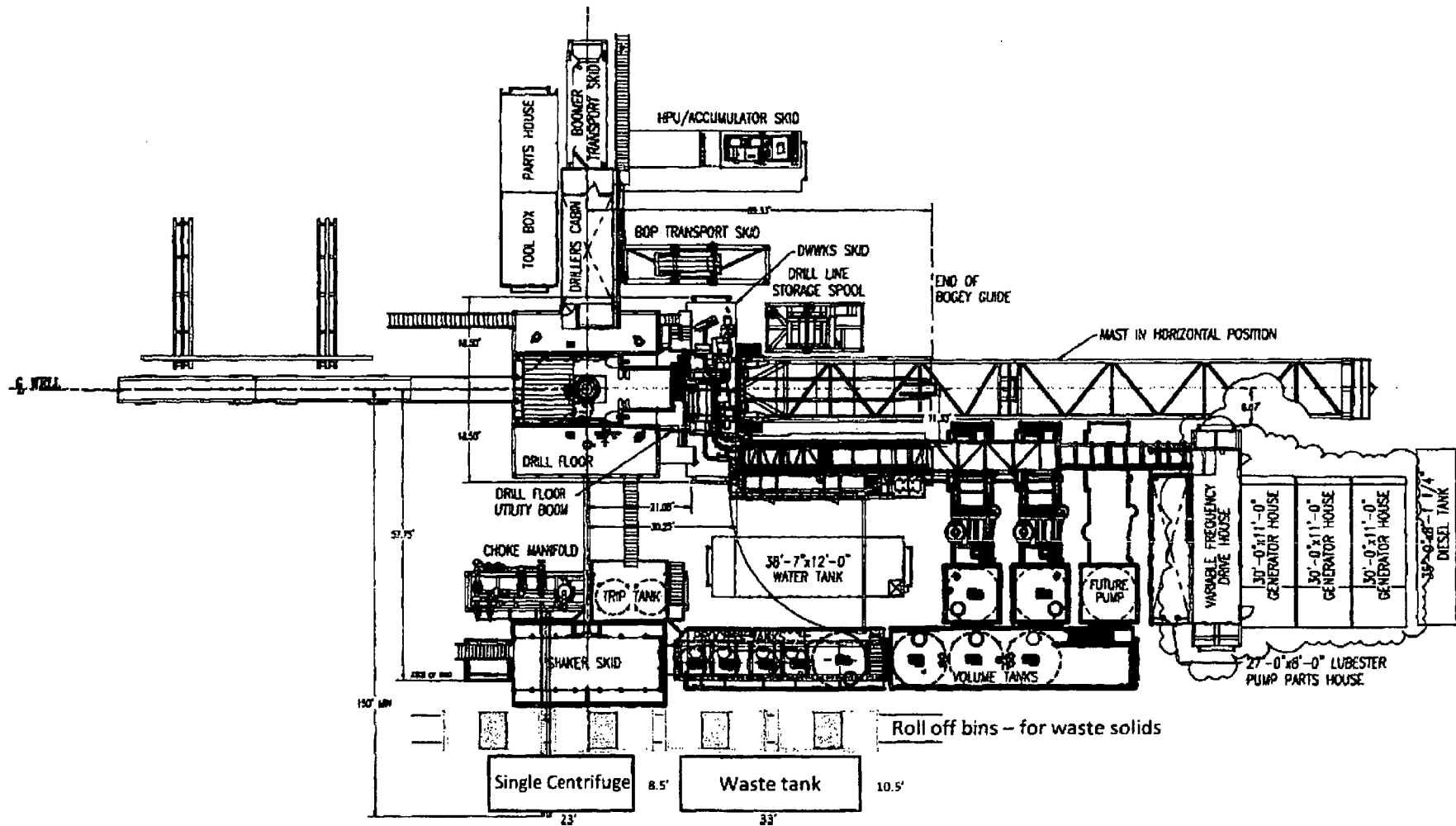
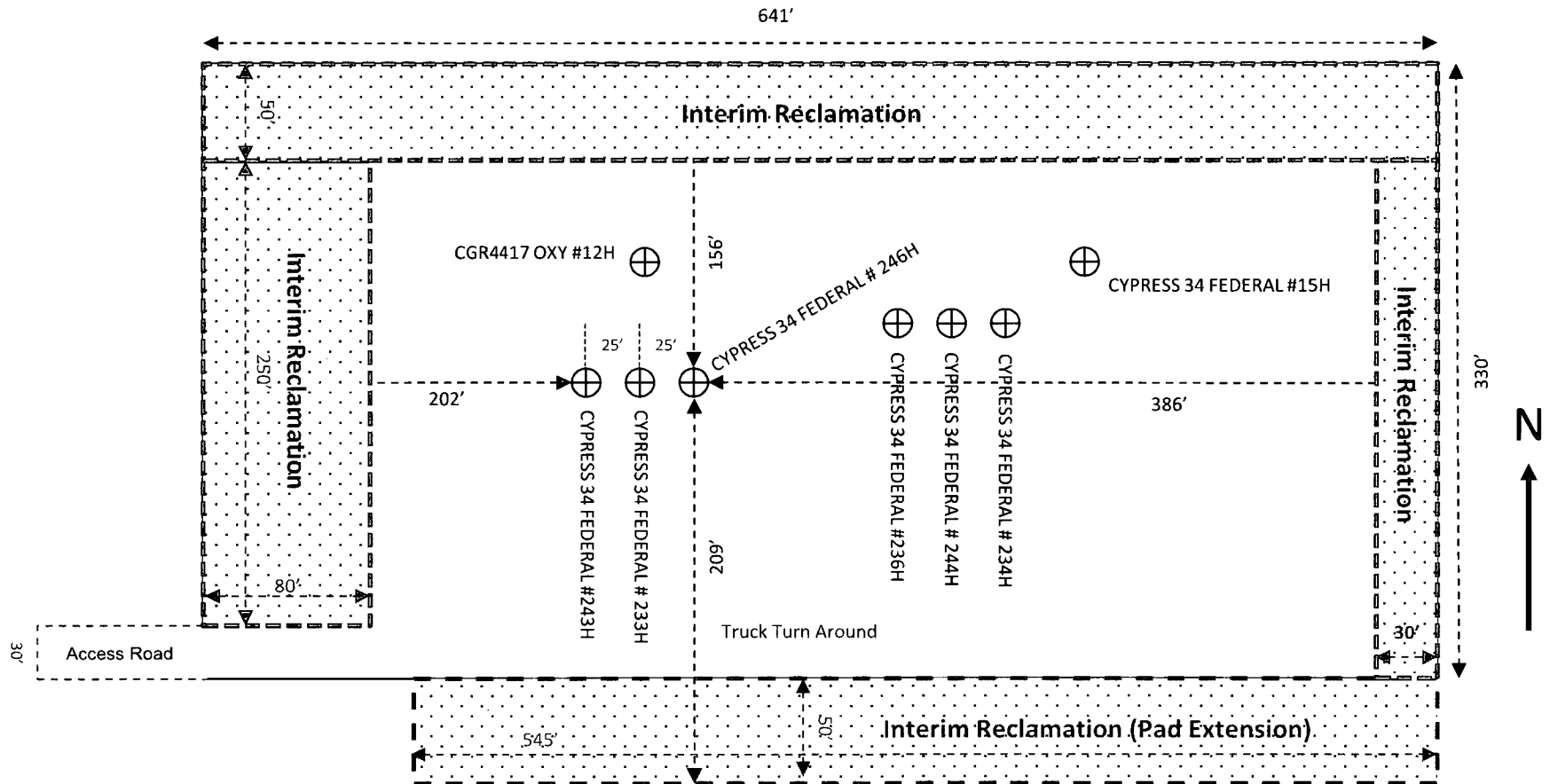


Figure 3

Tap Rock Operating LLC
Cypress 34 Federal
Well Pad Layout
Sec. 3-24N-29W
Eddy County, NM



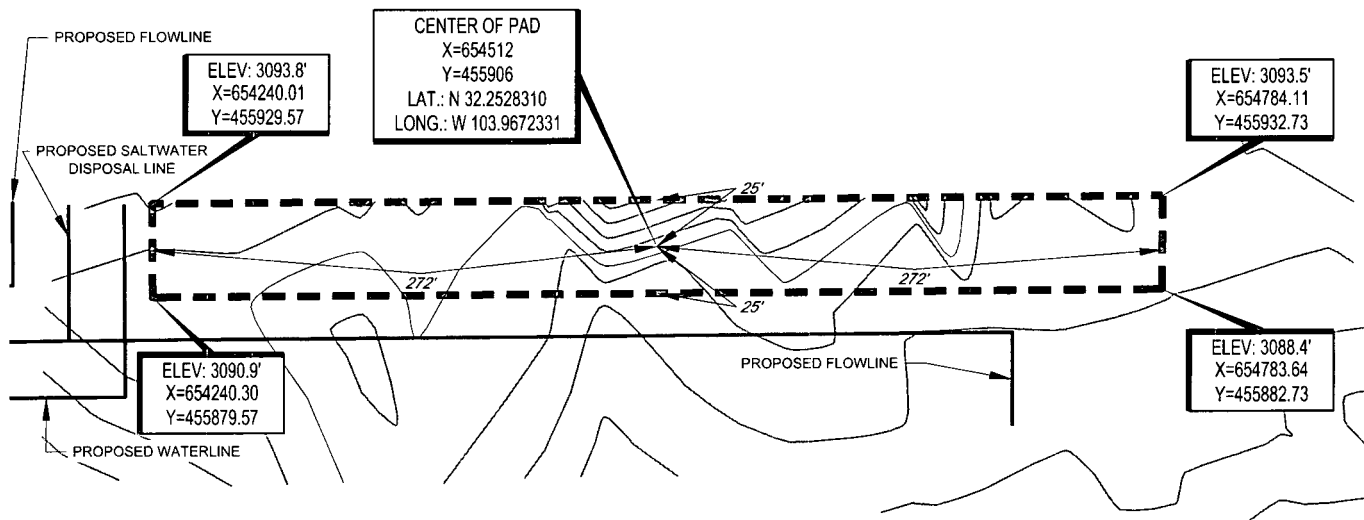
Production Layout & Interim Reclamation Diagram

CONSTRUCTION ESTIMATE

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.

EDDY COUNTY, NEW MEXICO

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



NOTE: 1' CONTOUR INTERVALS



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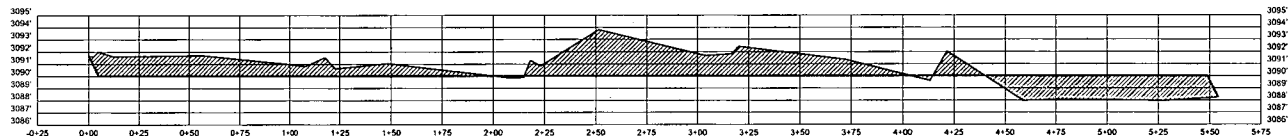
CYPRESS 34 PAD EXTENSION	REVISION:		NOTES: 1. ORIGINAL DOCUMENT SIZE: 8.5" X 11" 2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
DATE: 08/14/2018			
FILE: CD_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 1 OF 3			

Top of pad elevation: 3090.0
 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: 17,319.8 C.F., 641.47 C.Y.
 Fill: 17,319.8 C.F., 641.47 C.Y.
 Area: 33187.1 Sq.Ft., 0.762 Acres

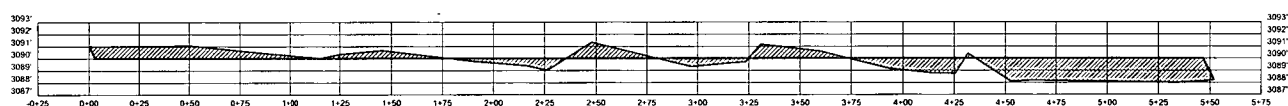
CONSTRUCTION ESTIMATE SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M. EDDY COUNTY, NEW MEXICO



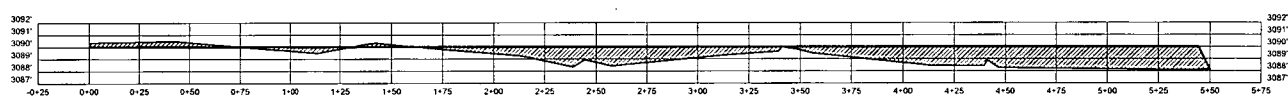
A-A'



B-B'



C-C'



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



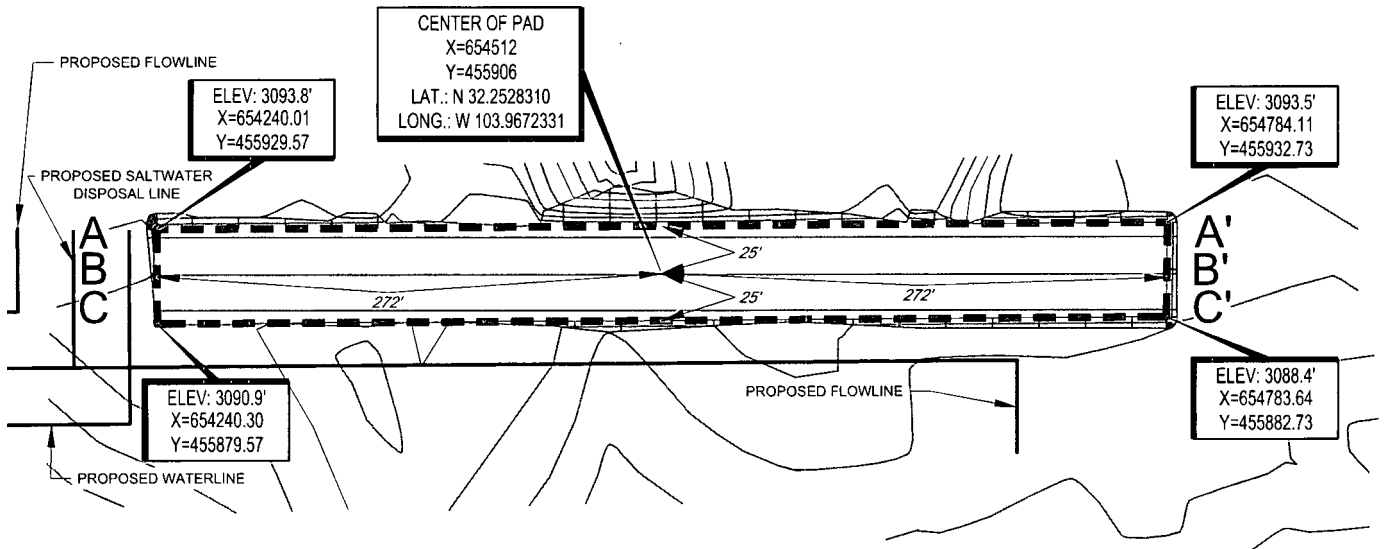
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CYPRESS 34 PAD EXTENSION	REVISION:		NOTES:
	INT	DATE	
DATE: 08/14/2018			1. ORIGINAL DOCUMENT SIZE: 11" X 17" 2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, 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 THE BOUNDARY OF 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.
FILE: CD_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 2 OF 3			

CONSTRUCTION ESTIMATE

SECTION 3, TOWNSHIP 24-S, RANGE 29-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

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



NOTE: 1' CONTOUR INTERVALS



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DATE: 08/14/2018			
FILE: CD_CYPRESS_34_PAD_EXTENSION			
DRAWN BY: IMU			
SHEET: 3 OF 3			

Tap Rock Operating LLC
Cypress 34 Federal #246H
SHL 241' FNL & 1146' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 1590' FEL, Sec. 3, 23S, 29E
Eddy County, NM

SURFACE PLAN PAGE 1

SURFACE USE PLAN OF OPERATIONS

1. ROAD DIRECTIONS & DESCRIPTIONS (See Maps 1 & 2)

From the intersection of SH 128 and SH 31, go east on SHW 128 for 4.5 miles. Turn south on CR 793 for 4.1 miles. Turn west on lease road for 3.5 miles. Turn south for 0.6 miles, turn southeast for 0.3 miles, turn south for 0.1 miles, turn southeast for 0.2 miles, turn south for 1.3 miles, and turn northeast for 0.2 miles. Turn right on proposed road and go southeast for 296.9', turn left and go east for 50' to location.

2. ROAD TO BE BUILT OR UPGRADED (See Map 2)

No new roads will be required to access this well pad as all drilling, completion, and production will occur on an existing, producing well pad that was approved and built in 2016 under API# 30-15-44397.

3. EXISTING WELLS (See Map 3)

Existing oil, gas, SWD, and P & A wells are within a mile. No active water or injection well is within a mile of the proposed wellbore.

4. PROPOSED PRODUCTION FACILITIES (See Figures 1-2, 1-3, & 1-4)

Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility currently serves the Cypress 34 Fed 15H, which has already been drilled and completed on the same pad, and will also be used for the recently accepted 234H, 236H, and 244H and the proposed 233H, 243H, and 246H wells once they have been drilled. The CTB and its associated infrastructure (road, power line, and flowlines) is located on the producing lease in Section 34, 23S 29E and was permitted with the previous group of Cypress 34 wells (234H, 236H, and 244H). An additional 3 flow lines will be constructed for the 3 additional wells (233H, 243H, and 246H) from the existing Cypress CTB to the existing well pad. These buried flowlines will be poly ~4" OD.

5. WATER SUPPLY (See Map 4)

This well will be drilled using a combination of water mud systems. Water will be trucked from a private water well (C 03662) on private land in NWNE 23-24s-33e.

6. CONSTRUCTION MATERIALS & METHODS (See Figures 1 & 2)

NM One Call (811) will be notified before construction starts. There will be no topsoil as fill will be brought in to extend the pad. No topsoil will be removed as it was previously removed and

Tap Rock Operating LLC
Cypress 34 Federal #246H
SHL 241' FNL & 1146' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 1590' FEL, Sec. 3, 23S, 29E
Eddy County, NM

SURFACE PLAN PAGE 2

stockpiled to the side of the pad when the location was originally constructed by Oxy USA. If additional caliche is needed it will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on location.

7. WASTE DISPOSAL

A closed loop drilling system will be used. All trash will be placed in a portable trash cage. It will be hauled to the Eddy County landfill. There will be no trash burning. Contents (drill cuttings, mud, salts, and other chemicals) of the mud tanks will be hauled to R360's state approved (NM1-6-0) disposal site at Halfway. Human waste will be disposed of in chemical toilets and hauled to the Carlsbad wastewater treatment plant.

8. ANCILLARY FACILITIES

There will be no airstrip or camp. Camper trailers will be on location for the company man, tool pusher, or mud logger.

9. WELL SITE LAYOUT (See Figures 1 & 3)

See attached rig diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See Figures 1 & 2)

Areas of the pad site not required for operations will be reclaimed. The original topsoil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

Disturbance:

+ 50' x 545' well pad expansion = 0.63 acres
+ 3782' x 30' additional flowlines = 2.60 acres
Short-term disturbance = 3.23 acres

– flowlines route = 2.60 acres
– Interim pad expansion reclamation = 0.63 acres
Long-term disturbance = 0.00 acres

11. SURFACE OWNER (See Map 3)

All construction will be on BLM, 620 E. Greene, Carlsbad NM 88220. Phone is (575) 234-5972.

Tap Rock Operating LLC
Cypress 34 Federal #246H
SHL 241' FNL & 1146' FEL, Sec. 3, 24S, 29E
BHL 5' FNL & 1590' FEL, Sec. 3, 23S, 29E
Eddy County, NM

SURFACE PLAN PAGE 3

12. OTHER INFORMATION

- On-site inspection was held with Matt Wirth (BLM) on August 24th, 2018.
- The vegetation cover is generally sparse consisting of mesquite, yucca, shinnery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, rodents, reptiles, dove and quail.
- There is no permanent or live water in the general proximity of the location.
- There are no dwellings within one mile of the proposed well site.
- Cultural Resources Examination - This well is located in the Permian Basin MOA - Fees were paid 2/11/16 Receipt 3490901, for the Cypress 34 Federal #15H.

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. Executed this 25th day of October, 2018.



Cory Walk, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120

Field representative will be:

*Doug Sproul
Tap Rock Operating, LLC
602 Park Point Dr., Suite 200, Golden CO 80401
Phone: (720) 772-5090*



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

PWD Data Report

06/17/2019

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:

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 surface owner:

PWD disturbance (acres):

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?

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):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

06/17/2019

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: