

Carlsbad Field Office OCD Artesia

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

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 23S29E3434 244H
3a. Address 602 Park Point Drive Suite 200 Golden CO 80401		9. API Well No 322450 30-015-45263
3b. Phone No (include area code) (720)460-3316		10. Field and Pool, or Exploratory PURPLE SAGE WOLFCAMP
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 1 / 180 FNL / 966 FEL / LAT 32.2535008 / LONG -103.967013 At proposed prod. zone NENE / 200 FNL / 330 FEL / LAT 32.2680416 / LONG -103.9650797		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
15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line, if any) 210 feet		13. State NM
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 30 feet		20. BLM/BIA Bond No. in file FED: NMB001443
19. Proposed Depth 11303 feet / 16223 feet		21. Elevations (Show whether DE, KDB, RT, GL, etc.) 3093 feet
22. Approximate date work will start* 08/01/2018		23. Estimated duration 90 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 06/05/2018
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 09/11/2018
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.

**NM OIL CONSERVATION
ARTESIA DISTRICT**

SEP 20 2018

RECEIVED

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 09/11/2018

RUP 9-21-18

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 collects this information to allow 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 Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 L.S., Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

I. SHL: LOT 1 / 180 FNL / 966 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.2535008 / LONG: -103.967013 (TVD: 0 feet, MD: 0 feet)
PPP: SESE / 0 FSL / 745 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.25398 / LONG: -103.96627 (TVD: 11300 feet, MD: 11600 feet)
PPP: LOT 1 / 180 FNL / 966 FEL / TWSP: 24S / RANGE: 29E / SECTION: 3 / LAT: 32.2535008 / LONG: -103.967013 (TVD: 0 feet, MD: 0 feet)
BHL: NENE / 200 FNL / 330 FEL / TWSP: 23S / RANGE: 29E / SECTION: 34 / LAT: 32.2680416 / LONG: -103.9650797 (TVD: 11303 feet, MD: 16223 feet)

BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

Review and Appeal Rights

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

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	TAP ROCK OPERATING LLC.
LEASE NO.:	NMNM085891
WELL NAME & NO.:	244H- CYPRESS 34 23S29E3434
SURFACE HOLE FOOTAGE:	180'/N & 966'/E
BOTTOM HOLE FOOTAGE	200'/N & 330'/E
LOCATION:	Section.3.,T24S.,R.29E., NMP
COUNTY:	EDDY County, New Mexico

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 **358** feet (a minimum of 25 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 **3178ft**:
- 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.

Operator shall filled 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

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

- 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. **Additional cement maybe required. Excess calculates to be 4%.**
- 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 conventional wellhead is used:

Test BOP/ BOPE after 1st intermediate casing 250 psi low and 3000 psi high.

Test BOP/ BOPE after 2nd intermediate casing 250 psi low and 7500 psi high.

Annular preventer will be tested 250 psi low and 50% psi high of working pressure on the surface and intermediate casing.

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. BOP will be tested to 250 psi low and 5000 psi high.

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 090618

Wedge 521®



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

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

Notes

This connection is fully interchangeable with:

Wedge 521® - 5 in. - 13 / 15 lbs/ft

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

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

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9/7/2018

DEPARTM

OF THE INTERIOR Mail - [EXTERNAL] Updated Cyr

Casing and Cement Details

From: Stevens, Zota <zstevens@blm.gov>

Sent: Friday, September 7, 2018 7:06 AM

To: Doug Sproul <dsproul@taprk.com>

Subject: Re: [EXTERNAL] Updated Cypress Casing and Cement Details

Thanks I need the specs sheet for the 5"

Zota Stevens
 Petroleum Engineer
 Bureau of Land Management
 620 E. Greene St.
 Carlsbad, NM 88220
 E-mail: zstevens@blm.gov
 Office: (575) 234-2228

Fax: (575) 234-5927

On Fri, Sep 7, 2018 at 6:23 AM, Doug Sproul <dsproul@taprk.com> wrote:

Good Morning Zota;

Here are the updated casing program details I promised you that override what we submitted with the original applications. You'll see that we omitted the 7" casing and replaced the 4 1/2" v details to match the casing program. As always, please do not hesitate to get a hold of me if there are any questions and thank you for your help.

Cypress 234 Casing

Name	Hole Size	Casing Size	Wt/Grade	Thread Collar	Top Csg	Setting Depth	Top Cement
Surface	17 1/2	13 3/8	54.5# J-55 (new)	BTC	0	400	Surface
1st Intermediate	12 1/4	9 5/8	40# J-55 (new)	BTC	0	3,200	Surface
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	BTC	0	3,000	2,200
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	Flush	3,000	10,450	
Production	6 3/4	5 1/2	20# P-110 (new)	BTC	0	10,450	9,450
Production	6 3/4	5	18# P-110 (new)	Flush	10,450	16,000	

Cypress 234 Cement

Name	Type	Sacks	Yield	Weight	Blend
Surface					
	Tail	309	1.8	13.5	Class C + 5% Bentonite + 2% CaCl + LCM
TOC = Surface		100% Excess		Centralizers per Onshore Order 2.III.B.1f	
1st Intermediate	Lead	732	2.19	12.7	Class C + Bentonite + 1% CaCL2 + 8% NaCl + LCM
	Tail	301	1.33	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	
2nd Intermediate	Lead	249	3.36	11.5	TXI + Fluid Loss + Dispersant + Retarder + LCM
	Tail	204	1.39	13.2	TXI + Fluid Loss + Dispersant + Retarder + LCM
TOC = 2200		35% Excess		2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement	
Production	Tail	950	1.24	14.2	Class H + Fluid Loss + Dispersant + Retarder + LCM

TOC = 9,450	10% Excess	2 on btm jt, 1 on 2nd jt, 1 every third jt to top of curve
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Cypress 236 Casing

Name	Hole Size	Casing Size	Wt/Grade	Thread Collar	Top Csg	Setting Depth	Top Cement
Surface	17 1/2	13 3/8	54.5# J-55 (new)	BTC	0	400	Surface
1st Intermediate	12 1/4	9 5/8	40# J-55 (new)	BTC	0	3,200	Surface
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	BTC	0	3,000	2,200
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	Flush	3,000	10,361	
Production	6 3/4	5 1/2	20# P-110 (new)	BTC	0	10,361	9,361
Production	6 3/4	5	18# P-110 (new)	Flush	10,361	15,995	

Cypress 236 Cement

Name	Type	Sacks	Yield	Weight	Blend
Surface					
	Tail	309	1.8	13.5	Class C + 5% Bentonite + 2% CaCl + LCM
TOC = Surface		100% Excess		Centralizers per Onshore Order 2.III.B.1f	
1st Intermediate	Lead	732	2.19	12.7	Class C + Bentonite + 1% CaCL2 + 8% NaCl + LCM
	Tail	301	1.33	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	
2nd Intermediate	Lead	246	3.36	11.5	TXI + Fluid Loss + Dispersant + Retarder + LCM
	Tail	202	1.39	13.2	TXI + Fluid Loss + Dispersant + Retarder + LCM
TOC = 2200		35% Excess		2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement	
Production	Tail	950	1.24	14.2	Class H + Fluid Loss + Dispersant + Retarder + LCM
TOC = 9,361		10% Excess		2 on btm jt, 1 on 2nd jt, 1 every third jt to top of curve	

Cypress 244 Casing

Name	Hole Size	Casing Size	Wt/Grade	Thread Collar	Top Csg	Setting Depth	Top Cement
Surface	17 1/2	13 3/8	54.5# J-55	BTC	0	400	Surface

9/7/2018

DEPARTM

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1st Intermediate	12 1/4	9 5/8	40# J-55 (new)	BTC	0	3,200	Surface
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	BTC	0	3,000	2,200
2nd Intermediate	8 3/4	7 5/8	29.7# P-110 (new)	Flush	3,000	10,723	
Production	6 3/4	5 1/2	20# P-110 (new)	BTC	0	10,723	9,723
Production	6 3/4	5	18# P-110 (new)	Flush	10,723	16,175	

Cypress 244 Cement

Name	Type	Sacks	Yield	Weight	Blend
Surface					
	Tail	309	1.8	13.5	Class C + 5% Bentonite + 2% CaCl + LCM
TOC = Surface		100% Excess		Centralizers per Onshore Order 2.III.B.1f	
1st Intermediate	Lead	732	2.19	12.7	Class C + Bentonite + 1% CaCL2 + 8% NaCl + LCM
	Tail	301	1.33	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	
2nd Intermediate	Lead	257	3.36	11.5	TXI + Fluid Loss + Dispersant + Retarder + LCM
	Tail	209	1.39	13.2	TXI + Fluid Loss + Dispersant + Retarder + LCM
TOC = 2200		35% Excess		2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement	
Production	Tail	950	1.24	14.2	Class H + Fluid Loss + Dispersant + Retarder + LCM
TOC = 9,723		10% Excess		2 on btm jt, 1 on 2nd jt, 1 every third jt to top of curve	

Doug Sproul

Drilling Manager

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Golden, CO 80401

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2 attachments

image001.png

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	TAP ROCK OPERATING LLC.
LEASE NO.:	NMNM085891
WELL NAME & NO.:	244H- CYPRESS 34 23S29E3434
SURFACE HOLE FOOTAGE:	180'/N & 966'/E
BOTTOM HOLE FOOTAGE	200'/N & 330'/E
LOCATION:	Section.3.,T24S.,R.29E., NMP
COUNTY:	EDDY County, New Mexico

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**
 - Hydrology
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **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 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.

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.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 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 Carlsbad Field Office at (575) 234-5972.

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

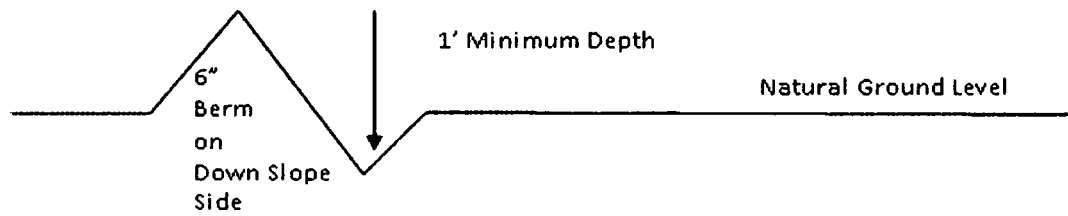
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing and insloping, lead-off 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.

Cross Section of a Typical 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 %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

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

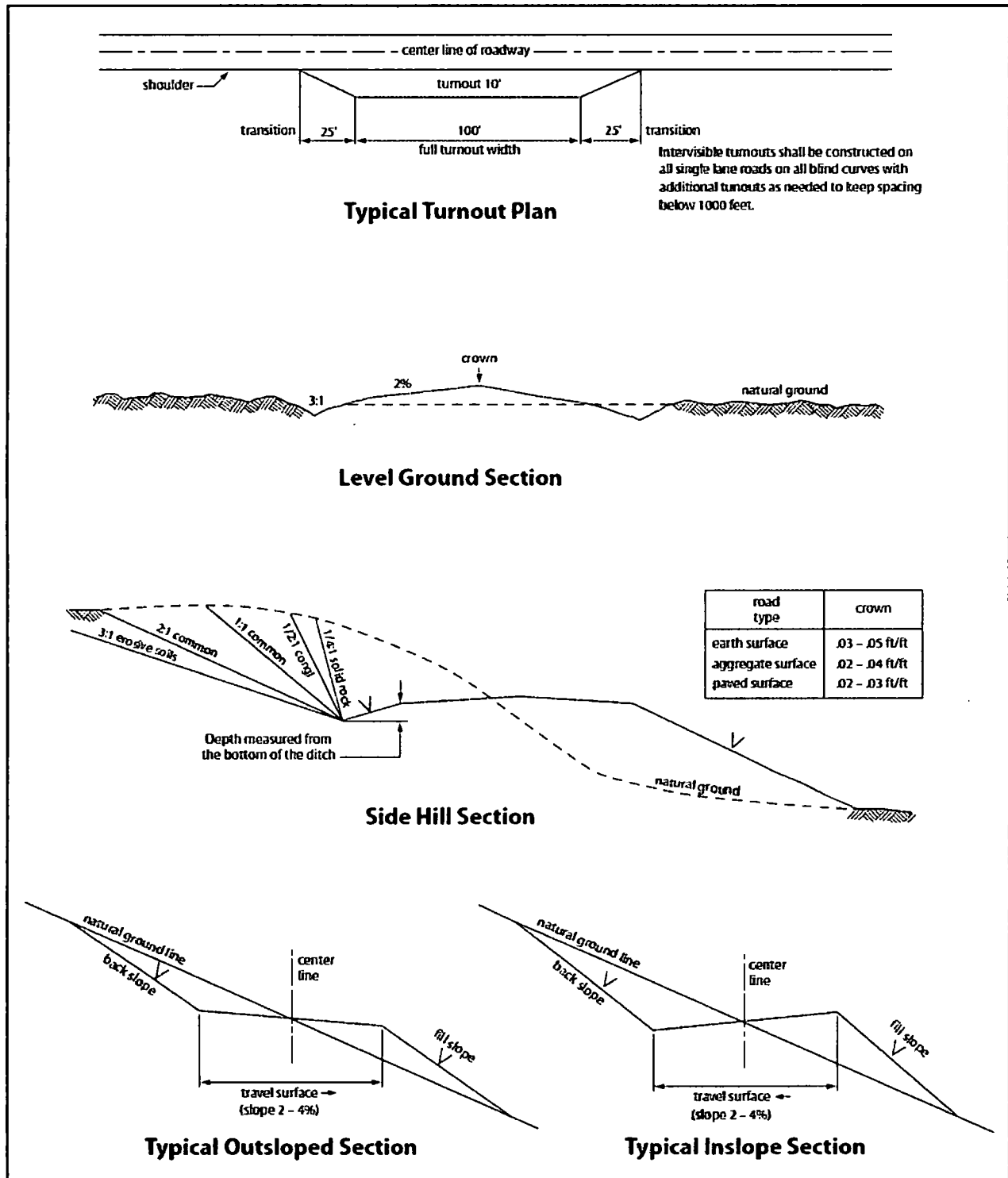


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VI. 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.

VRM Facility Requirement

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).

Pipelines STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, 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 activity of 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. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
 - (1) Land clearing.
 - (2) Earth-disturbing and earth-moving work.
 - (3) Blasting.
 - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, 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, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the 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 the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing

by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. 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.

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. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. 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. Signs will be maintained in a legible condition for the life of the pipeline.

14. 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. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (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 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.

16. 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, powerline 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.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

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 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 20 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.

Electric Line

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, 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. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.
5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. 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 the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (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.

11. Special Stipulations:

- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

VII. 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).

VIII. 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 (<i>Eragrostis intermedia</i>)	0.5
Sand dropseed (<i>Sporobolus cryptandrus</i>)	1.0
Sideoats grama (<i>Bouteloua curtipendula</i>)	5.0
Plains bristlegrass (<i>Setaria macrostachya</i>)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed
t Seed Mixture Here)



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

Operator Certification Data Report

09/12/2018

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: 06/04/2018

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

09/12/2018

APD ID: 10400030849

Submission Date: 06/05/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Highlighted data
reflects the most
recent changes

[Show Final Text](#)

Section 1 - General

APD ID: 10400030849

Tie to previous NOS?

Submission Date: 06/05/2018

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 23S29E3434

Well Number: 244H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: PURPLE SAGE

Pool Name:

WOLFCAMP

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

Operator Name: TAP ROCK OPER. 3 LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Describe other minerals:

Is the proposed well in a Helium production area? N

Use Existing Well Pad? YES

New surface disturbance? N

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name:

Number: 234H

Well Class: HORIZONTAL

CYPRESS

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: 30 FT

Distance to lease line: 210 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Cypress_244H_C102_et al_20180604151534.pdf

Well work start Date: 08/01/2018

Duration: 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 19642

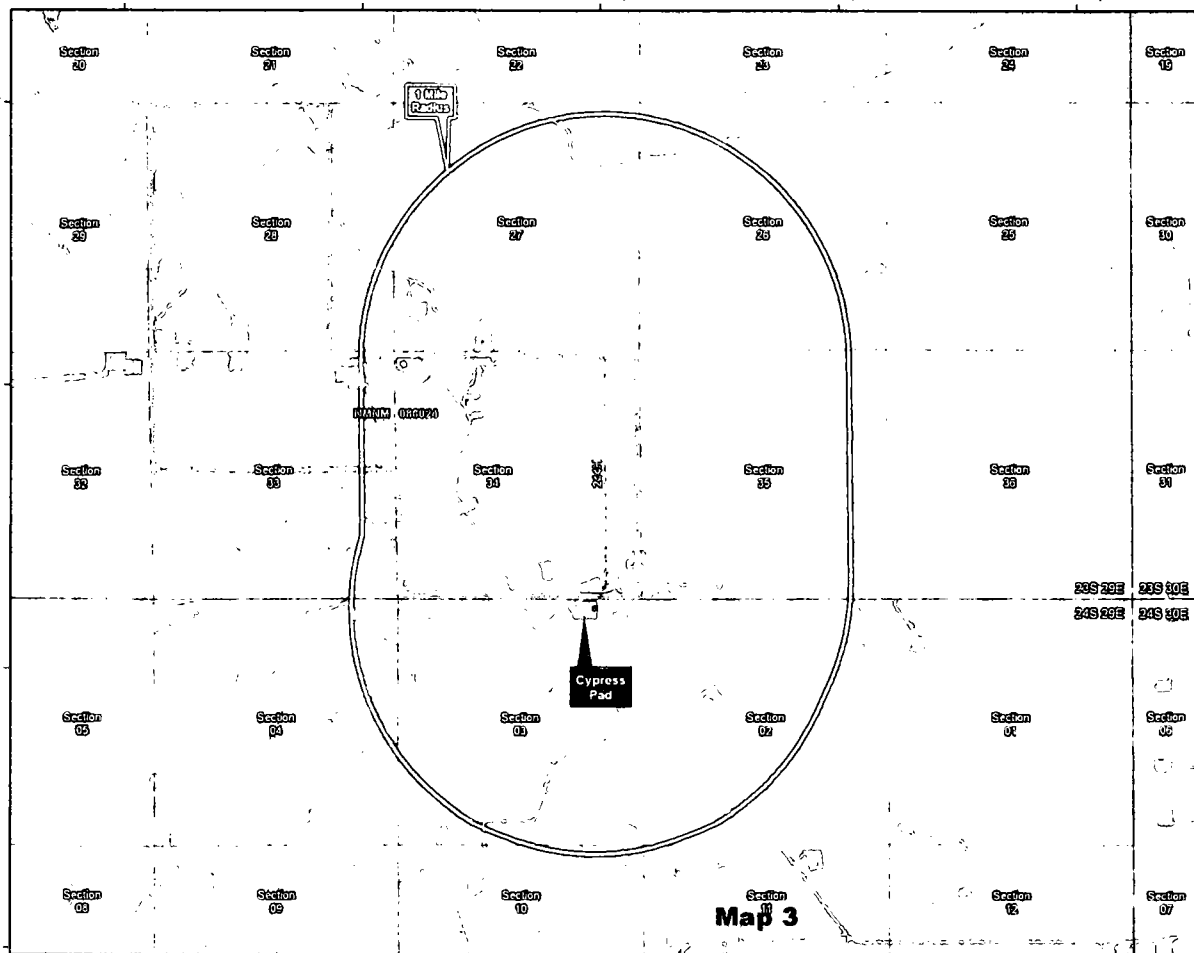
	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	180	FNL	966	FEL	24S	29E	3	Lot 1	32.25350 08	- 103.9670 13	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0
KOP Leg #1	330	FNL	330	FEL	24S	29E	3	Lot 1	32.25489 2	- 103.9649 4	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	- 763 3	107 37	107 26
PPP Leg #1	180	FNL	966	FEL	24S	29E	3	Lot 1	32.25350 08	- 103.9670 13	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 085891	309 3	0	0

Operator Name: TAP ROCK OPE. .NG LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

	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	745	FEL	23S	29E	34	Aliquot SESE	32.25398	- 103.9662 7	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 820 7	116 00	113 00
EXIT Leg #1	200	FNL	330	FEL	23S	29E	34	Aliquot NENE	32.26804 16	- 103.9650 797	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 821 0	162 23	113 03
BHL Leg #1	200	FNL	330	FEL	23S	29E	34	Aliquot NENE	32.26804 16	- 103.9650 797	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 086024	- 821 0	162 23	113 03



Tap Rock Operating LLC

Cypress 34 23S29E3434 #244H
Well Vicinity & Lease Map

Section 34, Township 23S Range 29E
Eddy County New Mexico

- Oil - Active
- Oil - New
- Oil - TA
- Oil - P&A
- Gas - Active
- Gas - New
- Gas - P&A
- Surface Hole Location
- ▼ Bottom Hole Location
- Proposed Well Bore
- Well Pad
- BLM
- STATE
- PRIVATE
- ✦ SWD - Active

1:24,000
0 0.5 1
Miles



NAD 1983 NAD State
Plane East Feet

PROPERTY LINE

Prepared by Permit, Inc. May 31, 2013 for
Tap Rock Operating LLC

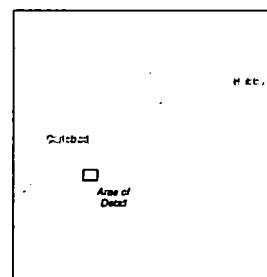
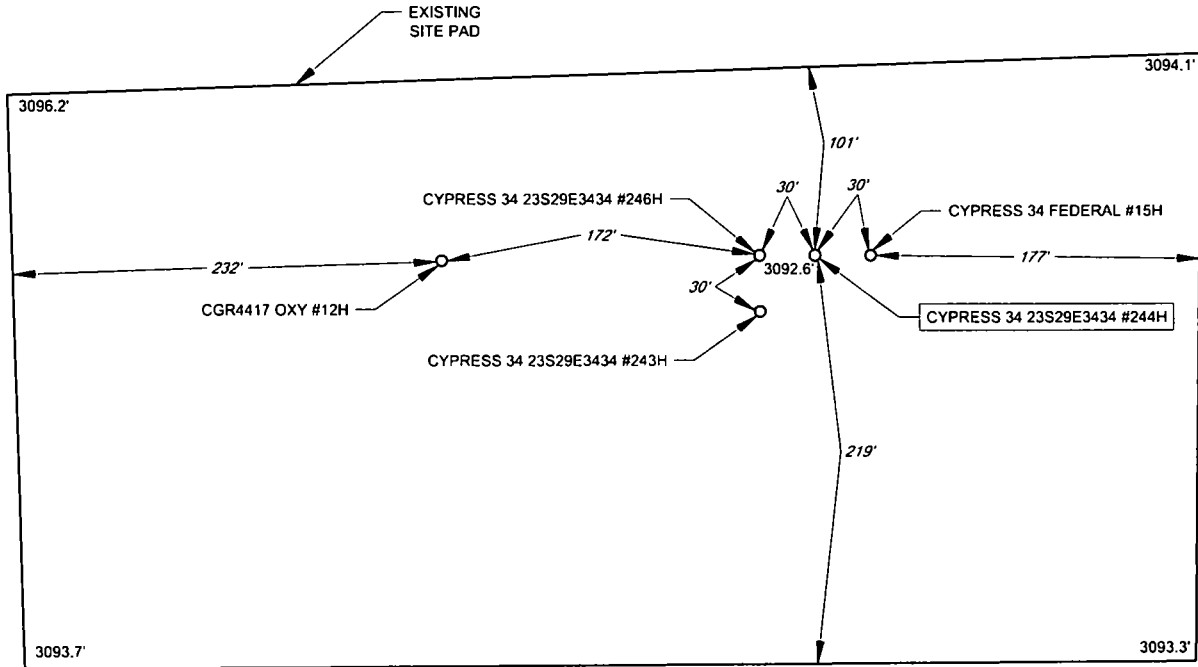


EXHIBIT 2B



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 #244H
244H LATITUDE N 32.2535008 244H LONGITUDE W 103.9670130



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

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

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

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM



APD ID: 10400030849

Submission Date: 06/05/2018

Highlighted data
reflects the most
recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

[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	---	3093	0	0	OTHER : Quaternary caliche	USEABLE WATER, OTHER : Salt	No
2	RUSTLER ANHYDRITE	2760	333	333		OTHER : Salt	Yes
3	SALADO	2445	648	648	SALT	OTHER : Salt	No
4	BASE OF SALT	-65	3158	3158		OTHER : Salt	No
5	BELL CANYON	-115	3208	3208	SANDSTONE	CO2,OIL	No
6	BRUSHY CANYON	-2210	5303	5303	SANDSTONE	NATURAL GAS,CO2,OIL	No
7	BONE SPRING	-3825	6918	6920	LIMESTONE	NATURAL GAS,CO2,OIL	No
8	BONE SPRING 1ST	-4815	7908	7912	SANDSTONE	NATURAL GAS,OIL	No
9	BONE SPRING 2ND	-5430	8523	8529	SANDSTONE	NATURAL GAS,CO2,OIL	No
10	BONE SPRING 3RD	-6760	9853	9862	SANDSTONE	NATURAL GAS,CO2,OIL	No
11	WOLFCAMP	-7075	10168	10178	OTHER : A	NATURAL GAS,CO2,OIL	No
12	WOLFCAMP	-7255	10348	10358	OTHER : A Fat	NATURAL GAS,CO2,OIL	No
13	WOLFCAMP	-7425	10518	10528	OTHER : B	NATURAL GAS,CO2,OIL	No
14	WOLFCAMP	-7925	11018	11043	OTHER : B2	NATURAL GAS,CO2,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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. BOP, choke manifold, co-flex hose, and speed head diagrams are attached. An accumulator will be on site. It will comply with Onshore Order 2 requirements for the BOP stack pressure rating. Rotating head will be installed as needed.

Requesting Variance? YES

Variance request: Tap Rock requests a variance to use a co-flex hose between the BOP stack and choke manifold. Co-flex hose certification is attached. Manufacturer does not require the hose to be anchored. If the specific hose is not available, then one of equal or higher rating will be used.

Testing Procedure: Pressure tests will be conducted before drilling out from under all casing strings. BOP will be inspected and operated as required by 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. A third-party company will test the BOPs. Test pressures will be: After surface casing is set and the BOP is nipped up, pressure tests will be made to 250 psi low and 2000 psi high. Test intermediate 1 casing to 250 psi low and 3000 psi high. Test intermediate 2 casing to 250 psi low and 7500 psi high. Annular preventer will be tested to 250 psi low and 1000 psi high on the surface casing and 250 psi low and 1500 psi high on both intermediate strings. In the case of running a speed head with landing mandrel for the 1st and 2nd intermediate casing the initial, after surface casing is set, BOP test pressures will be 250 psi low and 3000 psi high with well head seals tested to 5000 psi once the first intermediate casing has been landed and cemented. BOP may then be lifted to install the C-section of the wellhead. Tap Rock will then nipple the BOP back up and pressure tests will be made to 250 psi low and 5000 psi high. Annular preventer will be tested to 250 psi low and 1500 psi high.

Choke Diagram Attachment:

Cypress_244H_Choke_032918_20180604152502.pdf

BOP Diagram Attachment:

Cypress_244H_BOP_20180604152522.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	358	0	358	3093		358	J-55	54.5	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3178	0	3178	3093		3178	J-55	40	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
3	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	4000	0	4000	3093		4000	P-110	29.7	OTHER - Flush	1.13	1.15	DRY	1.51	DRY	1.51
4	PRODUCTION	6.125	5.5	NEW	API	Y	0	10823	0	10795	3093		10823	P-110	20	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
5	INTERMEDIATE	8.75	7.625	NEW	API	Y	4000	10823	4000	10795			6823	P-110	29.7	OTHER - Flush	1.13	1.15	DRY	1.51	DRY	1.51

Operator Name: TAP ROCK OPERA, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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
6	INTERMEDIATE	8.75	7.0	NEW	API	Y	10823	11437	10795	11265			614	P-110	29	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
7	PRODUCTION	6.125	4.5	NEW	API	Y	10823	16223	10795	11303			5400	P-110	13.5	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51

Casing Attachments

Casing ID: 1 String Type: SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152554.pdf

Casing ID: 2 String Type: INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152621.pdf

Operator Name: TAP ROCK OPERA, _LC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_244H_7.625_BTC_Casing_Spec_20180604152650.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152656.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_244H_7.625_P110_Casing_Spec_20180604152731.pdf

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152738.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_244H_5.5in_Casing_Spec_20180604152906.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152959.pdf

Operator Name: TAP ROCK OPERATIONS, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Casing Attachments

Casing ID: 6 String Type: INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_244H_7_BTC_Casing_Spec_20180604152826.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152835.pdf

Casing ID: 7 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Cypress_244H_4.5_BTC_Casing_Spec_20180604152938.PDF

Casing Design Assumptions and Worksheet(s):

Cypress_244H_Casing_Design_Assumptions_20180604152944.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	358	0	0	0	0	0	None	None
SURFACE	Tail		0	358	400	1.38	14.8	552	100	Class C	5% NaCl + LCM
INTERMEDIATE	Lead		0	3178	900	1.81	13.5	1629	100	Class C	Bentonite + 1% CaCl2 + 8% NaCl + LCM
INTERMEDIATE	Tail		0	3178	300	1.38	14.8	414	100	Class C	5% NaCl + LCM
INTERMEDIATE	Lead		0	4000	700	2.35	11.5	2275	35	TXI	Fluid loss + dispersant + retarder + LCM

Operator Name: TAP ROCK OPERA LC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Tail		0	4000	100	1.39	13.2	139	35	TXI	Fluid Loss + Dispersant + Retarder + LCM
PRODUCTION	Lead		0	10823	0	0	0	0	0	None	None
PRODUCTION	Tail		0	10823	500	1.17	15.8	585	10	Class H	Fluid Loss + Dispersant + Retarder + LCM
INTERMEDIATE	Lead		4000	10823	700	2.35	11.5	2275	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		4000	10823	100	1.39	13.2	139	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Lead		10823	11437	700	2.35	11.5	2275	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		10823	11437	100	1.39	13.2	139	35	TXI	fluid loss + dispersant + retarder + LCM
PRODUCTION	Lead		10823	16223	0	0	0	0	0	None	None
PRODUCTION	Tail		10823	16223	500	1.17	15.8	585	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. A closed loop system will be used.

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
-----------	--------------	----------	----------------------	----------------------	---------------------	-----------------------------	----	----------------	----------------	-----------------	----------------------------

Operator Name: TAP ROCK OPERATIONS, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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
400	3178	OTHER : Brine water	10	10							
0	400	OTHER : Fresh water spud	8.3	8.3							
3178	1143 7	OTHER : Fresh water & cut brine	9	9							
1143 7	1622 3	OIL-BASED MUD	12.5	12.5							

Section 6 - Test, Logging, Coring

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

A 2-person mud logging program will be used from 4700' MD to TD.

GR will be collected through the MWD tools from 1st Intermediate casing to TD. CBL with CCL will be run 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 core or drill stem test is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7497

Anticipated Surface Pressure: 5010.34

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:

Operator Name: TAP ROCK OPERA, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Cypress_244H_H2S_Plan_20180604153358.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cypress_244H_Horizontal_Plan_20180604153409.pdf

Other proposed operations facets description:

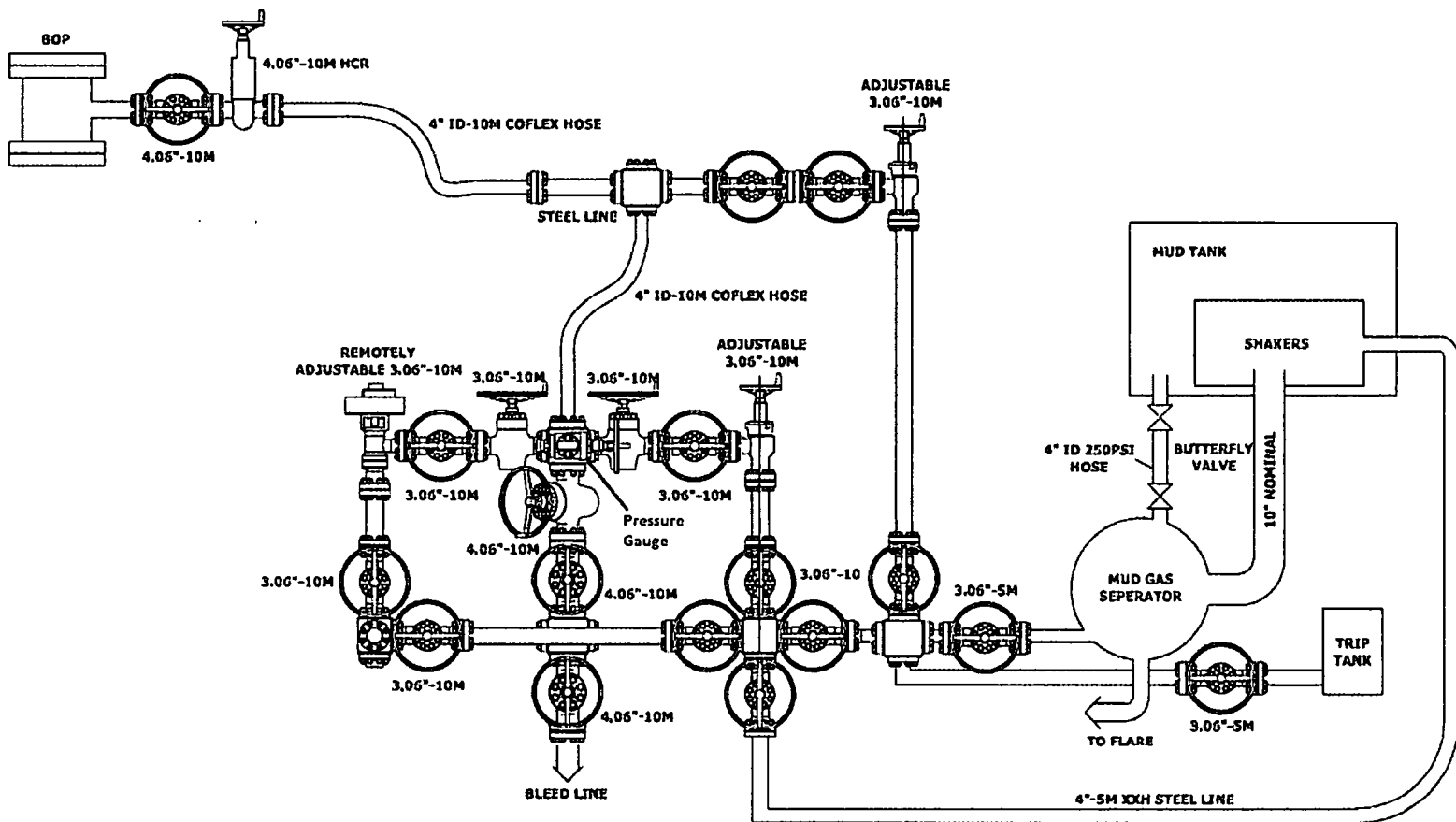
Other proposed operations facets attachment:

Cypress_244H_Speedhead_Specs_033018_20180604153419.pdf

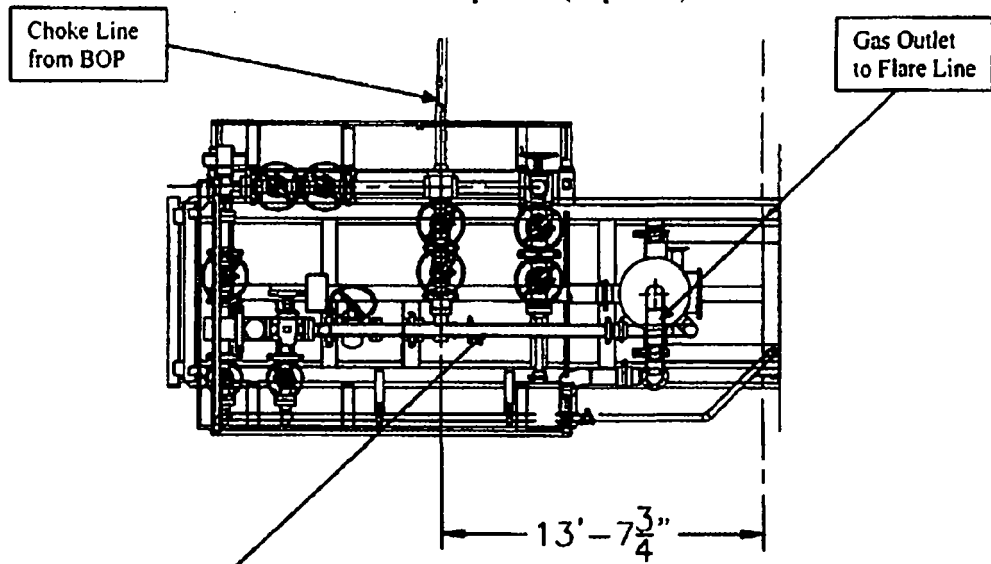
Cypress_244H_Drill_Plan_082718_20180828085600.pdf

Other Variance attachment:

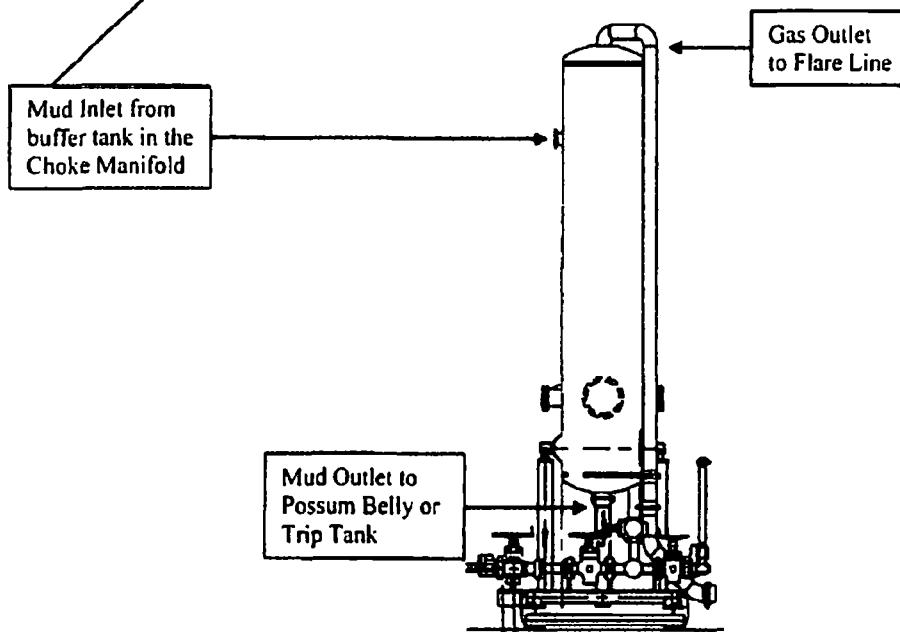
Cypress_244H_Casing_Cementing_Variance_20180823091045.pdf



Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)

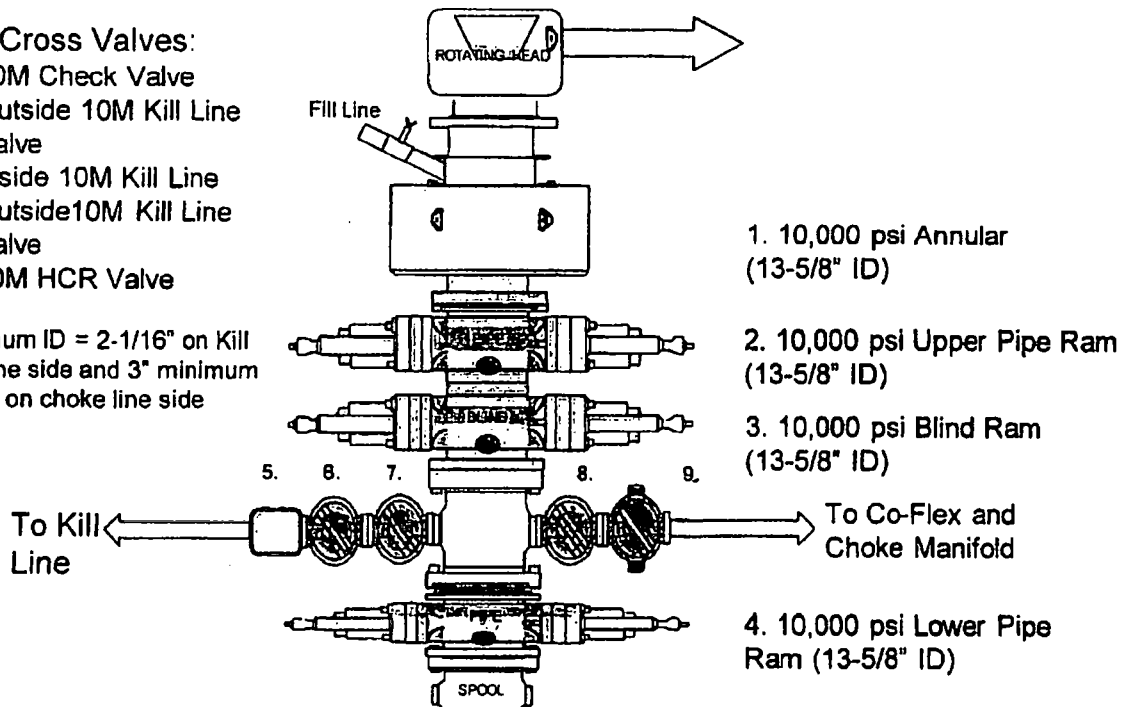


10,000 psi BOP Stack

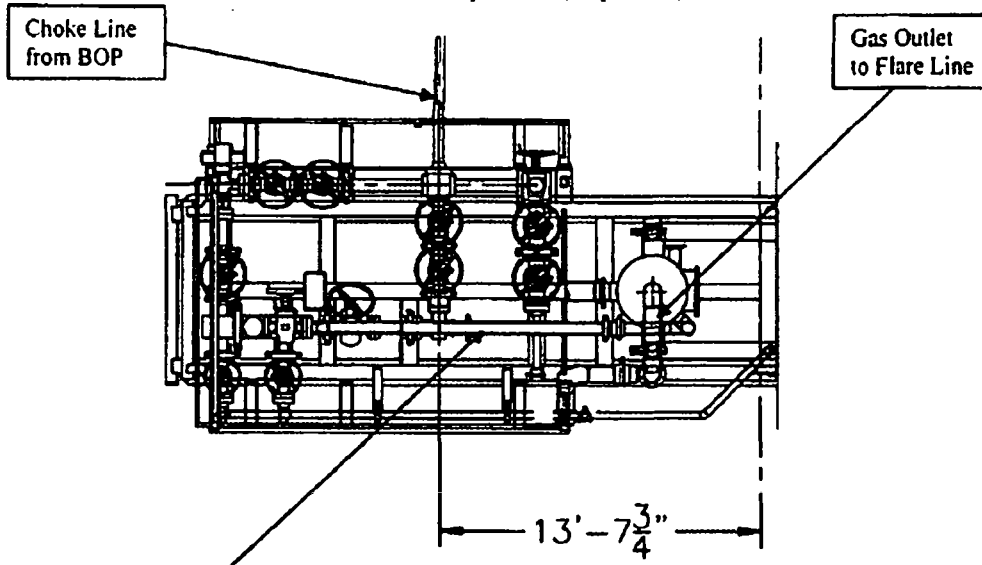
Mud Cross Valves:

- 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

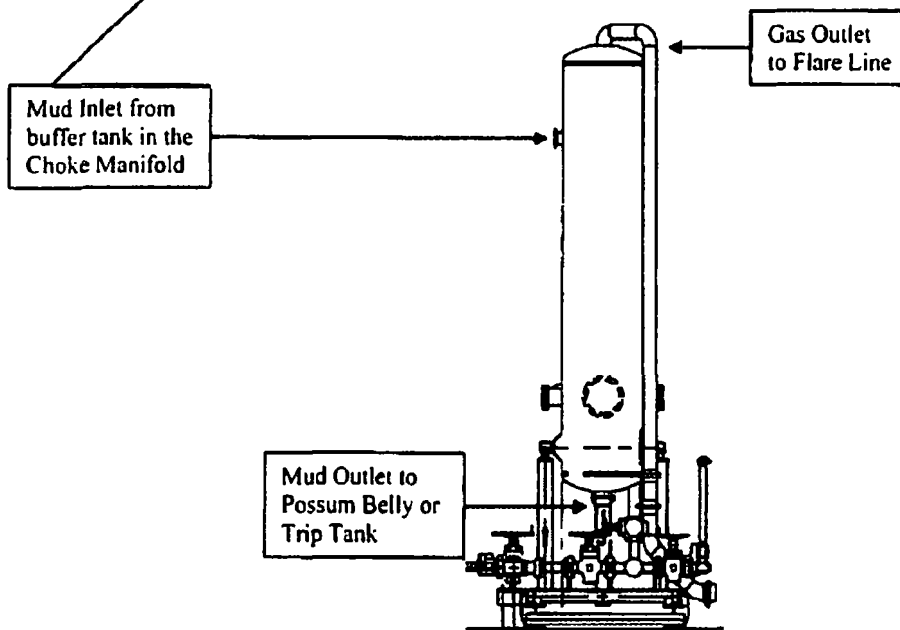
*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side



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		
ContiTech 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 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	Description	Qty	Serial Number	Test Pressure (PSI)	Test Temp (°F)	Test Date
20	RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53831	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	60887	10,000 psi	15,000 psi	60

Certificate of Conformity

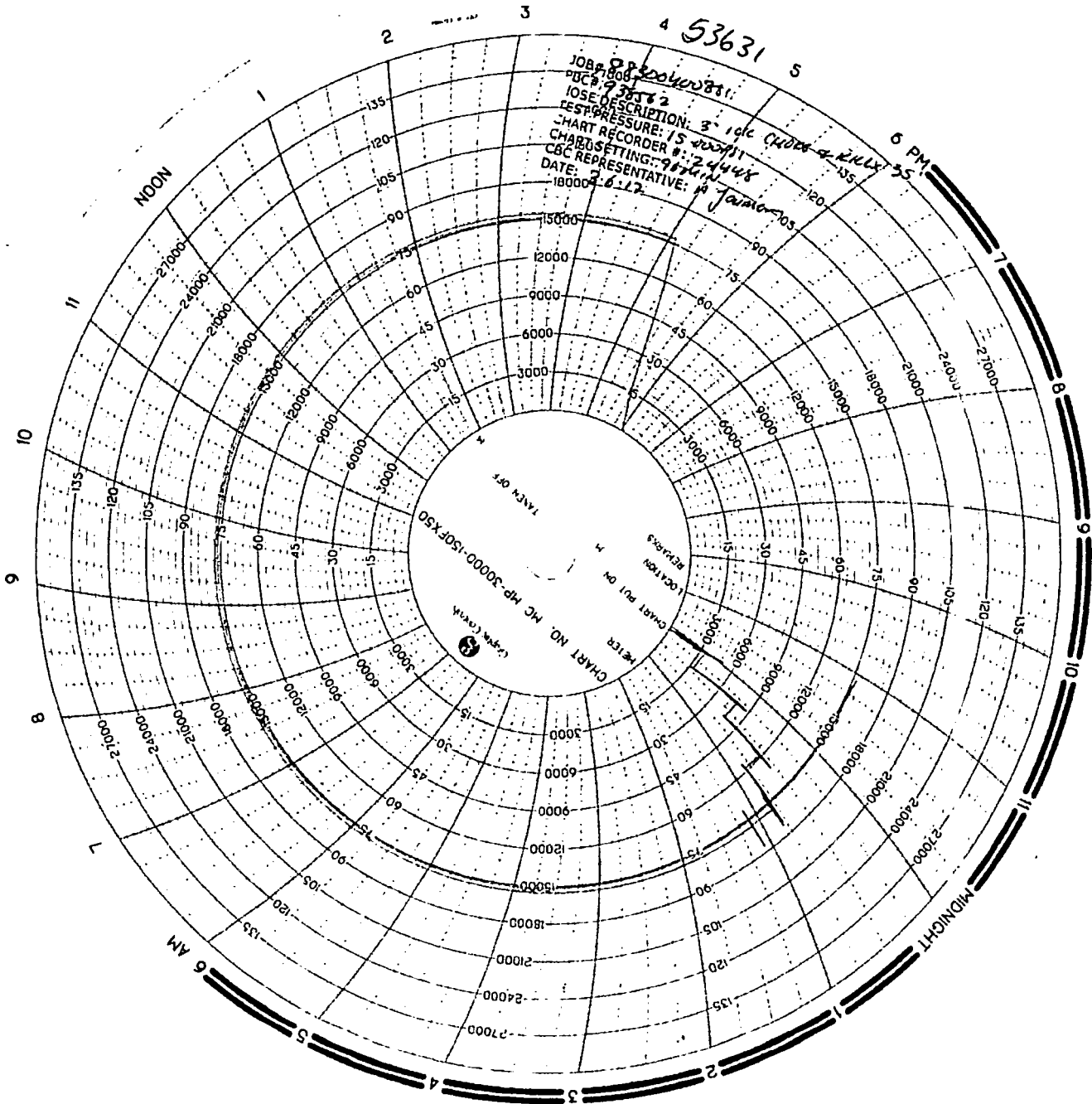


ContiTech

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: 8/13/17	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	Stock Number	Specification
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 # 800
POC # 2
JOSE DESCRIPTION: 3-196
CHART RECORDER # 24448
DATE: 2-6-12
CBC REPRESENTATIVE: A

CHART NO. MC HP-30000-ISO-FX-50
METER
LOCATION
REMARKS
TAKEN OFF

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
-------------------	-----------------------------

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'

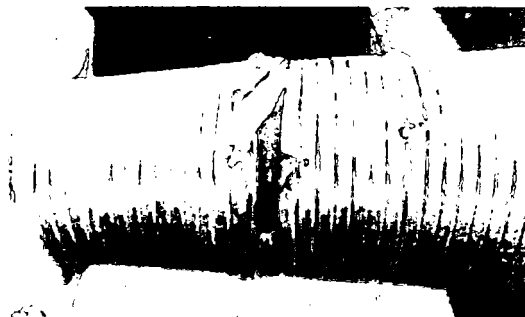
Conclusion: Hose #53631 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #53631 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #53631 is suitable for continued service.

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.

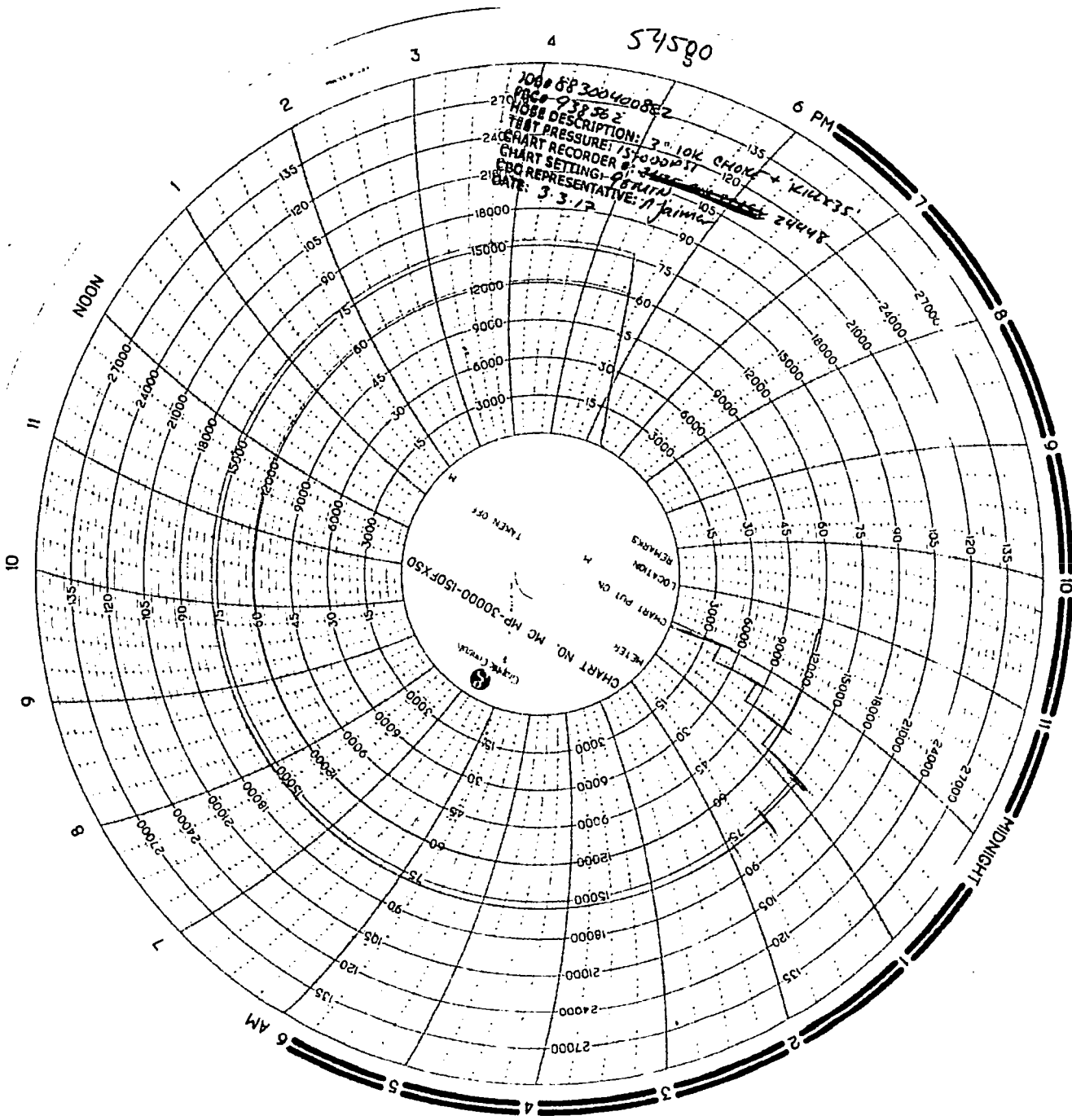
External Damage Post – Hydro test	
Approx. Distance from End A	3'
Width	8"
Length	3"
Depth	To hose body
Notes	Broken armor



Issued By: Alejandro Jaimes
 Date: 03/10/2017

Checked By: Gerson Mejia-Lazo
 Date: 03/10/2017

Page 1 of 1
 QF97



54580
1000 6830042082
HOBBS DESCRIPTION: 3" 10K CHOK
TEST PRESSURE: 15000 PSI
CHART RECORDER: 15000 PSI
CHART SETTING: 15000 PSI
FBO REPRESENTATIVE: J. J. JAMES
DATE: 3.3.12
TIME: 12:44:35

CHART NO. MC MP-3000-150F-X50
METER
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF

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
-------------------	-----------------------------

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:

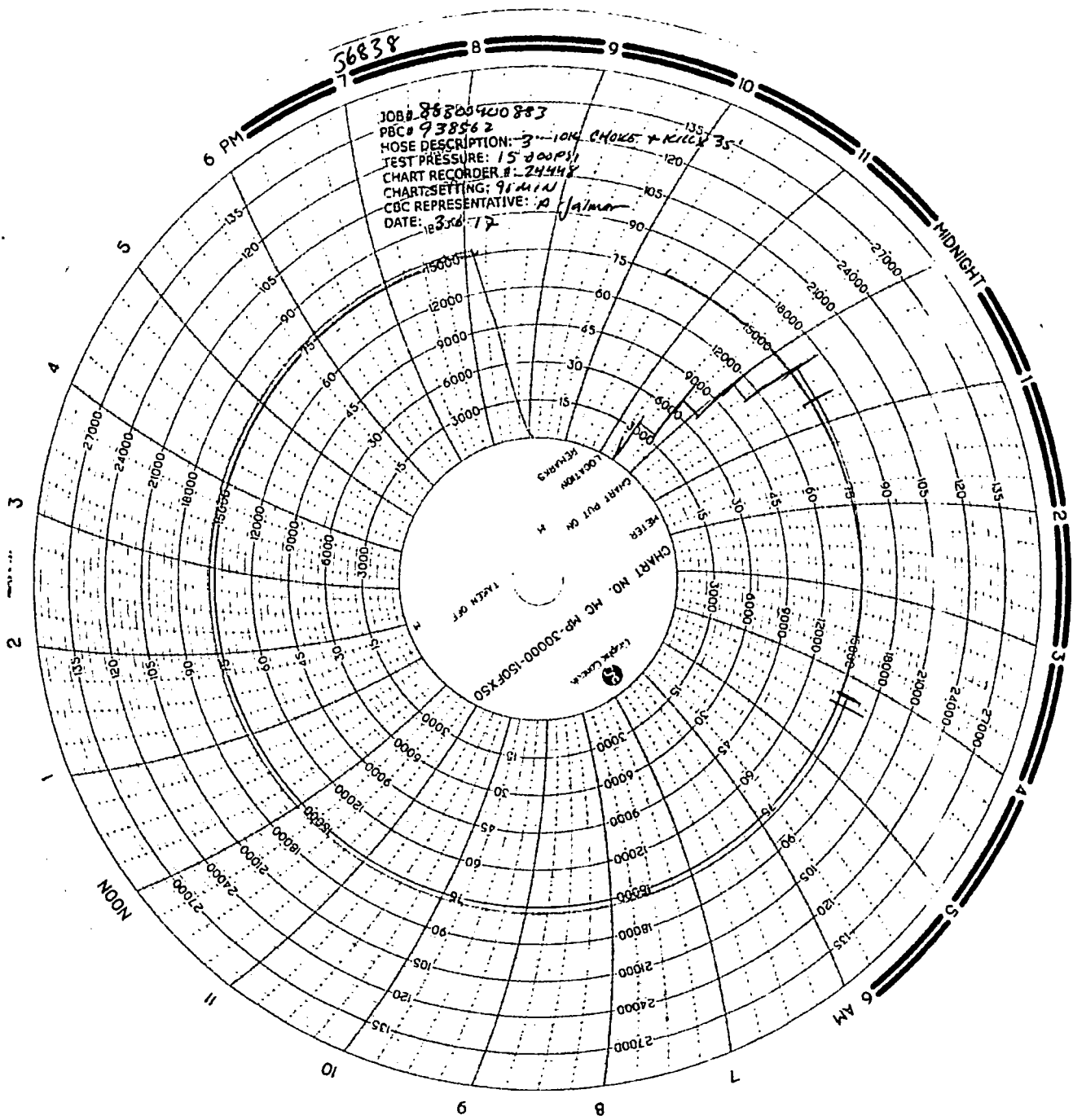
Visual inspection: Every 3 to 6 months (or during installation/removal)
 Annual: In-situ pressure test (in addition to the 3 to 6 monthly inspections)
 Initial 5 years service: Major inspection
 2nd Major inspection: Following subsequent 3 year life cycle
 (Detailed description of test regime available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

Issued By: Alejandro Jaimes
 Date: 03/13/2017

Checked By: Gerson Mejia-Lazo
 Date: 03/13/2017

Page 1 of 1
 QF97



JOB# 86800400883
PBC# 938562
HOSE DESCRIPTION: 3-104 CHOKES + KICK 35
TEST PRESSURE: 1500PSI
CHART RECORDER: 1-24448
CHART SETTING: 9 MIN
CBC REPRESENTATIVE: P. J. / 11/11/11
DATE: 12/30/12

CHART NO. HC MP-30000-150F-X50
CHART PUT ON
LOCATION
METER

Hose Inspection Report

ContiTech Oil & Marine

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

Hose Manufacturer	Contitech Rubber Industrial
-------------------	-----------------------------

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.

56489

6 PM

JOB# 3302400884
PBC# 8033562
HOSE DESCRIPTION 3" 100' Orange-Halifax 38
TEST PRESSURE 75000 PSI
CHART RECORDER# 2481
CHART SETTING 76-424
CBQ REPRESENTATIVE: J. J. J. J.
DATE: 3-1-12

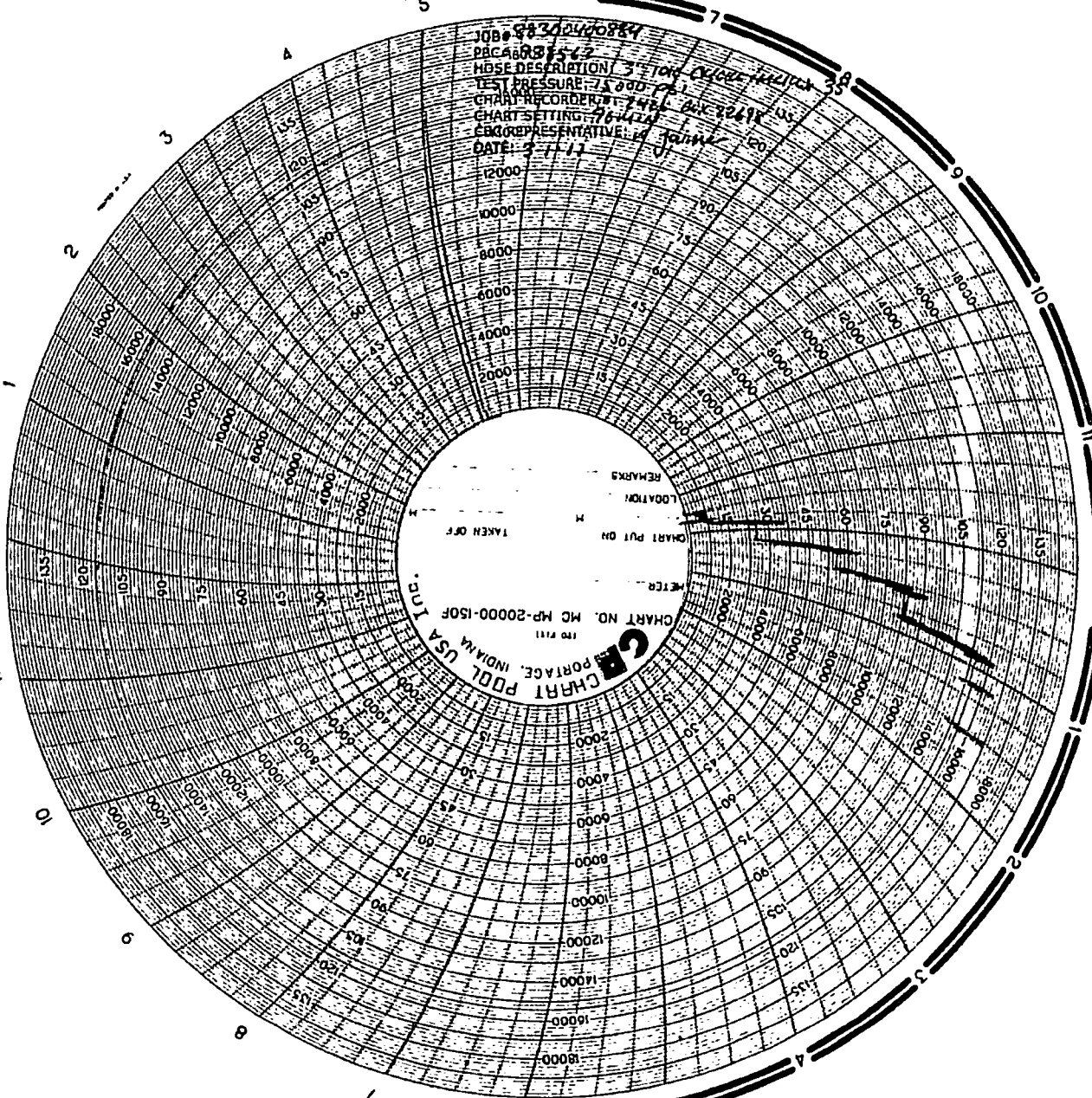
NOON

MIDNIGHT

6 AM

CHART NO. MC MP-20000-150F
CHART POOL USA
PORTAGE, INDIANA
170 F111

REMARKS
LOCATION
CHART PUT ON
TAKEN OFF



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
-------------------	-----------------------------

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

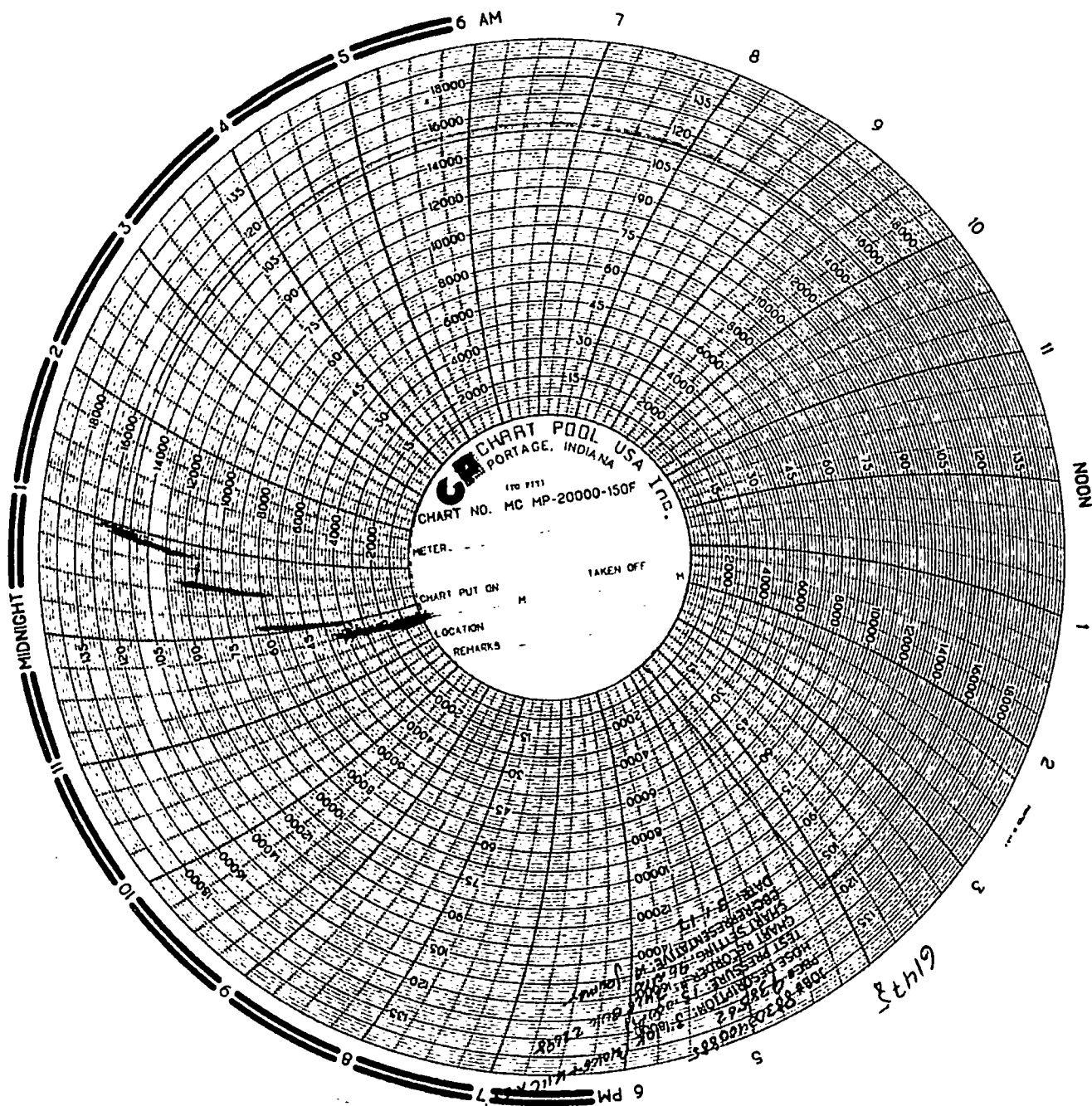
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	Material: Carbon Steel
Seal Face: BX155	Seal Face: BX155
Length Before Hydro Test: 35'	Length After Hydro test: 35'

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
-------------------	-----------------------------

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.

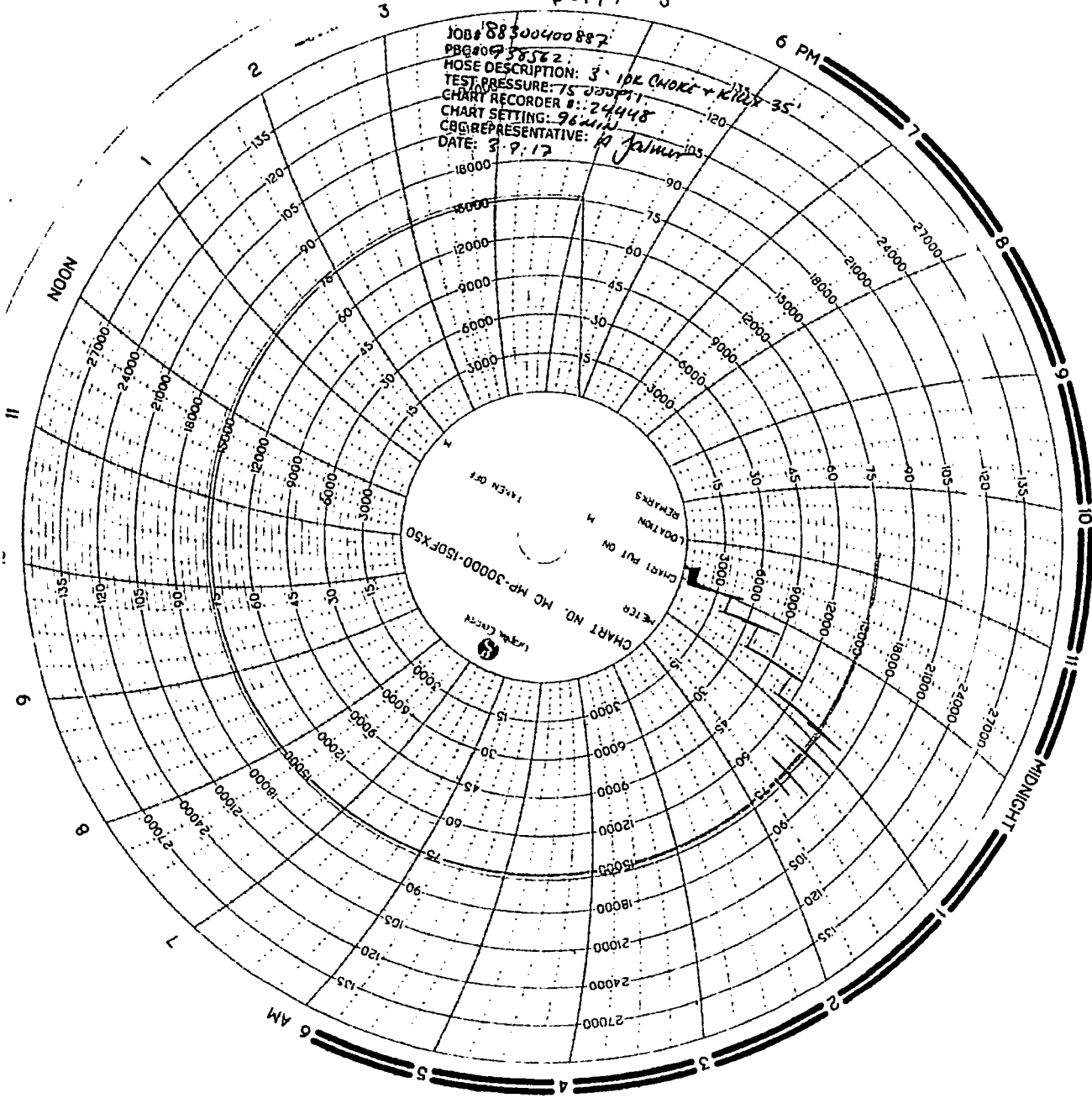
Recommendations: In general the hose should be inspected on a regular on-going basis. The frequency and degree of the inspection should as a minimum follow these guidelines:

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.

4 60197 5

100# 88300400887
PBG# 095852
HOSE DESCRIPTION: 3" 10K CHOKER + K12X 35'
TEST PRESSURE: 75 000 PSI
CHART RECORDER #: 24448
CHART SETTING: 96 111
CBO REPRESENTATIVE: 10 Janner
DATE: 3-9-17



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
-------------------	-----------------------------

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'

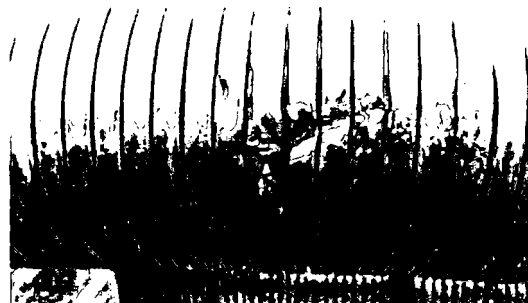
Conclusion: Hose #60197 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60197 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60197 is suitable for continued service.

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



Issued By: Alejandro Jaimes
 Date: 03/10/2017

Checked By: Gerson Mejia-Lazo
 Date: 03/10/2017

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 QF97

Hose Inspection Report

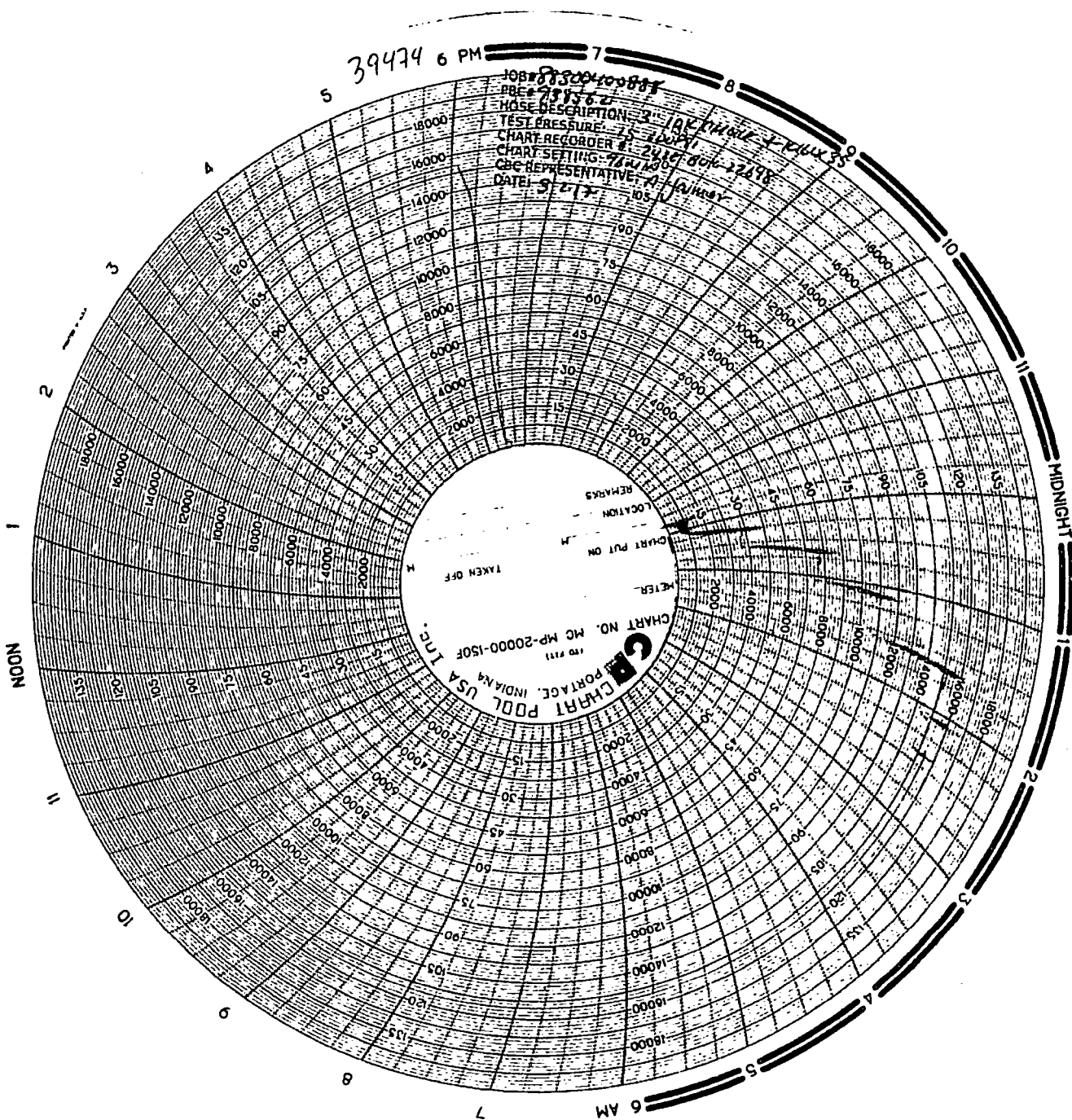
ContiTech Oil & Marine

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
-------------------	-----------------------------

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'

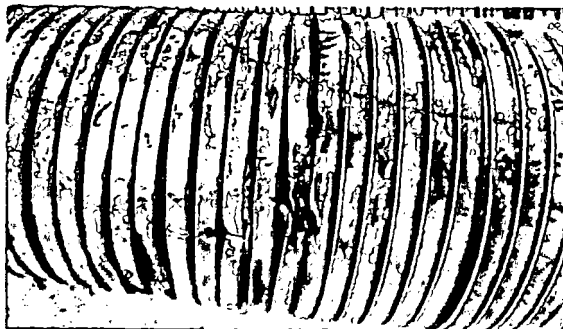
Conclusion: Hose #39474 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #39474 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #39474 is suitable for continued service.

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

108# 1800400 P89
PBC# 938562
HOSE DESCRIPTION: 5" 10K CHART 4-144K 35'
TEST PRESSURE: 1500 PSI
CHART RECORDER: 24448
CHART SETTING: 9000
CBC REPRESENTATIVE: J. J. J.
DATE: 8-7-79

NOON

MIDNIGHT

6 AM

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

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
-------------------	-----------------------------

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'

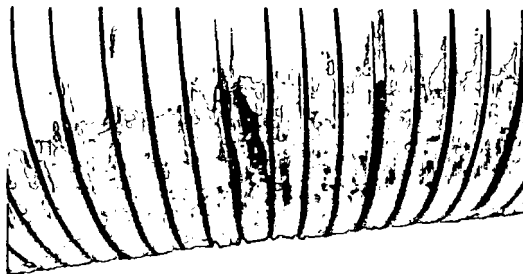
Conclusion: Hose #60887 passed the external inspection with minimal damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60887 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. Hose #60887 is suitable for continued service.

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



Issued By: Alejandro Jaimes
 Date: 03/10/2017

Checked By: Gerson Mejia-Lazo
 Date: 03/10/2017

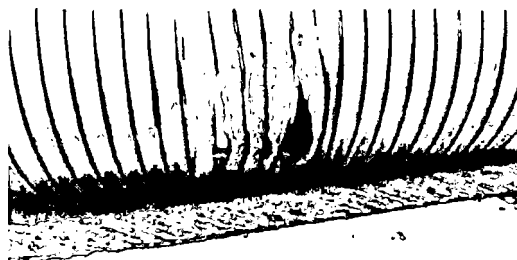
Page 1 of 2
 QF97

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



Issued By: Alejandro Jaimes
Date: 03/10/2017

Checked By: Gerson Mejia-Lazo
Date: 03/10/2017

Page 2 of 2
QF97



Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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



Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

Wedge 513®

Printed on: 01/30/2018



Outside Diameter	7.625 in.	Min. Wall Thickness	87.5%	(*) Grade P110	
Wall Thickness	0.375 in.	Connection OD Option	REGULAR	COUPLING	PIPE BODY
Grade	P110*	Drift	API Standard	Body: White	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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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%	▼
		Drift	API Standard	▼
Wall Thickness	0.361 in	Type	Casing	▼
Grade	P110	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 x 1000 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 x 1000 lbs	Internal Pressure Capacity ¹	12640,000 psi
Compression Efficiency	100 %	Compression Strength	641,000 x 1000 lbs	Max. Allowable Bending	92 °/100 ft
External Pressure Capacity	11100,000 psi				

MAKE-UP TORQUES

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

OPERATION LIMIT TORQUES

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

Casing Design Assumptions

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

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Hydrogen Sulfide Drilling

Operations Plan

Tap Rock Resources

1 H2S safety instructions to the following:

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

2 H2S Detection and Alarm Systems:

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

3 Windssocks and / Wind Streamers:

- Windssocks at mud pit area should be high enough to be visible
- Windssock 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

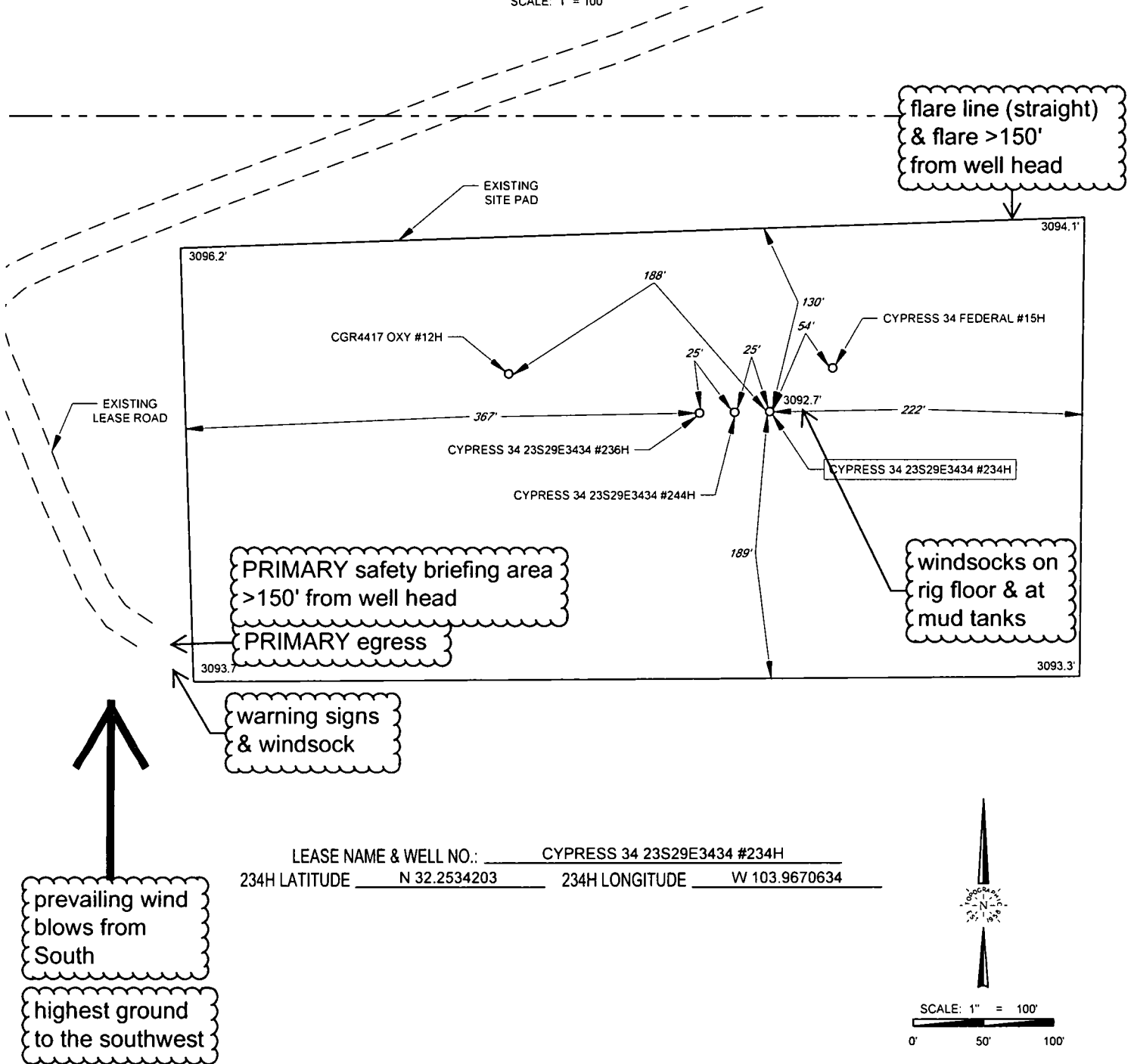
Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911
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.



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2803 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 23S29E3434 Well Pad
H₂S Contingency Plan:
2 Mile Radius Map

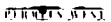
Sec. 3, Township 24S, Range 29E
Eddy County, New Mexico

⊙ Pad Location

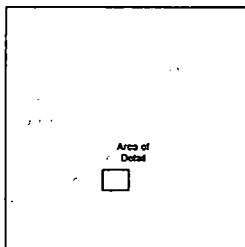
1:27,000
0 0.25 0.5
Miles



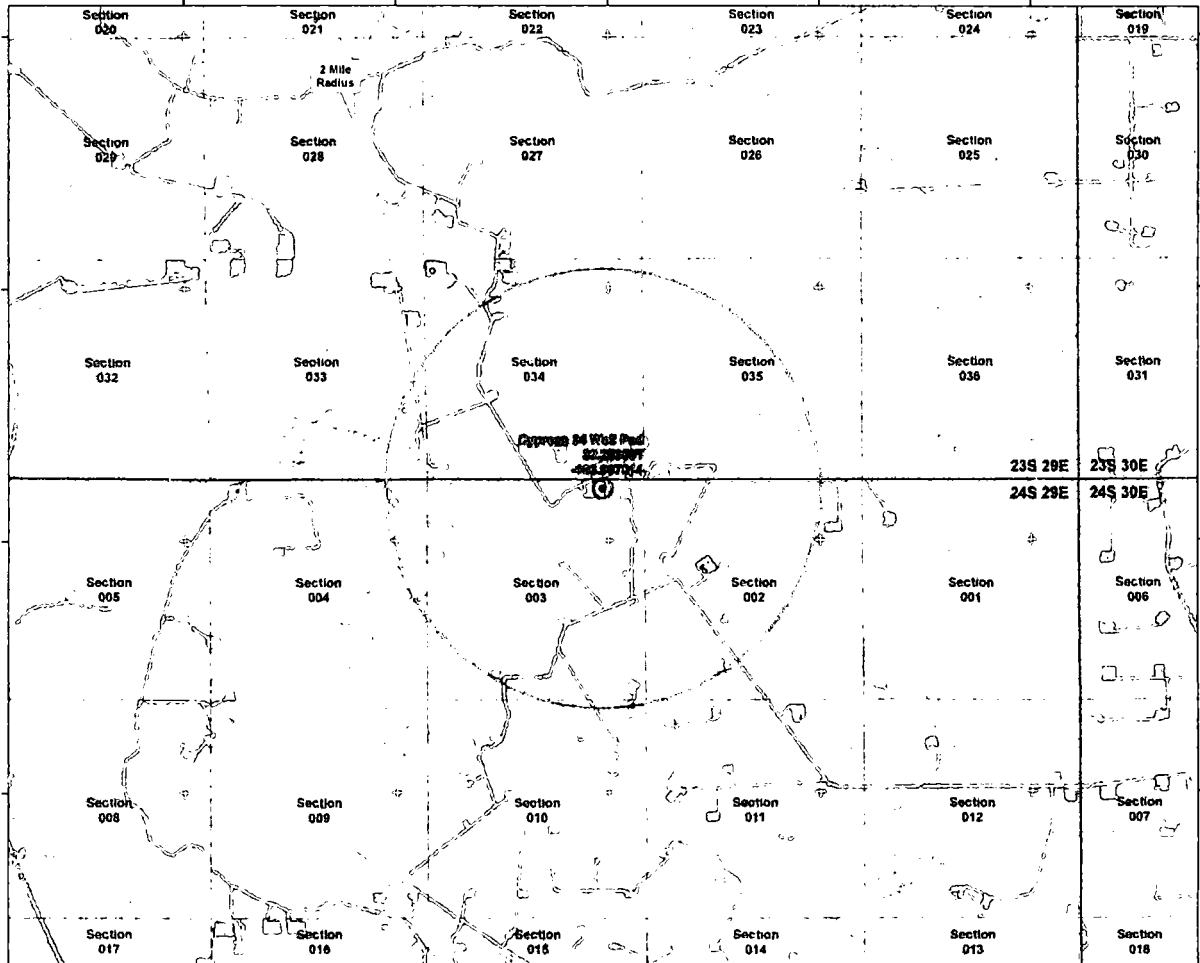
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



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



Area of
Detail





Company: Tap Rock Operating
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Project: Eddy County, New Mexico (NAD 83)
Rig: H&P 422

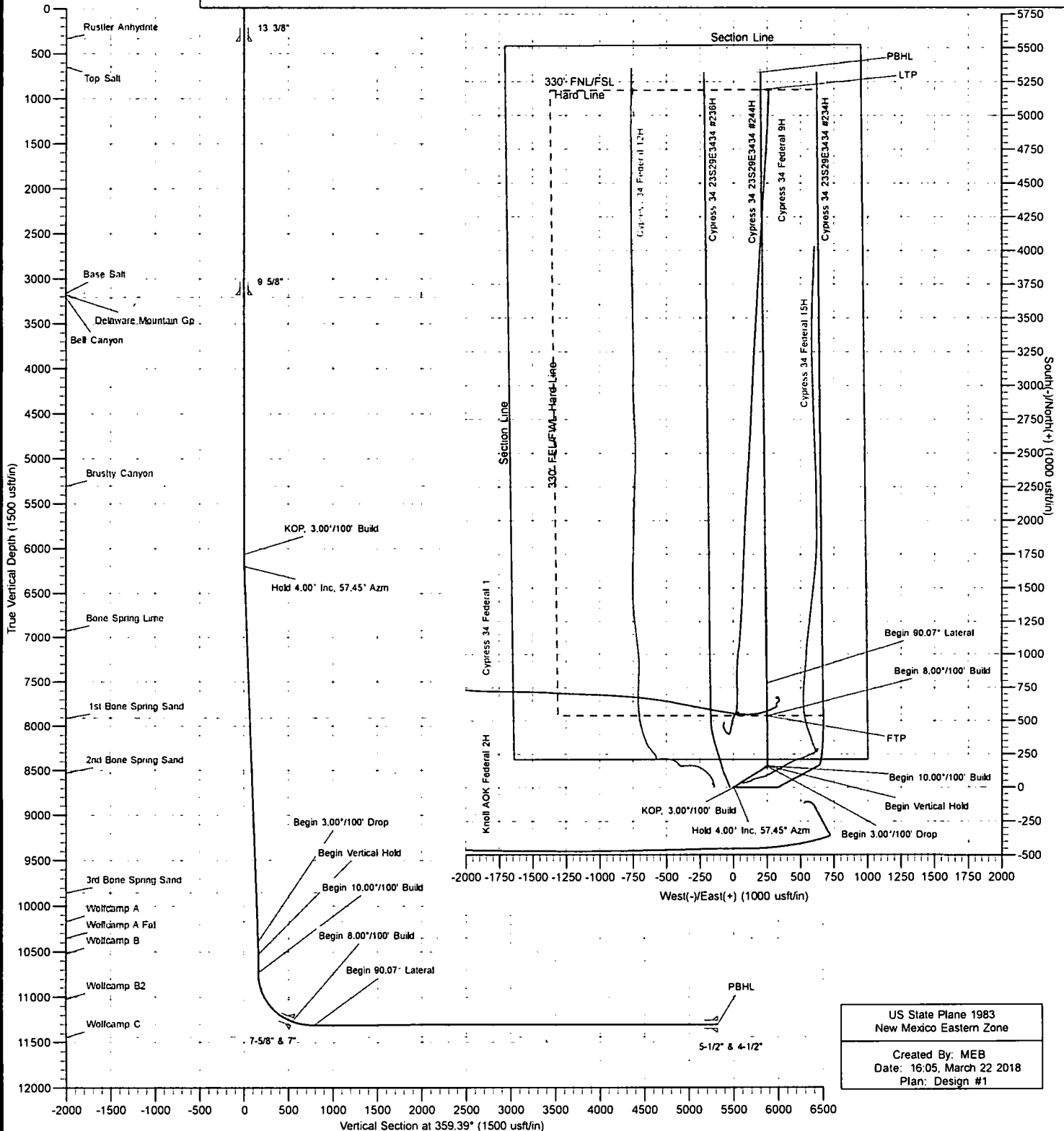


Azimuths to Grid North
True North: -0.20°
Magnetic North: 6.93°

Magnetic Field
Strength: 47875.3nT
Dip Angle: 59.98°
Date: 5/20/2018
Model: BGGM2017

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
6065.30	0.00	0.00	6065.30	0.00	0.00	0.00	0.00	KOP, 3.00°/100' Build
6198.64	4.00	57.45	6198.53	2.50	3.92	2.46	4.65	Hold 4.00° Inc, 57.45° Azm
10403.53	4.00	57.45	10393.17	160.31	251.17	157.63	297.97	Begin 3.00°/100' Drop
10536.86	0.00	0.00	10526.40	162.82	255.09	160.09	302.62	Begin Vertical Hold
10736.86	0.00	0.00	10726.40	162.82	255.09	160.09	302.62	Begin 10.00°/100' Build
11436.86	70.00	359.39	11264.80	539.79	251.08	537.09	679.82	Begin 8.00°/100' Build
11687.73	90.07	359.39	11308.00	785.60	248.44	782.91	925.44	Begin 90.07° Lateral
16222.60	90.07	359.39	11302.50	5320.21	199.97	5317.78	5460.31	PBHL



US State Plane 1983
New Mexico Eastern Zone

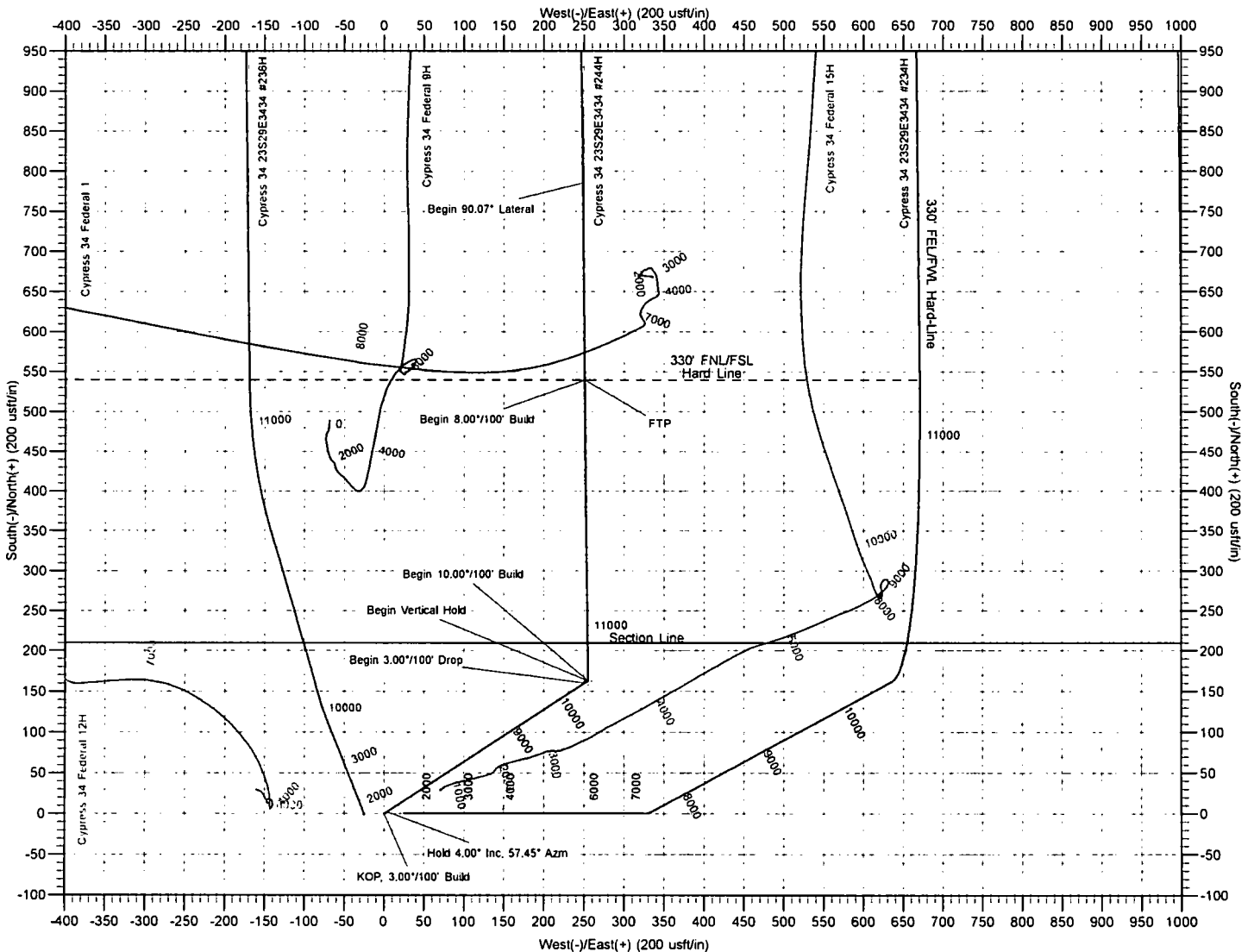
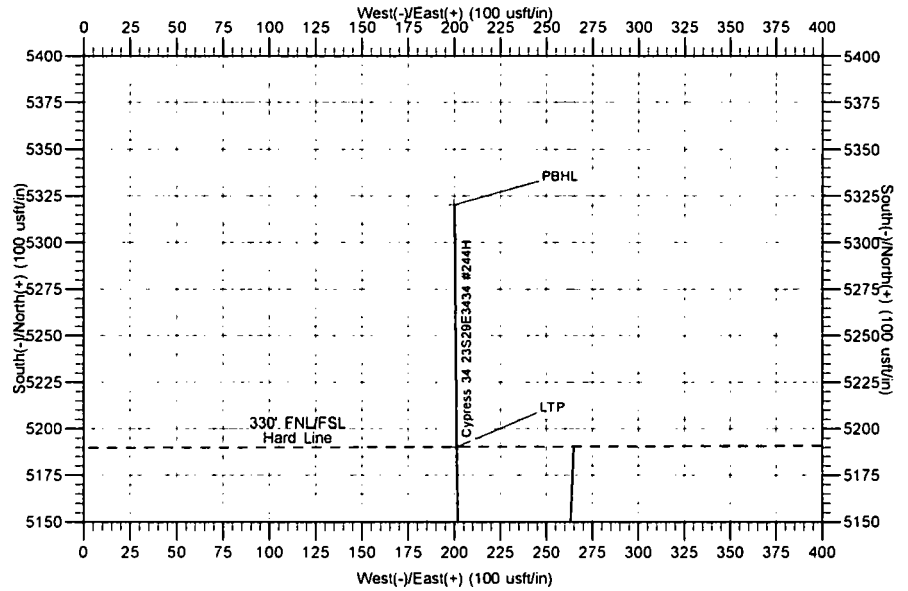
Created By: MEB
Date: 16.05, March 22 2018
Plan: Design #1

The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.

Any decisions made or wells drilled utilizing this or any other information supplied by MS Directional are at the sole risk and responsibility of the customer. MS Directional is not responsible for the accuracy of this schematic or the information contained herein.



Company: Tap Rock Operating
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Project: Eddy County, New Mexico (NAD 83)
Rig: H&P 422



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Tap Rock Operating

Eddy County, New Mexico (NAD 83)

Cypress 34 23S29E3434

Cypress 34 23S29E3434 #244H

Wellbore #1

Plan: Design #1

Standard Planning Report

22 March, 2018





MS Directional Planning Report



Database: EDM 5000.14 Conroe DB
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County, New Mexico (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 23S29E3434

Site Position: Northing: 456,120.72 usft Latitude: 32° 15' 12.313 N
From: Map Easting: 654,563.75 usft Longitude: 103° 58' 1.428 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.20 °

Well Cypress 34 23S29E3434 #244H

Well Position +N/-S -0.45 usft Northing: 456,120.27 usft Latitude: 32° 15' 12.309 N
+E/-W -25.00 usft Easting: 654,538.75 usft Longitude: 103° 58' 1.719 W
Position Uncertainty 0.00 usft Wellhead Elevation: Ground Level: 3,093.00 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2017	5/20/2018	7.12	59.98	47,875

Design Design #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00
Vertical Section: Depth From (TVD) +N/-S +E/-W Direction
(usft) (usft) (usft) (°)
0.00 0.00 0.00 359.39

Plan Survey Tool Program Date 3/20/2018

Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1 0.00	16,222.60	Design #1 (Wellbore #1)	MWD	
			OWSG MWD - Standard	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,065.30	0.00	0.00	6,065.30	0.00	0.00	0.00	0.00	0.00	0.00	
6,198.64	4.00	57.45	6,198.53	2.50	3.92	3.00	3.00	0.00	57.45	
10,403.53	4.00	57.45	10,393.18	160.31	251.17	0.00	0.00	0.00	0.00	
10,536.86	0.00	0.00	10,526.40	162.82	255.09	3.00	-3.00	0.00	180.00	Vert - Cypress 34 2
10,736.86	0.00	0.00	10,726.40	162.82	255.09	0.00	0.00	0.00	0.00	
11,436.86	70.00	359.39	11,264.80	539.79	251.06	10.00	10.00	0.00	359.39	PBHL - Cypress 34
11,687.73	90.07	359.39	11,308.00	785.60	248.44	8.00	8.00	0.00	0.00	
16,222.60	90.07	359.39	11,302.50	5,320.21	199.97	0.00	0.00	0.00	0.00	PBHL - Cypress 34



MS Directional
Planning Report



Database: EDM 5000.14 Conroe DB
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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
333.00	0.00	0.00	333.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler Anhydrite									
358.00	0.00	0.00	358.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
648.00	0.00	0.00	648.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Salt									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,158.00	0.00	0.00	3,158.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Salt									
3,178.00	0.00	0.00	3,178.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware Mountain Gp - 9 5/8"									
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,208.00	0.00	0.00	3,208.00	0.00	0.00	0.00	0.00	0.00	0.00
Bell Canyon									
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00



MS Directional Planning Report



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Survey Calculation Method: Minimum Curvature

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)
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,303.00	0.00	0.00	5,303.00	0.00	0.00	0.00	0.00	0.00	0.00
Brushy Canyon									
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,065.30	0.00	0.00	6,065.30	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 3.00°/100' Build									
6,100.00	1.04	57.45	6,100.00	0.17	0.27	0.17	3.00	3.00	0.00
6,198.64	4.00	57.45	6,198.53	2.50	3.92	2.46	3.00	3.00	0.00
Hold 4.00° Inc, 57.45° Azm									
6,200.00	4.00	57.45	6,199.89	2.55	4.00	2.51	0.00	0.00	0.00
6,300.00	4.00	57.45	6,299.64	6.31	9.88	6.20	0.00	0.00	0.00
6,400.00	4.00	57.45	6,399.40	10.06	15.76	9.89	0.00	0.00	0.00
6,500.00	4.00	57.45	6,499.16	13.81	21.64	13.58	0.00	0.00	0.00
6,600.00	4.00	57.45	6,598.91	17.57	27.52	17.27	0.00	0.00	0.00
6,700.00	4.00	57.45	6,698.67	21.32	33.40	20.96	0.00	0.00	0.00
6,800.00	4.00	57.45	6,798.43	25.07	39.28	24.65	0.00	0.00	0.00
6,900.00	4.00	57.45	6,898.18	28.83	45.16	28.34	0.00	0.00	0.00
6,919.87	4.00	57.45	6,918.00	29.57	46.33	29.08	0.00	0.00	0.00
Bone Spring Lime									
7,000.00	4.00	57.45	6,997.94	32.58	51.04	32.03	0.00	0.00	0.00
7,100.00	4.00	57.45	7,097.70	36.33	56.92	35.72	0.00	0.00	0.00
7,200.00	4.00	57.45	7,197.45	40.08	62.80	39.41	0.00	0.00	0.00
7,300.00	4.00	57.45	7,297.21	43.84	68.68	43.10	0.00	0.00	0.00
7,400.00	4.00	57.45	7,396.97	47.59	74.56	46.79	0.00	0.00	0.00
7,500.00	4.00	57.45	7,496.72	51.34	80.44	50.48	0.00	0.00	0.00
7,600.00	4.00	57.45	7,596.48	55.10	86.32	54.17	0.00	0.00	0.00
7,700.00	4.00	57.45	7,696.23	58.85	92.20	57.86	0.00	0.00	0.00
7,800.00	4.00	57.45	7,795.99	62.60	98.08	61.55	0.00	0.00	0.00
7,900.00	4.00	57.45	7,895.75	66.36	103.96	65.24	0.00	0.00	0.00
7,912.28	4.00	57.45	7,908.00	66.82	104.68	65.70	0.00	0.00	0.00
1st Bone Spring Sand									
8,000.00	4.00	57.45	7,995.50	70.11	109.84	68.94	0.00	0.00	0.00
8,100.00	4.00	57.45	8,095.26	73.86	115.72	72.63	0.00	0.00	0.00
8,200.00	4.00	57.45	8,195.02	77.61	121.60	76.32	0.00	0.00	0.00
8,300.00	4.00	57.45	8,294.77	81.37	127.48	80.01	0.00	0.00	0.00



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North Reference: Grid
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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)
8,400.00	4.00	57.45	8,394.53	85.12	133.36	83.70	0.00	0.00	0.00
8,500.00	4.00	57.45	8,494.29	88.87	139.24	87.39	0.00	0.00	0.00
8,528.78	4.00	57.45	8,523.00	89.95	140.93	88.45	0.00	0.00	0.00
2nd Bone Spring Sand									
8,600.00	4.00	57.45	8,594.04	92.63	145.12	91.08	0.00	0.00	0.00
8,700.00	4.00	57.45	8,693.80	96.38	151.00	94.77	0.00	0.00	0.00
8,800.00	4.00	57.45	8,793.56	100.13	156.88	98.46	0.00	0.00	0.00
8,900.00	4.00	57.45	8,893.31	103.89	162.76	102.15	0.00	0.00	0.00
9,000.00	4.00	57.45	8,993.07	107.64	168.64	105.84	0.00	0.00	0.00
9,100.00	4.00	57.45	9,092.82	111.39	174.52	109.53	0.00	0.00	0.00
9,200.00	4.00	57.45	9,192.58	115.14	180.40	113.22	0.00	0.00	0.00
9,300.00	4.00	57.45	9,292.34	118.90	186.28	116.91	0.00	0.00	0.00
9,400.00	4.00	57.45	9,392.09	122.65	192.16	120.60	0.00	0.00	0.00
9,500.00	4.00	57.45	9,491.85	126.40	198.04	124.29	0.00	0.00	0.00
9,600.00	4.00	57.45	9,591.61	130.16	203.92	127.98	0.00	0.00	0.00
9,700.00	4.00	57.45	9,691.36	133.91	209.80	131.67	0.00	0.00	0.00
9,800.00	4.00	57.45	9,791.12	137.66	215.68	135.36	0.00	0.00	0.00
9,862.03	4.00	57.45	9,853.00	139.99	219.33	137.65	0.00	0.00	0.00
3rd Bone Spring Sand									
9,900.00	4.00	57.45	9,890.88	141.42	221.56	139.05	0.00	0.00	0.00
10,000.00	4.00	57.45	9,990.63	145.17	227.44	142.74	0.00	0.00	0.00
10,100.00	4.00	57.45	10,090.39	148.92	233.32	146.43	0.00	0.00	0.00
10,177.80	4.00	57.45	10,168.00	151.84	237.90	149.30	0.00	0.00	0.00
Wolfcamp A									
10,200.00	4.00	57.45	10,190.14	152.67	239.20	150.12	0.00	0.00	0.00
10,300.00	4.00	57.45	10,289.90	156.43	245.08	153.81	0.00	0.00	0.00
10,358.24	4.00	57.45	10,348.00	158.61	248.51	155.96	0.00	0.00	0.00
Wolfcamp A Fat									
10,403.53	4.00	57.45	10,393.18	160.31	251.17	157.63	0.00	0.00	0.00
Begin 3.00°/100' Drop									
10,500.00	1.11	57.45	10,489.54	162.62	254.79	159.90	3.00	-3.00	0.00
10,528.46	0.25	57.45	10,518.00	162.81	255.08	160.08	3.00	-3.00	0.00
Wolfcamp B									
10,536.86	0.00	0.00	10,526.40	162.82	255.09	160.09	3.00	-3.00	0.00
Begin Vertical Hold									
10,600.00	0.00	0.00	10,589.54	162.82	255.09	160.09	0.00	0.00	0.00
10,700.00	0.00	0.00	10,689.54	162.82	255.09	160.09	0.00	0.00	0.00
10,736.86	0.00	0.00	10,726.40	162.82	255.09	160.09	0.00	0.00	0.00
Begin 10.00°/100' Build									
10,750.00	1.31	359.39	10,739.54	162.97	255.09	160.24	10.00	10.00	0.00
10,800.00	6.31	359.39	10,789.41	166.29	255.05	163.57	10.00	10.00	0.00
10,850.00	11.31	359.39	10,838.81	173.95	254.97	171.23	10.00	10.00	0.00
10,900.00	16.31	359.39	10,887.35	185.88	254.84	183.16	10.00	10.00	0.00
10,950.00	21.31	359.39	10,934.66	202.00	254.67	199.28	10.00	10.00	0.00
11,000.00	26.31	359.39	10,980.39	222.18	254.46	219.46	10.00	10.00	0.00
11,042.79	30.59	359.39	11,018.00	242.57	254.24	239.85	10.00	10.00	0.00
Wolfcamp B2									
11,050.00	31.31	359.39	11,024.18	246.27	254.20	243.55	10.00	10.00	0.00
11,100.00	36.31	359.39	11,065.71	274.09	253.90	271.37	10.00	10.00	0.00
11,150.00	41.31	359.39	11,104.66	305.42	253.57	302.70	10.00	10.00	0.00
11,200.00	46.31	359.39	11,140.73	340.02	253.20	337.30	10.00	10.00	0.00
11,250.00	51.31	359.39	11,173.64	377.63	252.80	374.92	10.00	10.00	0.00
11,300.00	56.31	359.39	11,203.15	417.97	252.36	415.26	10.00	10.00	0.00



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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)
11,350.00	61.31	359.39	11,229.04	460.73	251.91	458.02	10.00	10.00	0.00
11,400.00	66.31	359.39	11,251.09	505.58	251.43	502.88	10.00	10.00	0.00
11,436.86	70.00	359.39	11,264.80	539.79	251.06	537.09	10.00	10.00	0.00
Begin 8.00°/100' Build - 7-5/8" & 7"									
11,450.00	71.05	359.39	11,269.19	552.18	250.93	549.47	8.00	8.00	0.00
11,500.00	75.05	359.39	11,283.76	599.99	250.42	597.29	8.00	8.00	0.00
11,550.00	79.05	359.39	11,294.96	648.71	249.90	646.01	8.00	8.00	0.00
11,600.00	83.05	359.39	11,302.74	698.09	249.37	695.39	8.00	8.00	0.00
11,650.00	87.05	359.39	11,307.05	747.89	248.84	745.20	8.00	8.00	0.00
11,687.73	90.07	359.39	11,308.00	785.60	248.44	782.91	8.00	8.00	0.00
Begin 90.07° Lateral									
11,700.00	90.07	359.39	11,307.98	797.87	248.30	795.18	0.00	0.00	0.00
11,800.00	90.07	359.39	11,307.86	897.86	247.24	895.18	0.00	0.00	0.00
11,900.00	90.07	359.39	11,307.74	997.86	246.17	995.18	0.00	0.00	0.00
12,000.00	90.07	359.39	11,307.62	1,097.85	245.10	1,095.18	0.00	0.00	0.00
12,100.00	90.07	359.39	11,307.50	1,197.85	244.03	1,195.18	0.00	0.00	0.00
12,200.00	90.07	359.39	11,307.38	1,297.84	242.96	1,295.18	0.00	0.00	0.00
12,300.00	90.07	359.39	11,307.25	1,397.83	241.89	1,395.18	0.00	0.00	0.00
12,400.00	90.07	359.39	11,307.13	1,497.83	240.82	1,495.18	0.00	0.00	0.00
12,500.00	90.07	359.39	11,307.01	1,597.82	239.75	1,595.18	0.00	0.00	0.00
12,600.00	90.07	359.39	11,306.89	1,697.82	238.69	1,695.18	0.00	0.00	0.00
12,700.00	90.07	359.39	11,306.77	1,797.81	237.62	1,795.18	0.00	0.00	0.00
12,800.00	90.07	359.39	11,306.65	1,897.81	236.55	1,895.18	0.00	0.00	0.00
12,900.00	90.07	359.39	11,306.53	1,997.80	235.48	1,995.18	0.00	0.00	0.00
13,000.00	90.07	359.39	11,306.41	2,097.79	234.41	2,095.18	0.00	0.00	0.00
13,100.00	90.07	359.39	11,306.28	2,197.79	233.34	2,195.18	0.00	0.00	0.00
13,200.00	90.07	359.39	11,306.16	2,297.78	232.27	2,295.18	0.00	0.00	0.00
13,300.00	90.07	359.39	11,306.04	2,397.78	231.21	2,395.18	0.00	0.00	0.00
13,400.00	90.07	359.39	11,305.92	2,497.77	230.14	2,495.18	0.00	0.00	0.00
13,500.00	90.07	359.39	11,305.80	2,597.77	229.07	2,595.18	0.00	0.00	0.00
13,600.00	90.07	359.39	11,305.68	2,697.76	228.00	2,695.18	0.00	0.00	0.00
13,700.00	90.07	359.39	11,305.56	2,797.75	226.93	2,795.18	0.00	0.00	0.00
13,800.00	90.07	359.39	11,305.44	2,897.75	225.86	2,895.18	0.00	0.00	0.00
13,900.00	90.07	359.39	11,305.31	2,997.74	224.79	2,995.18	0.00	0.00	0.00
14,000.00	90.07	359.39	11,305.19	3,097.74	223.73	3,095.18	0.00	0.00	0.00
14,100.00	90.07	359.39	11,305.07	3,197.73	222.66	3,195.18	0.00	0.00	0.00
14,200.00	90.07	359.39	11,304.95	3,297.72	221.59	3,295.18	0.00	0.00	0.00
14,300.00	90.07	359.39	11,304.83	3,397.72	220.52	3,395.18	0.00	0.00	0.00
14,400.00	90.07	359.39	11,304.71	3,497.71	219.45	3,495.18	0.00	0.00	0.00
14,500.00	90.07	359.39	11,304.59	3,597.71	218.38	3,595.18	0.00	0.00	0.00
14,600.00	90.07	359.39	11,304.47	3,697.70	217.31	3,695.18	0.00	0.00	0.00
14,700.00	90.07	359.39	11,304.35	3,797.70	216.24	3,795.18	0.00	0.00	0.00
14,800.00	90.07	359.39	11,304.22	3,897.69	215.18	3,895.18	0.00	0.00	0.00
14,900.00	90.07	359.39	11,304.10	3,997.68	214.11	3,995.18	0.00	0.00	0.00
15,000.00	90.07	359.39	11,303.98	4,097.68	213.04	4,095.18	0.00	0.00	0.00
15,100.00	90.07	359.39	11,303.86	4,197.67	211.97	4,195.18	0.00	0.00	0.00
15,200.00	90.07	359.39	11,303.74	4,297.67	210.90	4,295.18	0.00	0.00	0.00
15,300.00	90.07	359.39	11,303.62	4,397.66	209.83	4,395.18	0.00	0.00	0.00
15,400.00	90.07	359.39	11,303.50	4,497.66	208.76	4,495.18	0.00	0.00	0.00
15,500.00	90.07	359.39	11,303.38	4,597.65	207.70	4,595.18	0.00	0.00	0.00
15,600.00	90.07	359.39	11,303.25	4,697.64	206.63	4,695.18	0.00	0.00	0.00
15,700.00	90.07	359.39	11,303.13	4,797.64	205.56	4,795.18	0.00	0.00	0.00
15,800.00	90.07	359.39	11,303.01	4,897.63	204.49	4,895.18	0.00	0.00	0.00



MS Directional Planning Report



Database: EDM 5000.14 Conroe DB
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
15,900.00	90.07	359.39	11,302.89	4,997.63	203.42	4,995.18	0.00	0.00	0.00
16,000.00	90.07	359.39	11,302.77	5,097.62	202.35	5,095.18	0.00	0.00	0.00
16,100.00	90.07	359.39	11,302.65	5,197.61	201.28	5,195.18	0.00	0.00	0.00
16,200.00	90.07	359.39	11,302.53	5,297.61	200.21	5,295.18	0.00	0.00	0.00
16,222.60	90.07	359.39	11,302.50	5,320.21	199.97	5,317.78	0.00	0.00	0.00
PBHL - 5-1/2" & 4-1/2"									

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
Vert - Cypress 34 244 - plan hits target center - Point	0.00	0.00	10,526.40	162.82	255.09	456,283.09	654,793.85	32° 15' 13.912 N	103° 57' 58.742 W
FTP - Cypress 34 244 - plan hits target center - Point	0.00	0.00	11,264.80	539.78	251.06	456,660.05	654,789.82	32° 15' 17.643 N	103° 57' 58.774 W
PBHL - Cypress 34 244 - plan hits target center - Point	0.00	0.01	11,302.50	5,320.21	199.97	461,440.48	654,738.73	32° 16' 4.950 N	103° 57' 59.179 W
LTP - Cypress 34 244 - plan hits target center - Point	0.00	0.01	11,302.66	5,190.21	201.36	461,310.48	654,740.12	32° 16' 3.664 N	103° 57' 59.168 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
358.00	358.00	13 3/8"	13-3/8	17-1/2
3,178.00	3,178.00	9 5/8"	9-5/8	12-1/4
11,436.86	11,264.80	7-5/8" & 7"	7	8-3/4
16,222.60	11,302.50	5-1/2" & 4-1/2"	4-1/2	6-1/8



MS Directional
Planning Report



Database: EDM 5000.14 Conroe DB
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Project: Eddy County, New Mexico (NAD 83)
Site: Cypress 34 23S29E3434
Well: Cypress 34 23S29E3434 #244H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
333.00	333.00	Rustler Anhydrite			
648.00	648.00	Top Salt			
3,158.00	3,158.00	Base Salt			
3,178.00	3,178.00	Delaware Mountain Gp			
3,208.00	3,208.00	Bell Canyon			
5,303.00	5,303.00	Brushy Canyon			
6,919.87	6,918.00	Bone Spring Lime			
7,912.28	7,908.00	1st Bone Spring Sand			
8,528.78	8,523.00	2nd Bone Spring Sand			
9,862.03	9,853.00	3rd Bone Spring Sand			
10,177.80	10,168.00	Wolfcamp A			
10,358.24	10,348.00	Wolfcamp A Fat			
10,528.46	10,518.00	Wolfcamp B			
11,042.79	11,018.00	Wolfcamp B2			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,065.30	6,065.30	0.00	0.00	KOP, 3.00°/100' Build
6,198.64	6,198.53	2.50	3.92	Hold 4.00° Inc, 57.45° Azm
10,403.53	10,393.18	160.31	251.17	Begin 3.00°/100' Drop
10,536.86	10,526.40	162.82	255.09	Begin Vertical Hold
10,736.86	10,726.40	162.82	255.09	Begin 10.00°/100' Build
11,436.86	11,264.80	539.79	251.06	Begin 8.00°/100' Build
11,687.73	11,308.00	785.60	248.44	Begin 90.07° Lateral
16,222.60	11,302.50	5,320.21	199.97	PBHL



Tap Rock Operating

Eddy County, New Mexico (NAD 83)

Cypress 34 23S29E3434

Cypress 34 23S29E3434 #244H

Wellbore #1

Design #1

Anticollision Report

22 March, 2018





Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Reference Design #1

Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method: MD + Stations Interval 100.00usft
Depth Range: Unlimited
Results Limited by: Maximum center-center distance of 10,000.00 u
Warning Levels Evaluated at: 3.00 Sigma
Error Model: ISCWSA
Scan Method: Closest Approach 3D
Error Surface: Pedal Curve
Casing Method: Not applied

Survey Tool Program Date 3/20/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	16,222.60	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

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 23S29E3434						
Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #	1,500.00	1,500.00	25.00	9.54	1.617	CC
Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #	1,600.00	1,599.56	25.87	9.36	1.566	ES, SF
Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #	1,500.00	1,500.00	25.00	9.54	1.617	CC
Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #	1,600.00	1,599.83	25.33	8.80	1.532	ES
Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #	1,700.00	1,699.61	26.45	8.85	1.503	SF
Cypress 34 Federal						
Cypress 34 Federal 1 - Wellbore #1 - Surveys	7,964.13	7,997.66	480.55	399.01	5.893	CC, ES, SF
Cypress 34 Federal 12H - Wellbore #1 - Surveys	2,930.68	2,934.98	140.32	109.64	4.573	CC
Cypress 34 Federal 12H - Wellbore #1 - Surveys	6,065.30	6,067.53	144.05	80.14	2.254	ES, SF
Cypress 34 Federal 15H - Wellbore #1 - Surveys	408.12	408.13	75.40	72.61	27.024	CC, ES
Cypress 34 Federal 15H - Wellbore #1 - Surveys	10,038.69	10,059.29	407.92	303.92	3.922	SF
Cypress 34 Federal 9H - Wellbore #1 - Surveys	3,324.85	3,333.77	401.17	367.93	12.071	CC, ES
Cypress 34 Federal 9H - Wellbore #1 - Surveys	8,300.00	8,292.00	482.40	407.15	6.410	SF
Knoll AOK Federal						
Knoll AOK Federal 2H - Wellbore #1 - Surveys	7,982.97	8,410.95	520.97	434.89	6.052	CC, ES
Knoll AOK Federal 2H - Wellbore #1 - Surveys	8,000.00	8,408.12	521.24	435.05	6.047	SF

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	88.97	0.45	25.00	25.00				
100.00	100.00	100.00	100.00	0.20	0.20	88.97	0.45	25.00	25.00	24.60	0.40	62.002	
200.00	200.00	200.00	200.00	0.74	0.74	88.97	0.45	25.00	25.00	23.53	1.48	16.910	
300.00	300.00	300.00	300.00	1.28	1.28	88.97	0.45	25.00	25.00	22.45	2.55	9.790	
400.00	400.00	400.00	400.00	1.81	1.81	88.97	0.45	25.00	25.00	21.37	3.63	6.889	
500.00	500.00	500.00	500.00	2.35	2.35	88.97	0.45	25.00	25.00	20.30	4.70	5.314	
600.00	600.00	600.00	600.00	2.89	2.89	88.97	0.45	25.00	25.00	19.22	5.78	4.326	
700.00	700.00	700.00	700.00	3.43	3.43	88.97	0.45	25.00	25.00	18.15	6.86	3.647	
800.00	800.00	800.00	800.00	3.97	3.97	88.97	0.45	25.00	25.00	17.07	7.93	3.153	
900.00	900.00	900.00	900.00	4.50	4.50	88.97	0.45	25.00	25.00	16.00	9.01	2.776	
1,000.00	1,000.00	1,000.00	1,000.00	5.04	5.04	88.97	0.45	25.00	25.00	14.92	10.08	2.480	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
1,100.00	1,100.00	1,100.00	1,100.00	5.58	5.58	88.97	0.45	25.00	25.00	13.85	11.16	2.241	
1,200.00	1,200.00	1,200.00	1,200.00	6.12	6.12	88.97	0.45	25.00	25.00	12.77	12.23	2.044	
1,300.00	1,300.00	1,300.00	1,300.00	6.65	6.65	88.97	0.45	25.00	25.00	11.70	13.31	1.879	
1,400.00	1,400.00	1,400.00	1,400.00	7.19	7.19	88.97	0.45	25.00	25.00	10.62	14.38	1.738	
1,500.00	1,500.00	1,500.00	1,500.00	7.73	7.73	88.97	0.45	25.00	25.00	9.54	15.46	1.617 CC	
1,600.00	1,600.00	1,599.56	1,599.55	8.27	8.25	89.00	0.45	25.86	25.87	9.36	16.52	1.566 ES, SF	
1,700.00	1,700.00	1,699.05	1,699.01	8.80	8.76	89.09	0.45	28.46	28.48	10.92	17.56	1.622	
1,800.00	1,800.00	1,801.58	1,798.28	9.34	9.30	89.21	0.45	32.77	32.82	14.20	18.61	1.763	
1,900.00	1,900.00	1,901.72	1,898.01	9.88	9.82	89.32	0.45	38.00	38.05	18.38	19.67	1.934	
2,000.00	2,000.00	2,001.86	1,997.73	10.42	10.35	89.40	0.45	43.22	43.28	22.56	20.73	2.088	
2,100.00	2,100.00	2,101.99	2,097.46	10.96	10.87	89.47	0.45	48.45	48.52	26.73	21.79	2.227	
2,200.00	2,200.00	2,202.13	2,197.19	11.49	11.41	89.52	0.45	53.68	53.75	30.90	22.85	2.352	
2,300.00	2,300.00	2,302.27	2,296.91	12.03	11.94	89.56	0.45	58.90	58.98	35.07	23.91	2.466	
2,400.00	2,400.00	2,402.40	2,396.64	12.57	12.47	89.60	0.45	64.13	64.22	39.24	24.98	2.571	
2,500.00	2,500.00	2,502.54	2,496.37	13.11	13.01	89.63	0.45	69.35	69.45	43.41	26.04	2.667	
2,600.00	2,600.00	2,602.68	2,596.09	13.64	13.55	89.65	0.45	74.58	74.68	47.57	27.11	2.755	
2,700.00	2,700.00	2,702.82	2,695.82	14.18	14.09	89.68	0.45	79.81	79.92	51.74	28.18	2.836	
2,800.00	2,800.00	2,802.95	2,795.54	14.72	14.63	89.70	0.45	85.03	85.15	55.90	29.25	2.911	
2,900.00	2,900.00	2,903.09	2,895.27	15.26	15.17	89.71	0.45	90.26	90.39	60.07	30.32	2.981	
3,000.00	3,000.00	3,003.23	2,995.00	15.80	15.71	89.73	0.45	95.49	95.62	64.23	31.39	3.046	
3,100.00	3,100.00	3,103.36	3,094.72	16.33	16.25	89.74	0.45	100.71	100.85	68.39	32.46	3.107	
3,200.00	3,200.00	3,196.50	3,194.45	16.87	16.76	89.76	0.45	105.94	106.09	72.59	33.49	3.168	
3,300.00	3,300.00	3,303.64	3,294.17	17.41	17.34	89.77	0.45	111.17	111.32	76.72	34.60	3.217	
3,400.00	3,400.00	3,403.78	3,393.90	17.95	17.88	89.78	0.45	116.39	116.55	80.88	35.67	3.267	
3,500.00	3,500.00	3,503.91	3,493.63	18.48	18.43	89.79	0.45	121.62	121.79	85.04	36.74	3.314	
3,600.00	3,600.00	3,604.05	3,593.35	19.02	18.97	89.80	0.45	126.84	127.02	89.20	37.82	3.359	
3,700.00	3,700.00	3,704.19	3,693.08	19.56	19.52	89.80	0.45	132.07	132.25	93.36	38.89	3.401	
3,800.00	3,800.00	3,804.32	3,792.80	20.10	20.06	89.81	0.45	137.30	137.49	97.52	39.96	3.440	
3,900.00	3,900.00	3,904.46	3,892.53	20.63	20.61	89.82	0.45	142.52	142.72	101.68	41.04	3.478	
4,000.00	4,000.00	4,004.60	3,992.26	21.17	21.16	89.83	0.45	147.75	147.95	105.84	42.11	3.514	
4,100.00	4,100.00	4,104.73	4,091.98	21.71	21.70	89.83	0.45	152.98	153.19	110.00	43.18	3.547	
4,200.00	4,200.00	4,204.87	4,191.71	22.25	22.25	89.84	0.45	158.20	158.42	114.16	44.26	3.580	
4,300.00	4,300.00	4,305.01	4,291.44	22.79	22.80	89.84	0.45	163.43	163.65	118.32	45.33	3.610	
4,400.00	4,400.00	4,394.85	4,391.16	23.32	23.29	89.85	0.45	168.66	168.89	122.54	46.35	3.644	
4,500.00	4,500.00	4,505.28	4,490.89	23.86	23.89	89.85	0.45	173.88	174.12	126.64	47.48	3.667	
4,600.00	4,600.00	4,594.58	4,590.61	24.40	24.38	89.86	0.45	179.11	179.36	130.86	48.50	3.698	
4,700.00	4,700.00	4,705.56	4,690.34	24.94	24.99	89.86	0.45	184.34	184.59	134.96	49.63	3.719	
4,800.00	4,800.00	4,805.69	4,790.07	25.47	25.54	89.86	0.45	189.56	189.82	139.12	50.71	3.744	
4,900.00	4,900.00	4,905.83	4,889.79	26.01	26.09	89.87	0.45	194.79	195.06	143.27	51.78	3.767	
5,000.00	5,000.00	5,005.97	4,989.52	26.55	26.63	89.87	0.45	200.01	200.29	147.43	52.86	3.789	
5,100.00	5,100.00	5,106.11	5,089.24	27.09	27.18	89.87	0.45	205.24	205.52	151.59	53.93	3.811	
5,200.00	5,200.00	5,206.24	5,188.97	27.62	27.73	89.88	0.45	210.47	210.76	155.75	55.01	3.831	
5,300.00	5,300.00	5,306.38	5,288.70	28.16	28.28	89.88	0.45	215.69	215.99	159.91	56.09	3.851	
5,400.00	5,400.00	5,406.52	5,388.42	28.70	28.83	89.88	0.45	220.92	221.22	164.06	57.16	3.870	
5,500.00	5,500.00	5,506.65	5,488.15	29.24	29.38	89.89	0.45	226.15	226.46	168.22	58.24	3.889	
5,600.00	5,600.00	5,593.21	5,587.87	29.78	29.85	89.89	0.45	231.37	231.69	172.45	59.24	3.911	
5,700.00	5,700.00	5,706.93	5,687.60	30.31	30.48	89.89	0.45	236.60	236.92	176.54	60.39	3.923	
5,800.00	5,800.00	5,807.06	5,787.33	30.85	31.03	89.89	0.45	241.83	242.16	180.69	61.47	3.940	
5,900.00	5,900.00	5,892.80	5,887.05	31.39	31.50	89.90	0.45	247.05	247.39	184.93	62.46	3.960	
6,000.00	6,000.00	6,007.34	5,986.78	31.93	32.13	89.90	0.45	252.28	252.63	189.01	63.62	3.971	
6,065.30	6,065.30	6,057.88	6,051.90	32.28	32.41	89.90	0.45	255.69	256.04	191.80	64.24	3.986	
6,100.00	6,100.00	6,107.46	6,086.52	32.46	32.68	89.94	0.45	257.51	257.59	192.90	64.69	3.982	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,198.64	6,198.53	6,208.88	6,184.97	32.98	33.24	90.45	0.45	262.67	259.11	193.35	65.75	3.941		
6,200.00	6,199.89	6,207.51	6,186.33	32.99	33.23	90.47	0.45	262.74	259.10	193.34	65.75	3.940		
6,300.00	6,299.64	6,307.59	6,286.12	33.51	33.78	91.30	0.45	267.97	258.51	191.69	66.82	3.869		
6,400.00	6,399.40	6,407.66	6,385.91	34.04	34.33	92.14	0.45	273.20	257.97	190.09	67.88	3.800		
6,500.00	6,499.16	6,507.73	6,485.70	34.57	34.88	92.98	0.45	278.43	257.48	188.54	68.94	3.735		
6,600.00	6,598.91	6,607.80	6,585.49	35.10	35.43	93.82	0.45	283.66	257.06	187.05	70.01	3.672		
6,700.00	6,698.67	6,707.88	6,685.28	35.63	35.98	94.67	0.45	288.89	256.68	185.61	71.07	3.612		
6,800.00	6,798.43	6,807.95	6,785.07	36.16	36.53	95.52	0.45	294.12	256.37	184.23	72.14	3.554		
6,900.00	6,898.18	6,908.02	6,884.86	36.70	37.08	96.37	0.45	299.35	256.11	182.90	73.20	3.499		
7,000.00	6,997.94	7,008.10	6,984.65	37.23	37.63	97.22	0.45	304.58	255.91	181.63	74.27	3.445		
7,100.00	7,097.70	7,108.17	7,084.44	37.76	38.18	98.08	0.45	309.81	255.76	180.42	75.34	3.395		
7,200.00	7,197.45	7,208.24	7,184.23	38.30	38.73	98.93	0.45	315.04	255.67	179.26	76.41	3.346		
7,300.00	7,297.21	7,308.31	7,284.02	38.83	39.28	99.78	0.45	320.26	255.64	178.15	77.48	3.299		
7,308.26	7,305.45	7,299.94	7,292.26	38.88	39.23	99.86	0.45	320.70	255.64	178.15	77.48	3.299		
7,400.00	7,396.97	7,391.61	7,383.81	39.37	39.74	100.64	0.45	325.49	255.66	177.19	78.47	3.258		
7,500.00	7,496.72	7,487.12	7,479.14	39.91	40.27	101.30	1.25	331.22	256.33	176.86	79.48	3.225		
7,600.00	7,596.48	7,582.06	7,573.60	40.44	40.80	101.12	5.27	339.81	259.35	178.90	80.46	3.224		
7,700.00	7,696.23	7,681.96	7,672.86	40.98	41.37	100.62	10.55	349.81	263.14	181.61	81.53	3.228		
7,800.00	7,795.99	7,781.86	7,772.12	41.52	41.93	100.13	15.84	359.81	266.94	184.34	82.60	3.232		
7,900.00	7,895.75	7,881.77	7,871.38	42.06	42.50	99.65	21.13	369.81	270.76	187.09	83.67	3.236		
8,000.00	7,995.50	7,981.67	7,970.64	42.60	43.07	99.19	26.42	379.81	274.61	189.86	84.75	3.240		
8,100.00	8,095.26	8,081.57	8,069.89	43.14	43.64	98.74	31.71	389.81	278.47	192.64	85.82	3.245		
8,200.00	8,195.02	8,181.47	8,169.15	43.68	44.21	98.31	37.00	399.81	282.34	195.44	86.90	3.249		
8,300.00	8,294.77	8,281.37	8,268.41	44.22	44.78	97.88	42.28	409.81	286.23	198.26	87.97	3.254		
8,400.00	8,394.53	8,381.28	8,367.67	44.76	45.35	97.47	47.57	419.81	290.14	201.09	89.05	3.258		
8,500.00	8,494.29	8,481.18	8,466.93	45.31	45.92	97.07	52.86	429.80	294.06	203.93	90.13	3.263		
8,600.00	8,594.04	8,581.08	8,566.19	45.85	46.49	96.67	58.15	439.80	298.00	206.79	91.20	3.267		
8,700.00	8,693.80	8,680.98	8,665.45	46.39	47.07	96.29	63.44	449.80	301.95	209.66	92.28	3.272		
8,800.00	8,793.56	8,780.89	8,764.71	46.94	47.64	95.92	68.73	459.80	305.91	212.55	93.36	3.277		
8,900.00	8,893.31	8,880.79	8,863.97	47.48	48.21	95.56	74.01	469.80	309.88	215.44	94.44	3.281		
9,000.00	8,993.07	8,980.69	8,963.23	48.02	48.79	95.20	79.30	479.80	313.87	218.35	95.52	3.286		
9,100.00	9,092.82	9,080.59	9,062.49	48.57	49.37	94.86	84.59	489.80	317.87	221.27	96.60	3.291		
9,200.00	9,192.58	9,180.49	9,161.75	49.11	49.94	94.52	89.88	499.80	321.88	224.20	97.68	3.295		
9,300.00	9,292.34	9,280.40	9,261.01	49.66	50.52	94.20	95.17	509.80	325.90	227.14	98.76	3.300		
9,400.00	9,392.09	9,380.30	9,360.27	50.20	51.10	93.88	100.46	519.80	329.93	230.09	99.84	3.305		
9,500.00	9,491.85	9,480.20	9,459.53	50.75	51.67	93.56	105.74	529.80	333.97	233.05	100.92	3.309		
9,600.00	9,591.61	9,580.10	9,558.79	51.30	52.25	93.26	111.03	539.80	338.02	236.02	102.00	3.314		
9,700.00	9,691.36	9,680.00	9,658.05	51.84	52.83	92.96	116.32	549.80	342.08	238.99	103.08	3.318		
9,800.00	9,791.12	9,779.91	9,757.31	52.39	53.41	92.67	121.61	559.80	346.15	241.98	104.17	3.323		
9,900.00	9,890.88	9,879.81	9,856.57	52.94	53.99	92.39	126.90	569.80	350.22	244.97	105.25	3.328		
10,000.00	9,990.63	9,979.71	9,955.83	53.48	54.57	92.11	132.19	579.80	354.31	247.98	106.33	3.332		
10,100.00	10,090.39	10,079.61	10,055.09	54.03	55.15	91.84	137.47	589.80	358.40	250.99	107.41	3.337		
10,200.00	10,190.14	10,179.51	10,154.35	54.58	55.73	91.57	142.76	599.80	362.50	254.00	108.50	3.341		
10,300.00	10,289.90	10,279.42	10,253.61	55.13	56.31	91.32	148.05	609.80	366.61	257.03	109.58	3.346		
10,400.00	10,389.66	10,379.32	10,352.87	55.68	56.89	91.06	153.34	619.79	370.73	260.06	110.66	3.350		
10,403.53	10,393.18	10,382.84	10,356.37	55.70	56.91	91.05	153.53	620.15	370.87	260.17	110.70	3.350		
10,500.00	10,489.54	10,479.07	10,451.98	56.22	57.47	90.61	158.62	629.78	376.89	265.15	111.74	3.373		
10,536.86	10,526.40	10,515.73	10,488.40	56.42	57.69	90.34	160.56	633.45	380.27	268.13	112.13	3.391		
10,600.00	10,589.54	10,579.35	10,551.56	56.75	58.06	89.72	164.70	639.77	386.56	273.74	112.82	3.426		
10,700.00	10,689.54	10,678.51	10,648.37	57.28	58.63	86.99	183.53	648.87	396.46	282.63	113.84	3.483		
10,736.86	10,726.40	10,713.07	10,681.17	57.48	58.82	85.50	194.00	651.75	400.45	286.29	114.16	3.508		
10,750.00	10,739.54	10,725.12	10,692.45	57.55	58.89	84.95	198.12	652.72	401.95	287.68	114.26	3.518		

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



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
10,800.00	10,789.41	10,770.26	10,733.90	57.82	59.13	82.99	215.62	656.16	407.92	293.29	114.62	3.559		
10,850.00	10,838.81	10,814.40	10,773.00	58.09	59.37	81.29	235.85	659.22	414.22	299.30	114.92	3.604		
10,900.00	10,887.35	10,857.65	10,809.71	58.36	59.59	79.88	258.53	661.92	420.73	305.59	115.14	3.654		
10,950.00	10,934.66	10,900.09	10,844.00	58.62	59.81	78.76	283.43	664.26	427.33	312.06	115.27	3.707		
11,000.00	10,980.39	10,941.82	10,875.84	58.88	60.01	77.92	310.31	666.25	433.90	318.59	115.31	3.763		
11,050.00	11,024.18	10,982.90	10,905.21	59.14	60.21	77.37	338.98	667.90	440.34	325.07	115.27	3.820		
11,100.00	11,065.71	11,023.42	10,932.11	59.39	60.41	77.10	369.23	669.22	446.53	331.37	115.16	3.877		
11,150.00	11,104.66	11,063.42	10,956.53	59.65	60.61	77.09	400.89	670.22	452.39	337.39	115.00	3.934		
11,200.00	11,140.73	11,102.98	10,978.46	59.91	60.81	77.35	433.79	670.89	457.81	343.01	114.80	3.988		
11,250.00	11,173.64	11,142.13	10,997.90	60.18	61.01	77.84	467.77	671.26	462.74	348.15	114.59	4.038		
11,300.00	11,203.15	11,180.94	11,014.85	60.46	61.21	78.57	502.67	671.33	467.08	352.69	114.39	4.083		
11,350.00	11,229.04	11,219.44	11,029.30	60.75	61.43	79.51	538.35	671.10	470.79	356.57	114.22	4.122		
11,400.00	11,251.09	11,257.52	11,041.45	61.05	61.64	80.67	574.44	670.72	473.81	359.69	114.12	4.152		
11,436.86	11,264.80	11,285.53	11,049.14	61.27	61.81	81.65	601.37	670.43	475.57	361.44	114.13	4.167		
11,450.00	11,269.19	11,295.51	11,051.63	61.35	61.87	82.01	611.02	670.33	476.12	361.96	114.15	4.171		
11,500.00	11,283.76	11,333.39	11,059.84	61.67	62.11	83.47	648.00	669.93	477.95	363.66	114.29	4.182		
11,550.00	11,294.96	11,371.18	11,066.07	62.00	62.36	85.02	685.27	669.54	479.40	364.86	114.54	4.185		
11,600.00	11,302.74	11,408.90	11,070.32	62.34	62.62	86.64	722.74	669.14	480.45	365.54	114.91	4.181		
11,650.00	11,307.05	11,446.58	11,072.59	62.68	62.89	88.30	760.34	668.73	481.08	365.68	115.40	4.169		
11,687.73	11,308.00	11,476.09	11,073.00	62.95	63.10	89.42	789.85	668.42	481.28	365.42	115.86	4.154		
11,700.00	11,307.98	11,488.36	11,072.99	63.04	63.19	89.42	802.12	668.29	481.28	365.26	116.02	4.148		
11,800.00	11,307.86	11,588.36	11,072.89	63.80	63.98	89.42	902.12	667.22	481.27	363.81	117.46	4.097		
11,900.00	11,307.74	11,688.36	11,072.79	64.66	64.86	89.42	1,002.11	666.15	481.25	362.21	119.05	4.042		
12,000.00	11,307.62	11,788.36	11,072.69	65.59	65.81	89.42	1,102.11	665.08	481.24	360.46	120.78	3.984		
12,100.00	11,307.50	11,888.36	11,072.59	66.60	66.85	89.42	1,202.10	664.01	481.23	358.58	122.66	3.923		
12,200.00	11,307.38	11,988.36	11,072.49	67.69	67.96	89.42	1,302.10	662.94	481.22	356.56	124.66	3.860		
12,300.00	11,307.25	12,088.36	11,072.39	68.85	69.13	89.42	1,402.09	661.88	481.21	354.41	126.80	3.795		
12,400.00	11,307.13	12,188.36	11,072.29	70.08	70.38	89.42	1,502.08	660.81	481.20	352.15	129.05	3.729		
12,500.00	11,307.01	12,288.36	11,072.19	71.37	71.69	89.42	1,602.08	659.74	481.19	349.77	131.42	3.661		
12,600.00	11,306.89	12,388.36	11,072.09	72.73	73.06	89.42	1,702.07	658.67	481.18	347.28	133.90	3.594		
12,700.00	11,306.77	12,488.36	11,071.99	74.14	74.49	89.42	1,802.07	657.60	481.17	344.69	136.48	3.526		
12,800.00	11,306.65	12,588.36	11,071.89	75.61	75.97	89.42	1,902.06	656.53	481.16	342.00	139.16	3.458		
12,900.00	11,306.53	12,688.36	11,071.79	77.13	77.50	89.42	2,002.06	655.46	481.15	339.22	141.92	3.390		
13,000.00	11,306.41	12,788.36	11,071.70	78.70	79.08	89.42	2,102.05	654.39	481.14	336.36	144.78	3.323		
13,100.00	11,306.28	12,888.36	11,071.60	80.31	80.70	89.42	2,202.04	653.33	481.13	333.41	147.71	3.257		
13,200.00	11,306.16	12,988.36	11,071.50	81.97	82.37	89.42	2,302.04	652.26	481.11	330.39	150.73	3.192		
13,300.00	11,306.04	13,088.36	11,071.40	83.67	84.08	89.42	2,402.03	651.19	481.10	327.29	153.81	3.128		
13,400.00	11,305.92	13,188.36	11,071.30	85.41	85.82	89.42	2,502.03	650.12	481.09	324.13	156.96	3.065		
13,500.00	11,305.80	13,288.36	11,071.20	87.18	87.60	89.42	2,602.02	649.05	481.08	320.91	160.18	3.003		
13,600.00	11,305.68	13,388.36	11,071.10	88.99	89.42	89.42	2,702.02	647.98	481.07	317.62	163.45	2.943		
13,700.00	11,305.56	13,488.36	11,071.00	90.83	91.26	89.42	2,802.01	646.91	481.06	314.28	166.78	2.884		
13,800.00	11,305.44	13,588.36	11,070.90	92.70	93.13	89.42	2,902.00	645.84	481.05	310.88	170.17	2.827		
13,900.00	11,305.31	13,688.36	11,070.80	94.59	95.04	89.42	3,002.00	644.78	481.04	307.44	173.60	2.771		
14,000.00	11,305.19	13,788.36	11,070.70	96.52	96.96	89.42	3,101.99	643.71	481.03	303.94	177.09	2.716		
14,100.00	11,305.07	13,888.36	11,070.60	98.47	98.92	89.42	3,201.99	642.64	481.02	300.41	180.61	2.663		
14,200.00	11,304.95	13,988.36	11,070.50	100.44	100.89	89.42	3,301.98	641.57	481.01	296.83	184.18	2.612		
14,300.00	11,304.83	14,088.36	11,070.41	102.43	102.89	89.42	3,401.97	640.50	481.00	293.21	187.79	2.561		
14,400.00	11,304.71	14,188.36	11,070.31	104.45	104.91	89.42	3,501.97	639.43	480.99	289.55	191.43	2.513		
14,500.00	11,304.59	14,288.36	11,070.21	106.48	106.95	89.42	3,601.96	638.36	480.97	285.86	195.11	2.465		
14,600.00	11,304.47	14,388.36	11,070.11	108.53	109.00	89.42	3,701.96	637.29	480.96	282.14	198.83	2.419		
14,700.00	11,304.35	14,488.36	11,070.01	110.61	111.08	89.42	3,801.95	636.23	480.95	278.38	202.57	2.374		
14,800.00	11,304.22	14,588.36	11,069.91	112.69	113.17	89.42	3,901.95	635.16	480.94	274.60	206.35	2.331		

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #234H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
14,900.00	11,304.10	14,688.36	11,069.81	114.80	115.27	89.42	4,001.94	634.09	480.93	270.78	210.15	2.289		
15,000.00	11,303.98	14,788.36	11,069.71	116.91	117.39	89.42	4,101.93	633.02	480.92	266.94	213.98	2.248		
15,100.00	11,303.86	14,888.36	11,069.61	119.05	119.53	89.42	4,201.93	631.95	480.91	263.08	217.83	2.208		
15,200.00	11,303.74	14,988.36	11,069.51	121.19	121.67	89.42	4,301.92	630.88	480.90	259.19	221.71	2.169		
15,300.00	11,303.62	15,088.36	11,069.41	123.35	123.83	89.42	4,401.92	629.81	480.89	255.27	225.62	2.131		
15,400.00	11,303.50	15,188.36	11,069.31	125.52	126.01	89.42	4,501.91	628.74	480.88	251.34	229.54	2.095		
15,500.00	11,303.38	15,288.36	11,069.21	127.70	128.19	89.42	4,601.91	627.68	480.87	247.38	233.48	2.060		
15,600.00	11,303.25	15,388.36	11,069.12	129.89	130.38	89.42	4,701.90	626.61	480.86	243.41	237.45	2.025		
15,700.00	11,303.13	15,488.36	11,069.02	132.10	132.59	89.42	4,801.89	625.54	480.85	239.42	241.43	1.992		
15,800.00	11,303.01	15,588.36	11,068.92	134.31	134.80	89.42	4,901.89	624.47	480.83	235.41	245.43	1.959		
15,900.00	11,302.89	15,688.36	11,068.82	136.53	137.02	89.42	5,001.88	623.40	480.82	231.38	249.44	1.928		
16,000.00	11,302.77	15,788.36	11,068.72	138.76	139.25	89.42	5,101.88	622.33	480.81	227.34	253.47	1.897		
16,100.00	11,302.65	15,888.36	11,068.62	141.00	141.49	89.42	5,201.87	621.26	480.80	223.28	257.52	1.867		
16,200.00	11,302.53	15,988.36	11,068.52	143.24	143.74	89.42	5,301.87	620.19	480.79	219.21	261.58	1.838		
16,222.60	11,302.50	16,010.97	11,068.50	143.75	144.25	89.42	5,324.47	619.95	480.79	218.29	262.50	1.832		



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD														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)	Azimuth from North (°)	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	-91.01	-0.44	-25.00	25.00						
100.00	100.00	100.00	100.00	0.20	0.20	-91.01	-0.44	-25.00	25.00	24.60	0.40	62.001			
200.00	200.00	200.00	200.00	0.74	0.74	-91.01	-0.44	-25.00	25.00	23.53	1.48	16.909			
300.00	300.00	300.00	300.00	1.28	1.28	-91.01	-0.44	-25.00	25.00	22.45	2.55	9.790			
400.00	400.00	400.00	400.00	1.81	1.81	-91.01	-0.44	-25.00	25.00	21.37	3.63	6.889			
500.00	500.00	500.00	500.00	2.35	2.35	-91.01	-0.44	-25.00	25.00	20.30	4.70	5.314			
600.00	600.00	600.00	600.00	2.89	2.89	-91.01	-0.44	-25.00	25.00	19.22	5.78	4.326			
700.00	700.00	700.00	700.00	3.43	3.43	-91.01	-0.44	-25.00	25.00	18.15	6.86	3.647			
800.00	800.00	800.00	800.00	3.97	3.97	-91.01	-0.44	-25.00	25.00	17.07	7.93	3.153			
900.00	900.00	900.00	900.00	4.50	4.50	-91.01	-0.44	-25.00	25.00	16.00	9.01	2.776			
1,000.00	1,000.00	1,000.00	1,000.00	5.04	5.04	-91.01	-0.44	-25.00	25.00	14.92	10.08	2.480			
1,100.00	1,100.00	1,100.00	1,100.00	5.58	5.58	-91.01	-0.44	-25.00	25.00	13.85	11.16	2.241			
1,200.00	1,200.00	1,200.00	1,200.00	6.12	6.12	-91.01	-0.44	-25.00	25.00	12.77	12.23	2.044			
1,300.00	1,300.00	1,300.00	1,300.00	6.65	6.65	-91.01	-0.44	-25.00	25.00	11.70	13.31	1.879			
1,400.00	1,400.00	1,400.00	1,400.00	7.19	7.19	-91.01	-0.44	-25.00	25.00	10.62	14.38	1.738			
1,500.00	1,500.00	1,500.00	1,500.00	7.73	7.73	-91.01	-0.44	-25.00	25.00	9.54	15.46	1.617 CC			
1,600.00	1,600.00	1,599.83	1,599.83	8.27	8.27	-89.17	0.37	-25.33	25.33	8.80	16.53	1.532 ES			
1,700.00	1,700.00	1,699.61	1,699.57	8.80	8.80	-83.96	2.78	-26.30	26.45	8.85	17.60	1.503 SF			
1,800.00	1,800.00	1,800.74	1,799.12	9.34	9.34	-76.31	6.80	-27.93	28.76	10.08	18.68	1.540			
1,900.00	1,900.00	1,900.88	1,898.85	9.88	9.88	-68.70	11.65	-29.88	32.10	12.35	19.75	1.625			
2,000.00	2,000.00	2,001.02	1,998.57	10.42	10.42	-62.61	16.50	-31.84	35.89	15.07	20.82	1.724			
2,100.00	2,100.00	2,101.15	2,098.30	10.96	10.96	-57.73	21.34	-33.80	40.01	18.12	21.89	1.828			
2,200.00	2,200.00	2,201.29	2,198.03	11.49	11.50	-53.78	26.19	-35.76	44.37	21.40	22.97	1.932			
2,300.00	2,300.00	2,301.43	2,297.75	12.03	12.04	-50.55	31.03	-37.72	48.89	24.85	24.04	2.034			
2,400.00	2,400.00	2,401.57	2,397.48	12.57	12.59	-47.88	35.88	-39.67	53.55	28.43	25.12	2.132			
2,500.00	2,500.00	2,501.70	2,497.20	13.11	13.13	-45.63	40.73	-41.63	58.31	32.11	26.19	2.226			
2,600.00	2,600.00	2,601.84	2,596.93	13.64	13.67	-43.73	45.57	-43.59	63.14	35.87	27.27	2.315			
2,700.00	2,700.00	2,701.98	2,696.66	14.18	14.22	-42.10	50.42	-45.55	68.03	39.68	28.34	2.400			
2,800.00	2,800.00	2,802.11	2,796.38	14.72	14.76	-40.68	55.26	-47.51	72.96	43.54	29.42	2.480			
2,900.00	2,900.00	2,902.25	2,896.11	15.26	15.31	-39.45	60.11	-49.46	77.94	47.44	30.50	2.556			
3,000.00	3,000.00	3,002.39	2,995.83	15.80	15.85	-38.37	64.95	-51.42	82.95	51.38	31.57	2.627			
3,100.00	3,100.00	3,097.48	3,095.56	16.33	16.37	-37.41	69.80	-53.38	87.98	55.36	32.62	2.697			
3,200.00	3,200.00	3,202.66	3,195.29	16.87	16.95	-36.55	74.65	-55.34	93.04	59.31	33.73	2.759			
3,300.00	3,300.00	3,302.80	3,295.01	17.41	17.49	-35.78	79.49	-57.29	98.12	63.31	34.80	2.819			
3,400.00	3,400.00	3,397.06	3,394.74	17.95	18.01	-35.09	84.34	-59.25	103.21	67.36	35.85	2.879			
3,500.00	3,500.00	3,503.07	3,494.46	18.48	18.59	-34.46	89.18	-61.21	108.31	71.35	36.96	2.931			
3,600.00	3,600.00	3,603.21	3,594.19	19.02	19.13	-33.89	94.03	-63.17	113.43	75.39	38.03	2.982			
3,700.00	3,700.00	3,703.35	3,693.92	19.56	19.68	-33.37	98.88	-65.13	118.55	79.44	39.11	3.031			
3,800.00	3,800.00	3,803.48	3,793.64	20.10	20.23	-32.89	103.72	-67.08	123.69	83.50	40.19	3.078			
3,900.00	3,900.00	3,903.62	3,893.37	20.63	20.78	-32.45	108.57	-69.04	128.83	87.57	41.27	3.122			
4,000.00	4,000.00	4,003.76	3,993.10	21.17	21.32	-32.05	113.41	-71.00	133.98	91.64	42.34	3.164			
4,100.00	4,100.00	4,103.90	4,092.82	21.71	21.87	-31.67	118.26	-72.96	139.14	95.72	43.42	3.204			
4,200.00	4,200.00	4,195.97	4,192.55	22.25	22.38	-31.32	123.10	-74.92	144.30	99.85	44.45	3.246			
4,300.00	4,300.00	4,295.83	4,292.27	22.79	22.92	-31.00	127.95	-76.87	149.47	103.94	45.53	3.283			
4,400.00	4,400.00	4,403.62	4,400.00	23.32	23.50	-30.82	130.75	-78.01	152.25	105.59	46.67	3.263			
4,413.82	4,413.82	4,418.62	4,415.01	23.40	23.59	-30.82	130.70	-77.98	152.20	105.38	46.82	3.251			
4,500.00	4,500.00	4,503.61	4,500.00	23.86	24.04	-30.82	130.75	-78.01	152.25	104.51	47.74	3.189			
4,600.00	4,600.00	4,603.61	4,600.00	24.40	24.57	-30.82	130.75	-78.01	152.25	103.44	48.81	3.119			
4,700.00	4,700.00	4,703.61	4,700.00	24.94	25.10	-30.82	130.75	-78.01	152.25	102.37	49.89	3.052			
4,800.00	4,800.00	4,803.61	4,800.00	25.47	25.63	-30.82	130.75	-78.01	152.25	101.29	50.96	2.988			
4,900.00	4,900.00	4,903.61	4,900.00	26.01	26.17	-30.82	130.75	-78.01	152.25	100.22	52.03	2.926			
5,000.00	5,000.00	5,003.61	5,000.00	26.55	26.70	-30.82	130.75	-78.01	152.25	99.15	53.11	2.867			

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #1														Offset Site Error: 0.00 usft
Survey Program: 0-MWD														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	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 Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
5,100.00	5,100.00	5,103.61	5,100.00	27.09	27.23	-30.82	130.75	-78.01	152.25	98.07	54.18	2.810		
5,200.00	5,200.00	5,203.61	5,200.00	27.62	27.76	-30.82	130.75	-78.01	152.25	97.00	55.25	2.756		
5,300.00	5,300.00	5,303.61	5,300.00	28.16	28.30	-30.82	130.75	-78.01	152.25	95.93	56.33	2.703		
5,400.00	5,400.00	5,403.61	5,400.00	28.70	28.83	-30.82	130.75	-78.01	152.25	94.85	57.40	2.652		
5,500.00	5,500.00	5,503.61	5,500.00	29.24	29.36	-30.82	130.75	-78.01	152.25	93.78	58.48	2.604		
5,600.00	5,600.00	5,603.61	5,600.00	29.78	29.90	-30.82	130.75	-78.01	152.25	92.70	59.55	2.557		
5,700.00	5,700.00	5,703.61	5,700.00	30.31	30.43	-30.82	130.75	-78.01	152.25	91.63	60.62	2.511		
5,800.00	5,800.00	5,803.61	5,800.00	30.85	30.97	-30.82	130.75	-78.01	152.25	90.56	61.70	2.468		
5,900.00	5,900.00	5,903.61	5,900.00	31.39	31.50	-30.82	130.75	-78.01	152.25	89.48	62.77	2.426		
6,000.00	6,000.00	6,003.61	6,000.00	31.93	32.03	-30.82	130.75	-78.01	152.25	88.41	63.85	2.385		
6,065.30	6,065.30	6,068.92	6,065.30	32.28	32.38	-30.82	130.75	-78.01	152.25	87.71	64.55	2.359		
6,100.00	6,100.00	6,103.61	6,100.00	32.46	32.57	-30.94	130.75	-78.01	152.24	87.33	64.92	2.345		
6,197.80	6,197.69	6,201.31	6,197.69	32.98	33.09	-32.55	130.75	-78.01	152.18	86.23	65.95	2.307		
6,198.64	6,198.53	6,202.14	6,198.53	32.98	33.10	-32.57	130.75	-78.01	152.18	86.22	65.96	2.307		
6,200.00	6,199.89	6,203.50	6,199.89	32.99	33.10	-32.61	130.75	-78.01	152.18	86.21	65.98	2.307		
6,300.00	6,299.64	6,303.26	6,299.64	33.51	33.64	-35.23	130.75	-78.01	152.35	85.31	67.04	2.273		
6,400.00	6,399.40	6,403.02	6,399.40	34.04	34.17	-37.84	130.75	-78.01	152.84	84.73	68.10	2.244		
6,500.00	6,499.16	6,502.77	6,499.16	34.57	34.70	-40.44	130.75	-78.01	153.64	84.47	69.17	2.221		
6,600.00	6,598.91	6,602.53	6,598.91	35.10	35.24	-42.99	130.75	-78.01	154.75	84.52	70.23	2.203		
6,700.00	6,698.67	6,702.28	6,698.67	35.63	35.77	-45.51	130.75	-78.01	156.16	84.87	71.29	2.190		
6,800.00	6,798.43	6,802.04	6,798.43	36.16	36.30	-47.98	130.75	-78.01	157.88	85.52	72.36	2.182		
6,900.00	6,898.18	6,901.80	6,898.18	36.70	36.84	-50.39	130.75	-78.01	159.87	86.45	73.43	2.177		
7,000.00	6,997.94	7,001.55	6,997.94	37.23	37.37	-52.74	130.75	-78.01	162.15	87.65	74.49	2.177		
7,100.00	7,097.70	7,101.31	7,097.70	37.76	37.91	-55.02	130.75	-78.01	164.68	89.12	75.56	2.179		
7,200.00	7,197.45	7,201.07	7,197.45	38.30	38.44	-57.22	130.75	-78.01	167.47	90.85	76.63	2.186		
7,300.00	7,297.21	7,300.82	7,297.21	38.83	38.98	-59.35	130.75	-78.01	170.50	92.81	77.70	2.194		
7,400.00	7,396.97	7,400.58	7,396.97	39.37	39.51	-61.41	130.75	-78.01	173.76	95.00	78.76	2.206		
7,500.00	7,496.72	7,500.34	7,496.72	39.91	40.04	-63.38	130.75	-78.01	177.23	97.40	79.83	2.220		
7,600.00	7,596.48	7,600.09	7,596.48	40.44	40.58	-65.28	130.75	-78.01	180.91	100.01	80.90	2.236		
7,700.00	7,696.23	7,700.15	7,696.23	40.98	41.11	-67.10	130.75	-78.01	184.77	102.80	81.97	2.254		
7,800.00	7,795.99	7,800.40	7,795.99	41.52	41.65	-68.84	130.75	-78.01	188.82	105.77	83.04	2.274		
7,900.00	7,895.75	7,900.64	7,895.75	42.06	42.19	-70.51	130.75	-78.01	193.03	108.91	84.11	2.295		
8,000.00	7,995.50	8,000.88	7,995.50	42.60	42.73	-72.11	130.75	-78.01	197.39	112.21	85.18	2.317		
8,100.00	8,095.26	8,101.13	8,095.26	43.14	43.26	-73.63	130.75	-78.01	201.91	115.65	86.26	2.341		
8,200.00	8,195.02	8,201.37	8,195.02	43.68	43.80	-75.09	130.75	-78.01	206.56	119.23	87.33	2.365		
8,300.00	8,294.77	8,301.61	8,294.77	44.22	44.34	-76.49	130.75	-78.01	211.34	122.94	88.40	2.391		
8,400.00	8,394.53	8,401.86	8,394.53	44.76	44.87	-77.82	130.75	-78.01	216.24	126.77	89.47	2.417		
8,500.00	8,494.29	8,502.10	8,494.29	45.31	45.41	-79.09	130.75	-78.01	221.25	130.71	90.54	2.444		
8,600.00	8,594.04	8,602.34	8,594.04	45.85	45.95	-80.30	130.75	-78.01	226.36	134.75	91.61	2.471		
8,700.00	8,693.80	8,702.59	8,693.80	46.39	46.49	-81.46	130.75	-78.01	231.57	138.89	92.68	2.499		
8,800.00	8,793.56	8,802.83	8,793.56	46.94	47.02	-82.57	130.75	-78.01	236.87	143.12	93.75	2.527		
8,900.00	8,893.31	8,903.08	8,893.31	47.48	47.56	-83.63	130.75	-78.01	242.26	147.44	94.83	2.555		
9,000.00	8,993.07	9,003.32	8,993.07	48.02	48.10	-84.65	130.75	-78.01	247.73	151.83	95.90	2.583		
9,100.00	9,092.82	9,103.56	9,092.82	48.57	48.64	-85.62	130.75	-78.01	253.27	156.30	96.97	2.612		
9,200.00	9,192.58	9,203.81	9,192.58	49.11	49.17	-86.54	130.75	-78.01	258.88	160.84	98.04	2.641		
9,300.00	9,292.34	9,304.05	9,292.34	49.66	49.71	-87.43	130.75	-78.01	264.55	165.44	99.11	2.669		
9,400.00	9,392.09	9,404.29	9,392.09	50.20	50.25	-88.28	130.75	-78.01	270.29	170.10	100.19	2.698		
9,500.00	9,491.85	9,504.54	9,491.85	50.75	50.79	-89.10	130.75	-78.01	276.08	174.82	101.26	2.727		
9,600.00	9,591.61	9,604.78	9,591.61	51.30	51.33	-89.88	130.75	-78.01	281.93	179.60	102.33	2.755		
9,700.00	9,691.36	9,705.02	9,691.36	51.84	51.86	-90.63	130.75	-78.01	287.82	184.42	103.40	2.784		
9,800.00	9,791.12	9,805.27	9,791.12	52.39	52.40	-91.35	130.75	-78.01	293.77	189.29	104.47	2.812		
9,900.00	9,890.88	9,905.51	9,890.88	52.94	52.94	-92.04	130.75	-78.01	299.76	194.21	105.55	2.840		

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



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,000.00	9,990.63	10,005.75	9,990.63	53.48	53.48	-92.70	130.75	-78.01	305.79	199.17	106.62	2.868		
10,100.00	10,090.39	10,106.00	10,090.39	54.03	54.02	-93.34	130.75	-78.01	311.86	204.16	107.69	2.896		
10,200.00	10,190.14	10,206.24	10,190.14	54.58	54.55	-93.95	130.75	-78.01	317.96	209.20	108.77	2.923		
10,300.00	10,289.90	10,306.49	10,289.90	55.13	55.09	-94.54	130.75	-78.01	324.11	214.27	109.84	2.951		
10,400.00	10,389.66	10,393.27	10,389.66	55.68	55.56	-95.11	130.75	-78.01	330.28	219.44	110.84	2.980		
10,403.53	10,393.18	10,403.21	10,393.18	55.70	55.61	-95.13	130.75	-78.01	330.50	219.59	110.91	2.980		
10,500.00	10,489.54	10,489.98	10,486.35	56.22	56.08	-95.35	131.45	-78.21	334.47	222.59	111.88	2.989		
10,536.86	10,526.40	10,523.00	10,519.26	56.42	56.26	-94.94	133.96	-78.94	335.35	223.11	112.24	2.988		
10,600.00	10,589.54	10,578.50	10,574.07	56.75	56.56	-93.50	142.26	-81.36	337.43	224.63	112.81	2.991		
10,700.00	10,689.54	10,661.72	10,654.03	57.28	57.02	-89.78	164.13	-87.74	344.67	231.22	113.44	3.038		
10,736.86	10,726.40	10,690.48	10,680.78	57.48	57.17	-88.11	174.25	-90.69	348.96	235.43	113.54	3.074		
10,750.00	10,739.54	10,700.50	10,689.98	57.55	57.23	-87.51	178.08	-91.80	350.74	237.20	113.55	3.089		
10,800.00	10,789.41	10,738.15	10,723.86	57.82	57.44	-85.52	193.82	-96.40	358.57	245.09	113.48	3.160		
10,850.00	10,838.81	10,775.09	10,755.99	58.09	57.64	-84.02	211.31	-101.50	367.87	254.61	113.25	3.248		
10,900.00	10,887.35	10,811.39	10,786.35	58.36	57.84	-82.99	230.40	-107.06	378.36	265.48	112.88	3.352		
10,950.00	10,934.66	10,847.10	10,814.94	58.62	58.04	-82.42	250.95	-113.05	389.81	277.41	112.40	3.468		
11,000.00	10,980.39	10,882.30	10,841.74	58.88	58.24	-82.29	272.83	-119.43	401.97	290.14	111.83	3.594		
11,050.00	11,024.18	10,917.01	10,866.77	59.14	58.44	-82.56	295.92	-126.17	414.63	303.42	111.22	3.728		
11,100.00	11,065.71	10,950.00	10,889.16	59.39	58.63	-83.35	319.17	-132.95	427.62	317.09	110.53	3.869		
11,150.00	11,104.66	10,985.22	10,911.48	59.65	58.84	-84.22	345.32	-140.57	440.74	330.71	110.04	4.005		
11,200.00	11,140.73	11,032.37	10,938.89	59.91	59.13	-84.02	382.33	-150.65	453.46	343.16	110.29	4.111		
11,250.00	11,173.64	11,089.21	10,968.72	60.18	59.48	-82.80	429.76	-160.02	463.81	352.81	111.01	4.178		
11,300.00	11,203.15	11,146.25	10,994.91	60.46	59.84	-81.56	480.04	-166.12	471.53	359.92	111.61	4.225		
11,350.00	11,229.04	11,203.13	11,017.03	60.75	60.20	-80.34	532.34	-168.85	476.56	364.47	112.09	4.252		
11,400.00	11,251.09	11,243.41	11,030.17	61.05	60.46	-81.24	570.41	-169.29	479.60	367.65	111.95	4.284		
11,436.86	11,264.80	11,271.08	11,037.94	61.27	60.64	-82.26	596.96	-169.57	481.32	369.46	111.86	4.303		
11,450.00	11,269.19	11,280.93	11,040.45	61.35	60.71	-82.64	606.49	-169.67	481.84	370.00	111.84	4.308		
11,500.00	11,283.76	11,318.37	11,048.82	61.67	60.96	-84.16	642.97	-170.06	483.58	371.73	111.84	4.324		
11,550.00	11,294.96	11,355.72	11,055.26	62.00	61.21	-85.78	679.76	-170.45	484.89	372.94	111.95	4.331		
11,600.00	11,302.74	11,393.02	11,059.77	62.34	61.48	-87.45	716.78	-170.85	485.77	373.59	112.17	4.330		
11,650.00	11,307.05	11,430.28	11,062.34	62.68	61.74	-89.17	753.95	-171.25	486.20	373.68	112.52	4.321		
11,687.73	11,308.00	11,458.39	11,063.00	62.95	61.94	-90.48	782.04	-171.55	486.23	373.37	112.87	4.308		
11,700.00	11,307.98	11,469.48	11,062.99	63.04	62.02	-90.65	793.14	-171.66	486.22	373.22	113.01	4.303		
11,701.22	11,307.98	11,470.70	11,062.99	63.05	62.03	-90.65	794.35	-171.68	486.22	373.20	113.02	4.302		
11,800.00	11,307.86	11,569.48	11,062.89	63.80	62.81	-90.65	893.13	-172.73	486.21	371.86	114.35	4.252		
11,900.00	11,307.74	11,669.48	11,062.80	64.66	63.68	-90.65	993.13	-173.80	486.20	370.37	115.84	4.197		
12,000.00	11,307.62	11,769.48	11,062.70	65.59	64.63	-90.65	1,093.12	-174.87	486.19	368.72	117.48	4.139		
12,100.00	11,307.50	11,869.48	11,062.60	66.60	65.66	-90.65	1,193.11	-175.94	486.18	366.92	119.26	4.077		
12,200.00	11,307.38	11,969.48	11,062.50	67.69	66.77	-90.65	1,293.11	-177.01	486.17	364.99	121.18	4.012		
12,300.00	11,307.25	12,069.48	11,062.40	68.85	67.95	-90.65	1,393.10	-178.08	486.16	362.93	123.23	3.945		
12,400.00	11,307.13	12,169.48	11,062.30	70.08	69.20	-90.65	1,493.10	-179.15	486.15	360.75	125.40	3.877		
12,500.00	11,307.01	12,269.48	11,062.20	71.37	70.51	-90.65	1,593.09	-180.21	486.14	358.44	127.69	3.807		
12,600.00	11,306.89	12,369.48	11,062.10	72.73	71.89	-90.65	1,693.09	-181.28	486.13	356.03	130.10	3.737		
12,700.00	11,306.77	12,469.48	11,062.00	74.14	73.32	-90.65	1,793.08	-182.35	486.12	353.51	132.61	3.666		
12,800.00	11,306.65	12,569.48	11,061.90	75.61	74.81	-90.65	1,893.07	-183.42	486.10	350.88	135.22	3.595		
12,900.00	11,306.53	12,669.48	11,061.80	77.13	76.36	-90.65	1,993.07	-184.49	486.09	348.17	137.92	3.524		
13,000.00	11,306.41	12,769.48	11,061.70	78.70	77.94	-90.65	2,093.06	-185.56	486.08	345.37	140.72	3.454		
13,100.00	11,306.28	12,869.48	11,061.60	80.31	79.58	-90.65	2,193.06	-186.63	486.07	342.48	143.59	3.385		
13,200.00	11,306.16	12,969.48	11,061.50	81.97	81.26	-90.65	2,293.05	-187.70	486.06	339.51	146.55	3.317		
13,300.00	11,306.04	13,069.48	11,061.41	83.67	82.98	-90.65	2,393.04	-188.76	486.05	336.47	149.58	3.249		
13,400.00	11,305.92	13,169.48	11,061.31	85.41	84.73	-90.65	2,493.04	-189.83	486.04	333.36	152.68	3.183		
13,500.00	11,305.80	13,269.48	11,061.21	87.18	86.53	-90.65	2,593.03	-190.90	486.03	330.18	155.84	3.119		

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 23S29E3434 - Cypress 34 23S29E3434 #236H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,600.00	11,305.68	13,369.48	11,061.11	88.99	88.35	-90.65	2,693.03	-191.97	486.02	326.95	159.07	3.055		
13,700.00	11,305.56	13,469.48	11,061.01	90.83	90.21	-90.65	2,793.02	-193.04	486.01	323.65	162.36	2.993		
13,800.00	11,305.44	13,569.48	11,060.91	92.70	92.10	-90.65	2,893.02	-194.11	486.00	320.30	165.69	2.933		
13,900.00	11,305.31	13,669.48	11,060.81	94.59	94.01	-90.65	2,993.01	-195.18	485.98	316.90	169.08	2.874		
14,000.00	11,305.19	13,769.48	11,060.71	96.52	95.95	-90.65	3,093.00	-196.25	485.97	313.45	172.52	2.817		
14,100.00	11,305.07	13,869.48	11,060.61	98.47	97.91	-90.65	3,193.00	-197.31	485.96	309.95	176.01	2.761		
14,200.00	11,304.95	13,969.48	11,060.51	100.44	99.90	-90.65	3,292.99	-198.38	485.95	306.42	179.54	2.707		
14,300.00	11,304.83	14,069.48	11,060.41	102.43	101.91	-90.65	3,392.99	-199.45	485.94	302.84	183.10	2.654		
14,400.00	11,304.71	14,169.48	11,060.31	104.45	103.94	-90.65	3,492.98	-200.52	485.93	299.22	186.71	2.603		
14,500.00	11,304.59	14,269.48	11,060.21	106.48	105.99	-90.65	3,592.98	-201.59	485.92	295.57	190.35	2.553		
14,600.00	11,304.47	14,369.48	11,060.11	108.53	108.06	-90.65	3,692.97	-202.66	485.91	291.88	194.03	2.504		
14,700.00	11,304.35	14,469.48	11,060.02	110.61	110.14	-90.65	3,792.96	-203.73	485.90	288.16	197.73	2.457		
14,800.00	11,304.22	14,569.48	11,059.92	112.69	112.24	-90.65	3,892.96	-204.80	485.89	284.41	201.47	2.412		
14,900.00	11,304.10	14,669.48	11,059.82	114.80	114.36	-90.65	3,992.95	-205.86	485.88	280.64	205.24	2.367		
15,000.00	11,303.98	14,769.48	11,059.72	116.91	116.49	-90.65	4,092.95	-206.93	485.86	276.83	209.03	2.324		
15,100.00	11,303.86	14,869.48	11,059.62	119.05	118.63	-90.65	4,192.94	-208.00	485.85	273.00	212.85	2.283		
15,200.00	11,303.74	14,969.48	11,059.52	121.19	120.79	-90.65	4,292.94	-209.07	485.84	269.15	216.69	2.242		
15,300.00	11,303.62	15,069.48	11,059.42	123.35	122.96	-90.65	4,392.93	-210.14	485.83	265.27	220.56	2.203		
15,400.00	11,303.50	15,169.48	11,059.32	125.52	125.14	-90.65	4,492.92	-211.21	485.82	261.37	224.45	2.165		
15,500.00	11,303.38	15,269.48	11,059.22	127.70	127.33	-90.65	4,592.92	-212.28	485.81	257.45	228.36	2.127		
15,600.00	11,303.25	15,369.48	11,059.12	129.89	129.53	-90.65	4,692.91	-213.35	485.80	253.51	232.29	2.091		
15,700.00	11,303.13	15,469.48	11,059.02	132.10	131.74	-90.65	4,792.91	-214.41	485.79	249.55	236.24	2.056		
15,800.00	11,303.01	15,569.48	11,058.92	134.31	133.97	-90.65	4,892.90	-215.48	485.78	245.58	240.20	2.022		
15,900.00	11,302.89	15,669.48	11,058.82	136.53	136.20	-90.65	4,992.90	-216.55	485.77	241.58	244.18	1.989		
16,000.00	11,302.77	15,769.48	11,058.72	138.76	138.43	-90.65	5,092.89	-217.62	485.76	237.57	248.18	1.957		
16,100.00	11,302.65	15,869.48	11,058.63	141.00	140.68	-90.65	5,192.88	-218.69	485.74	233.55	252.20	1.926		
16,200.00	11,302.53	15,969.48	11,058.53	143.24	142.94	-90.65	5,292.88	-219.76	485.73	229.51	256.22	1.896		
16,222.60	11,302.50	15,992.09	11,058.50	143.75	143.45	-90.65	5,315.48	-220.00	485.73	228.59	257.14	1.889		

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



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 1 - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7420-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +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	26.67	668.06	335.59	747.91				
100.00	100.00	75.93	75.93	0.20	0.20	26.67	668.20	335.65	747.77	747.37	0.40	1,860.438	
200.00	200.00	176.28	176.27	0.74	0.66	26.67	668.63	335.83	748.23	746.83	1.40	533.088	
300.00	300.00	279.52	279.51	1.28	1.21	26.63	668.99	335.49	748.40	745.92	2.48	301.306	
400.00	400.00	385.81	385.79	1.81	1.77	26.50	669.33	333.73	747.95	744.37	3.58	208.685	
500.00	500.00	488.52	488.47	2.35	2.32	26.32	669.36	331.09	746.83	742.16	4.67	159.988	
600.00	600.00	585.60	585.51	2.89	2.84	26.13	669.50	328.35	745.72	740.00	5.72	130.337	
700.00	700.00	684.39	684.26	3.43	3.36	25.91	670.03	325.54	744.95	738.17	6.78	109.817	
800.00	800.00	789.22	789.05	3.97	3.91	25.71	670.25	322.77	743.98	736.11	7.87	94.496	
900.00	900.00	890.07	889.87	4.50	4.44	25.59	669.63	320.69	742.54	733.60	8.94	83.080	
1,000.00	1,000.00	986.72	986.51	5.04	4.94	25.51	668.96	319.27	741.28	731.30	9.98	74.282	
1,100.00	1,100.00	1,084.72	1,084.50	5.58	5.45	25.48	668.39	318.50	740.42	729.39	11.03	67.140	
1,156.59	1,156.59	1,135.80	1,135.59	5.88	5.72	25.47	668.20	318.34	740.16	728.56	11.60	63.816	
1,200.00	1,200.00	1,173.68	1,173.46	6.12	5.92	25.48	668.32	318.43	740.32	728.29	12.03	61.547	
1,300.00	1,300.00	1,260.89	1,260.66	6.65	6.37	25.50	669.45	319.32	741.93	728.91	13.02	56.995	
1,400.00	1,400.00	1,354.89	1,354.62	7.19	6.87	25.54	671.84	321.06	745.01	730.97	14.04	53.056	
1,500.00	1,500.00	1,460.25	1,459.92	7.73	7.42	25.59	674.52	322.97	748.10	732.97	15.13	49.441	
1,600.00	1,600.00	1,567.89	1,567.54	8.27	7.99	25.61	676.31	324.17	750.07	733.84	16.23	46.206	
1,700.00	1,700.00	1,673.77	1,673.41	8.80	8.54	25.63	677.27	324.94	751.20	733.88	17.33	43.558	
1,800.00	1,800.00	1,776.93	1,776.58	9.34	9.08	25.67	677.52	325.58	751.69	733.29	18.40	40.846	
1,900.00	1,900.00	1,878.22	1,877.86	9.88	9.60	25.72	677.44	326.27	751.91	732.44	19.47	38.618	
2,000.00	2,000.00	1,975.55	1,975.19	10.42	10.11	25.78	677.32	327.13	752.19	731.67	20.52	36.661	
2,100.00	2,100.00	2,075.51	2,075.15	10.96	10.63	25.83	677.53	328.00	752.76	731.18	21.58	34.885	
2,200.00	2,200.00	2,176.10	2,175.73	11.49	11.16	25.87	677.74	328.65	753.23	730.58	22.64	33.263	
2,300.00	2,300.00	2,273.15	2,272.78	12.03	11.67	25.91	677.99	329.41	753.80	730.11	23.69	31.822	
2,400.00	2,400.00	2,371.97	2,371.59	12.57	12.18	25.96	678.58	330.36	754.76	730.02	24.74	30.504	
2,500.00	2,500.00	2,473.04	2,472.65	13.11	12.71	26.00	679.16	331.31	755.69	729.88	25.81	29.278	
2,600.00	2,600.00	2,575.57	2,575.18	13.64	13.25	26.08	679.38	332.47	756.38	729.50	26.89	28.133	
2,700.00	2,700.00	2,678.11	2,677.71	14.18	13.78	26.17	679.15	333.73	756.71	728.75	27.96	27.063	
2,800.00	2,800.00	2,782.82	2,782.41	14.72	14.33	26.29	678.36	335.06	756.61	727.56	29.05	26.048	
2,900.00	2,900.00	2,886.17	2,885.74	15.26	14.87	26.43	676.85	336.50	755.91	725.79	30.12	25.094	
3,000.00	3,000.00	2,990.99	2,990.52	15.80	15.42	26.62	674.63	338.15	754.72	723.51	31.21	24.183	
3,100.00	3,100.00	3,095.65	3,095.13	16.33	15.97	26.82	671.76	339.57	752.88	720.59	32.29	23.316	
3,200.00	3,200.00	3,195.58	3,195.02	16.87	16.49	26.98	668.87	340.53	750.73	717.38	33.35	22.510	
3,300.00	3,300.00	3,295.32	3,294.71	17.41	17.01	27.12	666.15	341.20	748.62	714.21	34.41	21.755	
3,400.00	3,400.00	3,393.47	3,392.83	17.95	17.52	27.24	663.71	341.71	746.64	711.17	35.46	21.054	
3,500.00	3,500.00	3,493.55	3,492.88	18.48	18.05	27.35	661.45	342.06	744.79	708.26	36.52	20.392	
3,600.00	3,600.00	3,594.08	3,593.40	19.02	18.57	27.43	659.22	342.20	742.89	705.30	37.59	19.764	
3,700.00	3,700.00	3,692.91	3,692.20	19.56	19.09	27.51	657.13	342.22	741.02	702.38	38.64	19.176	
3,800.00	3,800.00	3,790.64	3,789.92	20.10	19.60	27.58	655.28	342.33	739.39	699.70	39.69	18.628	
3,900.00	3,900.00	3,890.23	3,889.49	20.63	20.13	27.66	653.56	342.52	737.95	697.20	40.75	18.108	
4,000.00	4,000.00	3,987.77	3,987.01	21.17	20.64	27.72	652.11	342.62	736.68	694.88	41.80	17.623	
4,100.00	4,100.00	4,085.08	4,084.32	21.71	21.15	27.77	651.01	342.83	735.78	692.93	42.85	17.171	
4,200.00	4,200.00	4,183.59	4,182.83	22.25	21.66	27.82	650.20	343.07	735.17	691.26	43.90	16.745	
4,300.00	4,300.00	4,282.33	4,281.56	22.79	22.18	27.85	649.60	343.29	734.73	689.77	44.96	16.343	
4,400.00	4,400.00	4,382.28	4,381.52	23.32	22.70	27.88	649.15	343.43	734.40	688.38	46.02	15.959	
4,500.00	4,500.00	4,482.63	4,481.86	23.86	23.23	27.91	648.68	343.54	734.04	686.96	47.08	15.591	
4,600.00	4,600.00	4,582.40	4,581.63	24.40	23.75	27.93	648.18	343.66	733.66	685.51	48.14	15.239	
4,700.00	4,700.00	4,682.15	4,681.38	24.94	24.28	27.95	647.75	343.74	733.31	684.11	49.20	14.904	
4,800.00	4,800.00	4,783.45	4,782.68	25.47	24.81	27.97	647.32	343.71	732.92	682.65	50.27	14.580	
4,900.00	4,900.00	4,884.49	4,883.71	26.01	25.34	27.97	646.78	343.48	732.34	681.00	51.34	14.265	
5,000.00	5,000.00	4,984.04	4,983.26	26.55	25.86	27.97	646.25	343.14	731.71	679.32	52.40	13.965	

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



MS Directional
Anticollision Report



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Well Error: 0.00 usft
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TVD Reference: WELL @ 3118.00usft (H&P 422)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
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Offset Design Cypress 34 Federal - Cypress 34 Federal 1 - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7420-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,100.00	5,085.89	5,085.11	27.09	26.39	27.95	645.75	342.61	731.03	677.56	53.47	13.673	
5,200.00	5,200.00	5,187.67	5,186.89	27.62	26.92	27.92	645.03	341.88	730.07	675.53	54.54	13.387	
5,300.00	5,300.00	5,287.27	5,286.48	28.16	27.45	27.90	644.22	341.12	729.00	673.40	55.60	13.112	
5,400.00	5,400.00	5,389.87	5,389.07	28.70	27.98	27.85	643.45	339.99	727.82	671.15	56.67	12.843	
5,500.00	5,500.00	5,490.82	5,490.00	29.24	28.51	27.77	642.61	338.42	726.36	668.62	57.74	12.580	
5,600.00	5,600.00	5,590.66	5,589.83	29.78	29.03	27.69	641.76	336.80	724.85	666.05	58.80	12.328	
5,700.00	5,700.00	5,690.48	5,689.63	30.31	29.56	27.60	640.95	335.15	723.37	663.51	59.86	12.084	
5,800.00	5,800.00	5,791.34	5,790.47	30.85	30.09	27.52	640.10	333.47	721.85	660.92	60.93	11.848	
5,900.00	5,900.00	5,891.63	5,890.75	31.39	30.61	27.44	639.13	331.82	720.23	658.24	61.99	11.619	
6,000.00	6,000.00	5,991.54	5,990.64	31.93	31.13	27.37	638.05	330.37	718.60	655.55	63.05	11.397	
6,065.30	6,065.30	6,056.38	6,055.47	32.28	31.47	27.33	637.37	329.45	717.57	653.82	63.74	11.257	
6,100.00	6,100.00	6,090.80	6,089.89	32.46	31.66	27.30	637.03	328.96	716.76	652.65	64.11	11.180	
6,198.64	6,198.53	6,189.35	6,188.42	32.98	32.17	27.07	636.00	327.69	711.52	646.37	65.14	10.922	
6,200.00	6,199.89	6,190.71	6,189.78	32.99	32.18	27.07	635.98	327.67	711.41	646.26	65.16	10.918	
6,300.00	6,299.64	6,290.18	6,289.24	33.51	32.70	26.74	634.83	326.59	703.89	637.69	66.21	10.632	
6,400.00	6,399.40	6,391.56	6,390.61	34.04	33.23	26.42	633.52	325.55	696.29	629.03	67.26	10.352	
6,500.00	6,499.16	6,490.77	6,489.80	34.57	33.75	26.10	632.09	324.57	688.59	620.29	68.31	10.081	
6,600.00	6,598.91	6,590.44	6,589.45	35.10	34.28	25.78	630.66	323.65	680.96	611.60	69.36	9.818	
6,700.00	6,698.67	6,688.68	6,687.69	35.63	34.79	25.45	629.32	322.81	673.44	603.04	70.40	9.565	
6,800.00	6,798.43	6,788.38	6,787.37	36.16	35.32	25.13	628.01	322.15	666.06	594.61	71.46	9.321	
6,900.00	6,898.18	6,891.86	6,890.83	36.70	35.86	24.82	626.31	321.50	658.43	585.91	72.52	9.079	
7,000.00	6,997.94	6,989.74	6,988.70	37.23	36.37	24.50	624.49	320.83	650.60	577.03	73.57	8.843	
7,100.00	7,097.70	7,086.20	7,085.14	37.76	36.88	24.19	623.01	320.42	643.19	568.58	74.61	8.621	
7,200.00	7,197.45	7,185.35	7,184.28	38.30	37.40	23.90	621.63	320.51	636.13	560.47	75.66	8.407	
7,300.00	7,297.21	7,291.09	7,289.99	38.83	37.95	23.72	619.26	321.57	628.69	551.95	76.74	8.192	
7,400.00	7,396.97	7,394.47	7,393.27	39.37	38.50	23.69	615.47	323.74	620.38	542.58	77.81	7.974	
7,500.00	7,496.72	7,548.03	7,546.39	39.91	38.59	23.58	606.31	322.66	609.63	531.61	78.02	7.814	
7,600.00	7,596.48	7,794.34	7,775.78	40.44	38.70	17.03	571.88	244.64	576.41	501.20	75.21	7.664	
7,700.00	7,696.23	7,892.65	7,854.30	40.98	38.86	10.94	555.36	188.18	536.47	460.30	76.17	7.043	
7,800.00	7,795.99	7,943.99	7,889.34	41.52	39.01	6.20	550.22	151.07	503.64	424.87	78.78	6.393	
7,900.00	7,895.75	7,979.20	7,910.49	42.06	39.14	2.26	548.86	122.98	484.20	403.25	80.95	5.982	
7,964.13	7,959.73	7,997.66	7,920.67	42.41	39.22	-0.02	548.97	107.58	480.55	399.01	81.54	5.893 CC, ES, SF	
8,000.00	7,995.50	8,008.55	7,926.36	42.60	39.27	-1.38	549.24	98.29	481.69	400.14	81.54	5.907	
8,100.00	8,095.26	8,034.05	7,938.68	43.14	39.40	-4.76	550.34	76.01	496.99	416.77	80.22	6.196	
8,200.00	8,195.02	8,058.00	7,948.81	43.68	39.54	-8.07	551.90	54.36	529.33	451.97	77.37	6.842	
8,300.00	8,294.77	8,069.85	7,953.30	44.22	39.62	-10.11	552.85	43.44	576.25	502.80	73.44	7.846	
8,400.00	8,394.53	8,090.00	7,960.23	44.76	39.76	-13.04	554.68	24.61	634.92	565.19	69.73	9.105	
8,500.00	8,494.29	8,090.00	7,960.23	45.31	39.76	-13.83	554.68	24.61	702.38	636.59	65.79	10.676	
8,600.00	8,594.04	8,105.82	7,965.11	45.85	39.88	-16.29	556.32	9.65	776.49	713.59	62.90	12.345	
8,700.00	8,693.80	8,122.00	7,969.66	46.39	40.01	-18.75	558.19	-5.76	855.71	795.13	60.58	14.126	
8,800.00	8,793.56	8,122.00	7,969.66	46.94	40.01	-19.55	558.19	-5.76	938.56	880.25	58.32	16.094	
8,900.00	8,893.31	8,131.66	7,972.19	47.48	40.09	-21.32	559.40	-15.00	1,024.36	967.60	56.77	18.045	
9,000.00	8,993.07	8,139.07	7,974.04	48.02	40.15	-22.85	560.39	-22.11	1,112.40	1,056.87	55.52	20.035	
9,100.00	9,092.82	8,154.00	7,977.56	48.57	40.28	-25.06	562.53	-36.46	1,202.27	1,147.53	54.74	21.963	
9,200.00	9,192.58	8,154.00	7,977.56	49.11	40.28	-25.86	562.53	-36.46	1,293.39	1,239.52	53.87	24.010	
9,300.00	9,292.34	8,154.00	7,977.56	49.66	40.28	-26.66	562.53	-36.46	1,385.74	1,332.53	53.22	26.040	
9,400.00	9,392.09	8,164.66	7,979.91	50.20	40.39	-28.42	564.14	-46.73	1,478.98	1,426.05	52.93	27.944	
9,500.00	9,491.85	8,170.40	7,981.12	50.75	40.44	-29.71	565.02	-52.28	1,573.01	1,520.33	52.67	29.863	
9,600.00	9,591.61	8,175.71	7,982.21	51.30	40.49	-30.96	565.84	-57.41	1,667.67	1,615.15	52.52	31.751	
9,700.00	9,691.36	8,186.00	7,984.22	51.84	40.59	-32.59	567.44	-67.37	1,762.91	1,710.38	52.53	33.558	
9,800.00	9,791.12	8,186.00	7,984.22	52.39	40.59	-33.37	567.44	-67.37	1,858.57	1,806.10	52.47	35.420	
9,900.00	9,890.88	8,196.15	7,986.14	52.94	40.70	-34.94	569.04	-77.21	1,954.63	1,902.01	52.62	37.149	

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Survey Program: 100-GYRO-NS, 7420-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,000.00	9,990.63	8,208.50	7,988.48	53.48	40.83	-36.63	570.99	-89.18	2,050.98	1,998.15	52.84	38.819		
10,100.00	10,090.39	8,221.08	7,990.85	54.03	40.96	-38.28	572.98	-101.37	2,147.59	2,094.50	53.10	40.447		
10,200.00	10,190.14	8,234.77	7,993.43	54.58	41.12	-39.95	575.15	-114.64	2,244.42	2,191.01	53.41	42.025		
10,300.00	10,289.90	8,248.46	7,996.01	55.13	41.27	-41.55	577.32	-127.91	2,341.43	2,287.69	53.75	43.565		
10,400.00	10,389.66	8,250.00	7,996.30	55.68	41.29	-42.34	577.56	-129.40	2,438.64	2,384.67	53.97	45.184		
10,403.53	10,393.18	8,250.00	7,996.30	55.70	41.29	-42.37	577.56	-129.40	2,442.07	2,388.09	53.98	45.241		
10,500.00	10,489.54	8,250.00	7,996.30	56.22	41.29	-42.80	577.56	-129.40	2,536.09	2,481.88	54.21	46.782		
10,536.86	10,526.40	8,250.00	7,996.30	56.42	41.29	-42.83	577.56	-129.40	2,572.05	2,517.74	54.30	47.363		
10,600.00	10,589.54	8,262.71	7,998.62	56.75	41.45	-43.59	579.61	-141.73	2,633.57	2,578.96	54.61	48.229		
10,700.00	10,689.54	8,267.44	7,999.44	57.28	41.51	-43.87	580.39	-146.32	2,731.22	2,676.28	54.94	49.714		
10,736.86	10,726.40	8,269.12	7,999.73	57.48	41.53	-43.97	580.67	-147.95	2,767.25	2,712.19	55.07	50.254		
10,750.00	10,739.54	8,269.72	7,999.83	57.55	41.53	-44.01	580.77	-148.53	2,780.08	2,724.97	55.11	50.446		
10,800.00	10,789.41	8,282.00	8,001.85	57.82	41.68	-44.93	582.85	-160.47	2,828.44	2,773.08	55.36	51.093		
10,850.00	10,838.81	8,282.00	8,001.85	58.09	41.68	-45.46	582.85	-160.47	2,875.66	2,820.19	55.46	51.847		
10,900.00	10,887.35	8,282.00	8,001.85	58.36	41.68	-46.29	582.85	-160.47	2,921.54	2,865.99	55.55	52.594		
10,950.00	10,934.66	8,282.00	8,001.85	58.62	41.68	-47.47	582.85	-160.47	2,965.81	2,910.20	55.61	53.329		
11,000.00	10,980.39	8,282.00	8,001.85	58.88	41.68	-49.00	582.85	-160.47	3,008.20	2,952.54	55.66	54.045		
11,050.00	11,024.18	8,282.00	8,001.85	59.14	41.68	-50.94	582.85	-160.47	3,048.48	2,992.79	55.69	54.736		
11,100.00	11,065.71	8,282.00	8,001.85	59.39	41.68	-53.31	582.85	-160.47	3,086.43	3,030.72	55.71	55.397		
11,150.00	11,104.66	8,294.25	8,003.74	59.65	41.85	-56.72	584.99	-172.38	3,121.78	3,065.95	55.83	55.917		
11,200.00	11,140.73	8,298.18	8,004.33	59.91	41.90	-60.23	585.69	-176.20	3,154.44	3,098.57	55.86	56.466		
11,250.00	11,173.64	8,302.13	8,004.91	60.18	41.95	-64.25	586.40	-180.05	3,184.21	3,128.31	55.90	56.964		
11,300.00	11,203.15	8,314.00	8,006.59	60.46	42.11	-68.98	588.60	-191.59	3,210.98	3,154.98	56.00	57.341		
11,350.00	11,229.04	8,314.00	8,006.59	60.75	42.11	-73.92	588.60	-191.59	3,234.54	3,178.54	56.01	57.752		
11,400.00	11,251.09	8,314.00	8,006.59	61.05	42.11	-79.39	588.60	-191.59	3,254.86	3,198.83	56.03	58.093		
11,436.86	11,264.80	8,314.00	8,006.59	61.27	42.11	-83.71	588.60	-191.59	3,267.70	3,211.65	56.05	58.297		
11,450.00	11,269.19	8,314.00	8,006.59	61.35	42.11	-85.29	588.60	-191.59	3,271.86	3,215.80	56.06	58.360		
11,500.00	11,283.76	8,314.00	8,006.59	61.67	42.11	-91.48	588.60	-191.59	3,286.05	3,229.92	56.13	58.547		
11,550.00	11,294.96	8,325.97	8,008.21	62.00	42.27	-97.27	590.87	-203.23	3,297.54	3,241.24	56.30	58.567		
11,600.00	11,302.74	8,329.76	8,008.71	62.34	42.33	-103.14	591.59	-206.92	3,306.40	3,249.95	56.45	58.576		
11,650.00	11,307.05	8,333.43	8,009.18	62.68	42.38	-108.71	592.29	-210.49	3,312.56	3,255.95	56.62	58.508		
11,687.73	11,308.00	8,336.12	8,009.52	62.95	42.41	-112.67	592.80	-213.11	3,315.43	3,258.66	56.77	58.404		
11,700.00	11,307.98	8,346.00	8,010.73	63.04	42.55	-113.33	594.70	-222.73	3,316.17	3,259.28	56.89	58.294		
11,800.00	11,307.86	8,346.00	8,010.73	63.80	42.55	-122.83	594.70	-222.73	3,323.52	3,266.17	57.35	57.949		
11,900.00	11,307.74	8,346.00	8,010.73	64.66	42.55	-130.69	594.70	-222.73	3,333.86	3,275.89	57.97	57.513		
12,000.00	11,307.62	8,346.00	8,010.73	65.59	42.55	-137.08	594.70	-222.73	3,347.15	3,288.43	58.72	56.999		
12,100.00	11,307.50	8,346.00	8,010.73	66.60	42.55	-142.26	594.70	-222.73	3,363.37	3,303.77	59.61	56.428		
12,200.00	11,307.38	8,360.24	8,012.30	67.69	42.76	-145.60	597.49	-236.61	3,382.31	3,321.60	60.71	55.716		
12,300.00	11,307.25	8,364.19	8,012.69	68.85	42.82	-148.90	598.27	-240.45	3,404.14	3,342.31	61.83	55.055		
12,400.00	11,307.13	8,378.00	8,013.87	70.08	43.03	-151.11	601.06	-253.93	3,428.80	3,365.68	63.12	54.322		
12,500.00	11,307.01	8,378.00	8,013.87	71.37	43.03	-153.65	601.06	-253.93	3,456.04	3,391.66	64.37	53.688		
12,600.00	11,306.89	8,378.00	8,013.87	72.73	43.03	-155.81	601.06	-253.93	3,485.93	3,420.24	65.68	53.072		
12,700.00	11,306.77	8,378.00	8,013.87	74.14	43.03	-157.67	601.06	-253.93	3,518.40	3,451.37	67.04	52.484		
12,800.00	11,306.65	8,378.00	8,013.87	75.61	43.03	-159.28	601.06	-253.93	3,553.40	3,484.98	68.42	51.933		
12,900.00	11,306.53	8,378.00	8,013.87	77.13	43.03	-160.69	601.06	-253.93	3,590.84	3,521.01	69.83	51.423		
13,000.00	11,306.41	8,378.00	8,013.87	78.70	43.03	-161.93	601.06	-253.93	3,630.65	3,559.41	71.25	50.959		
13,100.00	11,306.28	8,378.00	8,013.87	80.31	43.03	-163.03	601.06	-253.93	3,672.76	3,600.09	72.67	50.543		
13,200.00	11,306.16	8,393.17	8,014.79	81.97	43.26	-163.52	604.14	-268.75	3,716.83	3,642.61	74.22	50.080		
13,300.00	11,306.04	8,395.84	8,014.90	83.67	43.31	-164.34	604.68	-271.36	3,763.19	3,687.54	75.65	49.746		
13,400.00	11,305.92	8,410.00	8,015.27	85.41	43.53	-164.75	607.51	-285.23	3,811.74	3,734.56	77.17	49.392		
13,500.00	11,305.80	8,410.00	8,015.27	87.18	43.53	-165.51	607.51	-285.23	3,862.05	3,783.51	78.54	49.172		
13,600.00	11,305.68	8,410.00	8,015.27	88.99	43.53	-166.20	607.51	-285.23	3,914.28	3,834.40	79.88	49.001		

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 1 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7420-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,700.00	11,305.56	8,410.00	8,015.27	90.83	43.53	-166.84	607.51	-285.23	3,968.34	3,887.15	81.19	48.875		
13,800.00	11,305.44	8,410.00	8,015.27	92.70	43.53	-167.42	607.51	-285.23	4,024.16	3,941.69	82.47	48.793		
13,900.00	11,305.31	8,410.00	8,015.27	94.59	43.53	-167.95	607.51	-285.23	4,081.67	3,997.95	83.72	48.753		
14,000.00	11,305.19	8,410.00	8,015.27	96.52	43.53	-168.45	607.51	-285.23	4,140.79	4,055.86	84.93	48.754		
14,100.00	11,305.07	8,410.00	8,015.27	98.47	43.53	-168.91	607.51	-285.23	4,201.46	4,115.35	86.11	48.793		
14,200.00	11,304.95	8,410.00	8,015.27	100.44	43.53	-169.33	607.51	-285.23	4,263.62	4,176.37	87.25	48.869		
14,300.00	11,304.83	8,425.70	8,015.25	102.43	43.78	-169.41	610.63	-300.62	4,327.01	4,238.47	88.54	48.870		
14,400.00	11,304.71	8,429.09	8,015.20	104.45	43.84	-169.72	611.31	-303.94	4,391.86	4,302.21	89.65	48.987		
14,500.00	11,304.59	8,442.00	8,014.83	106.48	44.05	-169.84	613.87	-316.59	4,458.06	4,367.20	90.85	49.069		
14,600.00	11,304.47	8,442.00	8,014.83	108.53	44.05	-170.18	613.87	-316.59	4,525.38	4,433.52	91.86	49.266		
14,700.00	11,304.35	8,442.00	8,014.83	110.61	44.05	-170.50	613.87	-316.59	4,593.89	4,501.07	92.82	49.491		
14,800.00	11,304.22	8,442.00	8,014.83	112.69	44.05	-170.80	613.87	-316.59	4,663.55	4,569.79	93.76	49.741		
14,900.00	11,304.10	8,442.00	8,014.83	114.80	44.05	-171.09	613.87	-316.59	4,734.28	4,639.63	94.66	50.016		
15,000.00	11,303.98	8,454.20	8,014.31	116.91	44.26	-171.16	616.27	-328.54	4,806.01	4,710.31	95.70	50.220		
15,100.00	11,303.86	8,459.60	8,014.06	119.05	44.35	-171.33	617.32	-333.84	4,878.72	4,782.10	96.62	50.495		
15,200.00	11,303.74	8,474.00	8,013.33	121.19	44.60	-171.36	620.06	-347.95	4,952.39	4,854.75	97.64	50.720		
15,300.00	11,303.62	8,474.00	8,013.33	123.35	44.60	-171.60	620.06	-347.95	5,026.89	4,928.47	98.43	51.073		
15,400.00	11,303.50	8,477.32	8,013.15	125.52	44.65	-171.78	620.68	-351.20	5,102.27	5,003.03	99.23	51.417		
15,500.00	11,303.38	8,490.57	8,012.41	127.70	44.89	-171.81	623.17	-364.20	5,178.44	5,078.26	100.18	51.693		
15,600.00	11,303.25	8,506.00	8,011.54	129.89	45.16	-171.81	626.05	-379.33	5,255.36	5,154.22	101.14	51.963		
15,700.00	11,303.13	8,518.59	8,010.82	132.10	45.40	-171.85	628.39	-391.69	5,332.99	5,230.96	102.04	52.265		
15,800.00	11,303.01	8,533.49	8,009.99	134.31	45.67	-171.85	631.13	-406.30	5,411.31	5,308.35	102.96	52.558		
15,900.00	11,302.89	8,578.58	8,007.80	136.53	46.54	-171.47	639.29	-450.59	5,490.21	5,385.78	104.43	52.571		
16,000.00	11,302.77	8,595.95	8,007.07	138.76	46.88	-171.45	642.40	-467.67	5,569.70	5,464.30	105.40	52.844		
16,100.00	11,302.65	8,602.00	8,006.82	141.00	47.01	-171.57	643.48	-473.62	5,649.79	5,543.67	106.12	53.237		
16,200.00	11,302.53	8,616.68	8,006.26	143.24	47.31	-171.58	646.04	-488.07	5,730.46	5,623.45	107.01	53.550		
16,222.60	11,302.50	8,618.62	8,006.19	143.75	47.35	-171.60	646.37	-489.97	5,748.78	5,641.60	107.18	53.635		



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 12H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 27-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	3.60	3.60	0.00	0.00	-79.50	29.75	-160.50	163.23				
100.00	100.00	103.98	103.98	0.20	0.41	-79.51	29.71	-160.41	163.14	162.53	0.61	267.040	
200.00	200.00	204.46	204.46	0.74	0.94	-79.54	29.56	-160.05	162.76	161.08	1.68	96.923	
300.00	300.00	304.95	304.94	1.28	1.47	-79.59	29.28	-159.41	162.08	159.33	2.75	58.991	
400.00	400.00	405.42	405.42	1.81	2.00	-79.67	28.88	-158.48	161.11	157.29	3.82	42.221	
500.00	500.00	505.58	505.56	2.35	2.54	-79.74	28.47	-157.36	159.93	155.04	4.89	32.731	
600.00	600.00	605.73	605.70	2.89	3.07	-79.78	28.16	-156.12	158.65	152.70	5.96	26.633	
700.00	700.00	705.84	705.81	3.43	3.60	-79.88	27.62	-154.83	157.29	150.26	7.03	22.376	
800.00	800.00	805.93	805.88	3.97	4.14	-80.13	26.71	-153.53	155.85	147.75	8.10	19.239	
900.00	900.00	905.96	905.90	4.50	4.67	-80.57	25.29	-152.27	154.37	145.20	9.17	16.833	
1,000.00	1,000.00	1,006.16	1,006.06	5.04	5.21	-81.23	23.31	-151.04	152.85	142.60	10.24	14.922	
1,100.00	1,100.00	1,106.45	1,106.31	5.58	5.74	-82.13	20.69	-149.69	151.14	139.83	11.32	13.357	
1,200.00	1,200.00	1,207.43	1,207.23	6.12	6.29	-83.26	17.49	-148.02	149.09	136.70	12.39	12.030	
1,300.00	1,300.00	1,306.97	1,306.70	6.65	6.82	-84.39	14.33	-145.97	146.71	133.24	13.47	10.894	
1,388.36	1,388.36	1,392.25	1,391.96	7.13	7.27	-85.01	12.68	-145.11	145.66	131.27	14.39	10.124	
1,400.00	1,400.00	1,403.44	1,403.14	7.19	7.33	-85.03	12.61	-145.13	145.68	131.17	14.51	10.041	
1,500.00	1,500.00	1,503.21	1,502.92	7.73	7.83	-85.08	12.54	-145.70	146.24	130.69	15.55	9.405	
1,600.00	1,600.00	1,603.25	1,602.95	8.27	8.33	-85.05	12.65	-146.14	146.69	130.09	16.59	8.841	
1,700.00	1,700.00	1,703.22	1,702.92	8.80	8.84	-85.00	12.83	-146.58	147.14	129.51	17.64	8.343	
1,800.00	1,800.00	1,803.43	1,803.13	9.34	9.35	-84.94	13.01	-146.96	147.53	128.85	18.68	7.896	
1,900.00	1,900.00	1,903.63	1,903.33	9.88	9.86	-84.90	13.13	-147.20	147.78	128.05	19.74	7.488	
2,000.00	2,000.00	2,003.87	2,003.57	10.42	10.38	-84.74	13.56	-147.26	147.88	127.09	20.79	7.112	
2,100.00	2,100.00	2,104.04	2,103.73	10.96	10.90	-84.42	14.37	-147.15	147.85	126.00	21.85	6.766	
2,200.00	2,200.00	2,204.17	2,203.86	11.49	11.42	-84.03	15.37	-146.90	147.70	124.79	22.91	6.447	
2,300.00	2,300.00	2,304.26	2,303.94	12.03	11.95	-83.63	16.37	-146.60	147.51	123.54	23.97	6.154	
2,400.00	2,400.00	2,404.93	2,404.61	12.57	12.47	-83.25	17.29	-146.12	147.14	122.10	25.04	5.877	
2,500.00	2,500.00	2,507.00	2,506.67	13.11	13.01	-82.98	17.83	-144.75	145.88	119.77	26.11	5.587	
2,600.00	2,600.00	2,607.53	2,607.16	13.64	13.55	-82.97	17.52	-142.15	143.27	116.10	27.18	5.272	
2,700.00	2,700.00	2,705.21	2,704.82	14.18	14.06	-83.27	16.57	-140.44	141.42	113.19	28.24	5.009	
2,800.00	2,800.00	2,804.86	2,804.46	14.72	14.59	-84.00	14.74	-140.23	141.00	111.70	29.30	4.813	
2,900.00	2,900.00	2,904.55	2,904.09	15.26	15.11	-85.35	11.38	-139.94	140.40	110.04	30.36	4.625	
2,930.68	2,930.68	2,934.98	2,934.49	15.42	15.27	-85.86	10.12	-139.96	140.32	109.64	30.68	4.573 CC	
3,000.00	3,000.00	3,002.86	3,002.34	15.80	15.63	-86.67	8.18	-140.37	140.61	109.20	31.41	4.477	
3,100.00	3,100.00	3,102.60	3,102.07	16.33	16.14	-87.24	6.83	-141.53	141.71	109.24	32.47	4.365	
3,200.00	3,200.00	3,202.96	3,202.41	16.87	16.67	-87.69	5.76	-142.65	142.77	109.24	33.53	4.258	
3,300.00	3,300.00	3,304.09	3,303.54	17.41	17.20	-87.90	5.24	-143.11	143.21	108.61	34.60	4.139	
3,400.00	3,400.00	3,404.14	3,403.58	17.95	17.72	-87.92	5.19	-143.12	143.21	107.55	35.66	4.016	
3,500.00	3,500.00	3,504.16	3,503.61	18.48	18.24	-87.88	5.29	-143.12	143.21	106.50	36.72	3.900	
3,600.00	3,600.00	3,604.18	3,603.63	19.02	18.76	-87.86	5.34	-143.10	143.20	105.43	37.78	3.791	
3,700.00	3,700.00	3,704.25	3,703.70	19.56	19.29	-87.85	5.38	-143.06	143.16	104.32	38.84	3.686	
3,800.00	3,800.00	3,804.26	3,803.71	20.10	19.81	-87.83	5.42	-142.96	143.07	103.16	39.90	3.585	
3,844.52	3,844.52	3,848.67	3,848.12	20.34	20.04	-87.82	5.44	-142.95	143.05	102.67	40.38	3.543	
3,900.00	3,900.00	3,904.08	3,903.53	20.63	20.33	-87.81	5.47	-142.96	143.07	102.11	40.96	3.493	
4,000.00	4,000.00	4,004.08	4,003.53	21.17	20.85	-87.79	5.51	-143.02	143.13	101.11	42.02	3.406	
4,100.00	4,100.00	4,104.15	4,103.60	21.71	21.37	-87.77	5.56	-143.05	143.16	100.08	43.08	3.323	
4,200.00	4,200.00	4,204.23	4,203.68	22.25	21.90	-87.79	5.53	-143.02	143.12	98.98	44.14	3.242	
4,300.00	4,300.00	4,304.25	4,303.69	22.79	22.43	-87.79	5.51	-142.95	143.06	97.85	45.21	3.165	
4,400.00	4,400.00	4,404.18	4,403.63	23.32	22.95	-87.78	5.55	-142.90	143.01	96.74	46.27	3.091	
4,422.63	4,422.63	4,426.78	4,426.23	23.44	23.07	-87.77	5.57	-142.90	143.01	96.50	46.51	3.075	
4,500.00	4,500.00	4,504.14	4,503.59	23.86	23.48	-87.74	5.64	-142.90	143.01	95.68	47.33	3.022	
4,600.00	4,600.00	4,604.16	4,603.60	24.40	24.00	-87.74	5.65	-142.90	143.02	94.62	48.39	2.955	
4,700.00	4,700.00	4,704.20	4,703.65	24.94	24.52	-87.76	5.59	-142.89	143.00	93.55	49.45	2.892	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 12H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 27-MWD														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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
4,800.00	4,800.00	4,804.23	4,803.68	25.47	25.05	-87.78	5.54	-142.85	142.96	92.44	50.52	2.830			
4,900.00	4,900.00	4,904.25	4,903.70	26.01	25.58	-87.78	5.53	-142.79	142.90	91.31	51.58	2.770			
5,000.00	5,000.00	5,004.16	5,003.60	26.55	26.10	-87.79	5.52	-142.75	142.86	90.21	52.64	2.714			
5,004.19	5,004.19	5,008.35	5,007.79	26.57	26.12	-87.79	5.52	-142.75	142.86	90.17	52.69	2.711			
5,100.00	5,100.00	5,104.05	5,103.50	27.09	26.62	-87.81	5.45	-142.79	142.89	89.18	53.71	2.661			
5,200.00	5,200.00	5,204.10	5,203.55	27.62	27.14	-87.82	5.44	-142.84	142.94	88.18	54.76	2.610			
5,300.00	5,300.00	5,303.98	5,303.43	28.16	27.66	-87.81	5.46	-142.92	143.03	87.21	55.82	2.562			
5,400.00	5,400.00	5,403.99	5,403.44	28.70	28.18	-87.82	5.45	-143.04	143.15	86.27	56.88	2.517			
5,500.00	5,500.00	5,504.06	5,503.51	29.24	28.70	-87.84	5.41	-143.13	143.24	85.30	57.94	2.472			
5,600.00	5,600.00	5,604.12	5,603.57	29.78	29.22	-87.86	5.36	-143.18	143.28	84.28	59.00	2.429			
5,700.00	5,700.00	5,704.16	5,703.61	30.31	29.75	-87.84	5.39	-143.19	143.29	83.23	60.06	2.386			
5,800.00	5,800.00	5,804.20	5,803.65	30.85	30.27	-87.81	5.48	-143.16	143.27	82.15	61.12	2.344			
5,877.45	5,877.45	5,881.60	5,881.05	31.27	30.67	-87.66	5.85	-143.12	143.24	81.30	61.94	2.313			
5,900.00	5,900.00	5,904.08	5,903.53	31.39	30.79	-87.48	6.29	-143.11	143.25	81.07	62.18	2.304			
6,000.00	6,000.00	6,003.56	6,002.88	31.93	31.31	-85.54	11.15	-143.05	143.49	80.25	63.23	2.269			
6,065.30	6,065.30	6,067.53	6,066.60	32.28	31.64	-83.34	16.69	-143.06	144.05	80.14	63.91	2.254 ES, SF			
6,100.00	6,100.00	6,100.48	6,099.36	32.46	31.81	-82.05	20.22	-143.35	145.07	80.82	64.25	2.258			
6,198.64	6,198.53	6,193.59	6,191.62	32.98	32.30	-78.67	32.49	-145.81	153.06	87.92	65.14	2.350			
6,200.00	6,199.89	6,194.87	6,192.89	32.99	32.30	-78.63	32.68	-145.86	153.22	88.07	65.15	2.352			
6,300.00	6,299.64	6,288.32	6,284.90	33.51	32.79	-75.38	48.20	-150.78	167.05	101.09	65.96	2.533			
6,400.00	6,399.40	6,383.12	6,377.89	34.04	33.29	-72.48	64.99	-158.26	184.20	117.41	66.79	2.758			
6,500.00	6,499.16	6,476.17	6,469.20	34.57	33.78	-70.59	80.41	-167.37	203.19	135.63	67.56	3.008			
6,600.00	6,598.91	6,564.66	6,555.53	35.10	34.25	-69.26	95.83	-179.16	225.94	157.86	68.08	3.319			
6,700.00	6,698.67	6,650.39	6,638.47	35.63	34.72	-68.33	111.69	-193.97	252.86	184.40	68.46	3.694			
6,800.00	6,798.43	6,732.64	6,717.20	36.16	35.17	-67.91	127.07	-212.08	284.22	215.57	68.65	4.140			
6,900.00	6,898.18	6,812.55	6,792.68	36.70	35.62	-67.94	141.86	-233.73	320.10	251.34	68.76	4.655			
7,000.00	6,997.94	6,905.29	6,879.82	37.23	36.15	-68.55	155.66	-262.23	357.91	288.16	69.75	5.131			
7,100.00	7,097.70	7,006.52	6,975.22	37.76	36.73	-70.15	163.43	-295.09	394.92	323.74	71.18	5.548			
7,200.00	7,197.45	7,129.56	7,092.55	38.30	37.43	-72.63	163.62	-332.04	427.70	354.26	73.44	5.824			
7,300.00	7,297.21	7,258.65	7,218.10	38.83	38.16	-74.69	161.71	-361.84	453.96	378.41	75.55	6.009			
7,400.00	7,396.97	7,373.86	7,331.58	39.37	38.80	-76.20	159.62	-381.58	474.74	397.71	77.02	6.164			
7,500.00	7,496.72	7,467.87	7,424.50	39.91	39.34	-76.87	162.34	-395.41	494.47	416.49	77.98	6.341			
7,600.00	7,596.48	7,583.15	7,538.37	40.44	40.00	-76.45	174.33	-408.45	512.66	433.28	79.38	6.458			
7,700.00	7,696.23	7,680.81	7,634.76	40.98	40.56	-75.82	187.53	-417.04	529.26	448.84	80.42	6.581			
7,800.00	7,795.99	7,768.61	7,721.56	41.52	41.07	-75.75	195.93	-427.05	547.38	466.11	81.27	6.735			
7,900.00	7,895.75	7,866.74	7,818.65	42.06	41.63	-76.13	200.77	-440.42	566.51	484.18	82.33	6.881			
8,000.00	7,995.50	7,970.20	7,921.16	42.60	42.23	-76.59	204.54	-453.91	584.78	501.29	83.48	7.005			
8,100.00	8,095.26	8,064.48	8,014.53	43.14	42.77	-76.92	209.07	-466.11	603.26	518.79	84.47	7.142			
8,200.00	8,195.02	8,163.62	8,112.67	43.68	43.35	-77.30	213.06	-479.51	622.15	536.61	85.54	7.273			
8,300.00	8,294.77	8,272.15	8,220.27	44.22	43.97	-77.82	215.40	-493.55	640.11	553.33	86.78	7.376			
8,400.00	8,394.53	8,379.39	8,326.79	44.76	44.57	-78.44	215.92	-505.93	656.43	568.46	87.97	7.462			
8,500.00	8,494.29	8,463.52	8,410.35	45.31	45.05	-79.02	215.94	-515.70	672.87	584.07	88.80	7.578			
8,600.00	8,594.04	8,544.16	8,490.08	45.85	45.51	-79.63	215.80	-527.70	692.41	602.87	89.54	7.733			
8,700.00	8,693.80	8,657.75	8,602.25	46.39	46.17	-80.35	214.86	-545.60	712.98	622.11	90.87	7.846			
8,800.00	8,793.56	8,784.38	8,728.00	46.94	46.88	-81.12	212.12	-560.15	729.01	636.67	92.34	7.895			
8,900.00	8,893.31	8,891.88	8,835.02	47.48	47.48	-81.66	211.27	-570.08	743.25	649.75	93.51	7.949			
9,000.00	8,993.07	9,038.98	8,981.85	48.02	48.28	-81.69	216.48	-576.73	753.42	658.43	94.99	7.932			
9,100.00	9,092.82	9,160.40	9,103.00	48.57	48.91	-81.44	224.32	-575.94	758.94	662.79	96.15	7.893			
9,200.00	9,192.58	9,229.87	9,172.26	49.11	49.28	-81.39	229.65	-575.73	765.13	668.06	97.07	7.883			
9,300.00	9,292.34	9,297.37	9,239.41	49.66	49.65	-81.30	235.92	-578.37	775.62	677.77	97.85	7.926			
9,400.00	9,392.09	9,367.13	9,308.48	50.20	50.05	-81.09	244.20	-583.60	790.05	691.49	98.56	8.016			
9,500.00	9,491.85	9,445.27	9,385.54	50.75	50.51	-80.80	254.31	-591.68	807.53	708.21	99.32	8.131			

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 12H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 27-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		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)		Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)					
9,600.00	9,591.61	9,537.39	9,476.12	51.30	51.06	-80.37	266.95	-602.64	826.70	726.41	100.29	8.243	
9,700.00	9,691.36	9,641.80	9,578.58	51.84	51.69	-79.77	282.73	-615.07	846.23	744.76	101.46	8.340	
9,800.00	9,791.12	9,739.66	9,674.85	52.39	52.29	-79.29	296.71	-625.62	864.55	762.02	102.53	8.432	
9,900.00	9,890.88	9,809.85	9,743.57	52.94	52.72	-78.96	308.30	-633.97	884.62	781.49	103.13	8.578	
10,000.00	9,990.63	9,875.00	9,806.01	53.48	53.13	-78.39	324.08	-643.66	908.99	805.44	103.55	8.778	
10,100.00	10,090.39	9,924.12	9,851.54	54.03	53.46	-77.78	340.54	-651.78	937.50	833.99	103.51	9.057	
10,200.00	10,190.14	9,971.00	9,893.14	54.58	53.78	-76.97	360.69	-659.53	970.24	866.99	103.24	9.398	
10,300.00	10,289.90	10,023.85	9,937.40	55.13	54.15	-75.77	388.12	-668.45	1,007.49	904.50	102.99	9.782	
10,400.00	10,389.66	10,065.00	9,969.66	55.68	54.44	-74.76	412.60	-675.65	1,049.65	947.35	102.30	10.261	
10,403.53	10,393.18	10,065.00	9,969.66	55.70	54.44	-74.77	412.60	-675.65	1,051.23	949.00	102.23	10.283	
10,500.00	10,489.54	10,103.47	9,997.98	56.22	54.72	-73.64	437.71	-682.49	1,095.14	993.74	101.41	10.800	
10,536.86	10,526.40	10,116.58	10,007.23	56.42	54.81	-73.19	446.71	-684.82	1,112.35	1,011.33	101.01	11.012	
10,600.00	10,589.54	10,137.63	10,021.61	56.75	54.97	-72.43	461.60	-688.56	1,142.97	1,042.70	100.27	11.399	
10,700.00	10,689.54	10,178.04	10,047.71	57.28	55.27	-70.92	491.65	-695.58	1,195.20	1,095.90	99.30	12.037	
10,736.86	10,726.40	10,201.50	10,062.20	57.48	55.45	-70.02	509.75	-699.15	1,215.28	1,116.09	99.18	12.253	
10,750.00	10,739.54	10,209.66	10,067.14	57.55	55.51	-69.71	516.14	-700.28	1,222.47	1,123.34	99.13	12.331	
10,800.00	10,789.41	10,241.26	10,085.76	57.82	55.75	-68.64	541.37	-704.13	1,249.37	1,150.42	98.94	12.627	
10,850.00	10,838.81	10,321.28	10,130.49	58.09	56.35	-65.80	607.46	-709.65	1,274.86	1,174.85	100.01	12.748	
10,900.00	10,887.35	10,364.84	10,153.98	58.36	56.68	-64.59	644.15	-710.01	1,297.72	1,197.67	100.06	12.970	
10,950.00	10,934.66	10,387.87	10,165.94	58.62	56.86	-64.42	663.82	-709.99	1,319.21	1,219.62	99.59	13.246	
11,000.00	10,980.39	10,411.80	10,177.98	58.88	57.05	-64.39	684.50	-709.93	1,339.19	1,240.04	99.15	13.507	
11,050.00	11,024.18	10,443.00	10,193.09	59.14	57.30	-64.22	711.80	-709.82	1,357.49	1,258.59	98.89	13.727	
11,100.00	11,065.71	10,443.00	10,193.09	59.39	57.30	-65.57	711.80	-709.82	1,374.09	1,276.19	97.90	14.036	
11,150.00	11,104.66	10,471.39	10,205.77	59.65	57.53	-65.85	737.20	-709.57	1,388.73	1,291.11	97.62	14.227	
11,200.00	11,140.73	10,487.87	10,212.43	59.91	57.66	-66.81	752.27	-709.31	1,401.71	1,304.64	97.07	14.440	
11,250.00	11,173.64	10,504.46	10,218.60	60.18	57.80	-67.93	767.66	-708.95	1,412.82	1,316.25	96.57	14.629	
11,300.00	11,203.15	10,537.00	10,229.13	60.46	58.07	-68.39	798.43	-708.00	1,422.25	1,325.80	96.44	14.747	
11,350.00	11,229.04	10,537.00	10,229.13	60.75	58.07	-70.62	798.43	-708.00	1,429.15	1,333.43	95.72	14.930	
11,400.00	11,251.09	10,560.25	10,235.62	61.05	58.27	-71.80	820.74	-707.22	1,434.16	1,338.62	95.54	15.011	
11,436.86	11,264.80	10,576.63	10,239.86	61.27	58.42	-72.78	836.56	-706.69	1,436.41	1,340.97	95.44	15.051	
11,450.00	11,269.19	10,582.49	10,241.30	61.35	58.47	-73.15	842.22	-706.51	1,436.93	1,341.52	95.41	15.060	
11,500.00	11,283.76	10,604.77	10,246.47	61.67	58.67	-74.57	863.89	-705.83	1,437.88	1,342.52	95.36	15.078	
11,550.00	11,294.96	10,632.00	10,252.08	62.00	58.91	-75.79	890.52	-705.07	1,437.20	1,341.73	95.47	15.054	
11,600.00	11,302.74	10,632.00	10,252.08	62.34	58.91	-78.60	890.52	-705.07	1,435.07	1,339.83	95.25	15.067	
11,650.00	11,307.05	10,632.00	10,252.08	62.68	58.91	-81.50	890.52	-705.07	1,432.08	1,336.92	95.16	15.050	
11,687.73	11,308.00	10,671.18	10,258.76	62.95	59.29	-81.44	929.13	-704.85	1,427.52	1,331.79	95.74	14.911	
11,700.00	11,307.98	10,674.96	10,259.32	63.04	59.33	-81.94	932.87	-704.92	1,426.23	1,330.42	95.80	14.887	
11,800.00	11,307.86	10,726.00	10,265.31	63.80	59.83	-84.88	983.48	-707.38	1,418.82	1,322.08	96.74	14.666	
11,897.08	11,307.74	10,726.00	10,265.31	64.63	59.83	-90.69	983.48	-707.38	1,415.50	1,318.34	97.16	14.568	
11,900.00	11,307.74	10,726.00	10,265.31	64.66	59.83	-90.86	983.48	-707.38	1,415.50	1,318.32	97.18	14.566	
12,000.00	11,307.62	10,775.27	10,268.27	65.59	60.37	-93.91	1,032.45	-711.76	1,416.90	1,318.49	98.40	14.399	
12,100.00	11,307.50	10,821.00	10,268.41	66.60	60.87	-97.12	1,077.88	-716.92	1,423.02	1,323.35	99.67	14.277	
12,200.00	11,307.38	10,921.32	10,266.93	67.69	62.06	-97.06	1,177.46	-729.02	1,431.53	1,329.94	101.59	14.091	
12,300.00	11,307.25	11,087.26	10,268.06	68.85	64.15	-93.20	1,342.57	-745.30	1,437.02	1,332.66	104.36	13.770	
12,400.00	11,307.13	11,223.60	10,268.54	70.08	65.97	-91.10	1,478.80	-750.43	1,438.44	1,331.74	106.71	13.480	
12,500.00	11,307.01	11,349.51	10,268.31	71.37	67.72	-89.60	1,604.71	-750.88	1,437.98	1,329.05	108.93	13.201	
12,600.00	11,306.89	11,465.21	10,268.95	72.73	69.40	-88.69	1,720.40	-749.77	1,436.09	1,324.96	111.13	12.923	
12,700.00	11,306.77	11,570.97	10,269.70	74.14	70.99	-88.35	1,826.14	-747.68	1,433.39	1,320.10	113.29	12.652	
12,800.00	11,306.65	11,670.49	10,270.37	75.61	72.54	-88.38	1,925.63	-745.53	1,430.60	1,315.12	115.47	12.389	
12,900.00	11,306.53	11,770.42	10,271.04	77.13	74.15	-88.38	2,025.54	-743.43	1,427.84	1,310.11	117.73	12.128	
13,000.00	11,306.41	11,868.38	10,271.51	78.70	75.76	-88.49	2,123.47	-741.22	1,425.13	1,305.11	120.02	11.874	
13,100.00	11,306.28	11,995.74	10,272.10	80.31	77.92	-86.88	2,250.74	-736.69	1,421.53	1,298.93	122.61	11.594	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 12H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 27-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,200.00	11,306.16	12,072.27	10,272.42	81.97	79.26	-88.25	2,327.22	-733.77	1,417.81	1,293.04	124.77	11.363		
13,300.00	11,306.04	12,148.93	10,272.43	83.67	80.61	-89.64	2,403.86	-732.38	1,415.75	1,288.72	127.02	11.146		
13,393.76	11,305.93	12,225.06	10,272.18	85.30	81.99	-90.69	2,479.99	-732.40	1,415.21	1,285.94	129.27	10.948		
13,400.00	11,305.92	12,230.26	10,272.16	85.41	82.09	-90.75	2,485.19	-732.44	1,415.21	1,285.79	129.42	10.935		
13,500.00	11,305.80	12,317.55	10,271.71	87.18	83.71	-91.50	2,572.47	-733.75	1,415.79	1,283.81	131.98	10.727		
13,600.00	11,305.68	12,411.38	10,271.26	88.99	85.49	-91.87	2,666.26	-736.13	1,417.04	1,282.32	134.72	10.519		
13,700.00	11,305.56	12,518.69	10,271.61	90.83	87.56	-91.44	2,773.50	-739.85	1,418.36	1,280.60	137.76	10.296		
13,800.00	11,305.44	12,615.51	10,273.32	92.70	89.46	-91.63	2,870.22	-743.98	1,419.18	1,278.36	140.81	10.078		
13,900.00	11,305.31	12,721.08	10,274.15	94.59	91.56	-91.30	2,975.72	-747.84	1,420.30	1,276.32	143.97	9.865		
14,000.00	11,305.19	12,864.22	10,274.69	96.52	94.41	-88.76	3,118.82	-746.98	1,418.48	1,271.11	147.37	9.625		
14,084.23	11,305.09	12,917.70	10,274.71	98.16	95.48	-90.57	3,172.30	-746.69	1,417.45	1,267.97	149.48	9.482		
14,100.00	11,305.07	12,929.00	10,274.70	98.47	95.71	-90.84	3,183.60	-746.83	1,417.46	1,267.57	149.90	9.456		
14,200.00	11,304.95	13,026.42	10,274.55	100.44	97.70	-90.99	3,281.01	-748.32	1,417.80	1,264.89	152.92	9.272		
14,300.00	11,304.83	13,117.73	10,273.82	102.43	99.59	-91.50	3,372.31	-749.54	1,418.48	1,262.63	155.85	9.101		
14,400.00	11,304.71	13,207.72	10,272.51	104.45	101.46	-92.09	3,462.28	-750.96	1,419.80	1,261.02	158.78	8.942		
14,500.00	11,304.59	13,320.87	10,271.75	106.48	103.84	-91.32	3,575.39	-753.57	1,421.05	1,258.93	162.13	8.765		
14,600.00	11,304.47	13,410.07	10,270.84	108.53	105.74	-91.95	3,664.56	-755.34	1,422.32	1,257.17	165.14	8.613		
14,700.00	11,304.35	13,508.84	10,269.29	110.61	107.85	-92.02	3,763.31	-757.13	1,423.89	1,255.61	168.27	8.462		
14,800.00	11,304.22	13,612.67	10,268.00	112.69	110.08	-91.80	3,867.11	-759.24	1,425.36	1,253.83	171.53	8.310		
14,900.00	11,304.10	13,716.40	10,266.98	114.80	112.33	-91.58	3,970.81	-761.16	1,426.52	1,251.71	174.81	8.160		
15,000.00	11,303.98	13,816.27	10,265.66	116.91	114.50	-91.59	4,070.67	-762.47	1,427.57	1,249.55	178.02	8.019		
15,100.00	11,303.86	13,918.18	10,264.26	119.05	116.73	-91.47	4,172.56	-763.82	1,428.66	1,247.39	181.26	7.882		
15,200.00	11,303.74	14,025.68	10,262.70	121.19	119.09	-91.03	4,280.05	-764.50	1,429.33	1,244.79	184.55	7.745		
15,300.00	11,303.62	14,129.67	10,261.42	123.35	121.39	-90.80	4,384.03	-764.73	1,429.56	1,241.78	187.79	7.613		
15,400.00	11,303.50	14,234.54	10,259.87	125.52	123.71	-90.52	4,488.89	-764.31	1,429.56	1,238.56	191.00	7.485		
15,500.00	11,303.38	14,340.59	10,258.75	127.70	126.07	-90.16	4,594.93	-763.73	1,429.14	1,234.91	194.24	7.358		
15,590.49	11,303.27	14,422.15	10,258.20	129.68	127.89	-90.69	4,676.49	-763.68	1,428.83	1,231.76	197.07	7.251		
15,600.00	11,303.25	14,430.60	10,258.15	129.89	128.08	-90.75	4,684.94	-763.74	1,428.83	1,231.46	197.37	7.239		
15,700.00	11,303.13	14,532.56	10,257.70	132.10	130.37	-90.63	4,786.90	-764.58	1,428.90	1,228.17	200.73	7.119		
15,800.00	11,303.01	14,636.76	10,257.38	134.31	132.72	-90.39	4,891.09	-765.17	1,428.69	1,224.58	204.11	7.000		
15,900.00	11,302.89	14,743.02	10,256.60	136.53	135.12	-90.02	4,997.35	-764.67	1,428.10	1,220.67	207.43	6.885		
16,000.00	11,302.77	14,844.80	10,255.84	138.76	137.42	-89.91	5,099.11	-763.78	1,427.24	1,216.57	210.67	6.775		
16,100.00	11,302.65	14,947.21	10,255.60	141.00	139.75	-89.77	5,201.52	-763.25	1,426.25	1,212.27	213.98	6.665		
16,200.00	11,302.53	15,051.14	10,255.73	143.24	142.12	-89.53	5,305.46	-762.76	1,425.03	1,207.68	217.35	6.556		
16,222.60	11,302.50	15,073.89	10,255.80	143.75	142.63	-89.52	5,328.20	-762.64	1,424.72	1,206.61	218.11	6.532		



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 15H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 76-VESSEI_GYRO_DROP_496-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +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	67.13	29.72	70.46	76.47				
100.00	100.00	100.12	100.12	0.20	0.13	67.24	29.55	70.43	76.38	76.04	0.33	228.384	
200.00	200.00	200.19	200.19	0.74	0.40	67.52	29.13	70.41	76.20	75.06	1.14	67.107	
300.00	300.00	300.33	300.33	1.28	0.67	67.94	28.48	70.29	75.84	73.91	1.94	39.151	
400.00	400.00	400.16	400.16	1.81	0.93	68.15	28.07	69.99	75.41	72.67	2.73	27.593	
408.12	408.12	408.13	408.12	1.86	0.94	68.14	28.07	69.98	75.40	72.61	2.79	27.024 CC, ES	
500.00	500.00	498.22	498.21	2.35	1.10	67.72	29.00	70.76	76.49	73.05	3.44	22.241	
600.00	600.00	598.01	597.95	2.89	1.35	67.06	30.78	72.74	79.01	74.79	4.23	18.688	
700.00	700.00	697.87	697.79	3.43	1.73	66.60	32.30	74.62	81.34	76.19	5.15	15.798	
800.00	800.00	794.14	793.95	3.97	2.17	66.52	34.16	78.64	85.95	79.83	6.12	14.041	
900.00	900.00	889.90	889.22	4.50	2.65	66.91	37.38	87.67	95.91	88.80	7.12	13.478	
1,000.00	1,000.00	990.54	989.30	5.04	3.19	67.65	40.22	97.84	106.32	98.16	8.16	13.028	
1,100.00	1,100.00	1,091.12	1,089.38	5.58	3.74	68.59	42.25	107.75	116.22	107.01	9.22	12.608	
1,200.00	1,200.00	1,193.40	1,191.32	6.12	4.30	69.20	44.02	115.86	124.24	113.95	10.30	12.067	
1,300.00	1,300.00	1,293.96	1,291.67	6.65	4.85	69.41	45.84	122.04	130.63	119.27	11.36	11.498	
1,400.00	1,400.00	1,393.13	1,390.61	7.19	5.39	69.70	47.50	128.41	137.24	124.81	12.42	11.048	
1,500.00	1,500.00	1,496.02	1,493.30	7.73	5.95	69.86	49.33	134.53	143.44	129.93	13.51	10.618	
1,600.00	1,600.00	1,598.15	1,595.36	8.27	6.50	69.38	51.77	137.62	147.11	132.53	14.59	10.085	
1,700.00	1,700.00	1,697.24	1,694.37	8.80	7.02	68.59	54.88	139.96	150.44	134.79	15.65	9.614	
1,800.00	1,800.00	1,794.41	1,791.43	9.34	7.54	68.06	57.82	143.57	155.01	138.31	16.70	9.283	
1,900.00	1,900.00	1,892.94	1,889.78	9.88	8.09	67.99	60.23	148.98	161.02	143.26	17.76	9.067	
2,000.00	2,000.00	1,992.37	1,989.00	10.42	8.64	68.17	62.15	155.15	167.50	148.67	18.83	8.896	
2,100.00	2,100.00	2,091.52	2,087.92	10.96	9.19	68.37	64.07	161.59	174.25	154.35	19.90	8.758	
2,200.00	2,200.00	2,192.47	2,188.65	11.49	9.75	68.63	65.77	168.09	180.85	159.87	20.98	8.620	
2,300.00	2,300.00	2,292.74	2,288.72	12.03	10.30	68.91	67.18	174.17	187.02	164.96	22.06	8.479	
2,400.00	2,400.00	2,392.79	2,388.59	12.57	10.85	69.17	68.48	179.99	192.91	169.78	23.13	8.339	
2,500.00	2,500.00	2,490.95	2,486.55	13.11	11.40	69.22	70.52	185.90	199.28	175.09	24.19	8.237	
2,600.00	2,600.00	2,589.98	2,585.34	13.64	11.95	69.34	72.59	192.50	206.25	180.99	25.26	8.164	
2,700.00	2,700.00	2,689.84	2,684.95	14.18	12.51	69.37	74.99	199.18	213.36	187.02	26.34	8.101	
2,800.00	2,800.00	2,790.52	2,785.39	14.72	13.07	69.47	77.08	205.82	220.26	192.84	27.42	8.032	
2,900.00	2,900.00	2,891.46	2,886.11	15.26	13.63	69.96	77.51	212.46	226.59	198.08	28.51	7.948	
3,000.00	3,000.00	2,990.38	2,984.81	15.80	14.18	70.53	77.41	218.99	232.76	203.19	29.57	7.870	
3,100.00	3,100.00	3,089.67	3,083.87	16.33	14.73	70.66	79.16	225.53	239.56	208.92	30.65	7.817	
3,200.00	3,200.00	3,189.23	3,183.21	16.87	15.29	70.59	81.60	231.55	246.08	214.36	31.72	7.758	
3,300.00	3,300.00	3,282.91	3,276.58	17.41	15.82	70.46	84.64	238.45	254.10	221.37	32.73	7.763	
3,400.00	3,400.00	3,378.23	3,371.41	17.95	16.37	70.27	88.68	247.29	264.26	230.50	33.75	7.829	
3,500.00	3,500.00	3,468.87	3,461.39	18.48	16.91	70.07	93.28	257.21	276.31	241.61	34.70	7.963	
3,600.00	3,600.00	3,560.90	3,552.26	19.02	17.47	69.59	100.41	269.87	291.87	256.22	35.65	8.187	
3,700.00	3,700.00	3,651.90	3,641.86	19.56	18.04	69.13	108.15	283.71	309.14	272.57	36.58	8.452	
3,800.00	3,800.00	3,744.96	3,732.99	20.10	18.64	68.71	117.02	300.33	329.22	291.68	37.54	8.769	
3,900.00	3,900.00	3,843.32	3,829.30	20.63	19.28	68.33	126.36	318.02	349.44	310.81	38.63	9.047	
4,000.00	4,000.00	3,943.42	3,927.33	21.17	19.94	67.97	135.89	335.88	369.54	329.79	39.75	9.298	
4,100.00	4,100.00	4,045.92	4,027.92	21.71	20.61	67.63	145.37	353.16	388.65	347.74	40.91	9.501	
4,200.00	4,200.00	4,147.78	4,128.07	22.25	21.27	67.30	154.49	369.30	406.73	364.68	42.05	9.673	
4,300.00	4,300.00	4,249.55	4,228.28	22.79	21.93	66.98	163.40	384.65	424.03	380.84	43.18	9.819	
4,400.00	4,400.00	4,344.36	4,321.65	23.32	22.55	66.72	171.62	398.89	441.25	397.05	44.21	9.982	
4,500.00	4,500.00	4,437.74	4,413.45	23.86	23.16	66.51	179.87	413.94	459.55	414.35	45.20	10.167	
4,600.00	4,600.00	4,539.64	4,513.56	24.40	23.83	66.33	188.81	430.71	478.16	431.81	46.34	10.317	
4,700.00	4,700.00	4,643.65	4,615.95	24.94	24.51	66.15	197.51	446.79	495.67	448.16	47.52	10.432	
4,800.00	4,800.00	4,741.27	4,712.13	25.47	25.15	66.12	204.47	461.91	512.73	464.14	48.59	10.553	
4,900.00	4,900.00	4,838.82	4,808.21	26.01	25.79	66.34	209.47	478.07	529.95	480.30	49.65	10.673	
5,000.00	5,000.00	4,925.98	4,893.86	26.55	26.38	66.55	214.08	493.55	548.35	497.79	50.56	10.845	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 15H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 76-VESSI_GYRO_DROP, 496-MWD												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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	5,100.00	5,013.07	4,979.12	27.09	26.97	66.64	220.29	510.13	568.66	517.20	51.45	11.052	
5,200.00	5,200.00	5,111.84	5,075.63	27.62	27.66	66.67	228.40	529.53	589.95	537.39	52.56	11.225	
5,300.00	5,300.00	5,212.35	5,173.93	28.16	28.36	66.69	236.54	548.85	610.81	557.12	53.69	11.377	
5,400.00	5,400.00	5,323.36	5,282.78	28.70	29.11	66.71	244.92	568.96	630.43	575.45	54.98	11.466	
5,500.00	5,500.00	5,431.89	5,389.60	29.24	29.84	66.74	252.14	586.71	648.07	591.85	56.22	11.528	
5,600.00	5,600.00	5,533.33	5,489.60	29.78	30.51	66.69	259.45	602.14	664.89	607.54	57.34	11.595	
5,700.00	5,700.00	5,659.89	5,614.62	30.31	31.30	66.47	269.48	618.93	680.42	621.67	58.76	11.581	
5,800.00	5,800.00	5,807.41	5,761.45	30.85	32.15	66.04	279.38	628.67	689.04	628.83	60.21	11.444	
5,900.00	5,900.00	5,932.89	5,886.77	31.39	32.79	65.69	285.21	631.22	692.79	631.42	61.37	11.289	
6,000.00	6,000.00	6,045.61	5,999.44	31.93	33.31	65.45	288.22	630.89	693.61	631.18	62.42	11.111	
6,065.30	6,065.30	6,117.23	6,071.05	32.28	33.64	65.35	289.18	630.16	693.36	630.26	63.10	10.988	
6,100.00	6,100.00	6,155.28	6,109.10	32.46	33.82	65.32	289.38	629.61	692.68	629.22	63.46	10.916	
6,198.64	6,198.53	6,253.93	6,207.74	32.98	34.24	65.31	289.50	628.20	687.15	622.72	64.44	10.664	
6,200.00	6,199.89	6,255.31	6,209.11	32.99	34.25	65.31	289.50	628.18	687.04	622.59	64.45	10.660	
6,300.00	6,299.64	6,355.92	6,309.71	33.51	34.68	65.37	289.10	626.79	678.71	613.27	65.44	10.371	
6,400.00	6,399.40	6,456.05	6,409.83	34.04	35.12	65.47	288.31	625.48	670.29	603.85	66.44	10.089	
6,500.00	6,499.16	6,555.39	6,509.16	34.57	35.55	65.60	287.19	624.28	661.82	594.39	67.43	9.814	
6,600.00	6,598.91	6,653.69	6,607.45	35.10	35.99	65.75	285.95	623.32	653.51	585.08	68.43	9.549	
6,700.00	6,698.67	6,752.32	6,706.06	35.63	36.42	65.92	284.61	622.61	645.40	575.96	69.44	9.294	
6,800.00	6,798.43	6,851.23	6,804.96	36.16	36.87	66.11	283.20	622.06	637.42	566.97	70.45	9.048	
6,900.00	6,898.18	6,949.93	6,903.65	36.70	37.32	66.31	281.74	621.67	629.57	558.11	71.46	8.810	
7,000.00	6,997.94	7,048.51	7,002.22	37.23	37.77	66.53	280.25	621.49	621.91	549.43	72.48	8.580	
7,100.00	7,097.70	7,145.73	7,099.43	37.76	38.22	66.77	278.68	621.62	614.51	541.00	73.51	8.360	
7,200.00	7,197.45	7,242.49	7,196.16	38.30	38.68	67.07	276.84	622.37	607.59	533.06	74.54	8.152	
7,300.00	7,297.21	7,344.21	7,297.87	38.83	39.15	67.37	275.00	623.29	600.86	525.29	75.56	7.952	
7,400.00	7,396.97	7,447.27	7,400.92	39.37	39.64	67.57	274.12	623.23	593.60	517.02	76.59	7.751	
7,500.00	7,496.72	7,546.25	7,499.90	39.91	40.10	67.71	273.65	622.75	586.12	508.50	77.61	7.552	
7,600.00	7,596.48	7,645.12	7,598.76	40.44	40.57	67.90	272.83	622.60	578.80	500.16	78.64	7.361	
7,700.00	7,696.23	7,746.64	7,700.28	40.98	41.04	68.09	272.08	622.30	571.39	491.73	79.66	7.173	
7,800.00	7,795.99	7,848.37	7,802.00	41.52	41.52	68.22	271.78	621.46	563.67	482.99	80.68	6.986	
7,900.00	7,895.75	7,951.07	7,904.70	42.06	42.00	68.34	271.32	620.17	555.48	473.79	81.69	6.799	
8,000.00	7,995.50	8,049.56	8,003.17	42.60	42.46	68.51	270.46	618.64	546.88	464.16	82.72	6.611	
8,100.00	8,095.26	8,140.10	8,093.70	43.14	42.90	68.72	269.61	618.44	539.48	455.71	83.77	6.440	
8,200.00	8,195.02	8,232.33	8,185.92	43.68	43.36	69.01	268.80	619.85	533.75	448.94	84.81	6.293	
8,300.00	8,294.77	8,329.44	8,283.00	44.22	43.86	69.29	268.36	622.06	528.88	443.01	85.87	6.159	
8,400.00	8,394.53	8,432.04	8,385.57	44.76	44.38	69.53	268.47	624.57	524.39	437.46	86.93	6.032	
8,500.00	8,494.29	8,548.05	8,501.57	45.31	44.95	69.68	268.64	624.69	517.72	429.76	87.96	5.886	
8,600.00	8,594.04	8,648.40	8,601.90	45.85	45.44	69.73	268.94	622.44	508.91	419.91	88.99	5.718	
8,700.00	8,693.80	8,740.54	8,694.01	46.39	45.89	69.69	270.39	621.13	501.30	411.25	90.05	5.567	
8,800.00	8,793.56	8,836.03	8,789.48	46.94	46.36	69.60	272.67	620.83	495.01	403.91	91.10	5.434	
8,900.00	8,893.31	8,933.96	8,887.40	47.48	46.86	69.71	273.52	621.57	489.20	397.05	92.15	5.309	
9,000.00	8,993.07	9,035.96	8,989.39	48.02	47.37	70.01	272.90	623.03	483.52	390.32	93.20	5.188	
9,100.00	9,092.82	9,140.15	9,093.57	48.57	47.89	70.31	272.09	623.66	477.02	382.77	94.25	5.061	
9,200.00	9,192.58	9,246.57	9,199.98	49.11	48.40	70.66	270.60	623.25	469.40	374.13	95.27	4.927	
9,300.00	9,292.34	9,353.14	9,306.49	49.66	48.91	71.17	267.42	621.72	460.29	364.03	96.27	4.781	
9,400.00	9,392.09	9,444.71	9,398.02	50.20	49.35	71.60	265.12	620.50	451.45	354.10	97.35	4.638	
9,500.00	9,491.85	9,547.15	9,500.45	50.75	49.84	71.91	263.97	619.20	443.14	344.77	98.37	4.505	
9,600.00	9,591.61	9,634.75	9,588.05	51.30	50.27	72.06	264.39	618.64	435.92	336.46	99.45	4.383	
9,700.00	9,691.36	9,736.82	9,690.09	51.84	50.79	72.05	266.39	618.63	429.76	329.26	100.50	4.276	
9,800.00	9,791.12	9,845.69	9,798.71	52.39	51.33	71.35	272.74	615.81	422.38	320.87	101.51	4.161	
9,900.00	9,890.88	9,944.04	9,894.53	52.94	51.81	68.61	292.80	607.97	415.02	312.44	102.58	4.046	
10,000.00	9,990.63	10,032.00	9,976.25	53.48	52.21	64.25	322.58	595.22	408.58	304.92	103.66	3.941	

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



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 15H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 76-VESSI_GYRO_DROP, 496-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,038.69	10,029.22	10,059.29	10,000.89	53.70	52.34	62.65	333.59	591.15	407.92	303.92	104.00	3.922 SF		
10,100.00	10,090.39	10,102.17	10,038.83	54.03	52.53	59.93	352.56	585.00	409.64	305.30	104.34	3.926		
10,200.00	10,190.14	10,174.00	10,098.24	54.58	52.84	54.45	390.74	572.29	419.60	315.22	104.39	4.020		
10,300.00	10,289.90	10,225.51	10,136.55	55.13	53.05	49.82	423.27	561.11	441.13	338.26	102.87	4.288		
10,400.00	10,389.66	10,268.00	10,164.62	55.68	53.22	45.65	453.51	551.04	476.16	376.17	100.00	4.762		
10,403.53	10,393.18	10,268.00	10,164.62	55.70	53.22	45.64	453.51	551.04	477.63	377.82	99.81	4.785		
10,500.00	10,489.54	10,300.00	10,183.59	56.22	53.34	42.45	478.09	543.33	525.72	429.48	96.24	5.463		
10,536.86	10,526.40	10,300.00	10,183.59	56.42	53.34	42.44	478.09	543.33	547.72	453.45	94.28	5.810		
10,600.00	10,589.54	10,320.68	10,194.97	56.75	53.43	40.51	494.70	538.63	588.41	496.18	92.23	6.380		
10,700.00	10,689.54	10,340.91	10,205.38	57.28	53.52	38.70	511.54	534.47	658.84	570.05	88.79	7.420		
10,736.86	10,726.40	10,347.71	10,208.73	57.48	53.55	38.11	517.32	533.19	686.29	598.63	87.66	7.829		
10,750.00	10,739.54	10,350.11	10,209.90	57.55	53.56	37.92	519.37	532.76	696.17	608.90	87.27	7.978		
10,800.00	10,789.41	10,362.00	10,215.52	57.82	53.61	37.19	529.65	530.73	733.06	647.14	85.92	8.532		
10,850.00	10,838.81	10,372.21	10,220.20	58.09	53.67	36.94	538.58	529.17	768.64	684.15	84.49	9.097		
10,900.00	10,887.35	10,394.00	10,229.91	58.36	53.78	36.14	557.90	526.49	802.75	719.10	83.65	9.597		
10,950.00	10,934.66	10,394.00	10,229.91	58.62	53.78	37.37	557.90	526.49	835.00	753.24	81.75	10.214		
11,000.00	10,980.39	10,412.94	10,237.89	58.88	53.89	37.46	575.00	524.82	865.38	784.59	80.79	10.712		
11,050.00	11,024.18	10,426.00	10,243.06	59.14	53.97	38.38	586.97	523.99	893.88	814.31	79.57	11.233		
11,100.00	11,065.71	10,426.00	10,243.06	59.39	53.97	40.80	586.97	523.99	920.65	842.80	77.86	11.825		
11,150.00	11,104.66	10,453.82	10,252.98	59.65	54.15	41.19	612.92	522.70	944.65	867.32	77.33	12.216		
11,200.00	11,140.73	10,467.93	10,257.40	59.91	54.25	43.22	626.31	522.19	966.74	890.45	76.29	12.673		
11,250.00	11,173.64	10,489.00	10,263.25	60.18	54.40	44.99	646.54	521.62	986.61	911.06	75.55	13.059		
11,300.00	11,203.15	10,489.00	10,263.25	60.46	54.40	49.67	646.54	521.62	1,004.08	929.87	74.20	13.532		
11,350.00	11,229.04	10,509.42	10,268.01	60.75	54.54	52.66	666.39	521.49	1,019.09	945.48	73.60	13.846		
11,400.00	11,251.09	10,521.00	10,270.32	61.05	54.63	57.50	677.74	521.69	1,031.79	958.93	72.86	14.161		
11,436.86	11,264.80	10,541.30	10,273.92	61.27	54.79	59.80	697.71	522.38	1,039.42	966.74	72.68	14.302		
11,450.00	11,269.19	10,553.00	10,275.83	61.35	54.88	60.00	709.24	522.92	1,041.83	969.10	72.73	14.325		
11,500.00	11,283.76	10,574.66	10,279.11	61.87	55.05	64.49	730.81	524.12	1,049.43	976.99	72.44	14.488		
11,550.00	11,294.96	10,585.00	10,280.57	62.00	55.14	71.47	740.83	524.78	1,055.00	982.97	72.03	14.647		
11,600.00	11,302.74	10,616.00	10,283.76	62.34	55.40	75.19	771.56	527.18	1,058.72	986.60	72.12	14.680		
11,650.00	11,307.05	10,644.83	10,285.78	62.68	55.65	79.45	800.21	529.67	1,060.47	988.22	72.25	14.677		
11,687.73	11,308.00	10,693.72	10,289.67	62.95	56.09	77.50	848.79	533.52	1,059.36	986.56	72.80	14.551		
11,700.00	11,307.98	10,705.91	10,290.67	63.04	56.21	77.57	860.91	534.41	1,058.65	985.72	72.93	14.516		
11,800.00	11,307.86	10,802.21	10,298.26	63.80	57.16	78.65	956.73	540.41	1,052.95	979.03	73.93	14.243		
11,900.00	11,307.74	10,883.48	10,303.94	64.66	58.01	82.42	1,037.65	545.28	1,048.17	973.36	74.81	14.010		
11,992.02	11,307.63	10,937.98	10,306.40	65.52	58.62	89.62	1,091.91	549.68	1,046.51	970.95	75.56	13.849		
12,000.00	11,307.62	10,942.70	10,306.54	65.59	58.67	90.23	1,096.61	550.13	1,046.52	970.88	75.64	13.836		
12,100.00	11,307.50	11,014.80	10,307.62	66.60	59.51	95.38	1,168.28	557.91	1,048.40	971.55	76.85	13.642		
12,200.00	11,307.38	11,091.57	10,307.48	67.69	60.44	99.35	1,244.47	567.21	1,052.51	974.22	78.28	13.445		
12,300.00	11,307.25	11,173.69	10,305.47	68.85	61.49	102.09	1,325.92	577.53	1,058.96	979.08	79.88	13.257		
12,400.00	11,307.13	11,277.88	10,302.58	70.08	62.89	101.11	1,429.41	589.16	1,065.43	983.77	81.66	13.047		
12,500.00	11,307.01	11,367.32	10,299.11	71.37	64.15	102.50	1,518.30	598.51	1,072.79	989.39	83.40	12.863		
12,600.00	11,306.89	11,499.41	10,294.65	72.73	66.10	97.36	1,649.69	611.19	1,079.68	994.22	85.46	12.633		
12,700.00	11,306.77	11,647.06	10,295.15	74.14	68.37	90.12	1,796.98	621.42	1,081.98	994.24	87.74	12.331		
12,800.00	11,306.65	11,775.56	10,297.94	75.61	70.43	85.92	1,925.41	623.51	1,080.73	991.02	89.72	12.046		
12,900.00	11,306.53	11,865.27	10,299.73	77.13	71.91	87.44	2,015.08	621.81	1,078.51	987.22	91.30	11.813		
12,959.10	11,306.46	11,910.00	10,299.84	78.06	72.66	89.57	2,059.80	620.90	1,078.11	985.91	92.20	11.693		
13,000.00	11,306.41	11,941.82	10,299.57	78.70	73.20	90.92	2,091.62	620.33	1,078.28	985.44	92.84	11.615		
13,100.00	11,306.28	12,041.60	10,297.52	80.31	74.92	90.95	2,191.37	619.01	1,079.99	985.47	94.52	11.426		
13,200.00	11,306.16	12,172.25	10,298.47	81.97	77.24	86.39	2,321.97	615.80	1,078.48	982.09	96.39	11.189		
13,300.00	11,306.04	12,258.17	10,299.01	83.67	78.79	88.49	2,407.84	612.94	1,077.01	978.95	98.06	10.983		
13,339.29	11,305.99	12,290.26	10,298.84	84.35	79.38	89.57	2,439.92	611.95	1,076.88	978.16	98.72	10.909		

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 15H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 76-VESSEI_GYRO_DROP_496-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,400.00	11,305.92	12,338.75	10,298.13	85.41	80.28	91.41	2,488.38	610.49	1,077.22	977.48	99.74	10.801	
13,500.00	11,305.80	12,428.74	10,295.50	87.18	81.97	92.95	2,578.29	607.65	1,079.08	977.65	101.44	10.638	
13,600.00	11,305.68	12,525.25	10,292.22	88.99	83.81	93.52	2,674.66	603.91	1,081.18	978.05	103.13	10.484	
13,700.00	11,305.56	12,705.84	10,291.94	90.83	87.33	81.21	2,855.04	597.40	1,080.71	975.51	105.21	10.272	
13,800.00	11,305.44	12,800.09	10,295.99	92.70	89.20	82.05	2,949.13	593.65	1,075.59	968.47	107.12	10.041	
13,900.00	11,305.31	12,884.51	10,298.31	94.59	90.90	84.42	3,033.46	590.53	1,071.96	962.96	109.00	9.834	
14,000.00	11,305.19	12,979.75	10,300.47	96.52	92.83	85.15	3,128.63	587.53	1,069.00	958.02	110.98	9.632	
14,100.00	11,305.07	13,070.56	10,301.90	98.47	94.69	86.58	3,219.39	585.13	1,066.88	953.89	112.99	9.442	
14,200.00	11,304.95	13,164.12	10,303.30	100.44	96.62	87.60	3,312.93	583.80	1,065.24	950.12	115.11	9.254	
14,266.55	11,304.87	13,218.12	10,303.74	101.76	97.74	89.58	3,366.93	583.68	1,064.85	948.30	116.55	9.136	
14,300.00	11,304.83	13,247.67	10,303.78	102.43	98.36	90.20	3,396.48	583.80	1,064.93	947.64	117.30	9.079	
14,400.00	11,304.71	13,345.29	10,303.98	104.45	100.41	90.57	3,494.10	584.52	1,065.24	945.61	119.63	8.905	
14,500.00	11,304.59	13,424.00	10,303.49	106.48	102.07	93.88	3,572.79	586.21	1,066.83	944.88	121.95	8.748	
14,600.00	11,304.47	13,504.50	10,301.68	108.53	103.79	96.83	3,653.22	588.86	1,070.33	945.98	124.35	8.608	
14,700.00	11,304.35	13,593.36	10,298.30	110.61	105.69	98.44	3,741.96	591.98	1,075.37	948.56	126.81	8.480	
14,800.00	11,304.22	13,731.18	10,294.35	112.69	108.67	92.71	3,879.63	596.70	1,079.69	949.99	129.70	8.324	
14,900.00	11,304.10	13,822.43	10,293.28	114.80	110.65	93.98	3,970.81	600.19	1,082.38	950.03	132.36	8.178	
15,000.00	11,303.98	13,883.00	10,292.60	116.91	111.97	99.67	4,031.33	602.64	1,085.85	951.09	134.77	8.057	
15,100.00	11,303.86	13,883.00	10,292.60	119.05	111.97	113.06	4,031.33	602.64	1,096.79	960.39	136.39	8.041	
15,200.00	11,303.74	13,883.00	10,292.60	121.19	111.97	124.21	4,031.33	602.64	1,116.60	978.94	137.66	8.111	
15,300.00	11,303.62	13,883.00	10,292.60	123.35	111.97	133.00	4,031.33	602.64	1,144.84	1,006.27	138.57	8.262	
15,400.00	11,303.50	13,883.00	10,292.60	125.52	111.97	139.81	4,031.33	602.64	1,180.89	1,041.77	139.12	8.488	
15,500.00	11,303.38	13,883.00	10,292.60	127.70	111.97	145.11	4,031.33	602.64	1,224.08	1,084.70	139.38	8.782	
15,600.00	11,303.25	13,883.00	10,292.60	129.89	111.97	149.28	4,031.33	602.64	1,273.67	1,134.29	139.38	9.138	
15,700.00	11,303.13	13,883.00	10,292.60	132.10	111.97	152.61	4,031.33	602.64	1,328.94	1,189.75	139.19	9.548	
15,800.00	11,303.01	13,883.00	10,292.60	134.31	111.97	155.32	4,031.33	602.64	1,389.22	1,250.38	138.85	10.005	
15,900.00	11,302.89	13,883.00	10,292.60	136.53	111.97	157.55	4,031.33	602.64	1,453.89	1,315.48	138.41	10.504	
16,000.00	11,302.77	13,883.00	10,292.60	138.76	111.97	159.42	4,031.33	602.64	1,522.38	1,384.48	137.91	11.039	
16,100.00	11,302.65	13,883.00	10,292.60	141.00	111.97	161.01	4,031.33	602.64	1,594.21	1,456.84	137.37	11.605	
16,200.00	11,302.53	13,883.00	10,292.60	143.24	111.97	162.37	4,031.33	602.64	1,668.94	1,532.12	136.82	12.198	
16,222.60	11,302.50	13,883.00	10,292.60	143.75	111.97	162.65	4,031.33	602.64	1,686.20	1,549.50	136.70	12.335	



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 9H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 489-MWD, 3253-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		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)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.00	0.00	6.79	6.79	0.00	0.02	-8.00	488.71	-68.66	493.51					
100.00	100.00	108.19	108.19	0.20	0.28	-8.00	488.54	-68.67	493.35	492.87	0.48	1,031.344		
200.00	200.00	209.59	209.59	0.74	0.54	-8.01	488.08	-68.70	492.90	491.63	1.28	386.579		
300.00	300.00	310.98	310.97	1.28	0.80	-8.03	487.33	-68.76	492.18	490.11	2.07	237.570		
400.00	400.00	412.37	412.36	1.81	1.06	-8.06	486.29	-68.83	491.17	488.30	2.87	171.237		
500.00	500.00	514.01	513.99	2.35	1.39	-8.09	484.94	-68.92	489.87	486.13	3.74	131.106		
600.00	600.00	616.47	616.44	2.89	1.94	-8.13	483.13	-68.99	488.13	483.30	4.83	101.155		
700.00	700.00	717.01	716.95	3.43	2.48	-8.17	480.94	-69.07	485.98	480.07	5.90	82.314		
800.00	800.00	815.76	815.68	3.97	3.02	-8.24	478.92	-69.34	484.00	477.02	6.97	69.412		
900.00	900.00	914.53	914.44	4.50	3.55	-8.32	477.13	-69.82	482.27	474.23	8.04	59.971		
1,000.00	1,000.00	1,013.33	1,013.22	5.04	4.08	-8.42	475.56	-70.40	480.79	471.68	9.11	52.775		
1,100.00	1,100.00	1,114.90	1,114.77	5.58	4.63	-8.55	473.93	-71.22	479.32	469.13	10.19	47.022		
1,200.00	1,200.00	1,217.05	1,216.89	6.12	5.18	-8.73	471.77	-72.46	477.41	466.13	11.28	42.325		
1,300.00	1,300.00	1,321.39	1,321.19	6.65	5.75	-8.89	468.90	-73.37	474.83	462.45	12.38	38.366		
1,400.00	1,400.00	1,425.76	1,425.49	7.19	6.31	-8.92	465.23	-73.03	471.31	457.83	13.47	34.985		
1,500.00	1,500.00	1,527.01	1,526.66	7.73	6.86	-8.92	461.16	-72.37	467.23	452.68	14.55	32.108		
1,600.00	1,600.00	1,628.38	1,627.93	8.27	7.42	-8.93	456.69	-71.77	462.78	447.15	15.63	29.604		
1,700.00	1,700.00	1,729.09	1,728.52	8.80	7.97	-8.92	452.05	-70.94	458.10	441.39	16.71	27.415		
1,800.00	1,800.00	1,827.66	1,826.98	9.34	8.50	-8.87	447.48	-69.83	453.35	435.57	17.78	25.501		
1,900.00	1,900.00	1,923.41	1,922.66	9.88	9.02	-8.80	443.77	-68.68	449.34	430.51	18.83	23.860		
2,000.00	2,000.00	2,019.90	2,019.09	10.42	9.55	-8.70	440.91	-67.49	446.21	426.33	19.89	22.437		
2,100.00	2,100.00	2,117.23	2,116.39	10.96	10.07	-8.58	438.67	-66.15	443.73	422.79	20.94	21.186		
2,200.00	2,200.00	2,215.39	2,214.52	11.49	10.59	-8.42	436.97	-64.67	441.80	419.80	22.00	20.079		
2,300.00	2,300.00	2,314.32	2,313.43	12.03	11.11	-8.24	435.56	-63.06	440.15	417.09	23.06	19.084		
2,400.00	2,400.00	2,417.75	2,416.84	12.57	11.67	-8.07	433.98	-61.53	438.43	414.28	24.15	18.155		
2,500.00	2,500.00	2,524.14	2,523.17	13.11	12.24	-8.08	430.75	-61.17	435.39	410.14	25.25	17.243		
2,600.00	2,600.00	2,624.29	2,623.24	13.64	12.78	-8.10	426.83	-60.78	431.45	405.13	26.32	16.392		
2,700.00	2,700.00	2,723.07	2,721.92	14.18	13.31	-7.78	423.55	-57.84	427.75	400.37	27.39	15.620		
2,800.00	2,800.00	2,827.88	2,826.57	14.72	13.88	-7.22	419.87	-53.18	423.69	395.22	28.47	14.880		
2,900.00	2,900.00	2,933.20	2,931.66	15.26	14.45	-6.70	414.77	-48.69	418.37	388.81	29.56	14.153		
3,000.00	3,000.00	3,030.06	3,028.32	15.80	14.98	-6.21	409.89	-44.62	412.88	382.26	30.63	13.481		
3,100.00	3,100.00	3,127.49	3,125.55	16.33	15.47	-5.70	405.46	-40.50	407.92	376.27	31.65	12.889		
3,200.00	3,200.00	3,223.26	3,221.19	16.87	15.74	-5.21	401.89	-36.61	403.81	371.36	32.46	12.442		
3,300.00	3,300.00	3,312.53	3,310.34	17.41	15.84	-4.67	399.93	-32.70	401.28	368.19	33.10	12.125		
3,324.85	3,324.85	3,333.77	3,331.55	17.54	15.85	-4.53	399.92	-31.66	401.17	367.93	33.23	12.071	CC, ES	
3,400.00	3,400.00	3,398.68	3,396.37	17.95	15.87	-4.07	401.04	-28.51	402.18	368.54	33.64	11.954		
3,500.00	3,500.00	3,487.30	3,484.86	18.48	15.91	-3.59	404.77	-25.42	406.16	371.97	34.19	11.881		
3,600.00	3,600.00	3,575.90	3,573.22	19.02	15.95	-3.22	410.91	-23.12	412.92	378.20	34.72	11.894		
3,700.00	3,700.00	3,665.54	3,662.43	19.56	16.00	-2.87	419.39	-21.05	422.24	386.99	35.25	11.977		
3,800.00	3,800.00	3,764.71	3,761.01	20.10	16.08	-2.52	429.94	-18.90	432.77	396.89	35.89	12.060		
3,900.00	3,900.00	3,864.53	3,860.24	20.63	16.18	-2.17	440.53	-16.72	443.29	406.74	36.54	12.131		
4,000.00	4,000.00	3,962.66	3,957.80	21.17	16.29	-1.87	450.90	-14.71	453.79	416.59	37.20	12.198		
4,100.00	4,100.00	4,055.44	4,049.92	21.71	16.42	-1.57	461.74	-12.68	465.40	427.57	37.82	12.305		
4,200.00	4,200.00	4,155.80	4,149.52	22.25	16.57	-1.25	473.92	-10.32	477.47	438.93	38.54	12.390		
4,300.00	4,300.00	4,255.54	4,248.52	22.79	16.74	-0.97	485.85	-8.23	489.39	450.13	39.26	12.465		
4,400.00	4,400.00	4,354.80	4,347.04	23.32	16.94	-0.69	497.69	-5.98	501.28	461.29	40.00	12.533		
4,500.00	4,500.00	4,454.33	4,445.83	23.86	17.16	-0.40	509.56	-3.55	513.19	472.44	40.76	12.592		
4,600.00	4,600.00	4,554.57	4,545.30	24.40	17.40	0.01	521.37	0.11	524.97	483.43	41.54	12.639		
4,700.00	4,700.00	4,657.69	4,647.61	24.94	17.67	0.58	533.17	5.39	536.46	494.11	42.36	12.665		
4,800.00	4,800.00	4,764.21	4,753.37	25.47	17.96	1.24	544.11	11.81	546.85	503.62	43.22	12.652		
4,900.00	4,900.00	4,877.35	4,865.84	26.01	18.29	2.00	553.73	19.35	555.57	511.42	44.15	12.583		
5,000.00	5,000.00	4,993.65	4,981.70	26.55	18.63	2.78	560.26	27.16	561.47	516.39	45.09	12.454		

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 9H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 489-MWD, 3253-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,100.00	5,104.76	5,092.58	27.09	18.97	3.38	563.83	33.27	564.99	519.01	45.98	12.287	
5,200.00	5,200.00	5,214.28	5,202.02	27.62	19.30	3.75	565.30	37.01	566.53	519.68	46.86	12.091	
5,300.00	5,300.00	5,320.12	5,307.85	28.16	19.61	3.93	565.51	38.83	566.85	519.13	47.71	11.881	
5,400.00	5,400.00	5,423.00	5,410.71	28.70	19.92	3.97	564.90	39.25	566.28	517.72	48.56	11.662	
5,500.00	5,500.00	5,523.74	5,511.46	29.24	20.22	4.00	564.11	39.42	565.51	516.11	49.40	11.448	
5,600.00	5,600.00	5,623.96	5,611.67	29.78	20.53	4.01	563.23	39.50	564.63	514.39	50.24	11.238	
5,700.00	5,700.00	5,722.74	5,710.45	30.31	20.85	4.02	562.43	39.52	563.83	512.73	51.10	11.034	
5,800.00	5,800.00	5,824.27	5,811.97	30.85	21.18	4.00	561.69	39.28	563.09	511.12	51.97	10.835	
5,900.00	5,900.00	5,926.55	5,914.25	31.39	21.52	3.94	560.57	38.58	561.95	509.11	52.84	10.635	
6,000.00	6,000.00	6,022.23	6,009.91	31.93	21.86	3.87	559.67	37.85	560.96	507.24	53.72	10.443	
6,065.30	6,065.30	6,084.47	6,072.16	32.28	22.07	3.84	559.50	37.57	560.76	506.47	54.29	10.329	
6,100.00	6,100.00	6,117.54	6,105.22	32.46	22.19	3.81	559.55	37.49	560.62	506.03	54.59	10.270	
6,198.64	6,198.53	6,217.97	6,205.65	32.98	22.56	3.43	559.67	37.27	558.17	502.70	55.47	10.062	
6,200.00	6,199.89	6,219.36	6,207.04	32.99	22.56	3.42	559.67	37.27	558.11	502.63	55.49	10.059	
6,300.00	6,299.64	6,321.25	6,308.94	33.51	22.93	2.80	559.41	36.95	553.77	497.39	56.38	9.821	
6,400.00	6,399.40	6,421.40	6,409.09	34.04	23.30	2.17	558.94	36.55	549.28	491.99	57.28	9.589	
6,500.00	6,499.16	6,521.80	6,509.49	34.57	23.68	1.52	558.35	36.08	544.74	486.55	58.19	9.362	
6,600.00	6,598.91	6,622.53	6,610.21	35.10	24.07	0.87	557.60	35.74	540.11	481.01	59.10	9.138	
6,700.00	6,698.67	6,722.45	6,710.13	35.63	24.45	0.23	556.68	35.59	535.39	475.36	60.02	8.920	
6,800.00	6,798.43	6,820.88	6,808.55	36.16	24.84	-0.41	555.93	35.48	530.88	469.93	60.94	8.711	
6,900.00	6,898.18	6,920.00	6,907.67	36.70	25.24	-1.07	555.38	35.34	526.65	464.78	61.87	8.512	
7,000.00	6,997.94	7,020.00	7,007.67	37.23	25.64	-1.76	554.81	34.98	522.49	459.68	62.81	8.319	
7,100.00	7,097.70	7,120.66	7,108.32	37.76	26.05	-2.49	554.15	34.41	518.32	454.57	63.75	8.130	
7,200.00	7,197.45	7,221.85	7,209.51	38.30	26.47	-3.24	553.21	33.78	513.97	449.27	64.70	7.944	
7,300.00	7,297.21	7,320.61	7,308.25	38.83	26.88	-4.02	552.14	32.94	509.57	443.92	65.65	7.762	
7,400.00	7,396.97	7,418.10	7,405.73	39.37	27.29	-4.91	551.39	31.27	505.66	439.06	66.60	7.593	
7,500.00	7,496.72	7,521.21	7,508.81	39.91	27.73	-5.88	550.55	28.99	501.88	434.32	67.57	7.428	
7,600.00	7,596.48	7,626.36	7,613.93	40.44	28.17	-6.82	548.65	27.25	497.19	428.65	68.54	7.254	
7,700.00	7,696.23	7,721.46	7,709.00	40.98	28.58	-7.70	546.83	26.24	492.46	422.96	69.50	7.086	
7,800.00	7,795.99	7,815.54	7,803.08	41.52	28.99	-8.55	546.08	25.37	488.92	418.46	70.46	6.939	
7,900.00	7,895.75	7,909.23	7,896.77	42.06	29.40	-9.41	546.44	24.38	486.67	415.26	71.41	6.815	
8,000.00	7,995.50	8,006.85	7,994.37	42.60	29.84	-10.28	547.66	23.27	485.40	413.01	72.38	6.706	
8,100.00	8,095.26	8,107.67	8,095.17	43.14	30.28	-11.16	548.97	21.96	484.32	410.95	73.37	6.601	
8,200.00	8,195.02	8,210.97	8,198.46	43.68	30.75	-12.05	549.86	20.76	482.90	408.52	74.38	6.492	
8,266.58	8,261.44	8,269.17	8,256.65	44.04	31.01	-12.64	550.25	20.11	481.94	406.94	75.00	6.426	
8,300.00	8,294.77	8,292.00	8,279.46	44.22	31.11	-12.89	551.12	19.98	482.40	407.15	75.25	6.410 SF	
8,400.00	8,394.53	8,349.03	8,336.15	44.76	31.38	-13.37	556.93	21.20	489.31	413.60	75.70	6.464	
8,500.00	8,494.29	8,407.58	8,393.64	45.31	31.66	-13.61	567.81	23.31	504.33	428.49	75.84	6.650	
8,600.00	8,594.04	8,462.93	8,446.97	45.85	31.94	-13.76	582.43	25.13	527.21	451.59	75.62	6.972	
8,700.00	8,693.80	8,518.48	8,498.97	46.39	32.22	-13.74	601.82	27.41	558.00	482.78	75.22	7.418	
8,800.00	8,793.56	8,575.00	8,550.69	46.94	32.52	-13.65	624.47	29.57	594.49	519.73	74.77	7.951	
8,900.00	8,893.31	8,632.79	8,602.19	47.48	32.83	-13.57	650.66	30.81	636.45	562.08	74.37	8.558	
9,000.00	8,993.07	8,680.86	8,643.72	48.02	33.10	-13.68	674.83	30.58	683.77	610.16	73.61	9.289	
9,100.00	9,092.82	8,724.44	8,679.88	48.57	33.35	-13.77	699.14	30.44	736.42	663.68	72.74	10.124	
9,200.00	9,192.58	8,765.00	8,712.26	49.11	33.60	-13.84	723.57	30.49	793.63	721.78	71.84	11.047	
9,300.00	9,292.34	8,812.98	8,749.41	49.66	33.91	-13.87	753.90	29.45	854.34	782.96	71.39	11.968	
9,400.00	9,392.09	8,852.03	8,778.41	50.20	34.17	-13.97	780.03	28.68	918.56	847.86	70.70	12.993	
9,500.00	9,491.85	8,891.00	8,806.08	50.75	34.44	-13.98	807.47	28.50	985.95	915.81	70.14	14.057	
9,600.00	9,591.61	8,913.00	8,820.98	51.30	34.60	-14.19	823.66	28.57	1,056.38	987.28	69.09	15.289	
9,700.00	9,691.36	8,938.84	8,837.76	51.84	34.80	-14.30	843.30	28.92	1,129.63	1,061.29	68.35	16.528	
9,800.00	9,791.12	8,966.15	8,854.66	52.39	35.01	-14.36	864.75	29.50	1,205.35	1,137.56	67.79	17.780	
9,900.00	9,890.88	8,999.96	8,874.84	52.94	35.28	-14.29	891.85	30.39	1,282.84	1,215.28	67.57	18.987	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 9H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 489-MWD, 3253-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
10,000.00	9,990.63	9,016.00	8,884.20	53.48	35.42	-14.51	904.87	30.89	1,361.92	1,295.01	66.91	20.355	
10,100.00	10,090.39	9,048.00	8,901.97	54.03	35.69	-14.43	931.46	31.92	1,442.65	1,375.82	66.83	21.587	
10,200.00	10,190.14	9,061.45	8,909.02	54.58	35.81	-14.67	942.91	32.40	1,525.04	1,458.71	66.33	22.992	
10,300.00	10,289.90	9,080.00	8,918.47	55.13	35.98	-14.79	958.85	33.21	1,608.73	1,542.66	66.07	24.349	
10,400.00	10,389.66	9,093.82	8,925.21	55.68	36.11	-14.98	970.88	33.98	1,693.69	1,627.91	65.78	25.746	
10,403.53	10,393.18	9,094.23	8,925.40	55.70	36.11	-14.99	971.24	34.00	1,696.71	1,630.94	65.77	25.796	
10,500.00	10,489.54	9,111.00	8,933.08	56.22	36.27	-14.93	986.11	35.18	1,780.40	1,714.73	65.67	27.112	
10,536.86	10,526.40	9,111.00	8,933.08	56.42	36.27	-14.96	986.11	35.18	1,812.80	1,747.29	65.51	27.671	
10,600.00	10,589.54	9,111.00	8,933.08	56.75	36.27	-14.96	986.11	35.18	1,868.76	1,803.49	65.27	28.629	
10,700.00	10,689.54	9,125.12	8,939.15	57.28	36.40	-14.66	998.80	36.37	1,958.08	1,892.82	65.26	30.005	
10,736.86	10,726.40	9,128.73	8,940.66	57.48	36.44	-14.59	1,002.07	36.69	1,991.21	1,925.97	65.24	30.523	
10,750.00	10,739.54	9,130.03	8,941.19	57.55	36.45	-14.56	1,003.24	36.81	2,002.98	1,937.75	65.23	30.707	
10,800.00	10,789.41	9,143.00	8,946.38	57.82	36.57	-14.34	1,015.06	38.08	2,046.70	1,981.38	65.32	31.333	
10,850.00	10,838.81	9,143.00	8,946.38	58.09	36.57	-14.46	1,015.06	38.08	2,088.34	2,023.22	65.13	32.067	
10,900.00	10,887.35	9,153.71	8,950.53	58.36	36.68	-14.41	1,024.87	39.22	2,127.83	2,062.74	65.09	32.689	
10,950.00	10,934.66	9,174.00	8,958.18	58.62	36.88	-14.21	1,043.51	41.63	2,164.83	2,099.64	65.19	33.206	
11,000.00	10,980.39	9,174.00	8,958.18	58.88	36.88	-14.53	1,043.51	41.63	2,199.16	2,134.26	64.90	33.884	
11,050.00	11,024.18	9,187.64	8,963.11	59.14	37.02	-14.60	1,056.11	43.33	2,230.69	2,165.87	64.82	34.414	
11,100.00	11,065.71	9,206.00	8,969.30	59.39	37.21	-14.61	1,073.25	45.52	2,259.46	2,194.67	64.78	34.876	
11,150.00	11,104.66	9,206.00	8,969.30	59.65	37.21	-15.16	1,073.25	45.52	2,285.01	2,220.58	64.42	35.468	
11,200.00	11,140.73	9,206.00	8,969.30	59.91	37.21	-15.81	1,073.25	45.52	2,307.59	2,243.54	64.05	36.027	
11,250.00	11,173.64	9,225.35	8,975.32	60.18	37.42	-16.03	1,091.52	47.64	2,326.77	2,262.81	63.96	36.376	
11,300.00	11,203.15	9,237.00	8,978.70	60.46	37.54	-16.56	1,102.61	48.78	2,342.70	2,278.96	63.74	36.752	
11,350.00	11,229.04	9,237.00	8,978.70	60.75	37.54	-17.56	1,102.61	48.78	2,355.31	2,291.97	63.35	37.182	
11,400.00	11,251.09	9,252.13	8,982.73	61.05	37.71	-18.22	1,117.13	50.12	2,364.41	2,301.24	63.16	37.435	
11,436.86	11,264.80	9,269.00	8,986.69	61.27	37.89	-18.58	1,133.47	51.47	2,369.11	2,306.01	63.10	37.546	
11,450.00	11,269.19	9,269.00	8,986.69	61.35	37.89	-18.94	1,133.47	51.47	2,370.25	2,307.26	62.99	37.626	
11,500.00	11,283.76	9,269.00	8,986.69	61.67	37.89	-20.45	1,133.47	51.47	2,373.08	2,310.47	62.61	37.900	
11,550.00	11,294.96	9,269.00	8,986.69	62.00	37.89	-22.26	1,133.47	51.47	2,373.49	2,311.24	62.25	38.126	
11,600.00	11,302.74	9,300.00	8,992.71	62.34	38.24	-22.80	1,163.81	53.61	2,371.17	2,308.88	62.29	38.069	
11,650.00	11,307.05	9,300.00	8,992.71	62.68	38.24	-25.14	1,163.81	53.61	2,366.08	2,304.11	61.96	38.186	
11,687.73	11,308.00	9,300.00	8,992.71	62.95	38.24	-27.25	1,163.81	53.61	2,360.64	2,298.90	61.74	38.237	
11,700.00	11,307.98	9,300.00	8,992.71	63.04	38.24	-28.01	1,163.81	53.61	2,358.68	2,297.01	61.67	38.247	
11,800.00	11,307.86	9,332.00	8,997.17	63.80	38.61	-32.77	1,195.42	55.73	2,344.25	2,282.75	61.50	38.115	
11,900.00	11,307.74	9,345.11	8,998.43	64.66	38.76	-41.99	1,208.43	56.63	2,333.28	2,271.99	61.29	38.070	
12,000.00	11,307.62	9,363.00	8,999.67	65.59	38.97	-55.56	1,226.24	57.84	2,325.76	2,264.50	61.26	37.963	
12,100.00	11,307.50	9,405.57	9,001.24	66.60	39.48	-68.92	1,268.71	60.24	2,321.33	2,259.80	61.53	37.725	
12,200.00	11,307.38	9,472.23	9,002.65	67.69	40.32	-78.23	1,335.29	63.23	2,318.70	2,256.66	62.04	37.374	
12,298.33	11,307.26	9,528.04	9,002.86	68.83	41.05	-91.66	1,391.05	65.43	2,317.83	2,255.27	62.56	37.053	
12,300.00	11,307.25	9,529.03	9,002.86	68.85	41.06	-91.88	1,392.04	65.46	2,317.83	2,255.26	62.56	37.047	
12,400.00	11,307.13	9,582.00	9,002.17	70.08	41.79	-106.95	1,444.97	67.36	2,318.77	2,255.62	63.15	36.719	
12,500.00	11,307.01	9,645.00	9,000.20	71.37	42.70	-117.84	1,507.91	69.52	2,321.51	2,257.65	63.86	36.355	
12,600.00	11,306.89	9,743.96	8,996.03	72.73	44.20	-118.82	1,606.71	73.13	2,325.25	2,260.45	64.80	35.884	
12,700.00	11,306.77	9,857.22	8,992.05	74.14	46.02	-116.10	1,719.78	78.35	2,328.18	2,262.29	65.89	35.334	
12,800.00	11,306.65	9,928.00	8,988.64	75.61	47.20	-124.67	1,790.41	81.30	2,332.36	2,265.55	66.81	34.909	
12,900.00	11,306.53	10,169.48	8,984.18	77.13	51.49	-76.79	2,031.52	91.80	2,333.72	2,264.74	68.97	33.835	
13,000.00	11,306.41	10,264.72	8,984.73	78.70	53.25	-78.21	2,126.66	96.08	2,332.66	2,262.46	70.20	33.229	
13,100.00	11,306.28	10,358.93	8,985.85	80.31	55.04	-80.14	2,220.71	101.46	2,330.98	2,259.52	71.46	32.617	
13,200.00	11,306.16	10,300.00	8,986.89	81.97	110.73	-73.25	2,335.08	108.33	2,329.57	2,236.38	93.20	24.996	
13,300.00	11,306.04	10,580.53	8,988.98	83.67	59.40	-69.26	2,441.88	114.70	2,327.10	2,252.65	74.45	31.259	
13,400.00	11,305.92	10,688.64	8,990.82	85.41	61.59	-64.51	2,549.78	121.05	2,324.94	2,248.95	75.99	30.595	
13,500.00	11,305.80	10,757.54	8,991.69	87.18	63.00	-78.69	2,618.57	124.99	2,323.23	2,246.02	77.21	30.089	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cypress 34 Federal - Cypress 34 Federal 9H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 489-MWD, 3253-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,600.00	11,305.68	10,892.18	8,993.41	88.99	65.81	-60.03	2,753.00	132.21	2,321.60	2,242.50	79.10	29.352	
13,700.00	11,305.56	10,977.03	8,994.99	90.83	67.60	-66.22	2,837.75	136.15	2,319.39	2,238.85	80.54	28.797	
13,800.00	11,305.44	11,066.11	8,996.16	92.70	69.49	-71.32	2,926.72	140.17	2,317.74	2,235.68	82.07	28.242	
13,900.00	11,305.31	11,155.51	8,996.92	94.59	71.42	-77.20	3,016.03	144.30	2,316.56	2,232.94	83.63	27.701	
13,950.85	11,305.25	11,184.45	8,996.98	95.57	72.04	-92.66	3,044.94	145.68	2,316.31	2,232.04	84.27	27.486	
14,000.00	11,305.19	11,211.51	8,996.76	96.52	72.63	-108.56	3,071.96	146.94	2,316.55	2,231.66	84.89	27.289	
14,100.00	11,305.07	11,288.35	8,995.06	98.47	74.30	-124.22	3,148.70	150.55	2,318.35	2,231.97	86.38	26.838	
14,200.00	11,304.95	11,412.14	8,993.01	100.44	77.02	-111.55	3,272.29	157.21	2,319.68	2,231.32	88.36	26.253	
14,300.00	11,304.83	11,515.74	8,991.85	102.43	79.31	-111.01	3,375.72	163.23	2,320.50	2,230.33	90.17	25.735	
14,400.00	11,304.71	11,673.41	8,992.32	104.45	82.82	-52.64	3,533.06	173.15	2,319.82	2,227.26	92.56	25.063	
14,500.00	11,304.59	11,785.25	8,994.08	106.48	85.34	-39.40	3,644.69	179.79	2,318.01	2,223.49	94.52	24.525	
14,600.00	11,304.47	11,889.08	8,996.28	108.53	87.68	-32.08	3,748.33	185.57	2,315.65	2,219.24	96.42	24.017	
14,700.00	11,304.35	11,992.82	8,998.52	110.61	90.04	-24.77	3,851.90	191.24	2,313.29	2,214.95	98.34	23.523	
14,800.00	11,304.22	12,064.28	8,999.83	112.69	91.66	-37.69	3,923.22	195.46	2,311.32	2,211.37	99.95	23.125	
14,900.00	11,304.10	12,137.52	9,000.07	114.80	93.34	-95.46	3,996.32	199.87	2,310.78	2,209.18	101.59	22.745	
14,911.77	11,304.09	12,147.72	9,000.06	115.05	93.57	-102.30	4,006.51	200.48	2,310.77	2,208.97	101.81	22.698	
15,000.00	11,303.98	12,247.16	8,999.85	116.91	95.85	-39.94	4,105.77	206.26	2,310.85	2,207.21	103.64	22.297	
15,100.00	11,303.86	12,383.69	9,001.55	119.05	98.99	2.57	4,242.08	213.96	2,309.43	2,203.45	105.99	21.790	
15,200.00	11,303.74	12,502.75	9,004.60	121.19	101.75	8.59	4,360.92	220.46	2,306.73	2,198.55	108.17	21.324	
15,300.00	11,303.62	12,577.00	9,006.26	123.35	103.47	21.49	4,435.04	224.55	2,304.41	2,194.50	109.91	20.967	
15,383.91	11,303.52	12,621.01	9,006.62	125.17	104.49	98.10	4,478.97	227.18	2,303.67	2,192.49	111.18	20.721	
15,400.00	11,303.50	12,629.32	9,006.60	125.52	104.68	118.75	4,487.26	227.71	2,303.69	2,192.28	111.42	20.676	
15,500.00	11,303.38	12,690.20	9,005.69	127.70	106.10	154.09	4,548.00	231.82	2,305.05	2,192.02	113.03	20.394	
15,600.00	11,303.25	12,792.36	9,003.58	129.89	108.48	146.07	4,649.90	238.74	2,307.09	2,191.99	115.10	20.044	
15,700.00	11,303.13	12,925.50	9,001.60	132.10	111.59	109.72	4,782.77	247.03	2,308.65	2,191.12	117.53	19.643	
15,800.00	11,303.01	13,031.54	9,001.41	134.31	114.08	100.51	4,888.63	253.01	2,308.83	2,189.15	119.68	19.291	
15,900.00	11,302.89	13,119.61	9,000.94	136.53	116.15	111.55	4,976.64	256.56	2,309.36	2,187.72	121.64	18.985	
16,000.00	11,302.77	13,215.89	9,000.01	138.76	118.42	113.18	5,072.84	260.24	2,310.31	2,186.61	123.70	18.677	
16,100.00	11,302.65	13,315.78	8,999.04	141.00	120.78	111.70	5,172.65	264.01	2,311.30	2,185.49	125.81	18.371	
16,200.00	11,302.53	13,333.00	8,998.87	143.24	121.18	149.12	5,189.86	264.66	2,313.77	2,186.77	127.00	18.219	
16,222.60	11,302.50	13,333.00	8,998.87	143.75	121.18	153.61	5,189.86	264.66	2,314.91	2,187.70	127.21	18.197	



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Knoll AOK Federal - Knoll AOK Federal 2H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7421-MWD													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)	Azimuth from North (°)	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	102.74	-119.37	527.85	542.31				
100.00	100.00	67.29	67.29	0.20	0.18	102.74	-119.34	527.71	541.04	540.66	0.38	1,426.623	
200.00	200.00	168.97	168.97	0.74	0.63	102.74	-119.13	527.10	540.41	539.04	1.37	395.707	
300.00	300.00	267.70	267.69	1.28	1.14	102.69	-118.54	526.55	539.73	537.31	2.42	222.815	
358.60	358.60	323.61	323.60	1.59	1.44	102.62	-117.91	526.50	539.54	536.51	3.03	177.887	
400.00	400.00	361.84	361.82	1.81	1.65	102.55	-117.22	526.77	539.67	536.21	3.46	155.987	
500.00	500.00	453.46	453.39	2.35	2.14	102.25	-114.80	528.56	541.01	536.52	4.49	120.444	
600.00	600.00	547.52	547.35	2.89	2.66	101.89	-111.99	531.90	543.84	538.31	5.54	98.205	
700.00	700.00	647.53	647.25	3.43	3.21	101.53	-109.37	535.90	547.23	540.62	6.61	82.799	
800.00	800.00	749.55	749.18	3.97	3.76	101.24	-107.21	539.45	550.23	542.54	7.68	71.610	
900.00	900.00	850.28	849.86	4.50	4.29	101.06	-106.02	542.57	553.04	544.29	8.75	63.229	
1,000.00	1,000.00	948.93	948.47	5.04	4.80	100.96	-105.62	545.42	555.79	546.00	9.80	56.734	
1,100.00	1,100.00	1,044.06	1,043.54	5.58	5.30	100.91	-105.78	548.62	559.14	548.31	10.83	51.637	
1,200.00	1,200.00	1,139.51	1,138.90	6.12	5.80	100.91	-106.57	552.69	563.47	551.61	11.86	47.505	
1,300.00	1,300.00	1,240.32	1,239.60	6.65	6.33	100.97	-108.01	557.22	568.16	555.24	12.93	43.954	
1,400.00	1,400.00	1,343.56	1,342.75	7.19	6.87	101.06	-109.73	561.20	572.26	558.25	14.01	40.857	
1,500.00	1,500.00	1,446.54	1,445.65	7.73	7.41	101.16	-111.37	564.78	575.98	560.89	15.09	38.182	
1,600.00	1,600.00	1,551.76	1,550.82	8.27	7.96	101.17	-112.07	567.74	578.87	562.70	16.18	35.786	
1,700.00	1,700.00	1,654.88	1,653.92	8.80	8.49	101.11	-111.91	569.99	580.97	563.72	17.25	33.671	
1,800.00	1,800.00	1,754.75	1,753.77	9.34	9.01	101.07	-111.84	571.89	582.83	564.51	18.32	31.821	
1,900.00	1,900.00	1,852.35	1,851.35	9.88	9.52	101.05	-112.12	573.91	584.92	565.56	19.36	30.206	
2,000.00	2,000.00	1,949.36	1,948.33	10.42	10.03	101.06	-112.63	576.38	587.52	567.11	20.41	28.785	
2,100.00	2,100.00	2,049.68	2,048.60	10.96	10.55	101.08	-113.42	579.23	590.46	568.99	21.47	27.496	
2,200.00	2,200.00	2,153.45	2,152.34	11.49	11.09	101.14	-114.49	581.62	592.92	570.36	22.56	26.283	
2,300.00	2,300.00	2,255.58	2,254.45	12.03	11.63	101.22	-115.76	583.34	594.81	571.18	23.63	25.169	
2,400.00	2,400.00	2,353.52	2,352.37	12.57	12.14	101.31	-116.95	584.94	596.65	571.97	24.68	24.171	
2,500.00	2,500.00	2,446.39	2,445.20	13.11	12.62	101.40	-118.38	587.10	599.24	573.54	25.71	23.311	
2,600.00	2,600.00	2,537.79	2,536.50	13.64	13.10	101.59	-121.10	590.36	603.32	576.61	26.72	22.582	
2,700.00	2,700.00	2,634.10	2,632.62	14.18	13.61	101.90	-125.30	594.59	608.51	580.76	27.76	21.921	
2,800.00	2,800.00	2,734.49	2,732.81	14.72	14.15	102.25	-130.06	598.88	613.69	584.86	28.83	21.286	
2,900.00	2,900.00	2,832.05	2,830.09	15.26	14.67	102.72	-136.12	603.03	619.18	589.30	29.88	20.719	
3,000.00	3,000.00	2,931.93	2,929.57	15.80	15.22	103.36	-144.11	606.97	624.85	593.89	30.96	20.183	
3,100.00	3,100.00	3,032.91	3,030.11	16.33	15.77	104.04	-152.75	610.70	630.48	598.44	32.04	19.676	
3,200.00	3,200.00	3,134.48	3,131.30	16.87	16.32	104.67	-160.82	614.27	635.87	602.74	33.13	19.194	
3,300.00	3,300.00	3,235.24	3,231.75	17.41	16.86	105.20	-167.84	617.86	641.12	606.91	34.20	18.744	
3,400.00	3,400.00	3,335.86	3,332.10	17.95	17.39	105.67	-174.36	621.40	646.24	610.97	35.28	18.319	
3,500.00	3,500.00	3,435.82	3,431.79	18.48	17.93	106.14	-180.83	624.84	651.33	614.98	36.34	17.921	
3,600.00	3,600.00	3,535.16	3,530.86	19.02	18.46	106.59	-187.14	628.30	656.46	619.06	37.41	17.549	
3,700.00	3,700.00	3,634.16	3,629.61	19.56	18.98	107.01	-193.29	631.90	661.75	623.28	38.47	17.203	
3,800.00	3,800.00	3,733.88	3,729.06	20.10	19.51	107.43	-199.55	635.57	667.13	627.60	39.53	16.875	
3,900.00	3,900.00	3,835.09	3,830.01	20.63	20.05	107.85	-205.85	639.24	672.48	631.87	40.61	16.560	
4,000.00	4,000.00	3,936.67	3,931.35	21.17	20.59	108.25	-211.94	642.59	677.48	635.79	41.69	16.252	
4,100.00	4,100.00	4,035.73	4,030.18	21.71	21.12	108.64	-217.88	645.89	682.54	639.80	42.74	15.968	
4,200.00	4,200.00	4,136.45	4,130.67	22.25	21.65	109.01	-223.75	649.29	687.62	643.80	43.82	15.693	
4,300.00	4,300.00	4,237.41	4,231.43	22.79	22.18	109.36	-229.33	652.56	692.50	647.61	44.89	15.427	
4,400.00	4,400.00	4,337.55	4,331.36	23.32	22.71	109.70	-234.85	655.77	697.36	651.41	45.95	15.175	
4,500.00	4,500.00	4,438.27	4,431.89	23.86	23.24	110.03	-240.23	658.90	702.11	655.09	47.02	14.931	
4,600.00	4,600.00	4,538.07	4,531.50	24.40	23.77	110.35	-245.48	661.99	706.83	658.75	48.09	14.699	
4,700.00	4,700.00	4,638.37	4,631.62	24.94	24.29	110.66	-250.78	665.09	711.58	662.43	49.15	14.477	
4,800.00	4,800.00	4,740.22	4,733.28	25.47	24.83	110.98	-256.14	668.02	716.15	665.92	50.23	14.257	
4,900.00	4,900.00	4,842.00	4,834.89	26.01	25.36	111.28	-261.23	670.74	720.44	669.13	51.31	14.042	
5,000.00	5,000.00	4,943.03	4,935.78	26.55	25.89	111.57	-266.13	673.26	724.54	672.16	52.38	13.833	

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



MS Directional Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Knoll AOK Federal - Knoll AOK Federal 2H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7421-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,100.00	5,043.64	5,036.24	27.09	26.42	111.85	-270.92	675.66	728.52	675.08	53.44	13.631	
5,200.00	5,200.00	5,143.65	5,136.12	27.62	26.95	112.12	-275.54	678.03	732.45	677.94	54.51	13.437	
5,300.00	5,300.00	5,244.14	5,236.48	28.16	27.47	112.38	-280.16	680.43	736.40	680.82	55.58	13.250	
5,400.00	5,400.00	5,344.16	5,336.37	28.70	28.00	112.63	-284.54	682.73	740.20	683.57	56.64	13.069	
5,500.00	5,500.00	5,443.50	5,435.58	29.24	28.52	112.87	-289.05	685.11	744.17	686.47	57.70	12.898	
5,600.00	5,600.00	5,544.45	5,536.40	29.78	29.05	113.12	-293.52	687.46	748.05	689.28	58.77	12.729	
5,700.00	5,700.00	5,644.93	5,636.76	30.31	29.57	113.36	-297.84	689.74	751.83	692.00	59.83	12.565	
5,800.00	5,800.00	5,744.81	5,736.53	30.85	30.09	113.58	-302.01	692.01	755.58	694.68	60.90	12.408	
5,900.00	5,900.00	5,844.46	5,836.07	31.39	30.62	113.80	-306.20	694.30	759.38	697.42	61.96	12.256	
6,000.00	6,000.00	5,945.11	5,936.60	31.93	31.14	114.01	-310.32	696.65	763.16	700.14	63.03	12.109	
6,065.30	6,065.30	6,011.18	6,002.60	32.28	31.49	114.14	-312.93	698.13	765.55	701.83	63.72	12.013	
6,100.00	6,100.00	6,045.89	6,037.28	32.46	31.67	114.23	-314.27	698.90	766.64	702.55	64.09	11.962	
6,198.64	6,198.53	6,145.72	6,137.02	32.98	32.19	114.68	-317.93	701.16	767.80	702.67	65.13	11.788	
6,200.00	6,199.89	6,147.11	6,138.41	32.99	32.20	114.69	-317.98	701.19	767.80	702.65	65.15	11.785	
6,300.00	6,299.64	6,247.62	6,238.83	33.51	32.73	115.30	-321.46	703.27	767.38	701.18	66.20	11.592	
6,400.00	6,399.40	6,347.05	6,338.18	34.04	33.25	115.92	-325.04	705.33	767.13	699.88	67.25	11.408	
6,500.00	6,499.16	6,446.73	6,437.78	34.57	33.77	116.53	-328.53	707.38	766.90	698.60	68.30	11.229	
6,600.00	6,598.91	6,546.15	6,537.12	35.10	34.29	117.15	-332.10	709.47	766.84	697.49	69.35	11.058	
6,700.00	6,698.67	6,646.66	6,637.53	35.63	34.81	117.77	-335.74	711.49	766.80	696.39	70.40	10.892	
6,763.24	6,761.76	6,710.19	6,701.01	35.97	35.15	118.15	-337.86	712.80	766.76	695.69	71.07	10.789	
6,800.00	6,798.43	6,745.57	6,736.37	36.16	35.33	118.37	-339.03	713.56	766.78	695.33	71.45	10.732	
6,900.00	6,898.18	6,844.27	6,834.99	36.70	35.85	118.97	-342.42	715.82	767.08	694.58	72.50	10.581	
7,000.00	6,997.94	6,946.32	6,936.96	37.23	36.38	119.55	-345.67	718.19	767.35	693.79	73.57	10.431	
7,100.00	7,097.70	7,053.41	7,043.99	37.76	36.94	120.12	-348.48	720.30	767.14	692.48	74.66	10.275	
7,200.00	7,197.45	7,162.05	7,152.61	38.30	37.51	120.65	-350.31	721.51	765.77	690.00	75.76	10.107	
7,300.00	7,297.21	7,265.75	7,256.29	38.83	38.05	121.18	-351.53	721.93	763.60	686.76	76.83	9.938	
7,400.00	7,396.97	7,368.59	7,359.13	39.37	38.58	121.74	-352.77	721.89	761.14	683.24	77.90	9.771	
7,500.00	7,496.72	7,478.09	7,468.50	39.91	44.89	-176.11	-451.33	46.22	707.56	641.69	65.87	10.741	
7,600.00	7,596.48	7,464.16	7,459.44	40.44	44.64	-177.04	-451.32	60.12	644.61	573.83	70.79	9.107	
7,700.00	7,696.23	7,450.58	7,460.34	40.98	44.41	-177.92	-451.30	73.67	591.66	515.69	75.97	7.788	
7,800.00	7,795.99	7,437.35	7,461.20	41.52	44.18	-178.75	-451.27	86.88	551.61	470.76	80.84	6.823	
7,900.00	7,895.75	7,424.93	7,461.98	42.06	43.96	-179.48	-451.22	99.27	527.40	442.86	84.55	6.238	
7,982.97	7,978.51	7,410.95	7,462.84	42.51	43.74	179.52	-451.12	113.23	520.97	434.89	86.08	6.052 CC, ES	
8,000.00	7,995.50	7,408.12	7,463.01	42.60	43.70	179.32	-451.08	116.04	521.24	435.05	86.20	6.047 SF	
8,100.00	8,095.26	7,391.88	7,463.97	43.14	43.44	178.20	-450.82	132.25	533.70	448.19	85.52	6.241	
8,200.00	8,195.02	7,376.18	7,464.85	43.68	43.19	177.15	-450.43	147.92	563.57	480.66	82.91	6.797	
8,300.00	8,294.77	7,361.00	7,465.68	44.22	42.95	176.17	-449.92	163.08	608.30	529.10	79.20	7.680	
8,400.00	8,394.53	7,347.93	7,466.32	44.76	42.76	175.43	-449.37	176.11	664.92	589.73	75.20	8.843	
8,500.00	8,494.29	7,337.01	7,466.76	45.31	42.60	174.92	-448.81	187.01	730.73	659.36	71.37	10.238	
8,600.00	8,594.04	7,327.67	7,467.06	45.85	42.47	174.59	-448.25	196.33	803.51	735.52	67.98	11.819	
8,700.00	8,693.80	7,319.59	7,467.26	46.39	42.35	174.40	-447.72	204.39	881.54	816.44	65.10	13.541	
8,800.00	8,793.56	7,312.54	7,467.40	46.94	42.25	174.31	-447.21	211.42	963.58	900.87	62.71	15.367	
8,900.00	8,893.31	7,306.33	7,467.49	47.48	42.16	174.31	-446.72	217.62	1,048.69	987.94	60.75	17.263	
9,000.00	8,993.07	7,300.81	7,467.54	48.02	42.08	174.38	-446.27	223.11	1,136.19	1,077.02	59.17	19.203	
9,100.00	9,092.82	7,295.86	7,467.57	48.57	42.01	174.51	-445.84	228.04	1,225.57	1,167.68	57.90	21.168	
9,200.00	9,192.58	7,290.23	7,467.59	49.11	41.94	174.57	-445.34	233.66	1,316.46	1,259.57	56.89	23.140	
9,300.00	9,292.34	7,284.73	7,467.60	49.66	41.87	174.64	-444.86	239.14	1,408.56	1,352.46	56.10	25.108	
9,400.00	9,392.09	7,279.36	7,467.61	50.20	41.80	174.73	-444.39	244.49	1,501.64	1,446.15	55.49	27.062	
9,500.00	9,491.85	7,274.11	7,467.62	50.75	41.73	174.82	-443.92	249.71	1,595.54	1,540.51	55.03	28.996	
9,600.00	9,591.61	7,268.99	7,467.62	51.30	41.66	174.93	-443.47	254.81	1,690.12	1,635.43	54.69	30.904	
9,700.00	9,691.36	7,263.97	7,467.62	51.84	41.60	175.05	-443.03	259.81	1,785.28	1,730.82	54.46	32.784	
9,800.00	9,791.12	7,258.23	7,467.62	52.39	41.49	174.79	-442.25	268.51	1,880.91	1,826.61	54.31	34.636	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Knoll AOK Federal - Knoll AOK Federal 2H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7421-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,900.00	9,890.88	8,246.25	7,967.62	52.94	41.38	174.52	-441.42	277.46	1,976.95	1,922.72	54.23	36.455	
10,000.00	9,990.63	8,237.01	7,967.63	53.48	41.27	174.23	-440.56	286.65	2,073.34	2,019.12	54.22	38.241	
10,100.00	10,090.39	8,231.00	7,967.64	54.03	41.20	174.25	-439.98	292.64	2,170.02	2,115.76	54.27	39.987	
10,200.00	10,190.14	8,231.00	7,967.64	54.58	41.20	174.85	-439.98	292.64	2,266.99	2,212.61	54.38	41.689	
10,300.00	10,289.90	8,231.00	7,967.64	55.13	41.20	175.44	-439.98	292.64	2,364.21	2,309.68	54.53	43.354	
10,400.00	10,389.66	8,221.70	7,967.63	55.68	41.09	175.14	-439.05	301.89	2,461.62	2,406.91	54.71	44.998	
10,403.53	10,393.18	8,221.62	7,967.63	55.70	41.09	175.15	-439.04	301.98	2,465.06	2,410.34	54.71	45.055	
10,500.00	10,489.54	8,220.23	7,967.62	56.22	41.08	175.38	-438.89	303.36	2,559.09	2,504.18	54.92	46.600	
10,536.86	10,526.40	8,220.19	7,967.62	56.42	41.08	175.48	-438.89	303.39	2,594.96	2,539.97	55.00	47.184	
10,600.00	10,589.54	8,220.35	7,967.62	56.75	41.08	175.43	-438.91	303.23	2,656.41	2,601.27	55.14	48.172	
10,700.00	10,689.54	8,220.59	7,967.63	57.28	41.08	175.45	-438.93	302.99	2,753.89	2,698.49	55.40	49.707	
10,736.86	10,726.40	8,220.68	7,967.63	57.48	41.08	175.46	-438.94	302.91	2,789.86	2,734.36	55.50	50.264	
10,750.00	10,739.54	8,220.70	7,967.63	57.55	41.08	175.46	-438.94	302.89	2,802.73	2,747.18	55.54	50.460	
10,800.00	10,789.41	8,220.69	7,967.63	57.82	41.08	175.48	-438.94	302.89	2,852.15	2,796.43	55.72	51.188	
10,850.00	10,838.81	8,220.53	7,967.62	58.09	41.08	175.51	-438.93	303.06	2,902.04	2,846.11	55.93	51.885	
10,900.00	10,887.35	8,220.22	7,967.62	58.36	41.08	175.56	-438.89	303.37	2,952.00	2,895.83	56.17	52.550	
10,950.00	10,934.66	8,219.76	7,967.62	58.62	41.07	175.61	-438.84	303.82	3,001.66	2,945.21	56.44	53.180	
11,000.00	10,980.39	8,219.16	7,967.62	58.88	41.06	175.68	-438.78	304.41	3,050.65	2,993.92	56.73	53.770	
11,050.00	11,024.18	8,218.43	7,967.61	59.14	41.06	175.75	-438.70	305.14	3,098.66	3,041.61	57.05	54.318	
11,100.00	11,065.71	8,217.57	7,967.60	59.39	41.05	175.82	-438.61	306.00	3,145.36	3,087.98	57.38	54.820	
11,150.00	11,104.66	8,216.57	7,967.59	59.65	41.04	175.89	-438.50	306.99	3,190.46	3,132.74	57.72	55.272	
11,200.00	11,140.73	8,215.45	7,967.58	59.91	41.02	175.96	-438.37	308.11	3,233.71	3,175.62	58.09	55.670	
11,250.00	11,173.64	8,214.20	7,967.57	60.18	41.01	176.03	-438.24	309.35	3,274.83	3,216.37	58.47	56.011	
11,300.00	11,203.15	8,212.83	7,967.55	60.46	40.99	176.10	-438.08	310.71	3,313.62	3,254.75	58.87	56.290	
11,350.00	11,229.04	8,211.33	7,967.54	60.75	40.98	176.16	-437.91	312.20	3,349.85	3,290.57	59.28	56.505	
11,400.00	11,251.09	8,209.70	7,967.51	61.05	40.96	176.22	-437.72	313.81	3,383.34	3,323.62	59.72	56.652	
11,436.86	11,264.80	8,200.00	7,967.33	61.27	40.85	175.76	-436.55	323.45	3,406.20	3,346.17	60.03	56.738	
11,450.00	11,269.19	8,200.00	7,967.33	61.35	40.85	175.81	-436.55	323.45	3,413.97	3,353.81	60.15	56.753	
11,500.00	11,283.76	8,200.00	7,967.33	61.67	40.85	175.97	-436.55	323.45	3,442.02	3,381.37	60.65	56.756	
11,550.00	11,294.96	8,200.00	7,967.33	62.00	40.85	176.12	-436.55	323.45	3,467.65	3,406.49	61.16	56.701	
11,600.00	11,302.74	8,200.00	7,967.33	62.34	40.85	176.26	-436.55	323.45	3,490.78	3,429.09	61.69	56.586	
11,650.00	11,307.05	8,200.00	7,967.33	62.68	40.85	176.40	-436.55	323.45	3,511.35	3,449.11	62.25	56.410	
11,687.73	11,308.00	8,200.00	7,967.33	62.95	40.85	176.49	-436.55	323.45	3,525.15	3,462.47	62.68	56.238	
11,700.00	11,307.98	8,200.00	7,967.33	63.04	40.85	176.52	-436.55	323.45	3,529.41	3,466.59	62.83	56.177	
11,800.00	11,307.86	8,200.00	7,967.33	63.80	40.85	176.73	-436.55	323.45	3,565.53	3,501.48	64.05	55.672	
11,900.00	11,307.74	8,200.00	7,967.33	64.66	40.85	176.92	-436.55	323.45	3,604.05	3,538.75	65.30	55.192	
12,000.00	11,307.62	8,200.00	7,967.33	65.59	40.85	177.08	-436.55	323.45	3,644.92	3,578.34	66.58	54.743	
12,100.00	11,307.50	8,200.00	7,967.33	66.60	40.85	177.22	-436.55	323.45	3,688.04	3,620.16	67.88	54.331	
12,200.00	11,307.38	8,200.00	7,967.33	67.69	40.85	177.34	-436.55	323.45	3,733.35	3,664.16	69.19	53.961	
12,300.00	11,307.25	8,200.00	7,967.33	68.85	40.85	177.45	-436.55	323.45	3,780.76	3,710.27	70.49	53.634	
12,400.00	11,307.13	8,200.00	7,967.33	70.08	40.85	177.55	-436.55	323.45	3,830.19	3,758.40	71.79	53.352	
12,500.00	11,307.01	8,200.00	7,967.33	71.37	40.85	177.64	-436.55	323.45	3,881.57	3,808.49	73.08	53.116	
12,600.00	11,306.89	8,185.50	7,966.80	72.73	40.70	177.34	-434.73	337.82	3,934.62	3,860.34	74.28	52.972	
12,700.00	11,306.77	8,183.97	7,966.72	74.14	40.68	177.39	-434.54	339.33	3,989.63	3,914.11	75.52	52.831	
12,800.00	11,306.65	8,182.44	7,966.63	75.61	40.67	177.44	-434.35	340.85	4,046.35	3,969.62	76.73	52.735	
12,900.00	11,306.53	8,168.00	7,965.59	77.13	40.52	177.18	-432.52	355.14	4,104.88	4,027.03	77.85	52.728	
13,000.00	11,306.41	8,168.00	7,965.59	78.70	40.52	177.27	-432.52	355.14	4,164.79	4,085.78	79.02	52.709	
13,100.00	11,306.28	8,168.00	7,965.59	80.31	40.52	177.35	-432.52	355.14	4,226.23	4,146.08	80.15	52.729	
13,200.00	11,306.16	8,168.00	7,965.59	81.97	40.52	177.42	-432.52	355.14	4,289.11	4,207.86	81.25	52.786	
13,300.00	11,306.04	8,168.00	7,965.59	83.67	40.52	177.49	-432.52	355.14	4,353.39	4,271.06	82.33	52.880	
13,400.00	11,305.92	8,168.00	7,965.59	85.41	40.52	177.56	-432.52	355.14	4,418.99	4,335.62	83.37	53.007	
13,500.00	11,305.80	8,168.00	7,965.59	87.18	40.52	177.62	-432.52	355.14	4,485.86	4,401.49	84.38	53.166	

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



MS Directional
Anticollision Report



Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Knoll AOK Federal - Knoll AOK Federal 2H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS, 7421-MWD													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)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,600.00	11,305.68	8,168.00	7,965.59	88.99	40.52	177.67	-432.52	355.14	4,553.95	4,468.60	85.35	53.355	
13,700.00	11,305.56	8,168.00	7,965.59	90.83	40.52	177.73	-432.52	355.14	4,623.20	4,536.90	86.30	53.573	
13,800.00	11,305.44	8,168.00	7,965.59	92.70	40.52	177.78	-432.52	355.14	4,693.55	4,606.34	87.21	53.818	
13,900.00	11,305.31	8,168.00	7,965.59	94.59	40.52	177.82	-432.52	355.14	4,764.97	4,676.87	88.10	54.089	
14,000.00	11,305.19	8,168.00	7,965.59	96.52	40.52	177.87	-432.52	355.14	4,837.40	4,748.45	88.95	54.383	
14,100.00	11,305.07	8,168.00	7,965.59	98.47	40.52	177.91	-432.52	355.14	4,910.79	4,821.02	89.78	54.701	
14,200.00	11,304.95	8,168.00	7,965.59	100.44	40.52	177.95	-432.52	355.14	4,985.12	4,894.54	90.57	55.039	
14,300.00	11,304.83	8,168.00	7,965.59	102.43	40.52	177.99	-432.52	355.14	5,060.32	4,968.98	91.34	55.398	
14,400.00	11,304.71	8,168.00	7,965.59	104.45	40.52	178.02	-432.52	355.14	5,136.38	5,044.29	92.09	55.776	
14,500.00	11,304.59	8,168.00	7,965.59	106.48	40.52	178.06	-432.52	355.14	5,213.24	5,120.43	92.81	56.172	
14,600.00	11,304.47	8,168.00	7,965.59	108.53	40.52	178.09	-432.52	355.14	5,290.88	5,197.37	93.50	56.584	
14,700.00	11,304.35	8,154.32	7,964.22	110.61	40.39	177.94	-430.80	368.64	5,369.11	5,275.01	94.10	57.058	
14,800.00	11,304.22	8,152.93	7,964.05	112.69	40.38	177.95	-430.63	370.01	5,448.16	5,353.42	94.74	57.506	
14,900.00	11,304.10	8,151.54	7,963.89	114.80	40.36	177.97	-430.46	371.38	5,527.89	5,432.53	95.36	57.968	
15,000.00	11,303.98	8,137.00	7,961.94	116.91	40.23	177.82	-428.66	385.67	5,608.40	5,512.51	95.89	58.490	
15,100.00	11,303.86	8,137.00	7,961.94	119.05	40.23	177.85	-428.66	385.67	5,689.37	5,592.89	96.47	58.973	
15,200.00	11,303.74	8,137.00	7,961.94	121.19	40.23	177.88	-428.66	385.67	5,770.94	5,673.89	97.04	59.468	
15,300.00	11,303.62	8,137.00	7,961.94	123.35	40.23	177.91	-428.66	385.67	5,853.07	5,755.48	97.59	59.974	
15,400.00	11,303.50	8,137.00	7,961.94	125.52	40.23	177.94	-428.66	385.67	5,935.76	5,837.63	98.13	60.490	
15,500.00	11,303.38	8,137.00	7,961.94	127.70	40.23	177.97	-428.66	385.67	6,018.97	5,920.33	98.65	61.017	
15,600.00	11,303.25	8,137.00	7,961.94	129.89	40.23	178.00	-428.66	385.67	6,102.69	6,003.54	99.15	61.552	
15,700.00	11,303.13	8,137.00	7,961.94	132.10	40.23	178.03	-428.66	385.67	6,186.89	6,087.26	99.63	62.097	
15,800.00	11,303.01	8,137.00	7,961.94	134.31	40.23	178.05	-428.66	385.67	6,271.55	6,171.45	100.11	62.649	
15,900.00	11,302.89	8,137.00	7,961.94	136.53	40.23	178.08	-428.66	385.67	6,356.66	6,256.10	100.56	63.210	
16,000.00	11,302.77	8,137.00	7,961.94	138.76	40.23	178.10	-428.66	385.67	6,442.20	6,341.19	101.01	63.778	
16,100.00	11,302.65	8,137.00	7,961.94	141.00	40.23	178.12	-428.66	385.67	6,528.15	6,426.71	101.44	64.353	
16,200.00	11,302.53	8,137.00	7,961.94	143.24	40.23	178.14	-428.66	385.67	6,614.49	6,512.63	101.86	64.934	
16,222.60	11,302.50	8,137.00	7,961.94	143.75	40.23	178.15	-428.66	385.67	6,634.06	6,532.10	101.96	65.067	



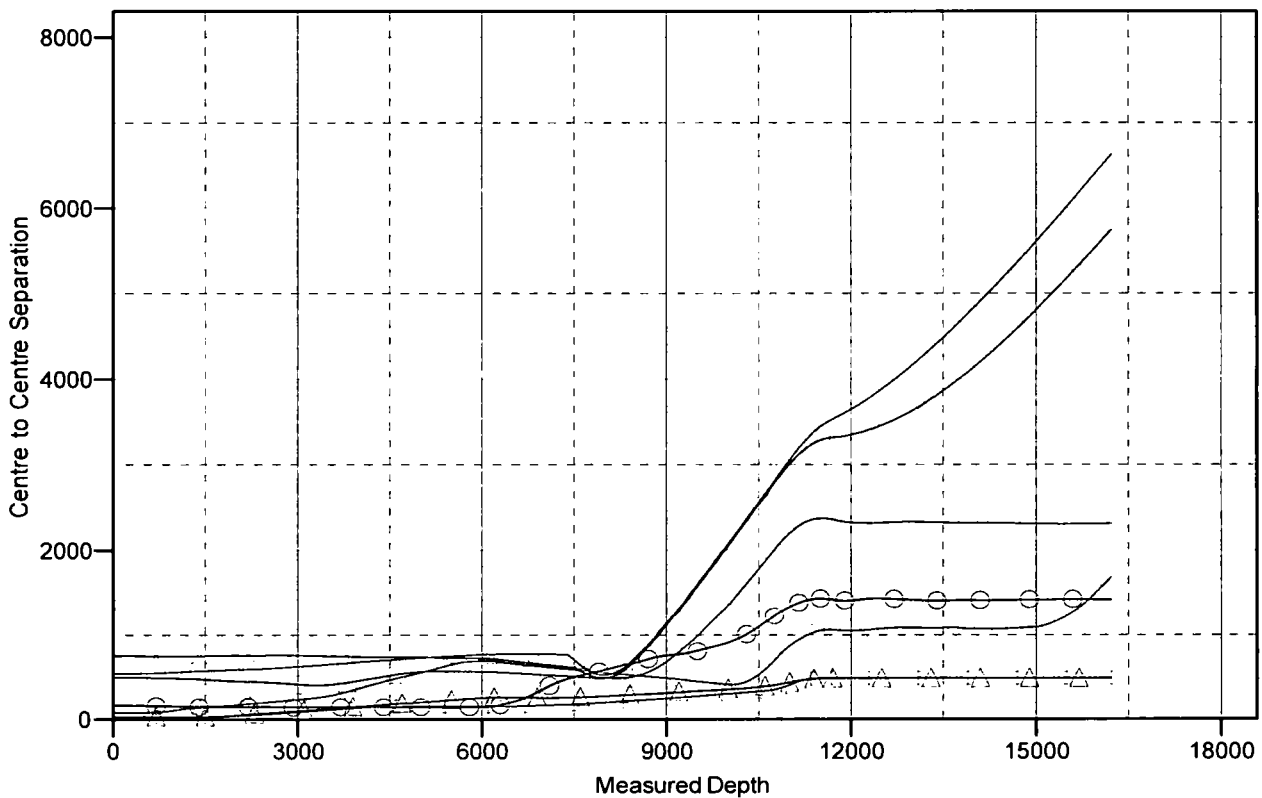
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 3118.00usft (H&P 422)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Cypress 34 23S29E3434 #244H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND



Cypress 34 Federal 15H, Wellbore #1, Surveys V0
Cypress 34 Federal 1, Wellbore #1, Surveys V0
Cypress 34 Federal 9H, Wellbore #1, Surveys V0



Cypress 34 Federal 12H, Wellbore #1, Surveys V0
Cypress 34 23S29E3434 #230H, Wellbore #1, Design #1 V0
Cypress 34 23S29E3434 #234H, Wellbore #1, Design #1 V0



KnobACK Federal 2H, Wellbore #1, Surveys V0



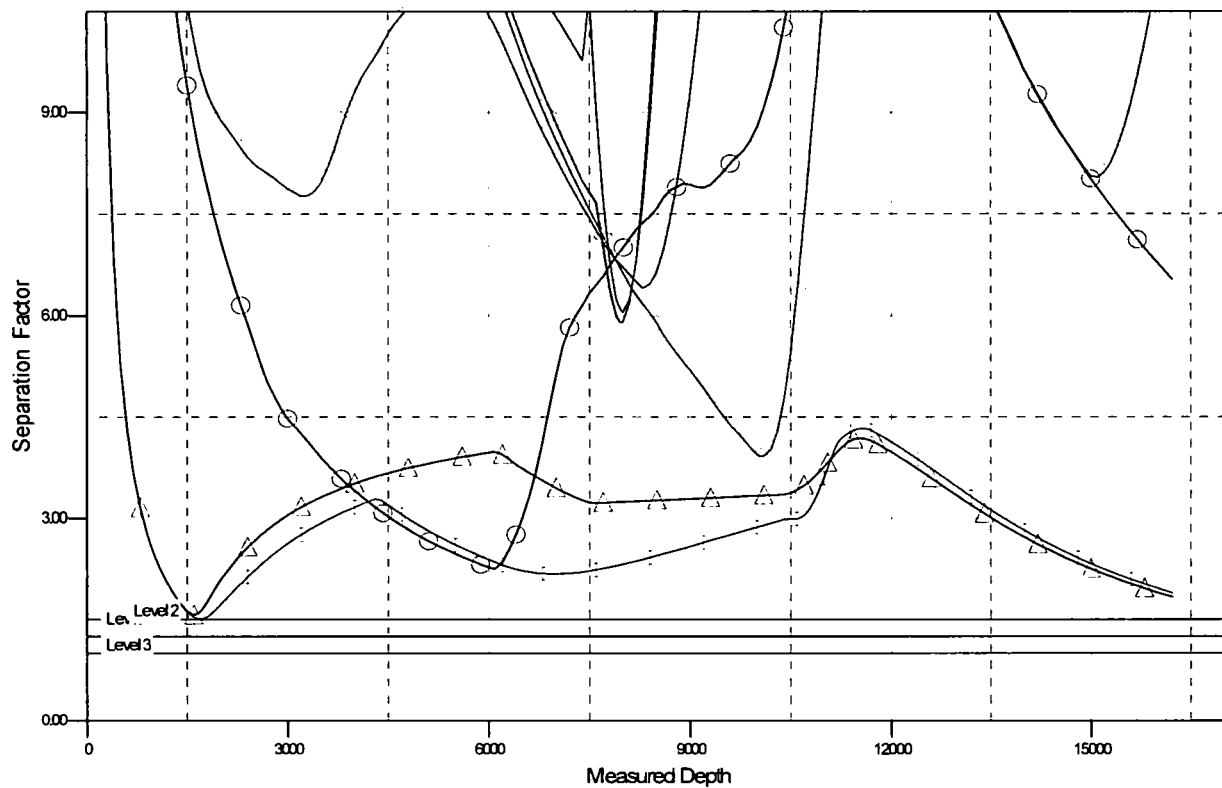
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cypress 34 23S29E3434
Site Error: 0.00 usft
Reference Well: Cypress 34 23S29E3434 #244H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well Cypress 34 23S29E3434 #244H
TVD Reference: WELL @ 3118.00usft (H&P 422)
MD Reference: WELL @ 3118.00usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 3.00 sigma
Database: EDM 5000.14 Conroe DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 3118.00usft (H&P 422)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Cypress 34 23S29E3434 #244H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.20°

Separation Factor Plot

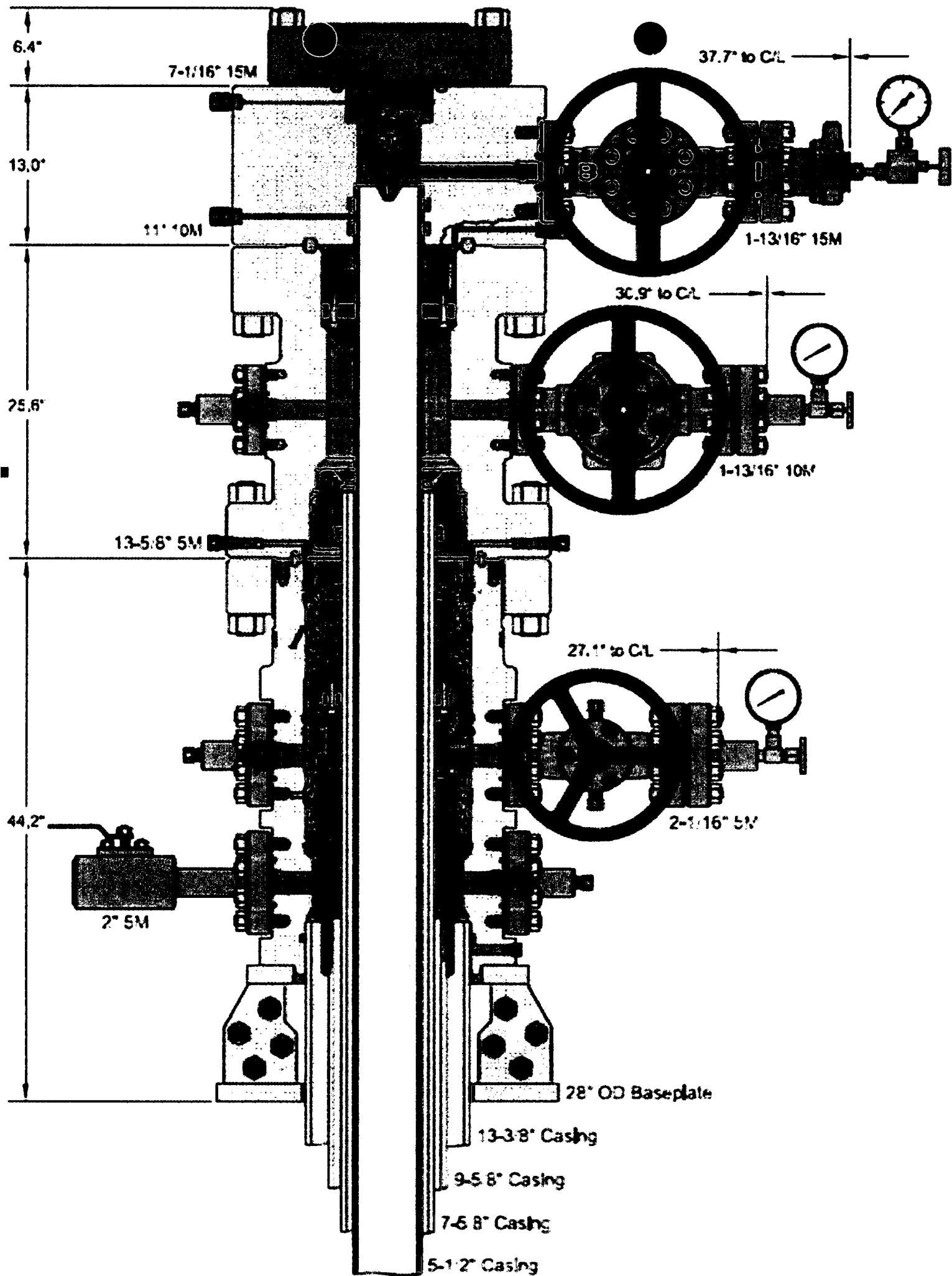


LEGEND

Cypress 34 Federal 15H, Wellbore #1, Surveys V0
 Cypress 34 Federal 1, Wellbore #1, Surveys V0
 Cypress 34 Federal 15H, Wellbore #1, Surveys V0

Cypress 34 Federal 12H, Wellbore #1, Surveys V0
 Cypress 34 23S29E3434 #236H, Wellbore #1, Design #1 V0
 Cypress 34 23S29E3434 #234H, Wellbore #1, Design #1 V0

Krot AOK Federal 2H, Wellbore #1, Surveys V0





Tenaris

Casing and Tubing Performance Data

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

Size: Wt: 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 Hybrid Premium Connections

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Ver 8.6



Tenaris

Casing and Tubing Performance Data

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

Size Wall Grade Connection Unit

Pipe Body Data

GEOMETRY

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

PERFORMANCE

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

Connection Data

GEOMETRY

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

Steel Grade	J55	Minimum Yield	55,000 psi	Minimum Ultimate	75,000 psi
Joint Strength	714,000 lbs	Internal Pressure Resistance	3,950 psi		

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Ver 8.6



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

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
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OPERATION LIMIT TORQUES

Operating Torque	47000 ft-lbs	Yield Torque	70000 ft-lbs
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Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

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

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

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Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

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

TXP® BTC

SHARE EXPORT DATA PRINT



Outside Diameter	5.500 in	Min. Wall Thickness	37.5%	▼	Clear Filters
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	70 lbs/ft	OD	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 x 1000 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 x 1000 lbs	Internal Pressure Capacity, PI	12640,000 psi
Compression Efficiency	100 %	Compression Strength	641,000 x 1000 lbs	Max. Allowable Bending	92,7100 ft
External Pressure Capacity	11100,000 psi				

MAKE-UP TORQUES

Maximum	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
-----------------	----------	----------------	---	----------------------	-----

PERFORMANCE

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

Tap Rock Operating, LLC
 Cypress 34 23S29E3434 #244H
 SHL 210' FNL & 1007' FEL
 BHL 200' FNL & 33' FEL
 Sec. 34, T. 23S., R. 29E., Eddy County, NM

DRILL PLAN PAGE 1

DRILLING PROGRAM

1. ESTIMATED TOPS

Formation Name	MD'	TVD'	Bearing
Quaternary caliche	0	0	water/salt
Rustler anhydrite	333	333	salt
Salado salt (top salt)	648	648	salt
Base salt	3158	3158	salt
Bell Canyon sandstone	3208	3208	hydrocarbons
Brushy Canyon sandstone	5303	5303	hydrocarbons
Bone Spring limestone	6920	6918	hydrocarbons
1 st Bone Spring sandstone	7912	7908	hydrocarbons
2 nd Bone Spring sandstone	8529	8523	hydrocarbons
3 rd Bone Spring sandstone	9862	9853	hydrocarbons
Wolfcamp A	10178	10168	hydrocarbons
Wolfcamp A Fat	10358	10348	hydrocarbons
Wolfcamp B	10528	10518	hydrocarbons
(KOP	10737	10726	hydrocarbons)
Wolfcamp B2 (Goal)	11043	11018	hydrocarbons
TD	16223	11303	--

2. NOTABLE ZONES

Wolfcamp B2 is the goal. Hole will extend north of the last perforation point to allow for pump installation. All perforations will be $\geq 330'$ from the dedication perimeter. Closest water well (C 01627) in State Engineer records is 8,461' northwest. Well was drilled to 170'. Depth to water was not reported but OSE estimated ground water depth is 44'.

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DRILL PLAN PAGE 2

3. PRESSURE CONTROL

A 13,000' 10,000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. BOP, choke manifold, co-flex hose, and speed head diagrams are attached.

An accumulator will be on site. It will comply with Onshore Order 2 requirements for the BOP stack pressure rating. Rotating head will be installed as needed.

Pressure tests will be conducted before drilling out from under all casing strings. BOP will be inspected and operated as required by 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.

A third-party company will test the BOPs. Test pressures will be:

After surface casing is set and the BOP is nipped up, pressure tests will be made to 250 psi low and 2000 psi high.

Test intermediate 1 casing to 250 psi low and 3000 psi high.

Test intermediate 2 casing to 250 psi low and 7500 psi high.

Annular preventer will be tested to 250 psi low and 1000 psi high on the surface casing and 250 psi low and 1500 psi high on both intermediate strings.

In the case of running a speed head with landing mandrel for the 1st and 2nd intermediate casing the initial, after surface casing is set, BOP test pressures will be 250 psi low and 3000 psi high with well head seals tested to 5000 psi once the first intermediate casing has been landed and cemented. BOP may then be lifted to install the C-section of the wellhead. Tap Rock will then nipple the BOP back up and pressure tests will be made to 250 psi low and 5000 psi high. Annular preventer will be tested to 250 psi low and 1500 psi high.

Tap Rock requests a variance to use a co-flex hose between the BOP stack and choke manifold. Co-flex hose certification is attached. Manufacturer does not require the hose to be anchored. If the specific hose is not available, then one of equal or higher rating will be used.

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DRILL PLAN PAGE 3

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 - 358	0 - 358	13.375" surface	54.5	J-55	BTC	1.13	1.15	1.51
12.25"	0 - 3178	0 - 3178	9.625" inter. 1	40.0	J-55	BTC	1.13	1.15	1.51
8.75"	0 - 4000	0 - 4000	7.625" inter. 2 top	29.7	P-110	flush	1.13	1.15	1.51
8.75"	4000 - 10823	4000 - 10795	7.625" inter. 2 middle	29.7	P-110	flush	1.13	1.15	1.51
8.75"	10823 - 11437	10795 - 11265	7.0" inter. 2 bottom	29.0	P-110	BTC	1.13	1.15	1.51
6.125"	0 - 10823	0 - 10795	5.5" product. top	20.0	P-110	BTC	1.13	1.15	1.51
6.125"	10823 - 16223	10795 - 11303	4.5" product. bottom	13.5	P-110	BTC	1.13	1.15	1.51

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

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DRILL PLAN PAGE 4

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	400	1.38	552	14.8	Class C + 5% NaCl + LCM
TOC = GL		100% Excess			Centralizers per Onshore Order 2 III. B. 1f	
Intermediate 1	Lead	900	1.81	1629	13.5	Class C + bentonite + 1% CaCl ₂ + 8% NaCl + LCM
	Tail	300	1.38	414	14.8	Class C + 5% NaCl + LCM
TOC = GL		100% Excess			2 on btm jt, 1 on 2nd jt, 1 every 4th jt to GL	
Intermediate 2	Lead	700	2.35	2275	11.5	TXI + fluid loss + dispersant + retarder + LCM
	Tail	100	1.39	139	13.2	TXI + fluid loss + dispersant + retarder + LCM
TOC = 2700		35% Excess			2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement (500' above TOC)	
Production	Tail	500	1.17	585	15.8	Class H + fluid loss + dispersant + retarder + LCM
TOC = 10823		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.

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss
fresh water spud	0 - 400	8.3	28	NC
brine water	400 - 3178	10.0	30 - 32	NC
fresh water & cut brine	3178 - 11437	9.0	30 - 32	NC
OBM	11437 - 16223	12.5	15 - 20	<10

Tap Rock Operating, LLC
Cypress 34 23S29E3434 #244H
SHL 210' FNL & 1007' FEL
BHL 200' FNL & 33' FEL
Sec. 34, T. 23S., R. 29E., Eddy County, NM

DRILL PLAN PAGE 5

6. CORES, TESTS, & LOGS

No core or drill stem test is planned.

A 2-person mud logging program will be used from ≈4700' MD to TD.

GR will be collected through the MWD tools from 1st Intermediate casing to TD. CBL with CCL will be run as far as gravity will let it fall to TOC.

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈7,497 psi. Expected bottom hole temperature is ≈160° F.

Tap Rock does not anticipate that there will be enough H₂S from the surface to the Bone Spring to meet the BLM's Onshore Order 6 requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for drilling and completing this well. Tap Rock has an H₂S safety package on all wells and an "H₂S Drilling Operations Plan" is attached. Adequate flare lines will be installed off the mud/gas separator where gas may be safely flared. All personnel will be familiar with all aspects of safe operation of equipment being used.

8. OTHER INFORMATION

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

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

APD ID: 10400030849

Submission Date: 06/05/2018

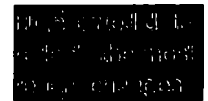
Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill



[Show Final Text](#)

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Cypress_244H_Road_Map1_20180604153445.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_244H_Well_Map3_20180604153500.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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 will initially serve the Cypress 34 Fed 15H, which has already been drilled and is being completed on the same pad, and will also be used for the proposed 234H, 236H, and 244H 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 is currently being permitted via a sundry notice.

Production Facilities map:

Cypress_244H_Production_Facilities_FIG1_20180604153509.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: PRIVATE

Water source volume (barrels): 20000

Source volume (acre-feet): 2.577862

Source volume (gal): 840000

Water source and transportation map:

Cypress_244H_Water_Source_Map4_20180604153703.pdf

Water source comments:

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Operator Name: TAP ROCK OPERATING, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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: Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility will initially serve the Cypress 34 Fed 15H, which has already been drilled and is being completed on the same pad, and will also be used for the proposed 234H, 236H, and 244H 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 is currently being permitted via a sundry notice.

Construction Materials source location attachment:

Cypress_244H_Construction_Methods_FIG1_20180604153807.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

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.)

Reserve pit width (ft.)

Operator Name: TAP ROCK OPERATING, LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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_244H_Rig_Layout_FIG3.pdf_20180604153827.pdf

Comments:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: CYPRESS

Multiple Well Pad Number: 234H

Recontouring attachment:

Cypress_244H_InterimRec_Production_FIG1_20180604153856.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres): 4.86	Well pad interim reclamation (acres): 1.45	Well pad long term disturbance (acres): 3.41
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): 0	Pipeline interim reclamation (acres): 0	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: 4.86	Total interim reclamation: 1.45	Total long term disturbance: 3.41

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:

Seedling transplant description:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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:

Weed treatment plan description: To BLM standards

Weed treatment plan attachment:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 23S29E3434

Well Number: 244H

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):

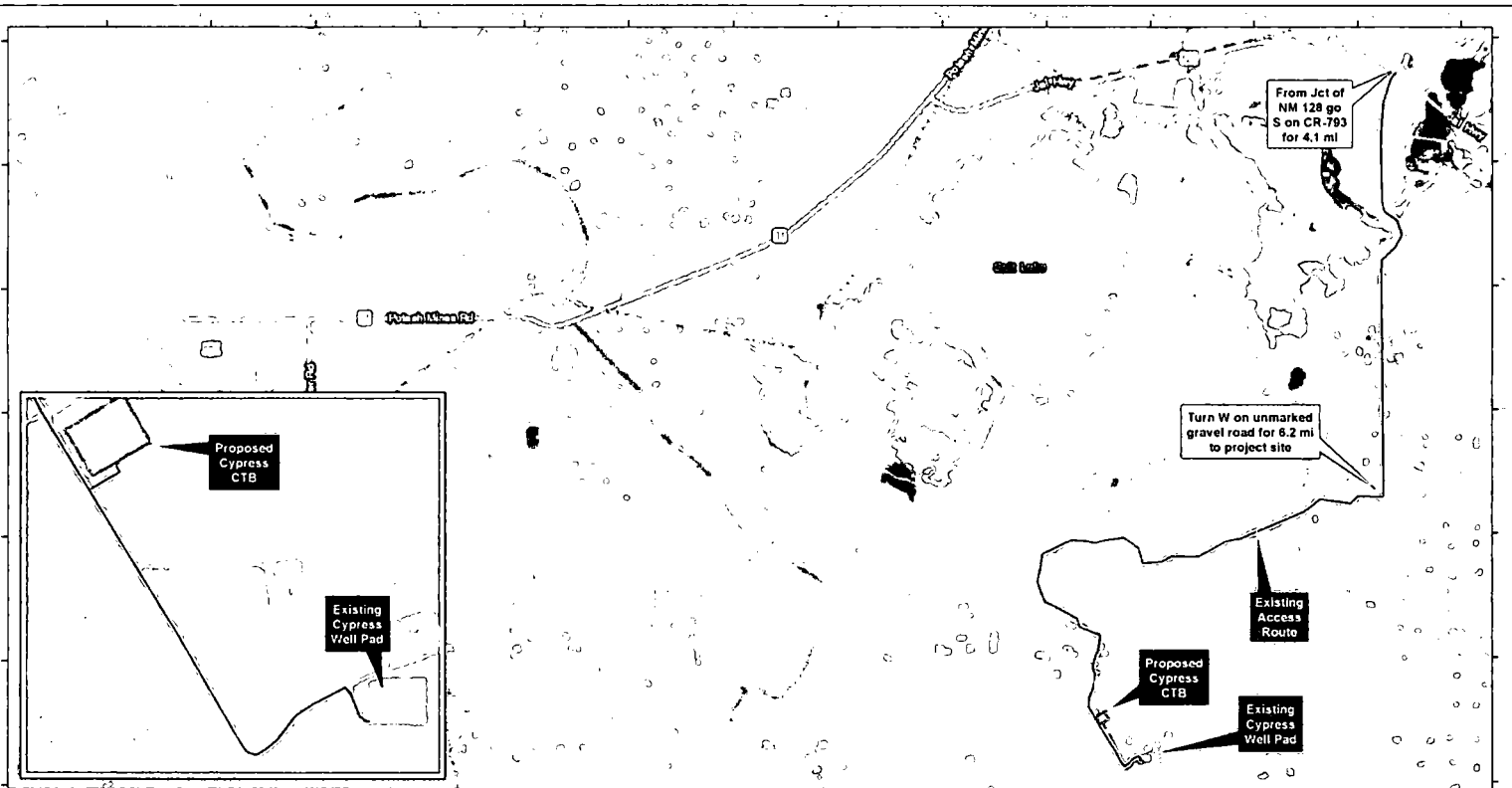
ROW Applications

SUPO Additional Information: 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 #12H. Use a previously conducted onsite? YES

Previous Onsite information: Onsite was conducted April 19, 2018 with BLM and representatives from Taprock.

Other SUPO Attachment

Cypress_244H_SUPO_20180604153958.pdf



Tap Rock Operating LLC

Cypress Well Pad & CTB Site Access Map

Loving, Eddy County, New Mexico

Existing Access Road from NM Hwy 128

Map 1-1

154,520
0.5
Miles

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

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

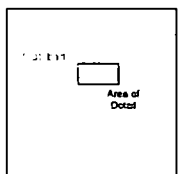
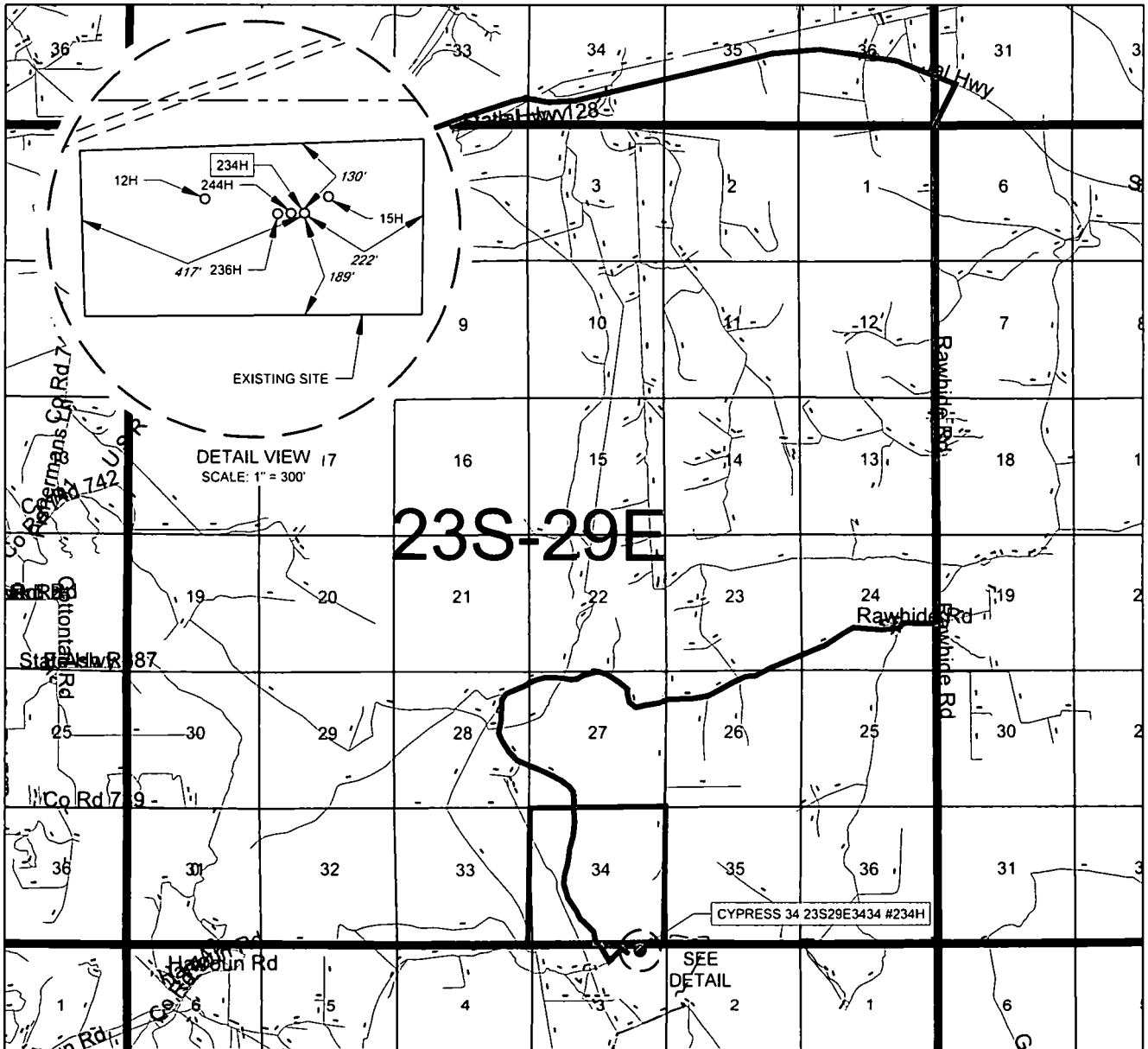


EXHIBIT 2 VICINITY MAP



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

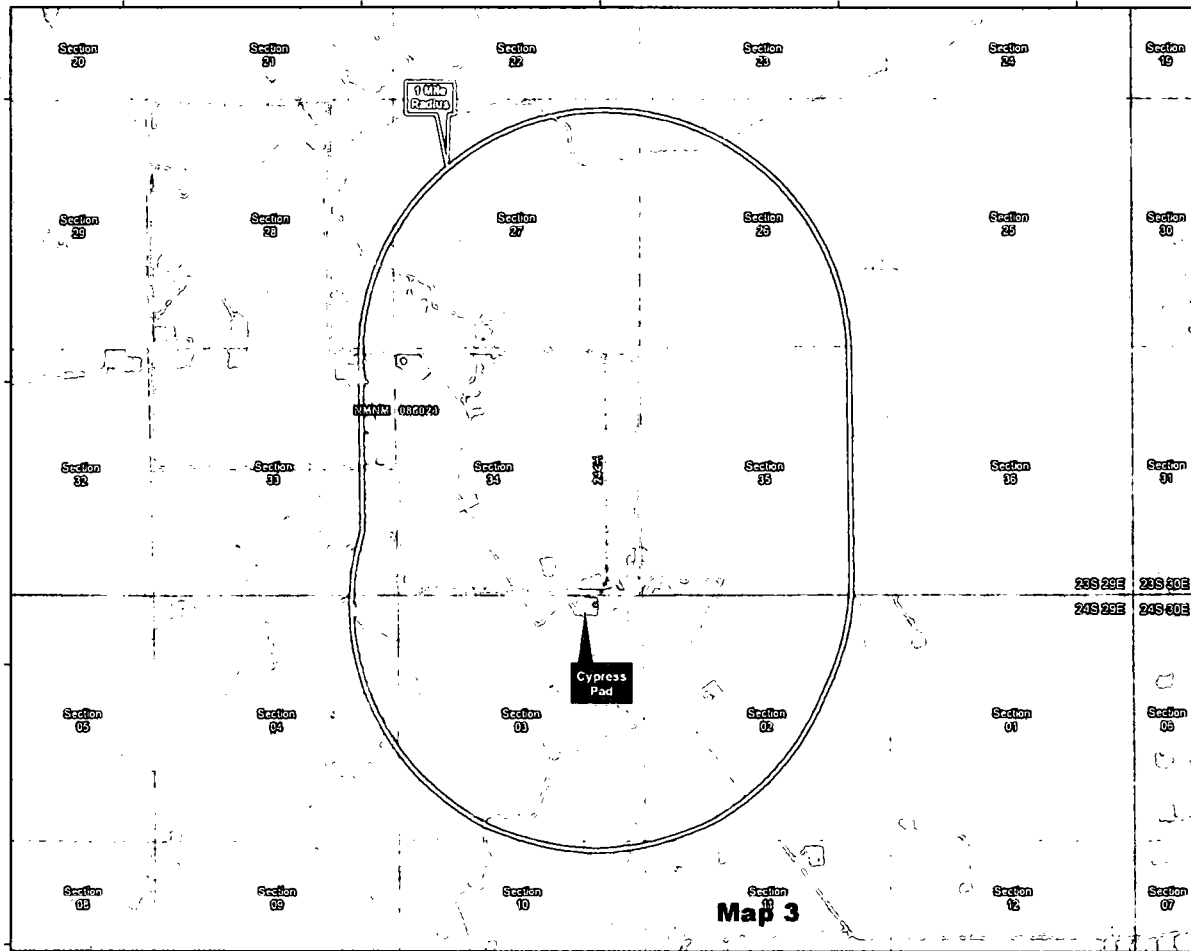


SCALE: 1" = 10000'
0' 5000' 10000'



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



Tap Rock Operating LLC

Cypress 34 23S29E3434 #244H
Well Vicinity & Lease Map

Section 34, Township 23S Range 29E
Eddy County New Mexico

- Oil - Active
- Oil - New
- Oil - TA
- Oil - P&A
- ✦ Gas - Active
- ✦ Gas - New
- Gas - P&A
- ✦ SWD - Active
- Surface Hole Location
- ▼ Bottom Hole Location
- Proposed Well Bore
- Well Pad
- BLM
- STATE
- PRIVATE

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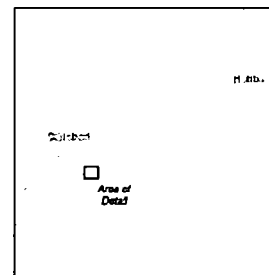
0 0.5 1
Miles

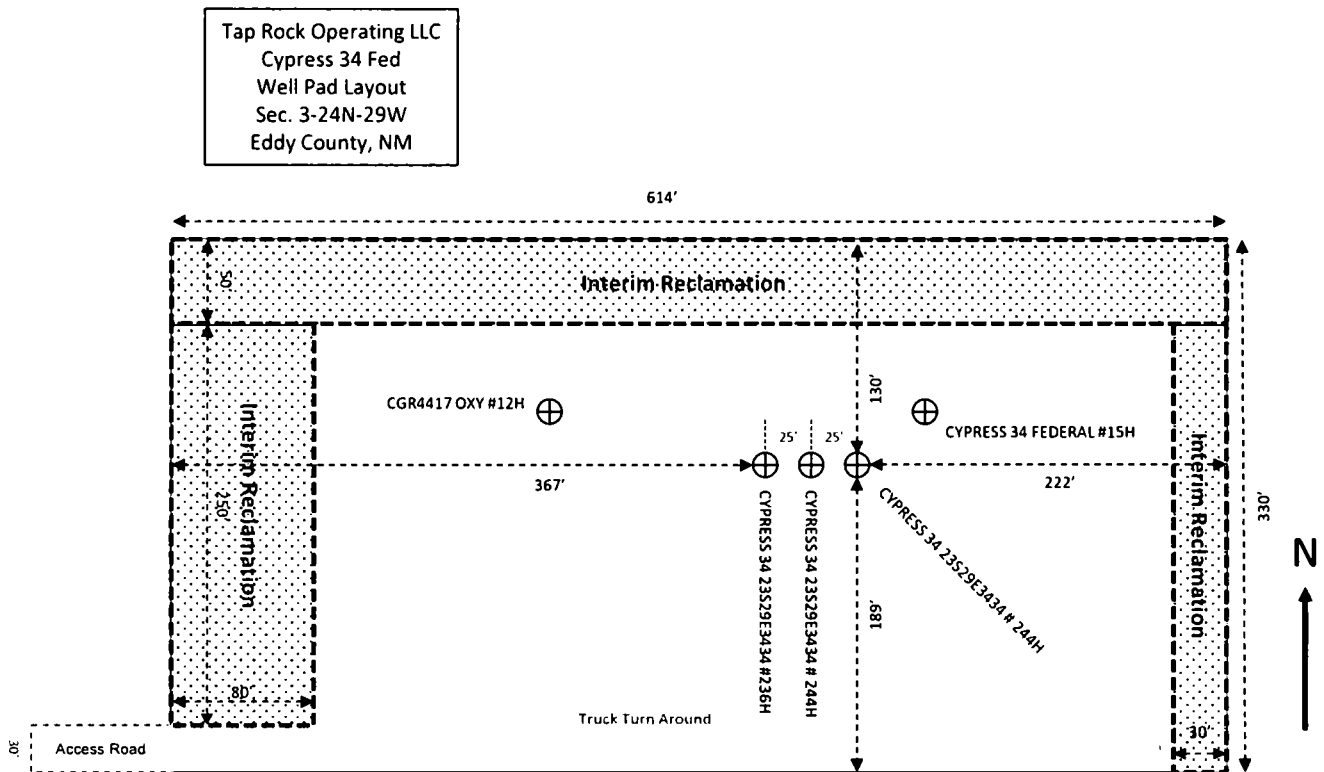


NAD 1983 NM State
Plane East Feet

PERMITS ONLY

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





Production Layout & Interim Reclamation Diagram

FIGURE 1-1

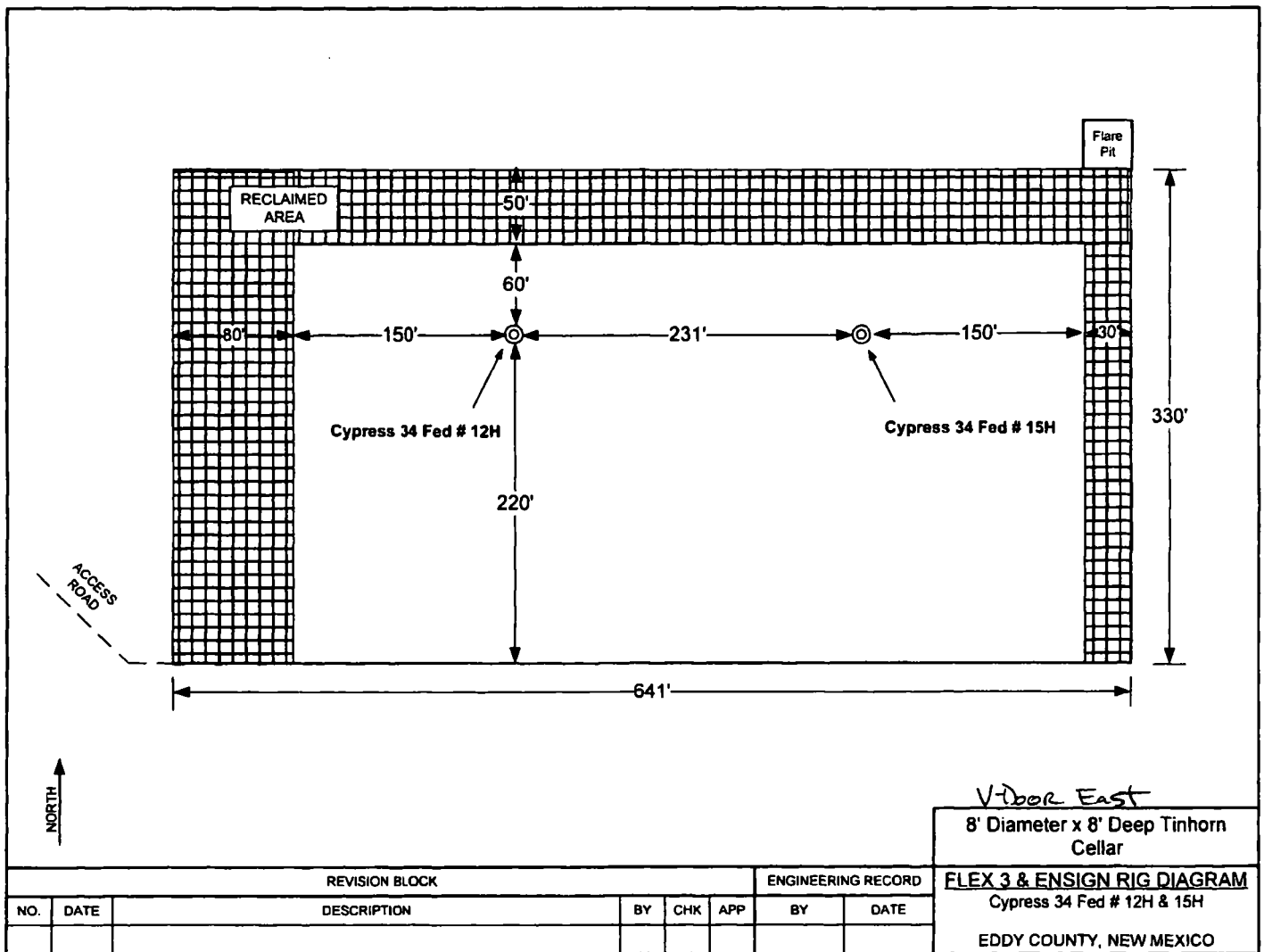
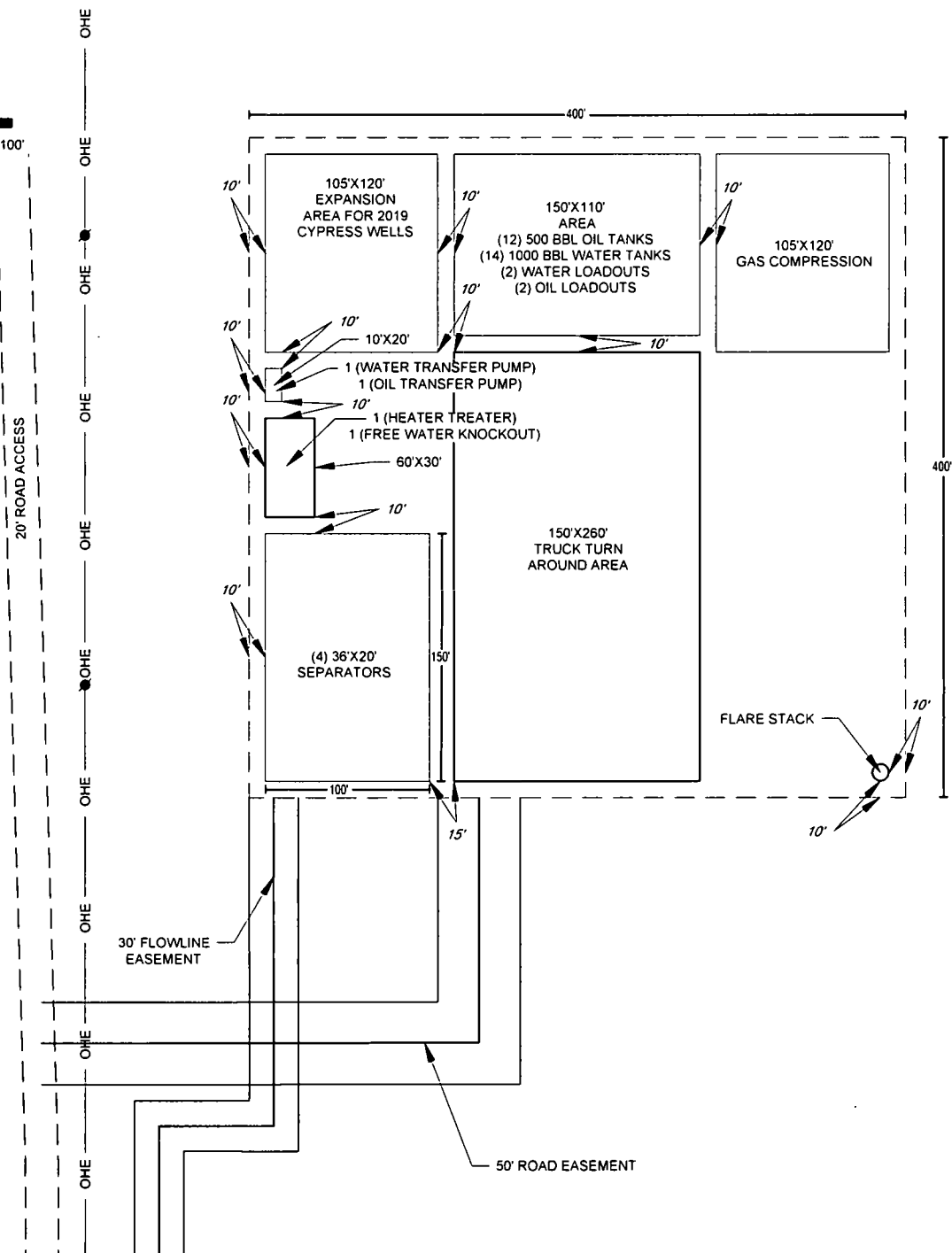
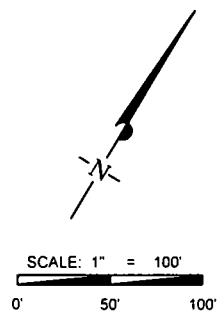


FIGURE 1-2

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		

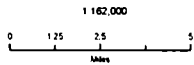
FIGURE 1-3

Tap Rock Operating LLC

Cypress 34 23S29E3434
234H, 236H, & 244H
Water & Caliche Source Map

Lea & Eddy County, New Mexico

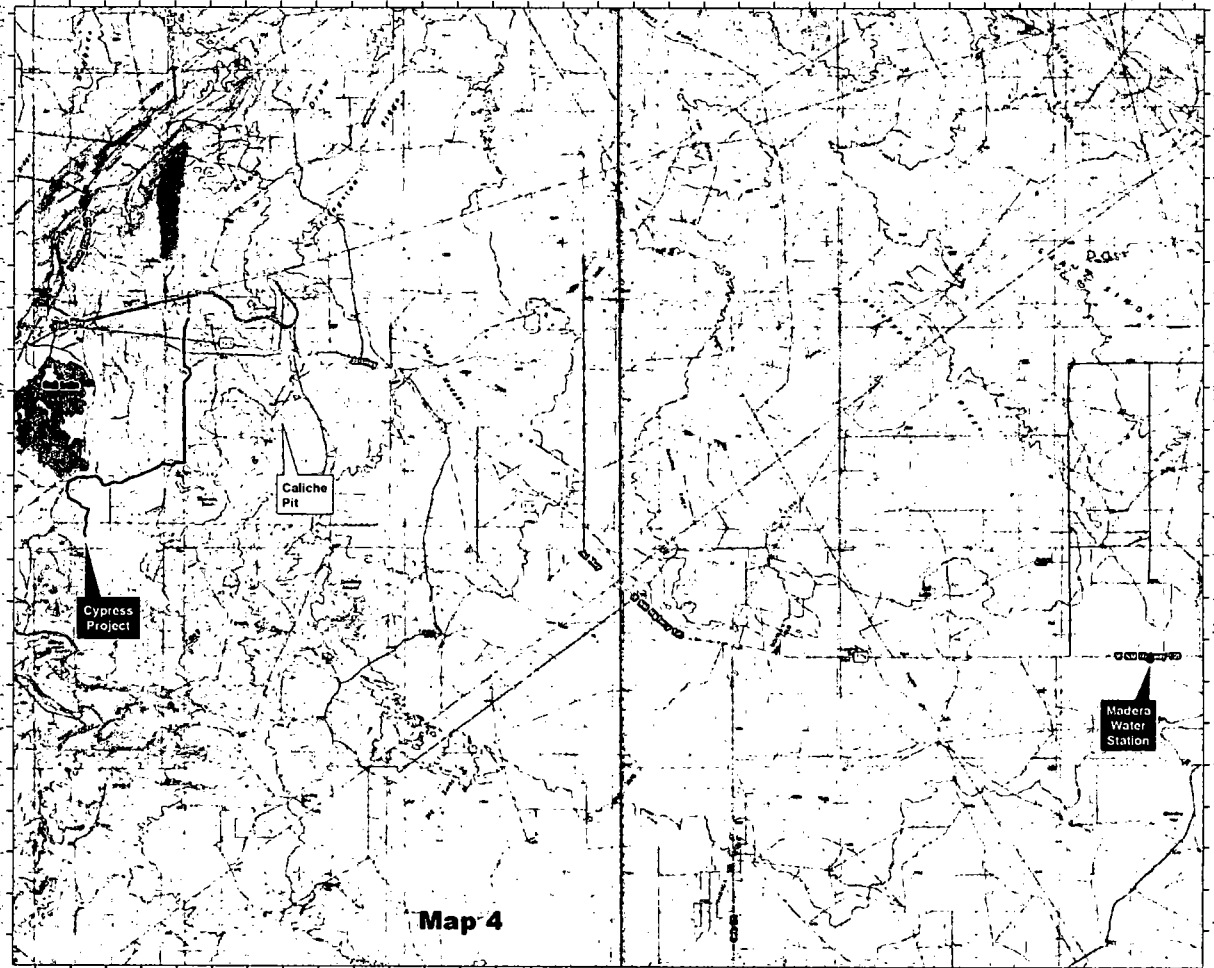
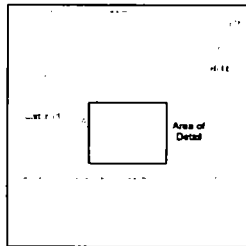
- Caliche Source
- Water Source



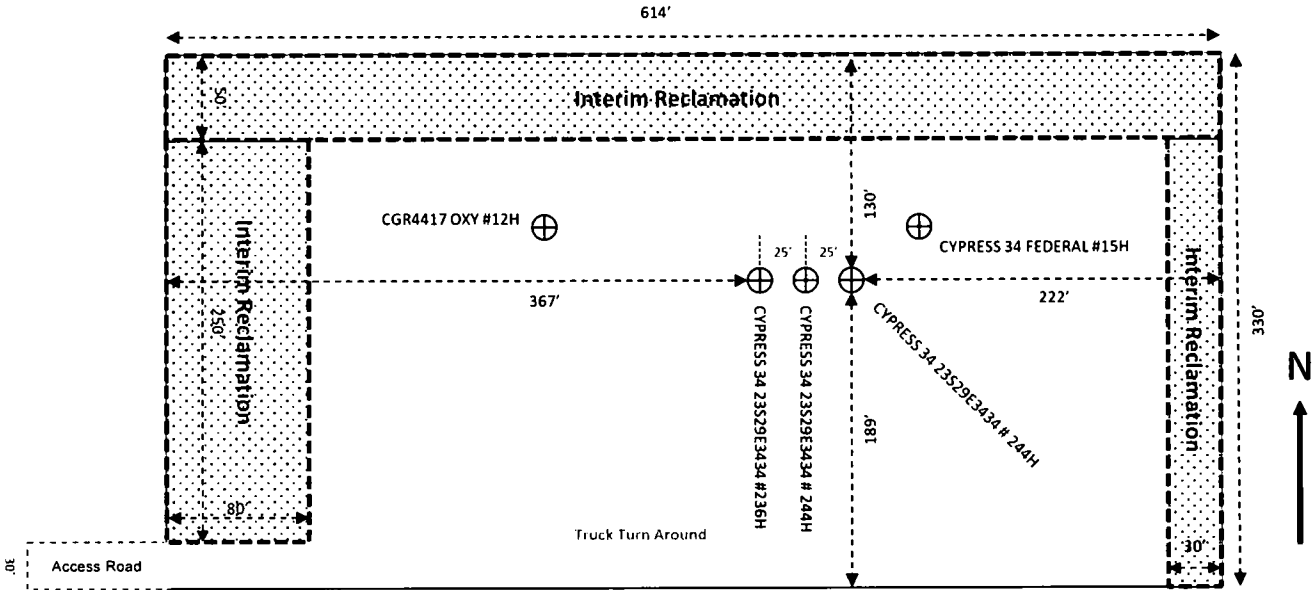
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

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



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



Production Layout & Interim Reclamation Diagram

FIGURE 1-1

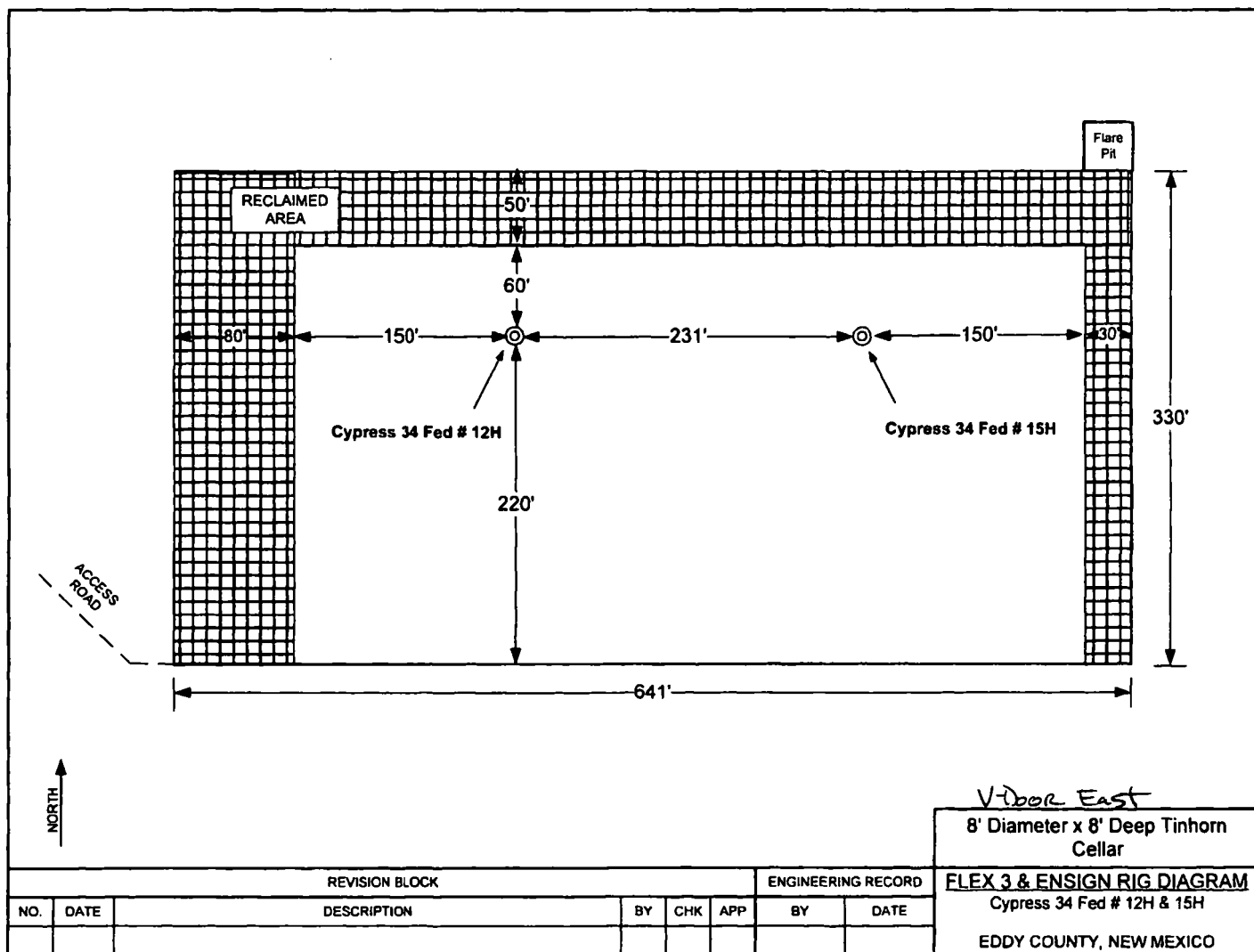


FIGURE 1-2

Rig Layout Diagram

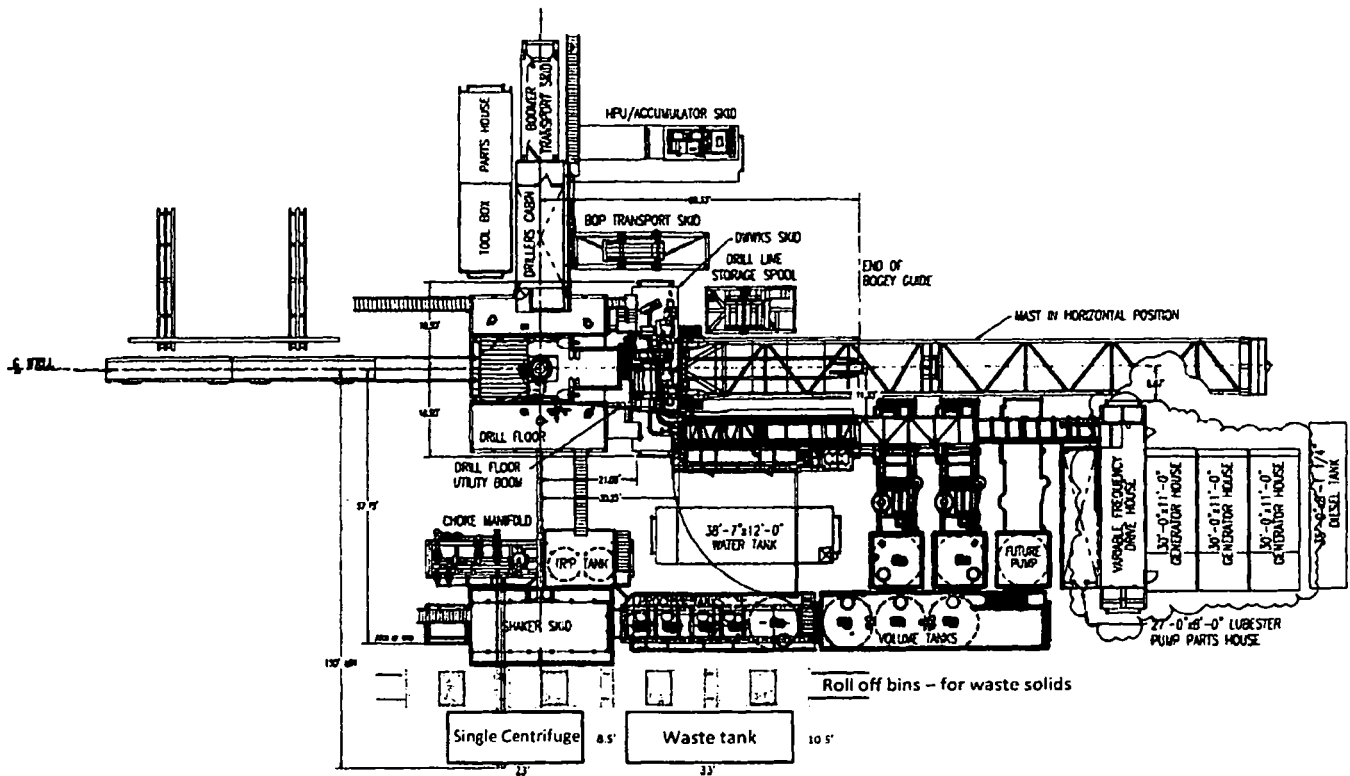
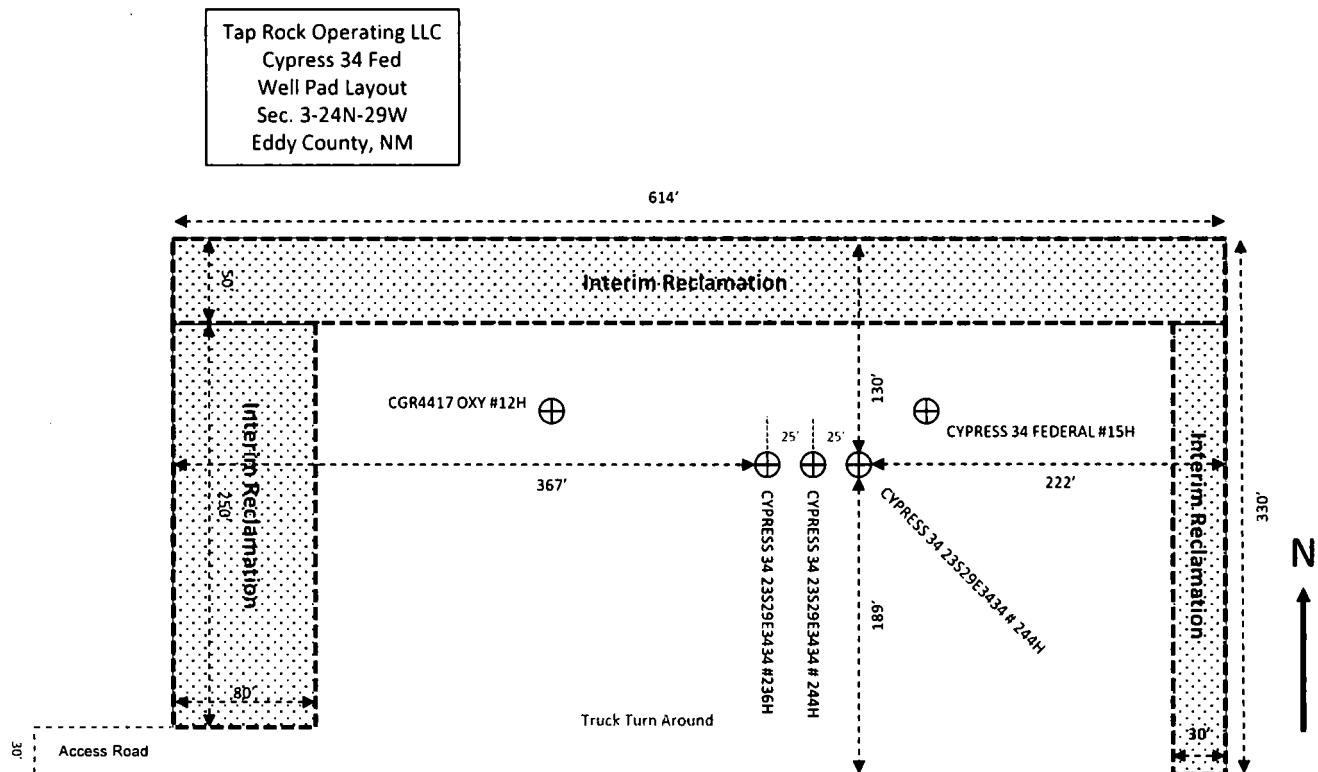


Figure 3



Production Layout & Interim Reclamation Diagram

FIGURE 1-1

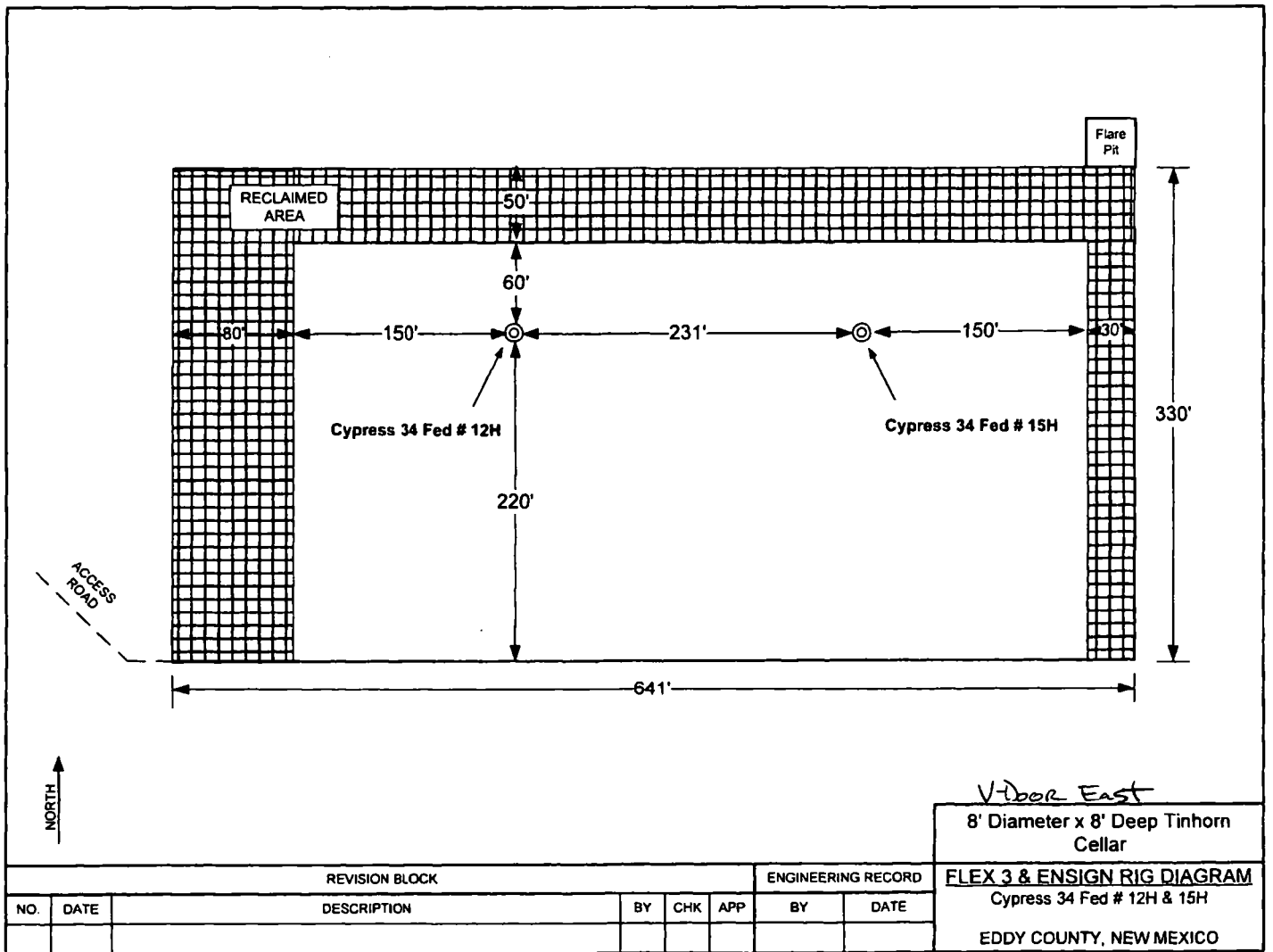
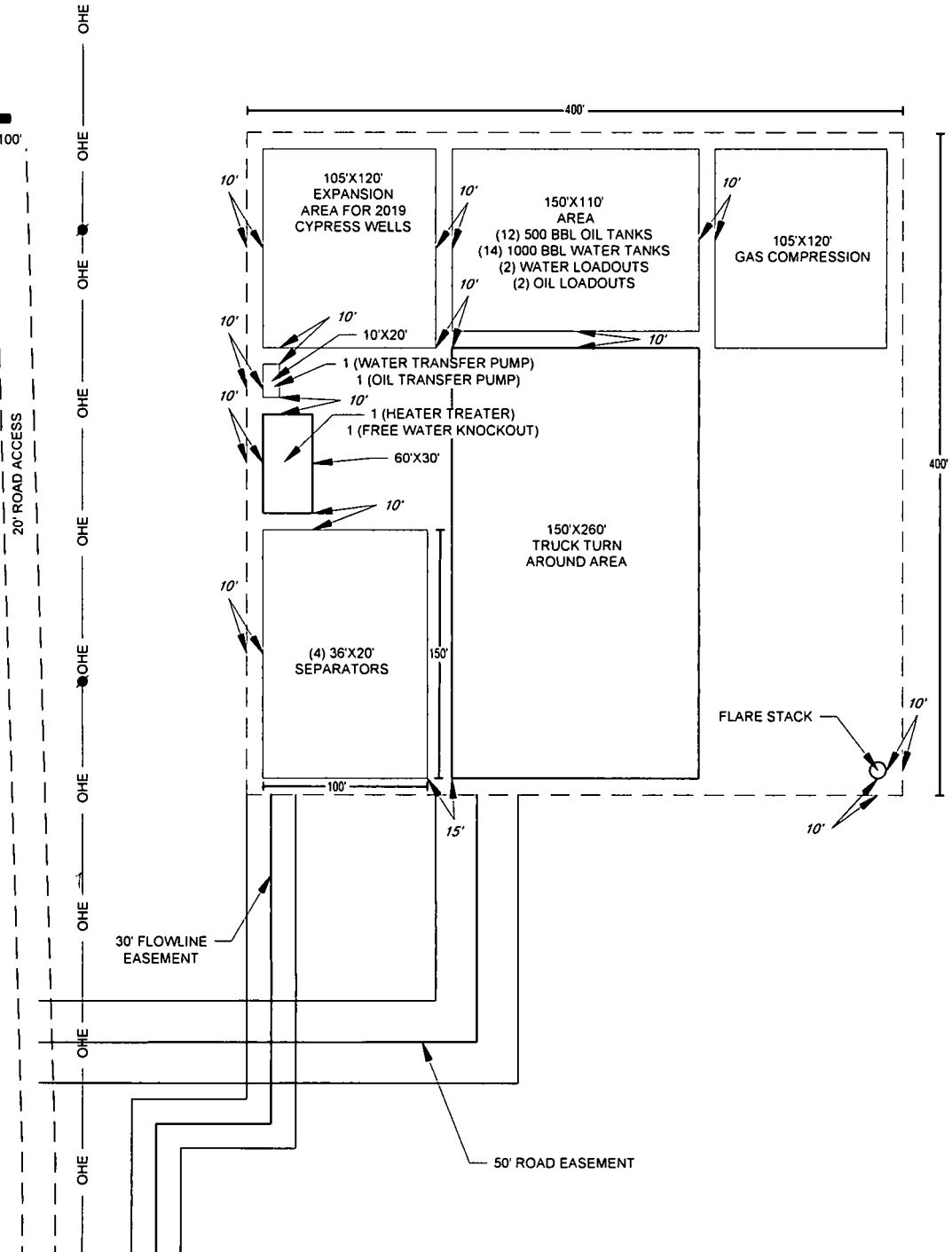
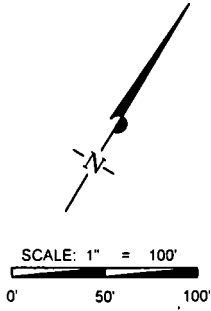


FIGURE 1-2

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_23S29E34_34_AREA_REV		
DRAWN BY: AMD		
SHEET: 1 OF 1		

FIGURE 1-3

Tap Rock Operating LLC
Cypress 34 23S29E3434 #244H
SHL 180' FNL & 966' FEL
BHL 200' FNL & 330' FEL
Sec. 34, T. 23S., R. 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 water or injection well is within a mile.

4. PROPOSED PRODUCTION FACILITIES (See Figure 1)

Production facilities will be located off-pad, on a separate central tank battery (CTB) site. This facility will initially serve the Cypress 34 Fed 15H, which has already been drilled and is being completed on the same pad, and will also be used for the proposed 234H, 236H, and 244H 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 is currently being permitted via a sundry notice.

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. As this is an existing 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.

Tap Rock Operating LLC
Cypress 34 23S29E3434 #244H
SHL 180' FNL & 966' FEL
BHL 200' FNL & 330' FEL
Sec. 34, T. 23S., R. 29E., Eddy County, NM

SURFACE PLAN PAGE 2

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:

330' x 641' pad short-term disturbance = 4.86 acres
– Interim pad reclamation = 1.45 acres
3.41 acres long term

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 23S29E3434 #244H
SHL 180' FNL & 966' FEL
BHL 200' FNL & 330' FEL
Sec. 34, T. 23S., R. 29E., Eddy County, NM

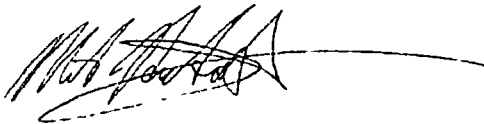
SURFACE PLAN PAGE 3

12. OTHER INFORMATION

- 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 #12H.

CERTIFICATION

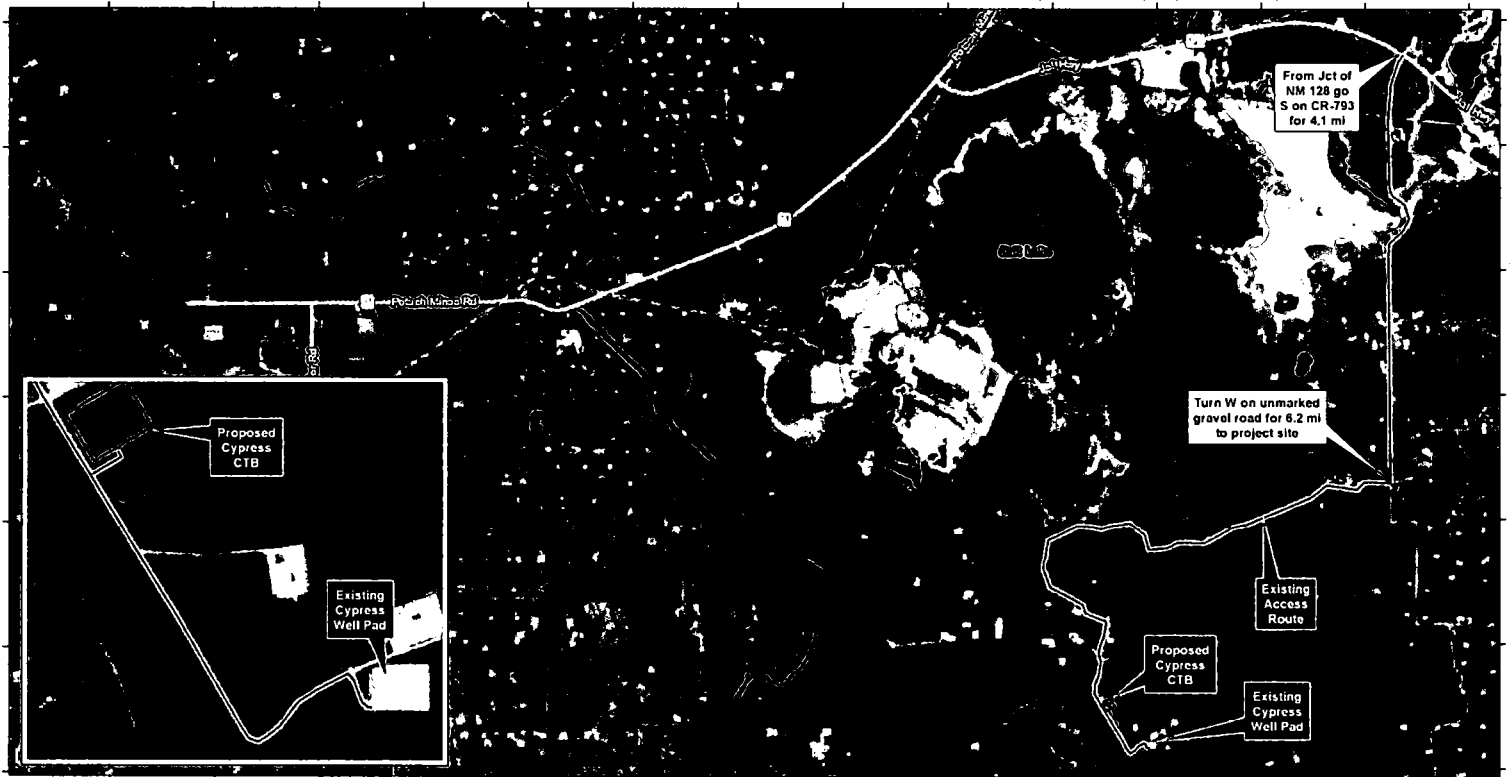
I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in 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 31st day of May, 2018.



Mike Deutsch, 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*



Tap Rock Operating LLC

**Cypress Well Pad & CTB
Site Access Map**

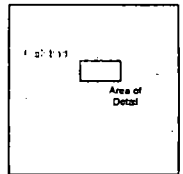
Loving, Eddy County, New Mexico

Existing Access Road from NM
Hwy 128

Map 1

1:54,500
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Miles
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet
UTM 12N 12E

Prepared by Permats West, Inc., May 31, 2016
for Tap Rock Operating, LLC

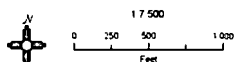


Tap Rock Operating LLC

Proposed Cypress 34 23S29E3434
#234H, 236H, & 244H
Plan of Development Map

Section 34, Township 23S, Range 29E
Section 3, Township 24S, Range 29E
Eddy County, New Mexico

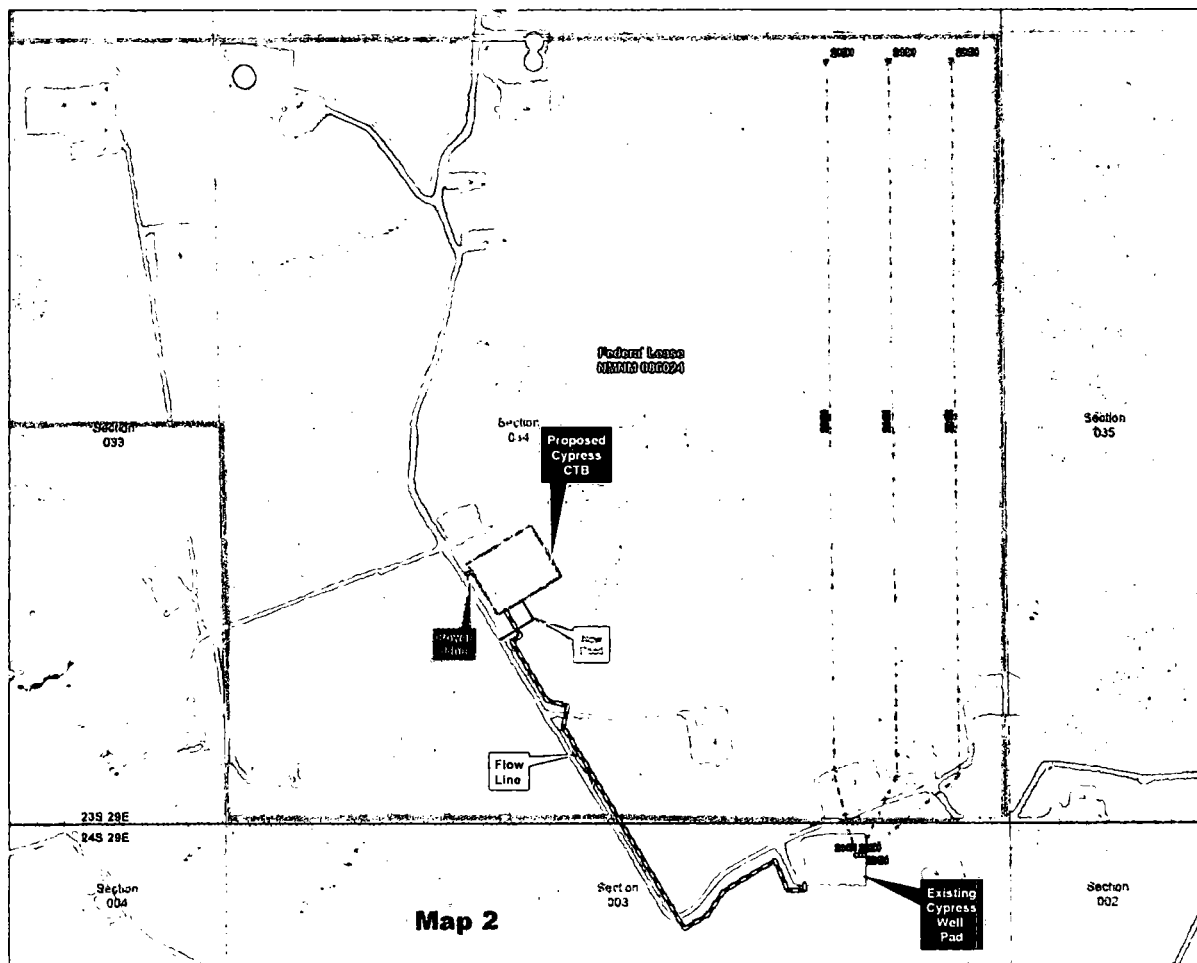
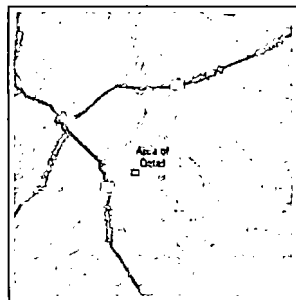
- Proposed SHL
- ▼ Proposed BHL
- Proposed Lateral

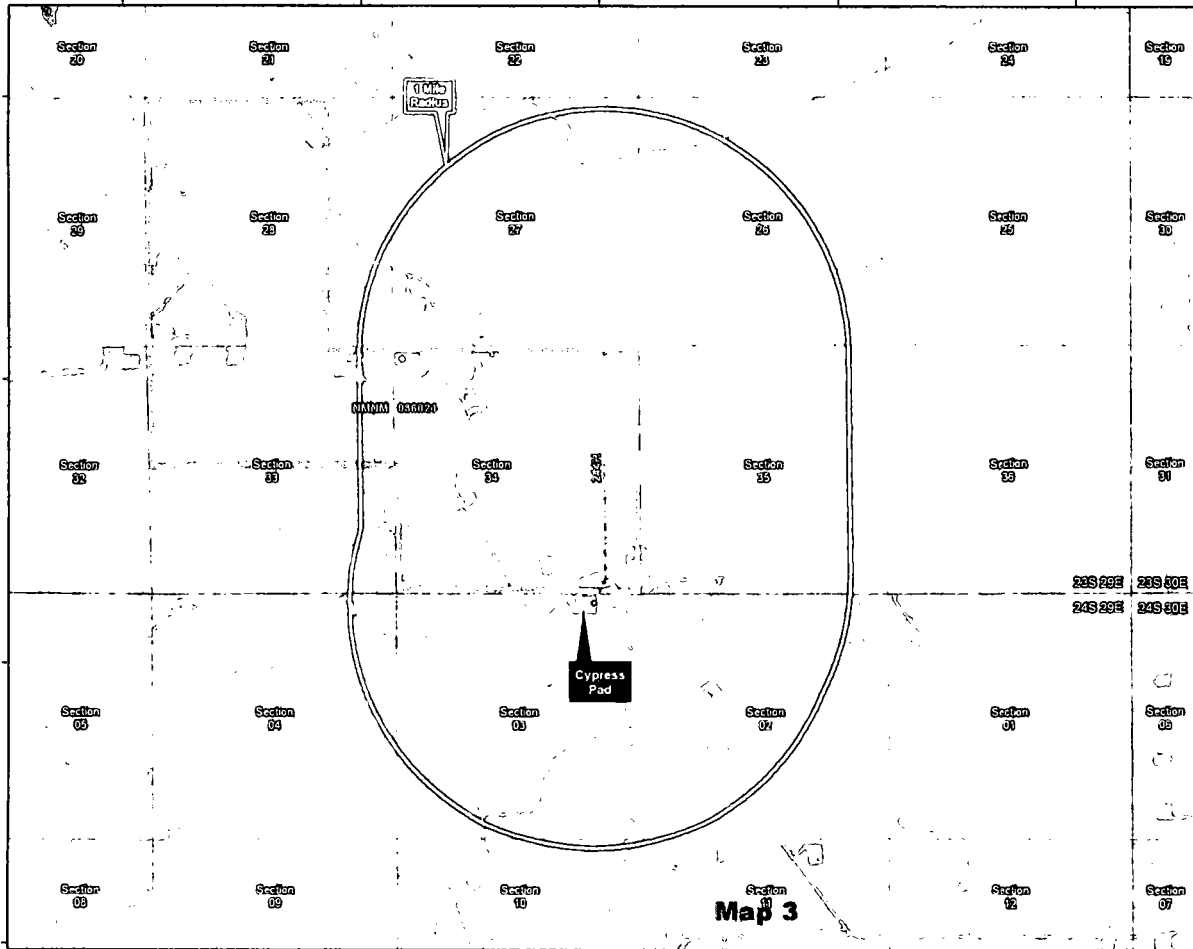


NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS W-1

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for Tap Rock Operating





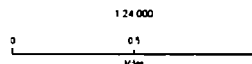
Map 3

Tap Rock Operating LLC

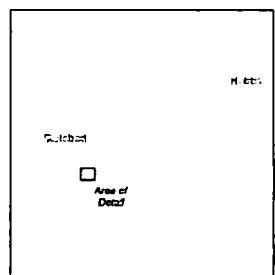
Cypress 34 23S29E3434 #244H
Well Vicinity & Lease Map

Section 34, Township 23S Range 29E
Eddy County New Mexico

- Oil - Active
- Oil - New
- Oil - TA
- Oil - P&A
- Gas - Active
- ◆ Gas - New
- Gas - P&A
- Surface Hole Location
- ▼ Bottom Hole Location
- Proposed Well Bore
- Well Pad
- BLM
- STATE
- PRIVATE
- ✦ SWD - Active



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

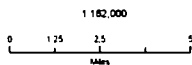


**Tap Rock Operating
LLC**

Cypress 34 23S29E3434
234H, 236H, & 244H
Water & Caliche Source Map

Lea & Eddy County, New Mexico

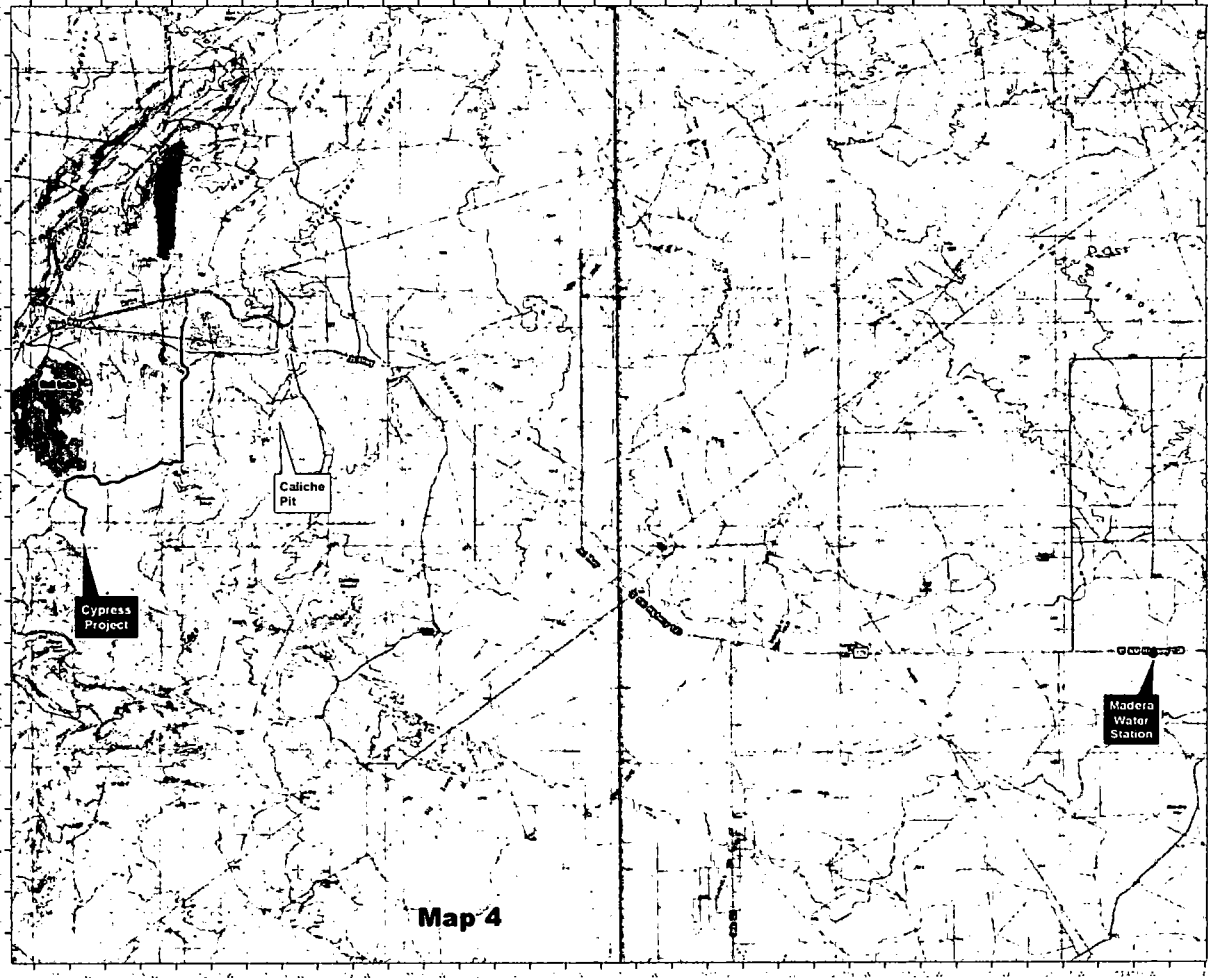
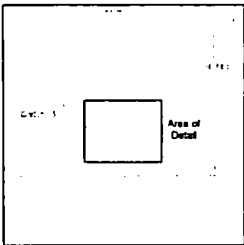
- ✓ Caliche Source
- Water Source



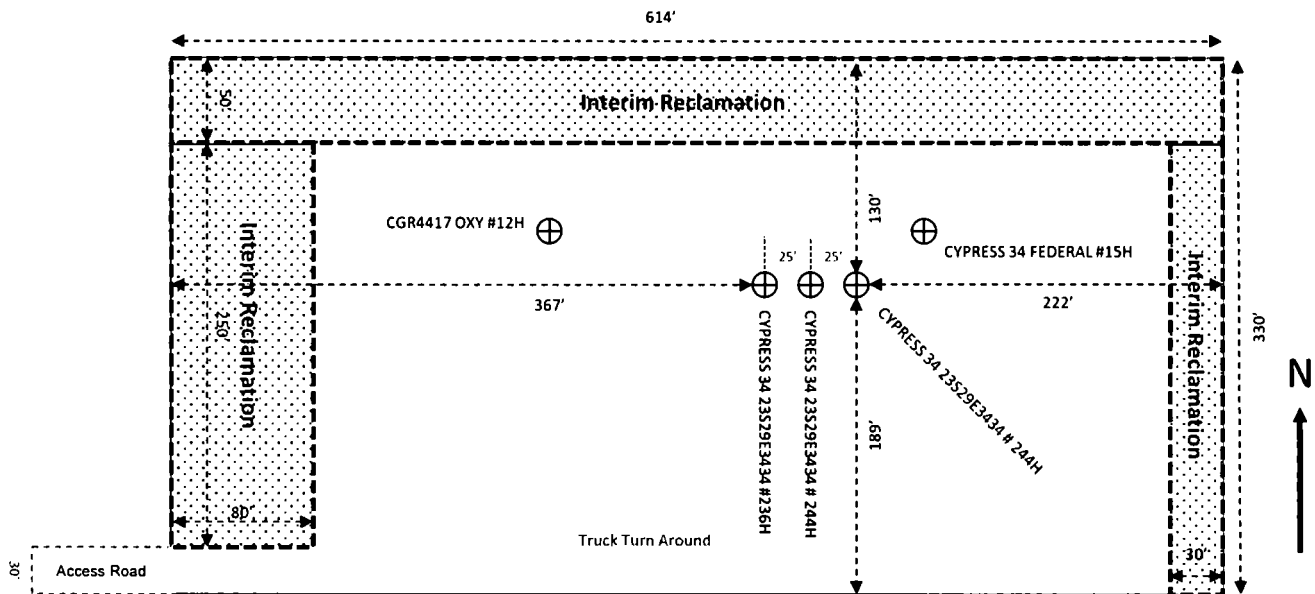
NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



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



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



Production Layout & Interim Reclamation Diagram

FIGURE 1-1

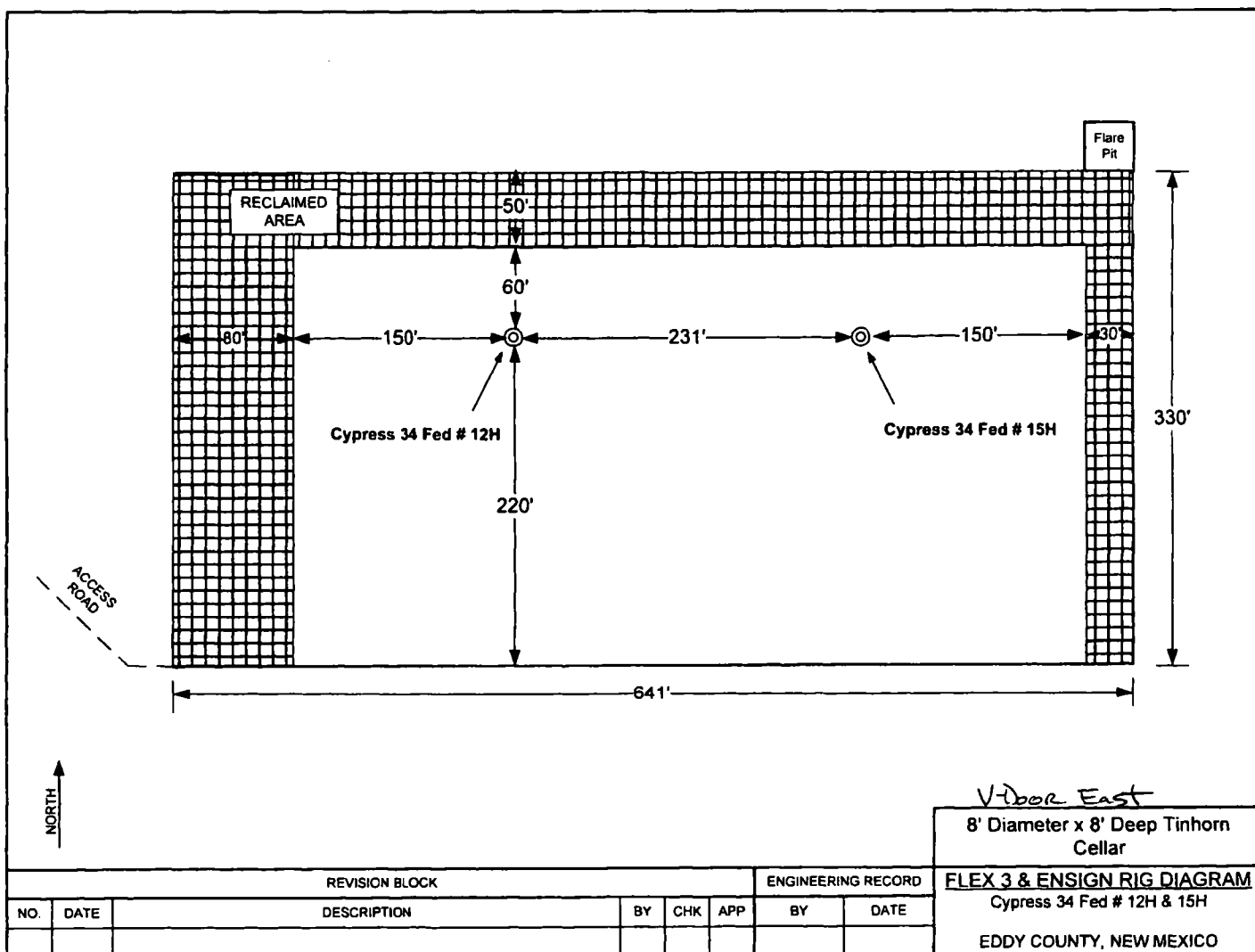
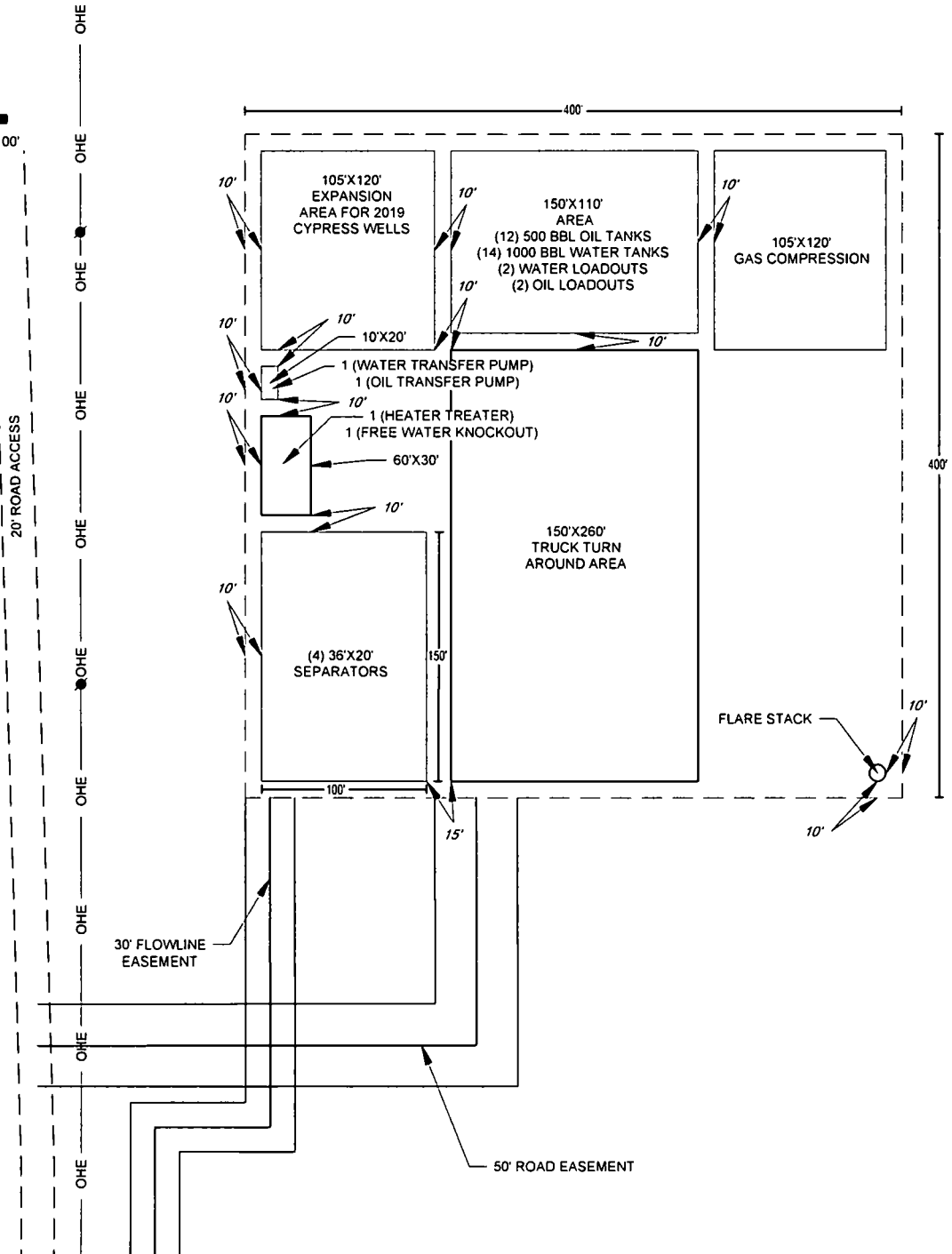
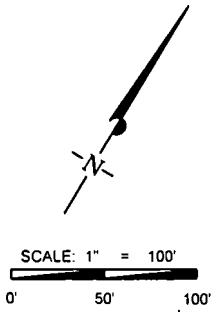


FIGURE 1-2

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		

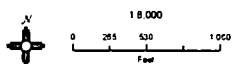
FIGURE 1-3

Tap Rock Operating LLC

Proposed Cypress 34 23S29E3434
#234H, 236H, & 244H
Pre-Construction Topographical Map

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

- Proposed SHL
- ▼ Proposed BHL
- Proposed Lateral



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

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for Tap Rock Operating

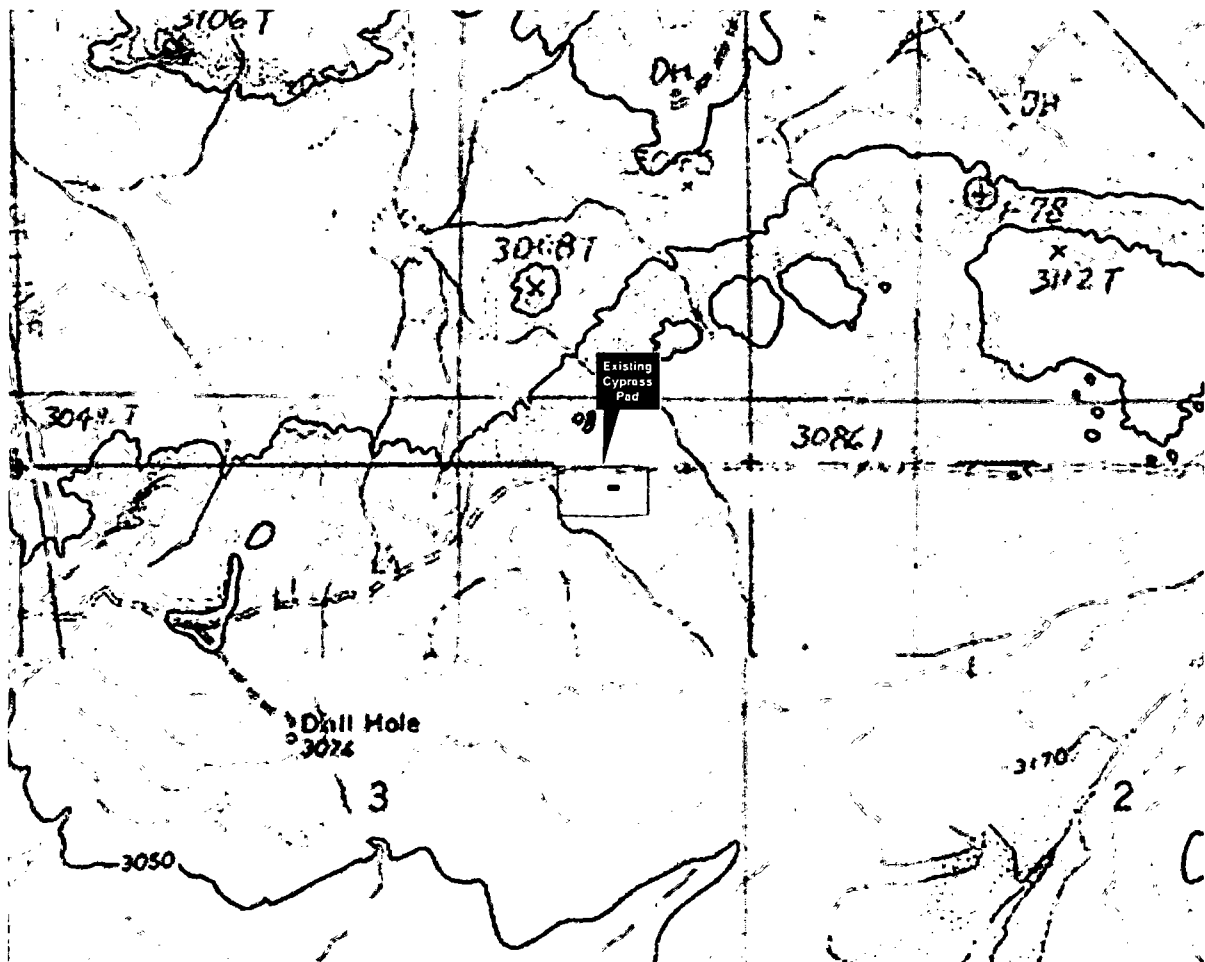
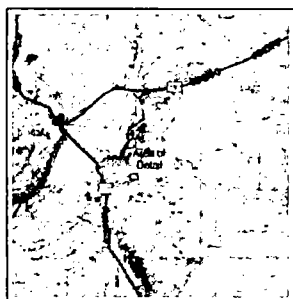


FIGURE 2

Rig Layout Diagram

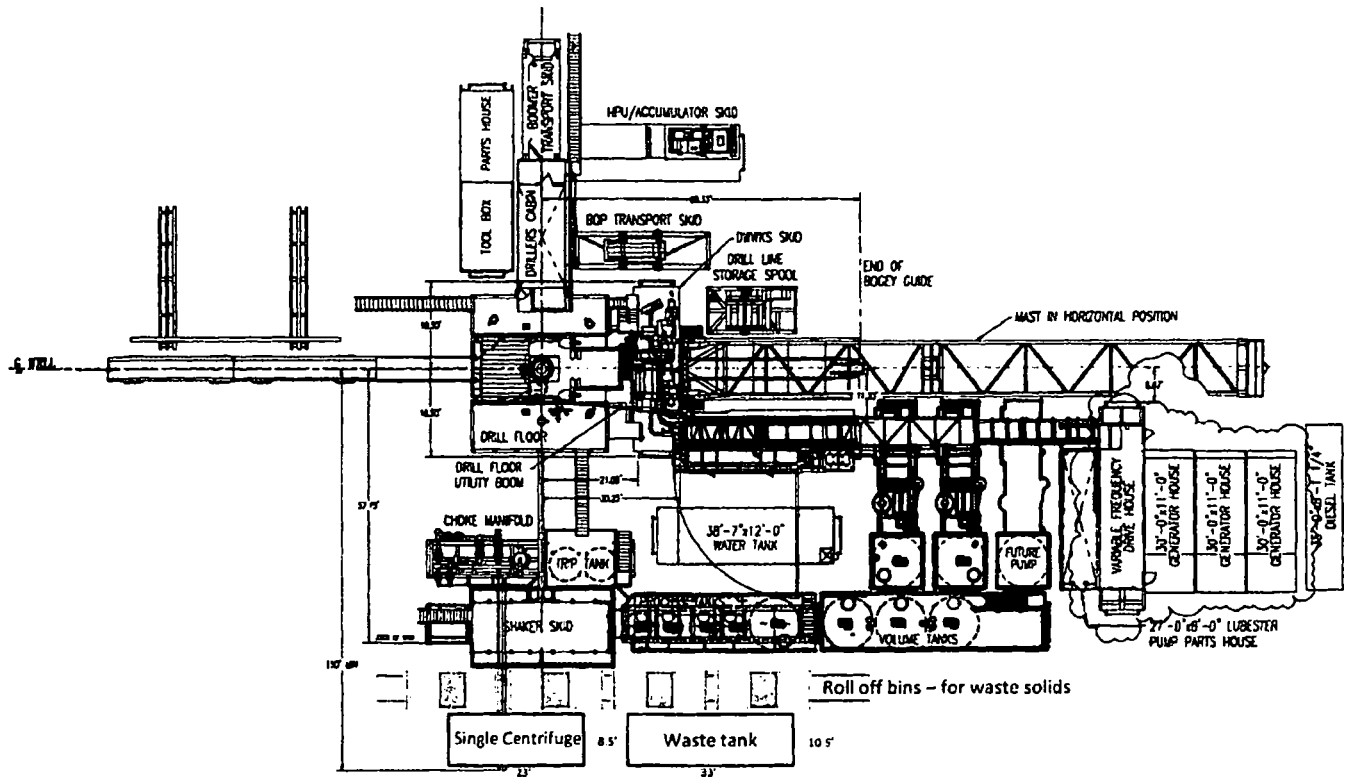


Figure 3



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

PWD Data Report

09/12/2018

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

09/12/2018

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: