OCD Artesia
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Form 3160-3
(March 2012)

MAY 16 2018

DISTRICT II-ARTESIA O.C.D.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

5. Lease Serial No.
NMNM116044

6. If Indian, Allotee or Tribe Name

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

1a. Type of work: ☑ DRILL ☐ REENTER

8. Lease Name and Well No. 321444
DOUBLE DIAMOND FED COM 224H

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

2. Name of Operator
TAP ROCK OPERATING LLC 372043

9. API Well No.
30-015-44979

3a. Address
602 Park Point Drive Suite 200 Golden CO 80

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 SESE / 305 FSL / 885 FEL / LAT 32.210958 / LONG -103.7432647
At proposed prod. zone NENE / 200 FNL / 990 FEL / LAT 32.2240899 / LONG -103.743268

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 14 / T24S / R31E / NMP

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

12. County or Parish
EDDY

13. State
NM

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

16. No. of acres in lease
320

17. Spacing Unit dedicated to this well
320

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

19. Proposed Depth
12495 feet / 17296 feet

20. BLM/BIA Bond No. on file
FED: NMB001443

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3586 feet

22. Approximate date work will start*
04/01/2018

23. Estimated duration
90 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Brian Wood / Ph: (505)466-8120	02/13/2018

Title
President

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	04/27/2018

Title	Office
Supervisor Multiple Resources	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.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

Approval Date: 04/27/2018

RECEIVED
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DISTRICT II-ARTESIA O.C.D.

RKlein 5-18-2018

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.

Operator shall filled 1/3rd casing with fluid while running 1st and 2nd intermediate casings to maintain collapse safety factor.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Variance for annular spacing between 7 5/8 x 9 5/8 inch casing is approved.

3. The minimum required fill of cement behind the **7-5/8** inch production casing is:
   - Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

Variance for annular spacing between 7 5/8 x 5 1/2 inch casing is approved.

4. The minimum required fill of cement behind the **5-1/2 x 4 ½** inch production casing is: Cement should tie-back 500' 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 **2000 (2M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi.

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7-5/8** intermediate casing shoe shall be **10,000 (10M)** psi.

GENERAL REQUIREMENTS

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

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

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

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

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

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

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

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. 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 042518

Stevens, Zota <zstevens@blm.gov>

[EXTERNAL] Double Diamond 5-1/2" TXP Casing Clearance Variance Request

1 message

Doug Sproul <dsproul@taprk.com> Tue, Apr 24, 2018 at 9:37 AM
To: "zstevens@blm.gov" <zstevens@blm.gov>

Good Morning Zota;

Tap Rock is requesting a variance to be less than the 0.422" standoff regulation per Onshore Order No. 2 for the casing programs of the wells listed below for which we have applications processing. Specifically, we wish to run 5-1/2" 20# TXP inside 7-5/8" 29.7# BTC for our 4-string Wolfcamp wells.

Double Diamond 158H

Double Diamond 224H

Double Diamond 228H

Double Diamond 238H

Thank you!

Doug Sproul

Drilling Manager

Tap Rock Resources

602 Park Point DR

Suite 200

Golden, CO 80401

Cell: (303) 653-3518

dsproul@taprk.com

Stevens, Zota <zstevens@blm.gov>

[EXTERNAL] Double Diamond Casing Variance Request

2 messages

Doug Sproul <dsproul@taprk.com> Mon, Apr 23, 2018 at 8:57 PM
To: "zstevens@blm.gov" <zstevens@blm.gov>

Hi Zota;

I'm sending you this e-mail as follow-up per our phone conversation last week regarding running 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 for the casing programs of the wells listed below for which we have applications processing:

Double Diamond 158H

Double Diamond 224H

Double Diamond 228H

Double Diamond 238H

Please do let me know if any issues arise that need to be resolved, and thank you for your help.

Doug Sproul

Drilling Manager

Tap Rock Resources

602 Park Point DR

Suite 200

Golden, CO 80401

Cell: (303) 653-3518

dsproul@taprk.com

Stevens, Zota <zstevens@blm.gov> Tue, Apr 24, 2018 at 7:28 AM
To: Doug Sproul <dsproul@taprk.com>

Dear Doug,
Thanks for the the variance. Also i need a variance for the 5.5 x 7.625 because the spacing is 0.41 not .422.
Thanks.

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

[Quoted text hidden]

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
LEASE NO.:	NMNM116044
WELL NAME & NO.:	Double Diamond Fed Com 224H
SURFACE HOLE FOOTAGE:	305'/S & 885'/E
BOTTOM HOLE FOOTAGE	200'/N & 990'/E
LOCATION:	Section 14, T.24 S., R.31 E., NMPM
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.

Approval Date: 04/27/2018

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)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Cattle Guard Requirement

Any new or existing cattle guards on the access 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. Once the road is abandoned, the fence would be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Livestock Watering Requirement

Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

Any damage to fences, cattle guards, and pipelines or structures that provide water to livestock during construction, throughout the life of the project, and caused by its operation, must be immediately corrected by Tap Rock. Tap Rock must notify the grazing allottee or the private surface landowner and the BLM-CFO (575-234-5972) if any damage occurs to pipelines or structures that provide water to livestock.

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.

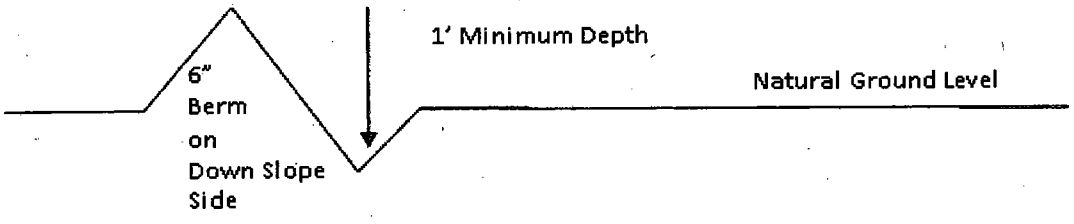
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping 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 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ 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

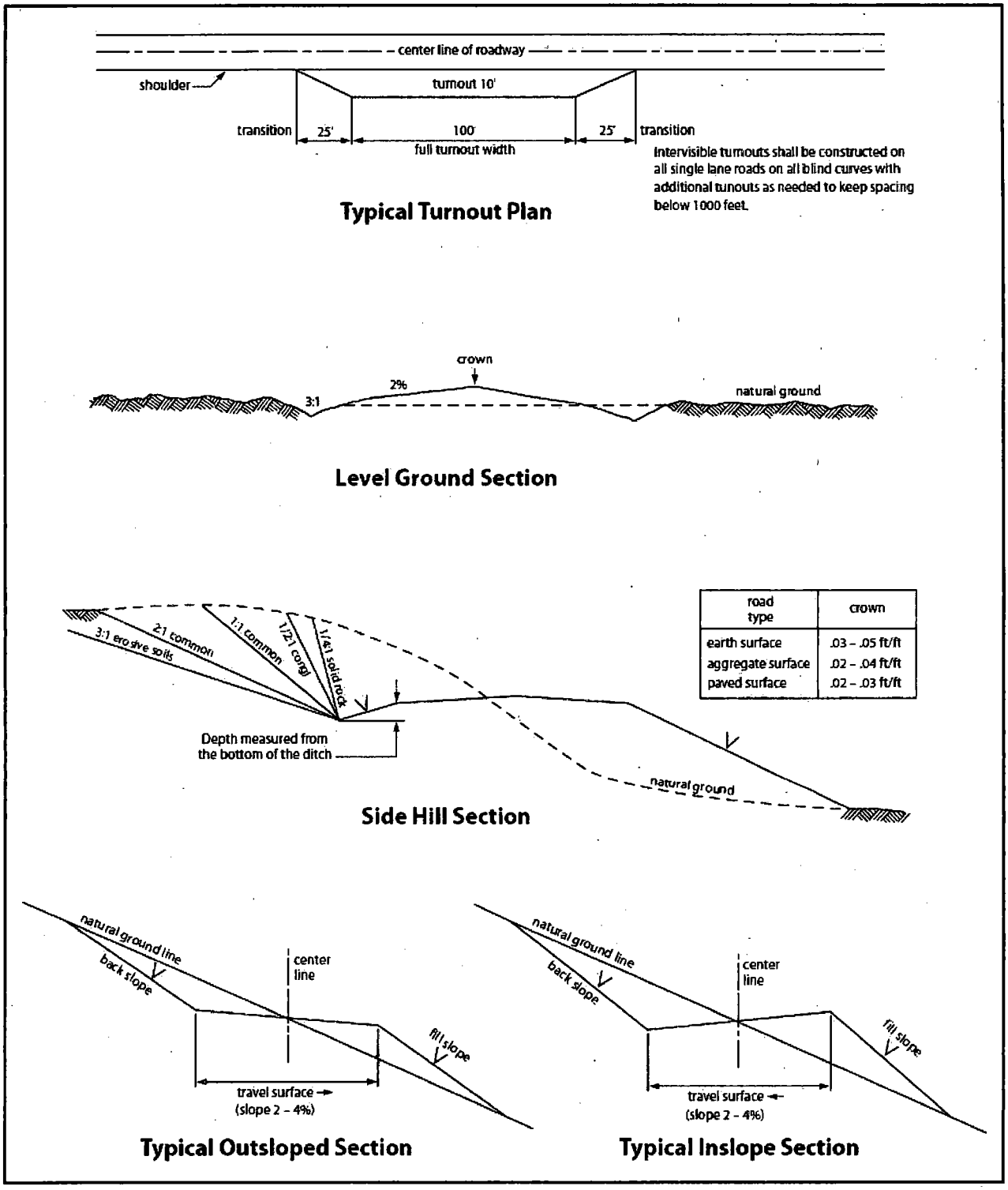


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

Chemical and Fuel Secondary Containment and Exclosure Screening
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Containment Structures

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

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

VIII. INTERIM RECLAMATION

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

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

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory

revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

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

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

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery 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 will be tested and the viability testing of seed shall 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 will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/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 will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. 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:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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

Approval Date: 04/27/2018

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
LEASE NO.:	NMNM116044
WELL NAME & NO.:	Double Diamond Fed Com 224H
SURFACE HOLE FOOTAGE:	305'/S & 885'/E
BOTTOM HOLE FOOTAGE	200'/N & 990'/E
LOCATION:	Section 14, T.24 S., R.31 E., NMPM
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.

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)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Cattle Guard Requirement

Any new or existing cattle guards on the access 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. Once the road is abandoned, the fence would be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Livestock Watering Requirement

Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

Any damage to fences, cattle guards, and pipelines or structures that provide water to livestock during construction, throughout the life of the project, and caused by its operation, must be immediately corrected by Tap Rock. Tap Rock must notify the grazing allottee or the private surface landowner and the BLM-CFO (575-234-5972) if any damage occurs to pipelines or structures that provide water to livestock.

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.

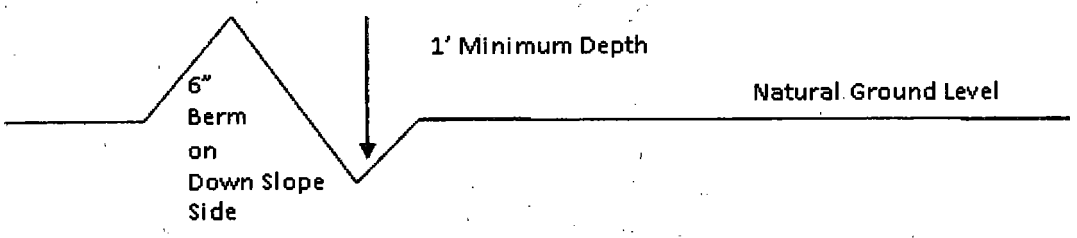
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping 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 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ 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

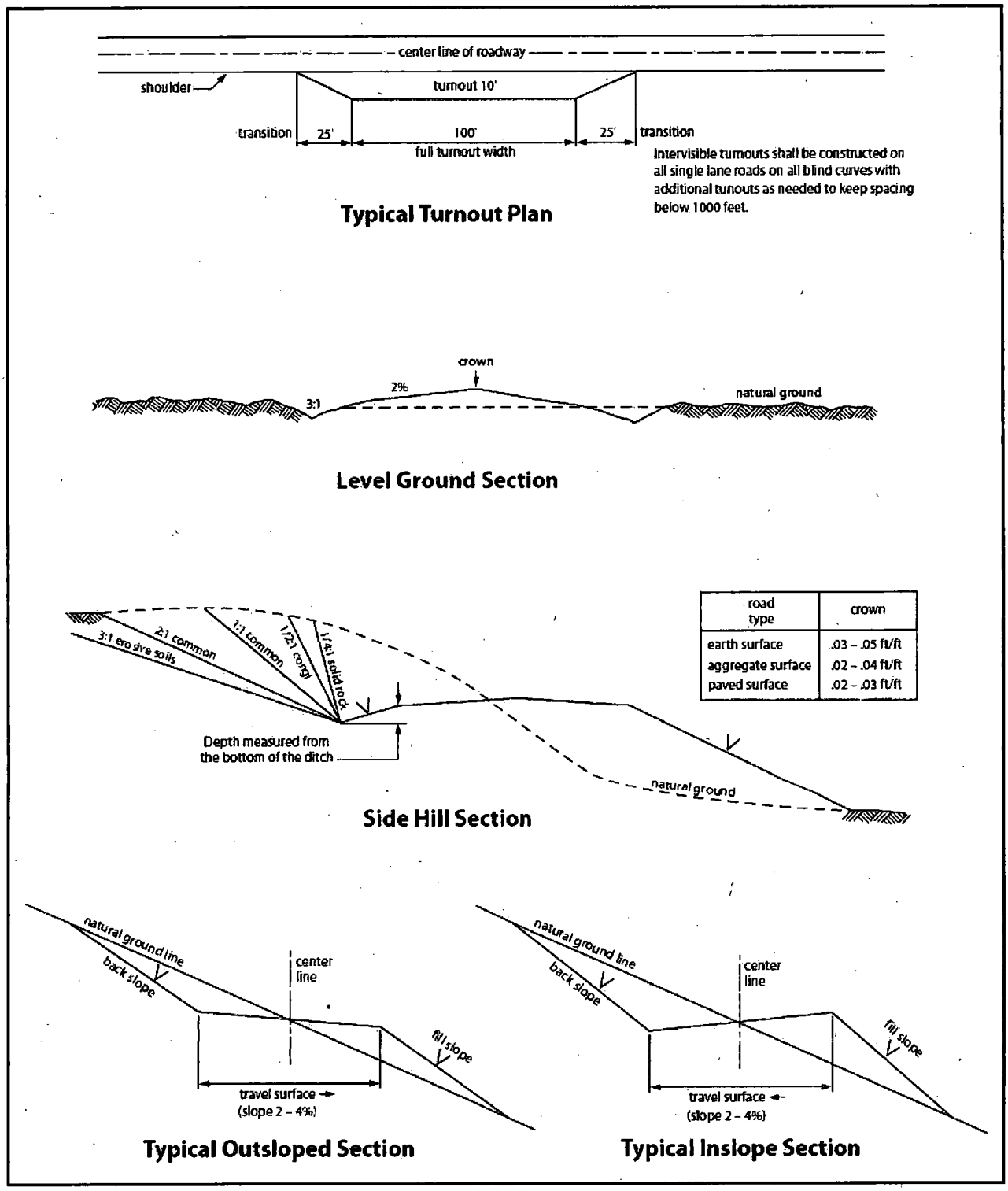


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

Exclosure Netting (Open-top Tanks)
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Species to be planted in pounds of pure live seed* per acre:

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Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

05/01/2018

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: 02/13/2018

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:

AFMSS

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

Application Data Report
05/01/2018

APD ID: 10400027216 **Submission Date:** 02/13/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400027216 **Tie to previous NOS?** **Submission Date:** 02/13/2018

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: NMNM116044 **Lease Acres:** 320

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 **Mater Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H **Well API Number:**

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

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

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** DOUBLE DIAMOND **Number:** 238H

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

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 19 Miles **Distance to nearest well:** 648 FT **Distance to lease line:** 305 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: DD_224H_Plat_20180212151935.pdf

Well work start Date: 04/01/2018 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 18329

	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	305	FSL	885	FEL	24S	31E	14	Aliquot SESE	32.210958	-103.7432647	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 116044	3586	0	0
KOP Leg #1	305	FSL	885	FEL	24S	31E	14	Aliquot SESE	32.210958	-103.7432647	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 116044	-8342	11936	11928
PPP Leg #1	305	FSL	885	FEL	24S	31E	14	Aliquot SESE	32.210958	-103.7432647	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 116044	3586	0	0

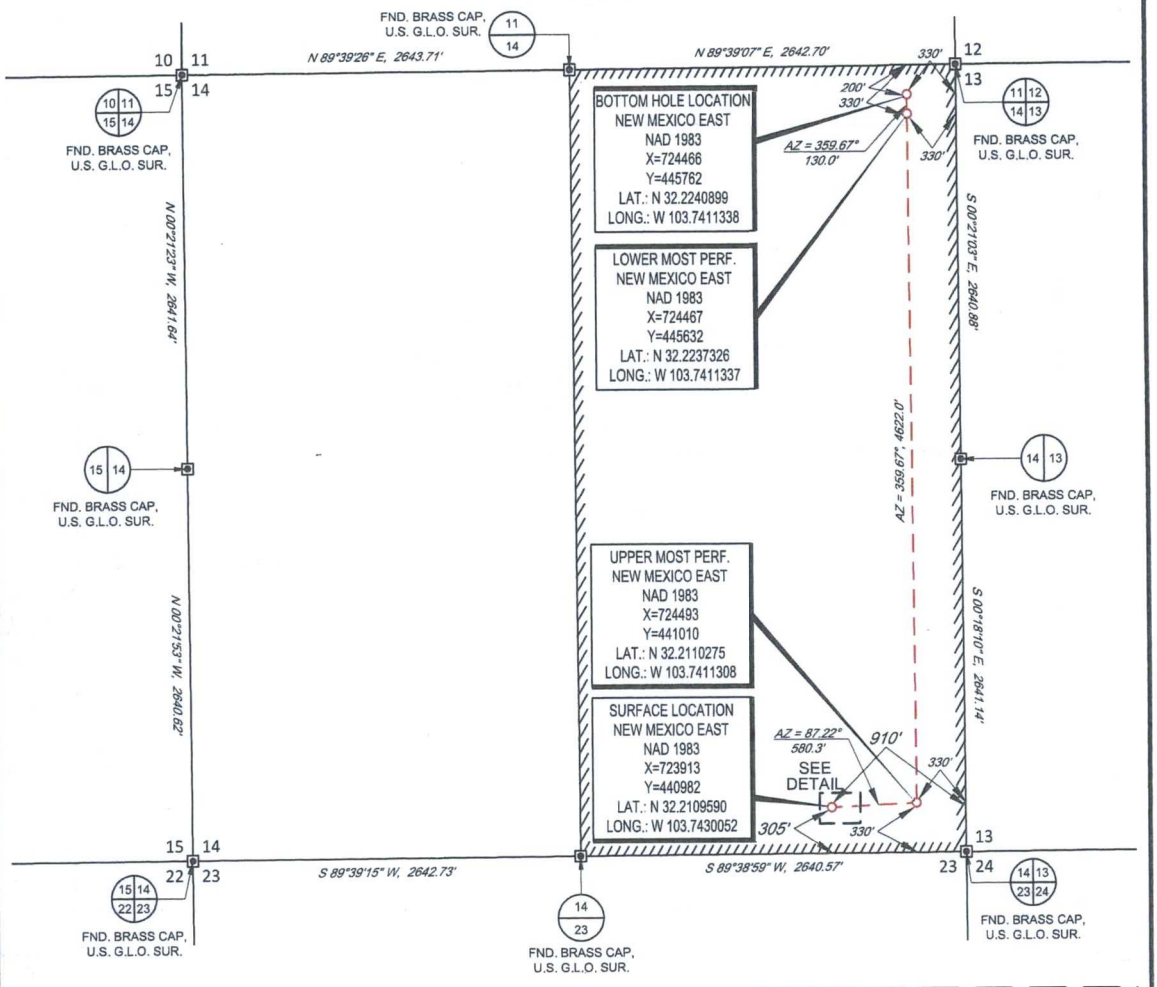
Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

	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	2640	FNL	990	FEL	24S	31E	14	Aliquot SENE	32.217395	-103.743266	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 111960	-8909	14849	12495
EXIT Leg #1	200	FNL	990	FEL	24S	31E	14	Aliquot NENE	32.224089	-103.743268	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 111960	-8909	17296	12495
BHL Leg #1	200	FNL	990	FEL	24S	31E	14	Aliquot NENE	32.224089	-103.743268	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 111960	-8909	17296	12495

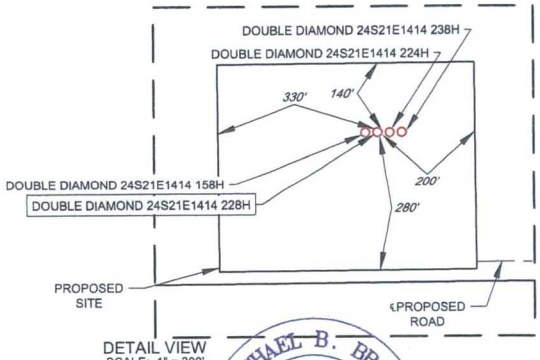
EXHIBIT 2A

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



SCALE: 1" = 2000'

0' 1000' 2000'



DETAIL VIEW
SCALE: 1" = 300'

LEASE NAME & WELL NO.: DOUBLE DIAMOND 24S21E1414 228H

SECTION 14 TWP 24-S RGE 31-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 305' FSL & 910' FEL

DISTANCE & DIRECTION
FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ±19.6 MILES, THENCE SOUTHWEST (RIGHT) ON BUCK JACKSON RD. ±1.1 MILES, THENCE SOUTHEAST, (LEFT) ON LEASE RD ±1.6 MILES, THENCE WEST ON PROPOSED RD ±215 FEET TO A POINT ±332 FEET SOUTHEAST OF THE LOCATION.

MICHAEL B. BROWN
NEW MEXICO
18329
PROFESSIONAL SURVEYOR

Michael B. Brown, P.S. No. 18329
JANUARY 26, 2018

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

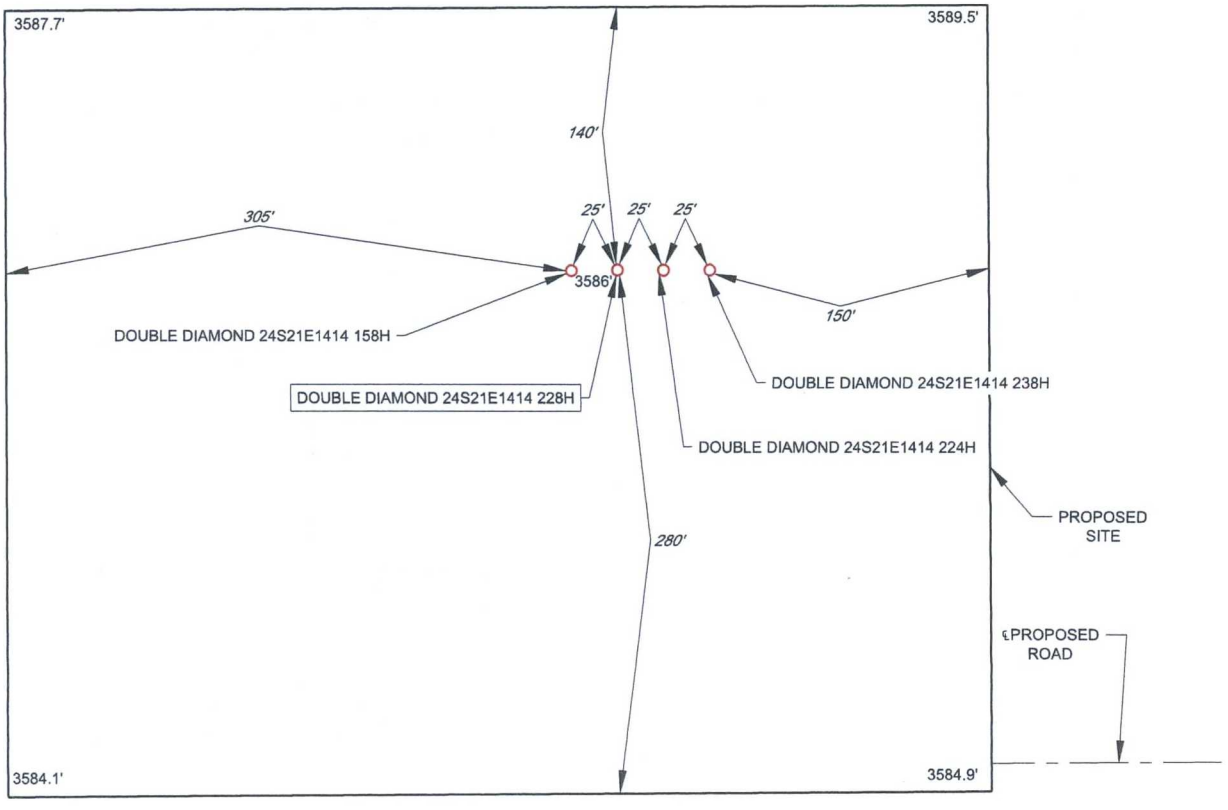
THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF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

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

EXHIBIT 2B

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: DOUBLE DIAMOND 24S21E1414 228H
228H LATITUDE N 32.2109590 228H LONGITUDE W 103.7430052

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

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

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

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ORIGINAL DOCUMENT SIZE: 8.5" X 11"

S:\SURVEY\TAPROCK\DOUBLE_DIAMOND_UNIT\FINAL_PRODUCTS\LO_DOUBLE_DIAMOND_24S21E1414_228H.DWG 1/26/2018 12:01:02 PM bgregory

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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. 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 nippled 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:

DD_224H_Choke_032918_20180330160507.pdf

BOP Diagram Attachment:

DD_224H_BOP_032918_20180330160611.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	1000	0	1000	3586		1000	HCP-110	54.5	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
2	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	4000	0	3995	3586		4000	P-110	29.7	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4700	0	4695	3586		4700	J-55	40	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51
4	PRODUCTION	6.125	5.5	NEW	API	Y	0	11936	0	11928			11936	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	11936	3995	11928			7936	P-110	29.7	OTHER - Flush	1.13	1.15	DRY	1.51	DRY	1.51
6	INTERMEDIATE	8.75	7.0	NEW	API	Y	11936	12636	11928	12466			700	P-110	29	OTHER - BTC	1.13	1.15	DRY	1.51	DRY	1.51

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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
7	PRODUCTION	6.125	4.5	NEW	API	Y	11936	17296	11928	12495			5360	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):

DD_224H_Casing_Design_Assumptions_20180213113958.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

DD_224H_7.625_BTC_Casing_Spec_20180213122214.PDF

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213122328.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213114053.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

DD_224H_7.625_P110_Casing_Spec_20180213122308.pdf

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213122319.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

DD_224H_5.5in_Casing_Spec_20180213122459.PDF

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213122518.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

Casing Attachments

Casing ID: 6 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

DD_224H_7_BTC_Casing_Spec_20180213122411.PDF

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213122426.pdf

Casing ID: 7 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

DD_224H_4.5_BTC_Casing_Spec_20180213122557.PDF

Casing Design Assumptions and Worksheet(s):

DD_224H_Casing_Design_Assumptions_20180213122616.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	1000	1000	1.38	14.8	1380	100	Class C	5% NaCl + LCM
SURFACE	Tail		0	1000	1000	1.38	14.8	1380	100	Class C	5% NaCl + LCM
INTERMEDIATE	Lead		0	4000	660	2.35	11.5	1551	35	TXI	Fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		0	4000	120	1.39	13.2	166	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Lead		0	4700	1300	1.81	13.5	2353	100	Class C	Bentonite + 1% CaCl2 + 8% NaCl + LCM

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Tail		0	4700	427	1.38	14.8	589	100	Class C	5% NaCl + LCM
PRODUCTION	Lead		0	11936	550	1.17	15.8	643	10	Class H	fluid loss + dispersant + retarder + LCM
PRODUCTION	Tail		0	11936	550	1.17	15.8	643	10	Class H	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Lead		4000	11936	660	2.35	11.5	1551	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		4000	11936	120	1.39	13.2	166	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Lead		11936	12636	660	2.35	11.5	1551	35	TXI	fluid loss + dispersant + retarder + LCM
INTERMEDIATE	Tail		11936	12636	120	1.39	13.2	166	35	TXI	fluid loss + dispersant + retarder + LCM
PRODUCTION	Lead		11936	17296	550	1.17	15.8	643	10	Class H	fluid loss + dispersant + retarder + LCM
PRODUCTION	Tail		11936	17296	550	1.17	15.8	643	10	Class H	fluid loss + dispersant + retarder + LCM

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions.

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

Circulating Medium Table

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

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
1000	4700	OTHER : Brine water	10	10							
0	1000	OTHER : Fresh water spud	8.3	8.3							
4700	13100	OTHER : Fresh water & cut brine	9	9							
13100	17736	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. Triple combo logs (density, porosity, resistivity, GR) will be run in the pilot hole. GR will be collected through the MWD tools from 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,MWD

Coring operation description for the well:

No core or drill stem test is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 8700 **Anticipated Surface Pressure:** 5951.1

Anticipated Bottom Hole Temperature(F): 180

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

DD_224H_H2S_Plan_20180213102951.pdf

APD ID: 10400027216 **Submission Date:** 02/13/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	---	3586	0	0	OTHER : Quaternary caliche	USEABLE WATER	No
2	RUSTLER ANHYDRITE	2855	731	731		NONE	No
3	SALADO	2519	1067	1067	SALT	NONE	No
4	BASE OF SALT	771	2815	2817		NONE	No
5	BELL CANYON	-1027	4613	4618	SANDSTONE	NATURAL GAS,CO2,OIL	No
6	BRUSHY CANYON	-3137	6723	6728	SANDSTONE	NATURAL GAS,CO2,OIL	No
7	BONE SPRING	-4857	8443	8448	LIMESTONE	NATURAL GAS,CO2,OIL	No
8	BONE SPRING 1ST	-5857	9443	9448	SANDSTONE	NATURAL GAS,CO2,OIL	No
9	BONE SPRING 2ND	-6497	10083	10088	SANDSTONE	NATURAL GAS,CO2,OIL	No
10	BONE SPRING 3RD	-7757	11343	11351	SANDSTONE	NATURAL GAS,CO2,OIL	No
11	WOLFCAMP	-8237	11823	11831	OTHER : A Carbonate	NATURAL GAS,CO2,OIL	No
12	WOLFCAMP	-8417	12003	12014	OTHER : A Fat Carbonate	NATURAL GAS,CO2,OIL	No
13	WOLFCAMP	-8909	12495	17296	OTHER : B1 Carbonate	NATURAL GAS,CO2,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

DD_224H_Horizontal_Drill_Plan_20180213135310.pdf

Other proposed operations facets description:

Deficiency Letter dated 3/29/18 requested:
1) Revised Choke/BOP to reflect 10M system - See revised attachments;
2) Multibowl wellhead will be used - See revised Speedhead Specs attachment

Addressed 3/31/18

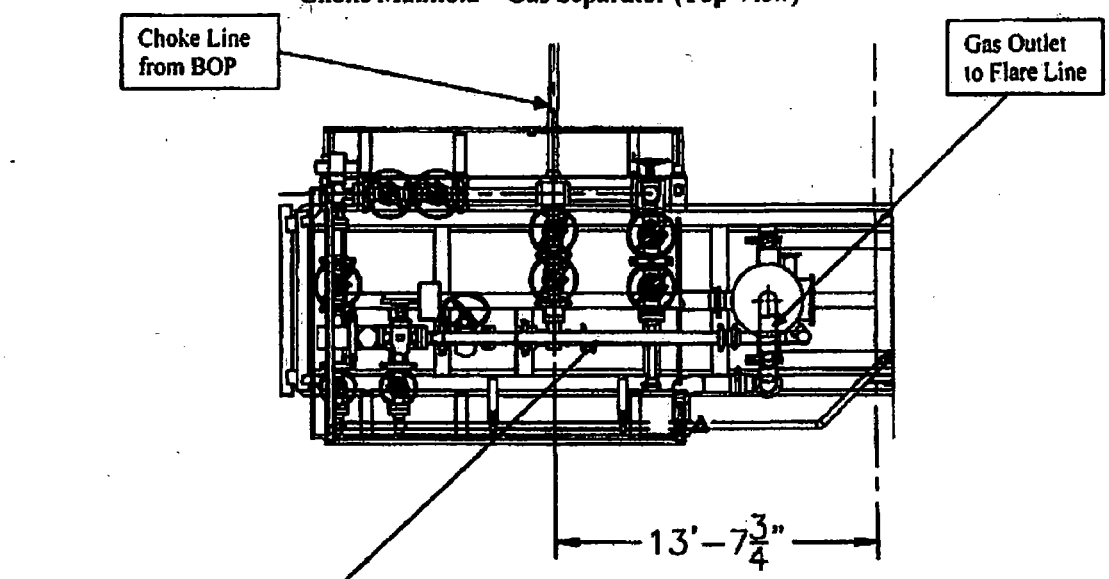
Other proposed operations facets attachment:

DD_224H_General_Drill_Plan_20180213124144.pdf

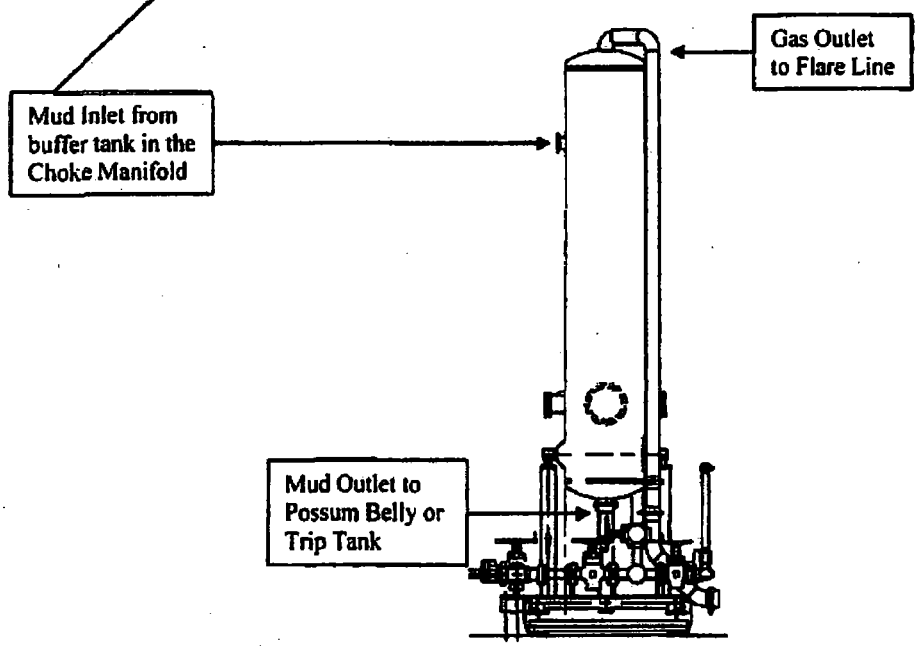
DD_224H_Speedhead_Specs_033018_20180330161031.pdf

Other Variance attachment:

Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)

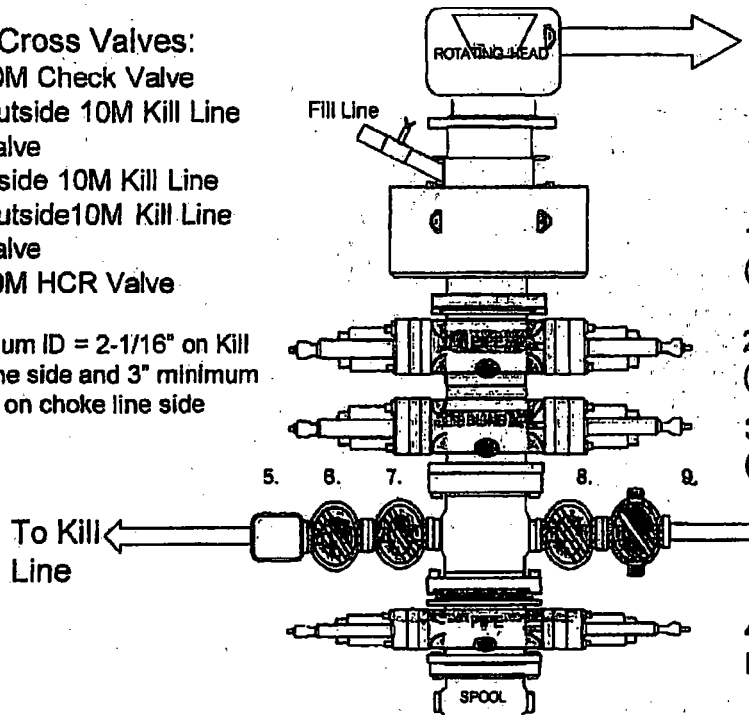


10,000 psi BOP Stack

Mud Cross Valves:

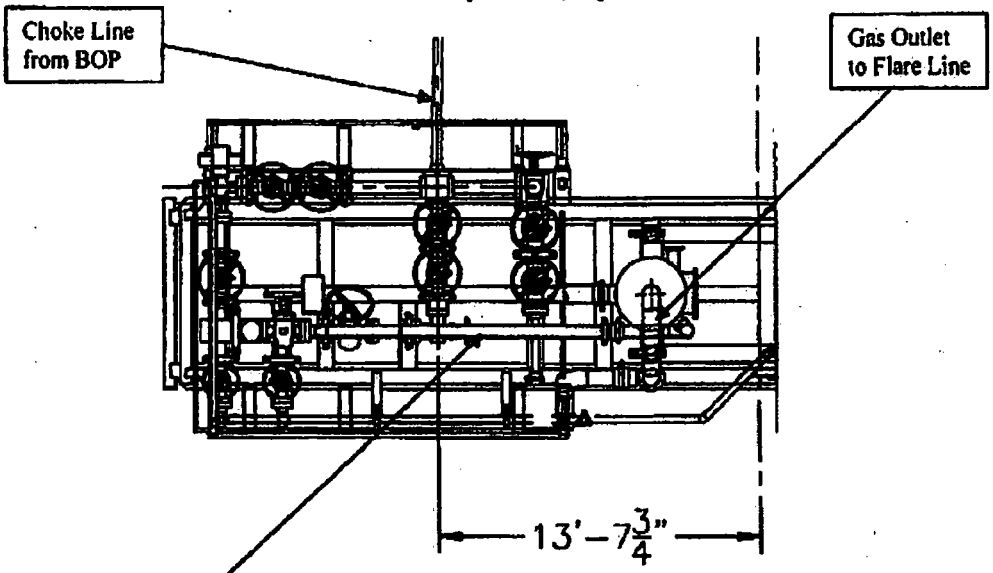
5. 10M Check Valve
6. Outside 10M Kill Line Valve
7. Inside 10M Kill Line
8. Outside10M Kill Line Valve
9. 10M HCR Valve

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

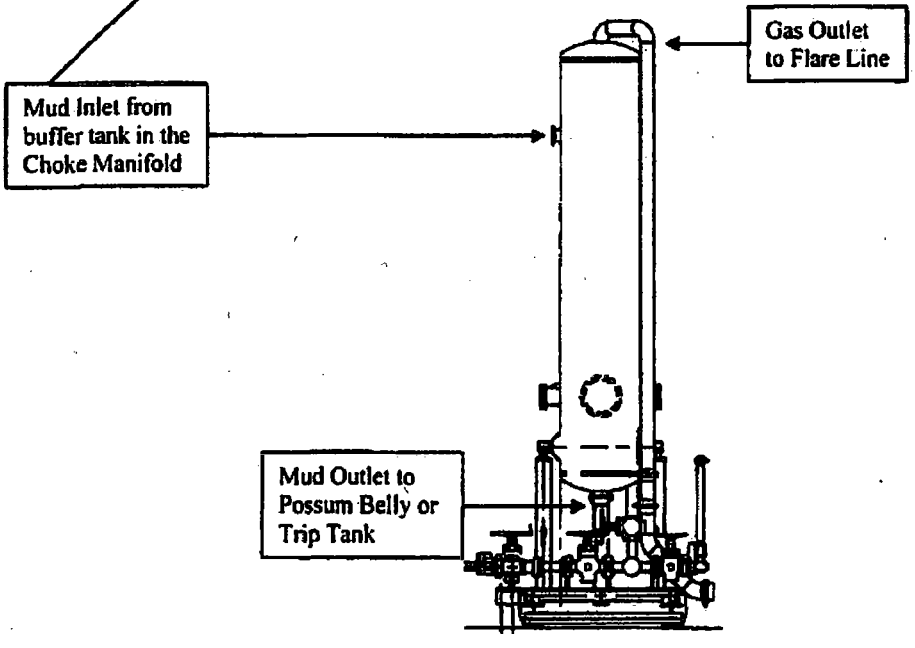


1. 10,000 psi Annular (13-5/8" ID)
2. 10,000 psi Upper Pipe Ram (13-5/8" ID)
3. 10,000 psi Blind Ram (13-5/8" ID)
4. 10,000 psi Lower Pipe Ram (13-5/8" ID)

Choke Manifold – Gas Separator (Top View)



Choke Manifold – Gas Separator (Side View)



Hydrostatic Test Certificate

ContiTech

Certificate Number	COM Order Reference	Customer Name & Address
938562	938562	HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No:	740043386	
Project:	HOW	

Test Center Address	Accepted by COM Inspection	Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Roger Suarez Date: 3/13/17	

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

Item	Part No.	Description	Qnty	Serial Number	Work. Press.	Test Press.	Test Time (minutes)
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	10,000 psi	15,000 psi	60
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	10,000 psi	15,000 psi	60
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56836	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

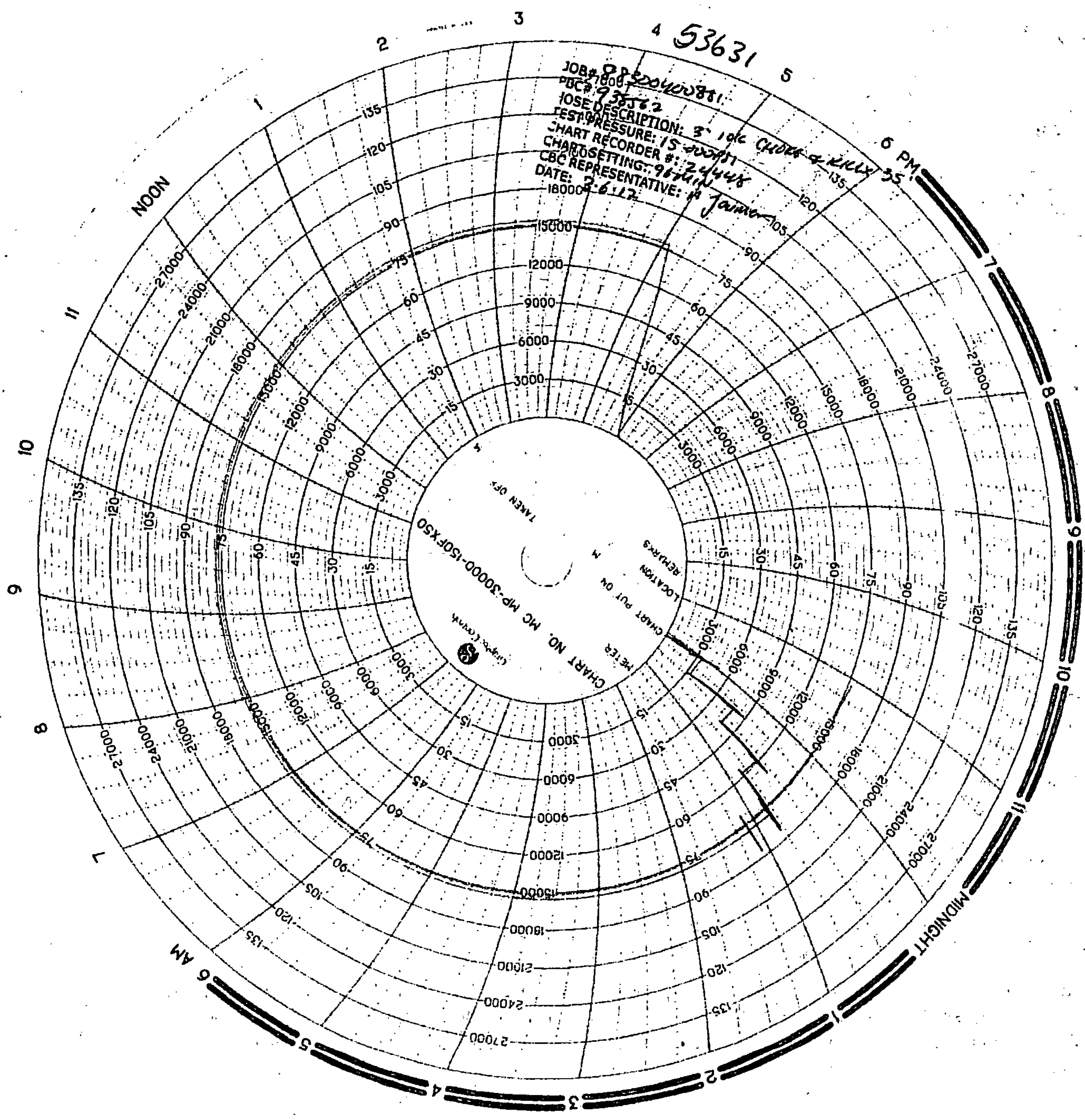
ContiTech

Certificate Number	COM Order Reference	Customer Name & Address
938562	938562	HELMERICH & PAYNE DRILLING CO 1434 SOUTH BOULDER AVE TULSA, OK 74119 USA
Customer Purchase Order No:	740043386	
Project: HOW		

Test Center Address	Accepted by COM Inspection	Accepted by Client Inspection
ContiTech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Roger Suarez Date: 3/13/17	

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	Qnty	Serial Number	Specifications
20		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	53631	ContiTech Standard
30		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	54500	ContiTech Standard
40		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56838	ContiTech Standard
50		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	56489	ContiTech Standard
60		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	61475	ContiTech Standard
80		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60197	ContiTech Standard
90		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	39474	ContiTech Standard
100		RECERTIFICATION - 3" ID 10K Choke and Kill Hose x 35 ft OAL	1	60887	ContiTech Standard



53631
JOB#
PBC#
HOSE DESCRIPTION:
TEST PRESSURE:
CHART RECORDER #:
CHART SETTING:
CBC REPRESENTATIVE:
DATE: 2-6-12
CHART NO. MC MP-30000-1SDF-X50
METER
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF
NOON
6 PM
MIDNIGHT
6 AM

Hose Inspection Report

ContiTech Oil & Marine

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

Hose Manufacturer	Contitech Rubber Industrial

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'

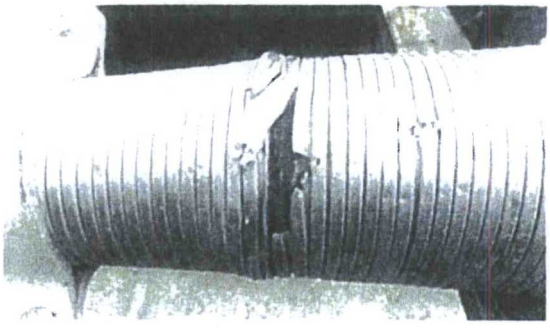
Conclusion: Hose #53631 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #53631 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #53631 is suitable for continued service.**

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)

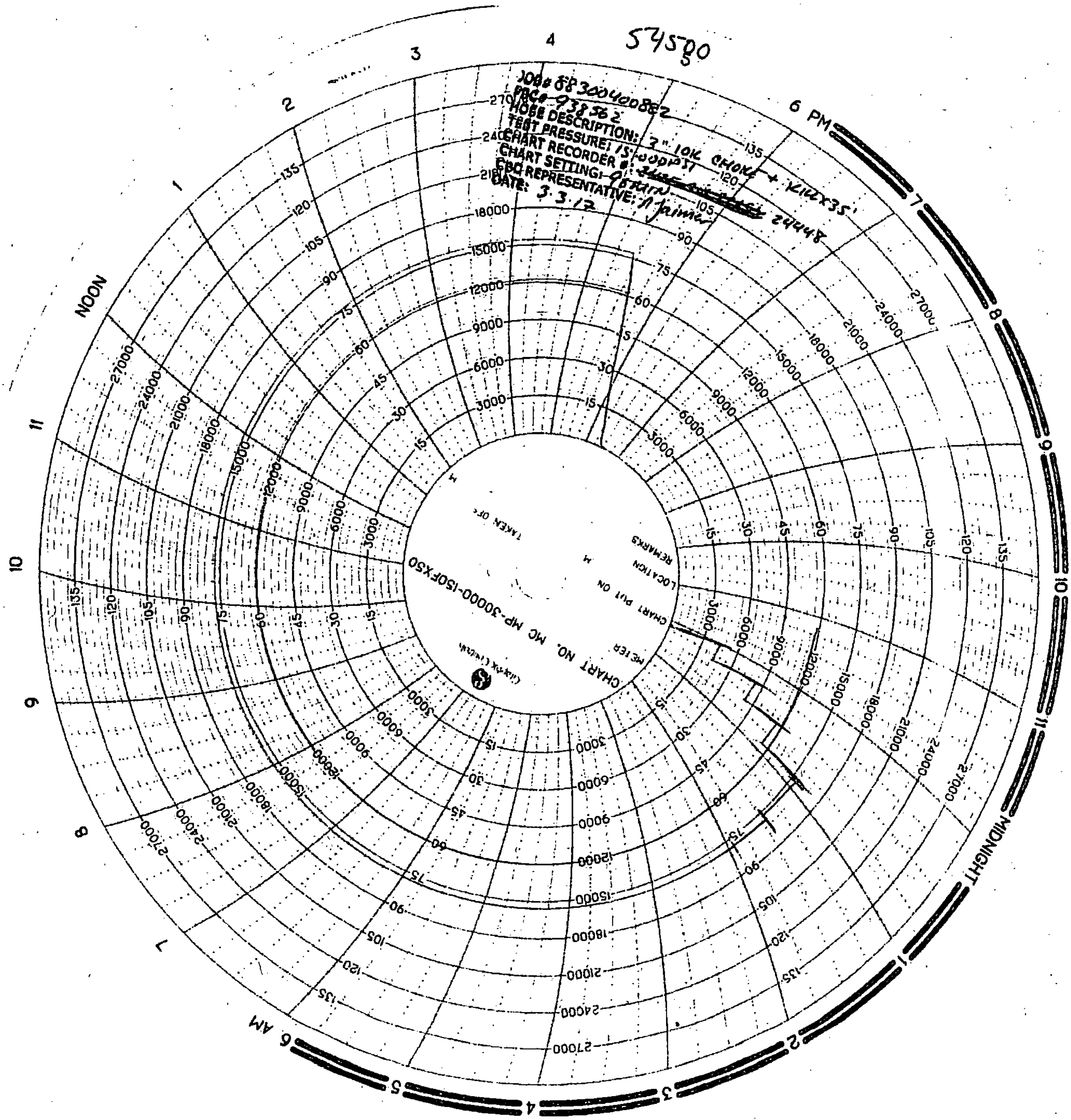
**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life,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


54580
JOB# 883004008E2
PRC# 938562
HOSE DESCRIPTION: 3" 10K CHOKE + KILL X35'
TEST PRESSURE: 15,000 PSI
CHART RECORDER #: 24448
CHART SETTING: 95 MIN
CBC REPRESENTATIVE: A Jaimes
DATE: 3.3.12
CHART NO. MC MP-30000-1SOFX50
METER
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF
NOON
6 PM
MIDNIGHT
6 AM

Hose Inspection Report

ContiTech Oil & Marine

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

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

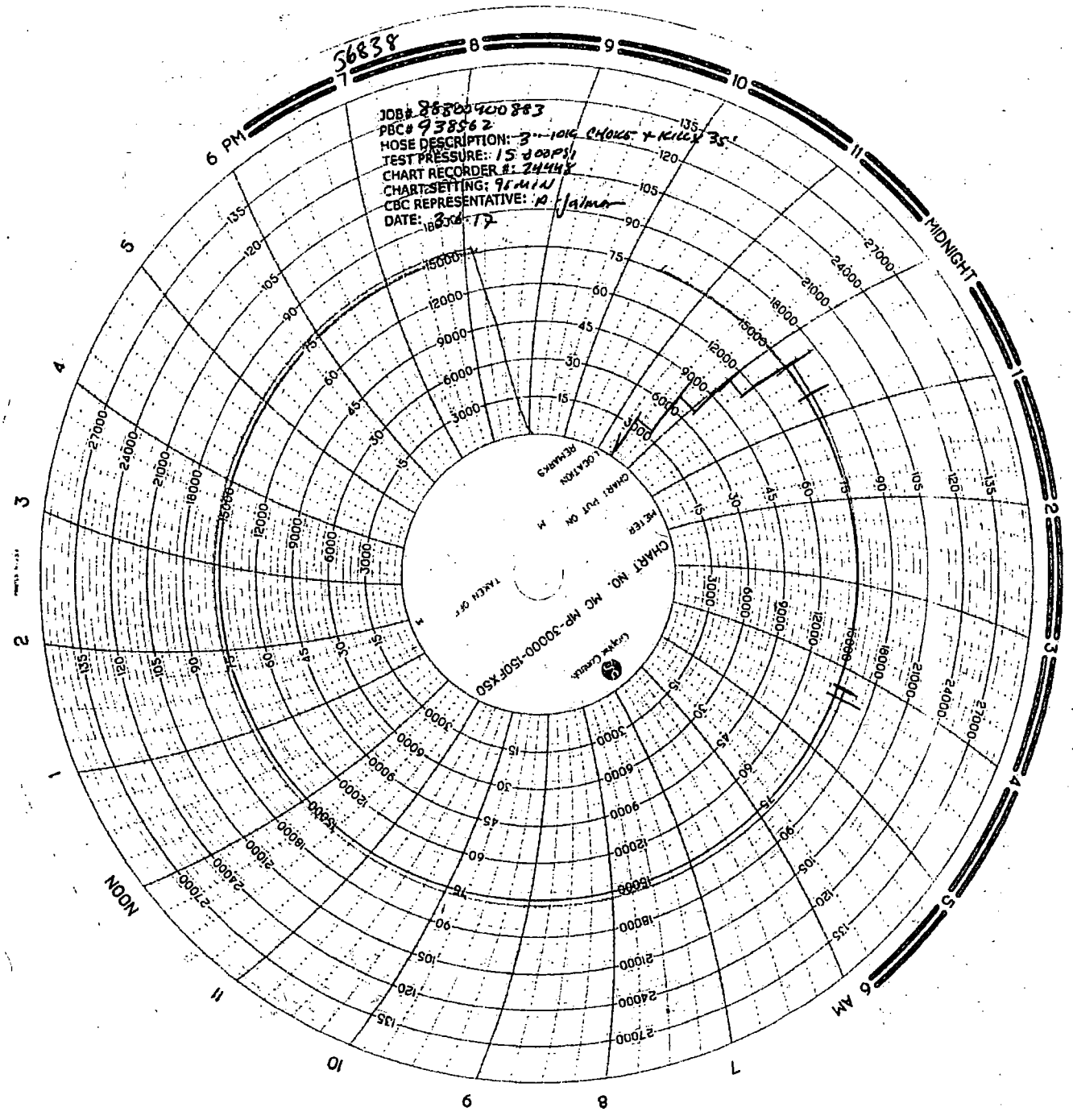
End A: 3.1/8" 5KPsi API Spec 6A Type 6BX Flange	**End B:** 3.1/8" 5Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	**Material:** Carbon Steel
Seal Face: BX155	**Seal Face:** BX155
Length Before Hydro Test: 35'	**Length After Hydro test:** 35'

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.


56838
JOB# 880094000883
PBC# 938562
HOSE DESCRIPTION: 3" 10K CHOKE & KILL 35'
TEST PRESSURE: 15,000PSI
CHART RECORDER #: 24448
CHART SETTING: 9 MIN
CBC REPRESENTATIVE: A. Jaime
DATE: 3-04-17
CHART NO. MC MP-30000-15QF-X50
MIDNIGHT
NOON
6 PM
6 AM

Hose Inspection Report

ContiTech Oil & Marine

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

Hose Manufacturer	Contitech Rubber Industrial

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.

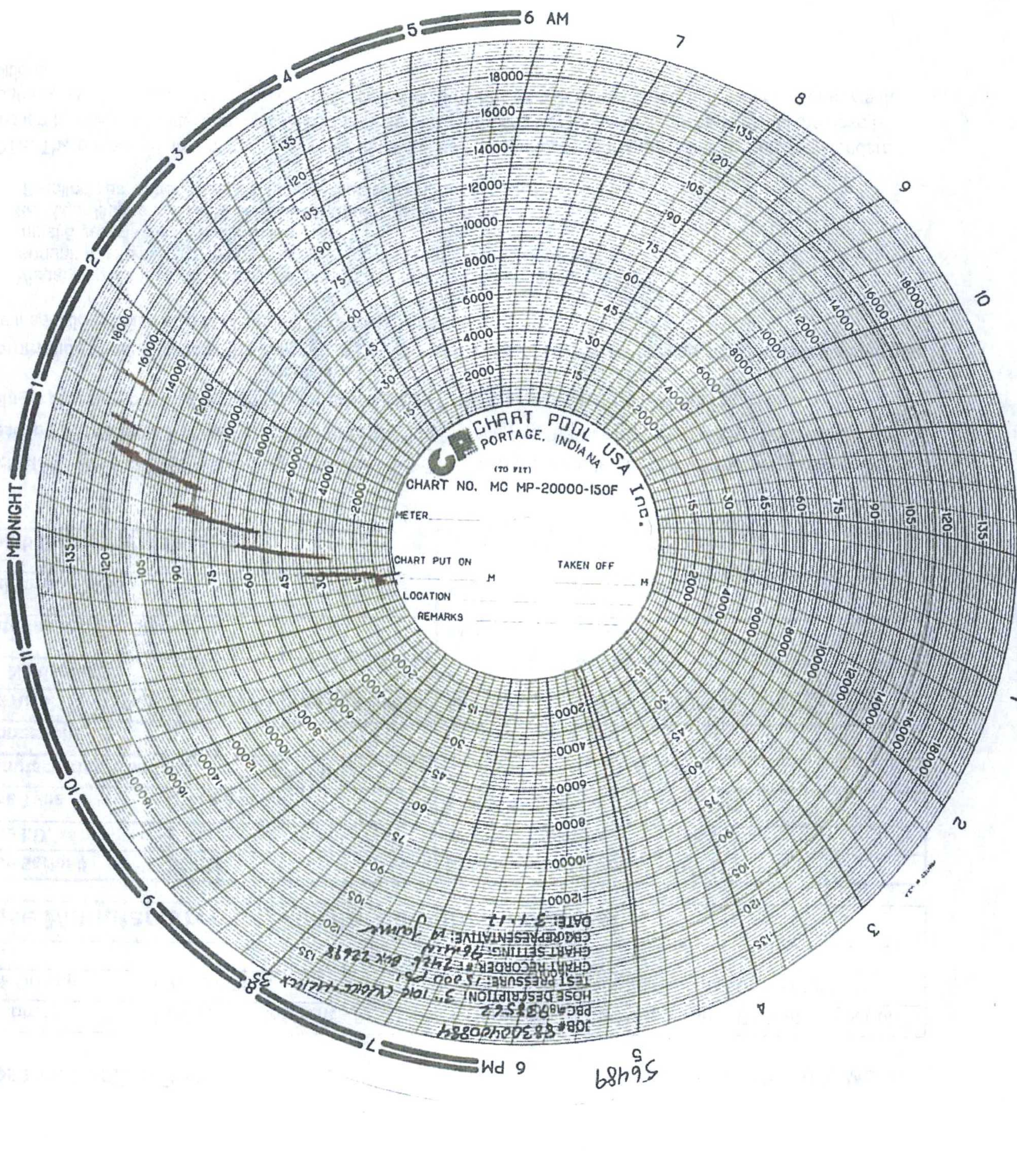


CHART POOL USA Inc.
PORTAGE, INDIANA
(TO FIT)
CHART NO. MC MP-20000-150F
METER
CHART PUT ON
TAKEN OFF
LOCATION
REMARKS
6 AM
NOON
6 PM
MIDNIGHT
JOB#
HOSE DESCRIPTION
TEST PRESSURE
CHART RECORDER #
CHART SETTING
CBG REPRESENTATIVE
DATE

56489

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

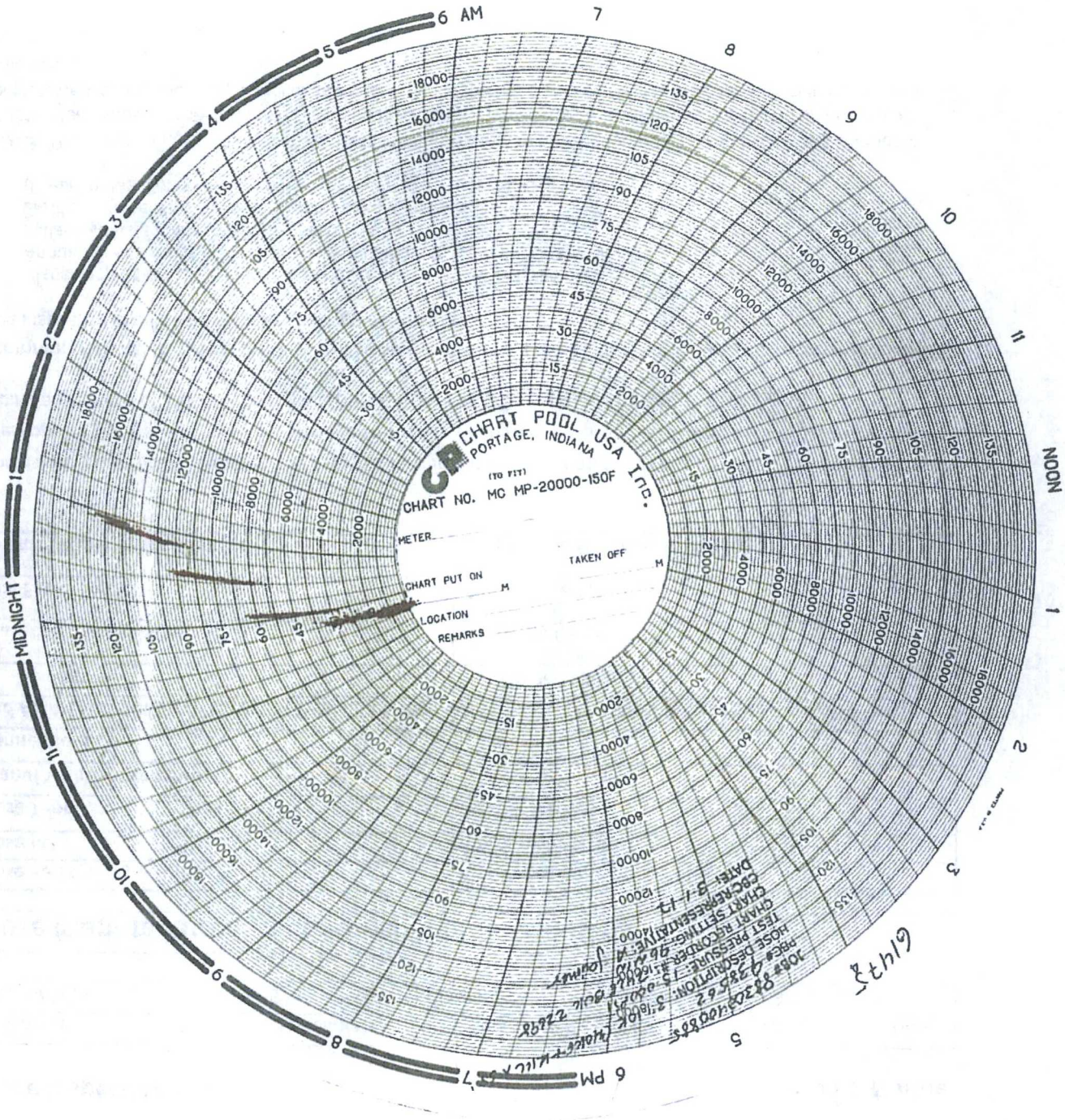
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	**End B:** 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	**Material:** Carbon Steel
Seal Face: BX155	**Seal Face:** BX155
Length Before Hydro Test: 35'	**Length After Hydro test:** 35'

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.


6 AM
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
CHART POOL USA Inc.
PORTAGE, INDIANA
(TO FIT)
CHART NO. MC MP-20000-150F
METER
TAKEN OFF
M
CHART PUT ON
M
LOCATION
REMARKS

Hose Inspection Report

ContiTech Oil & Marine

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

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

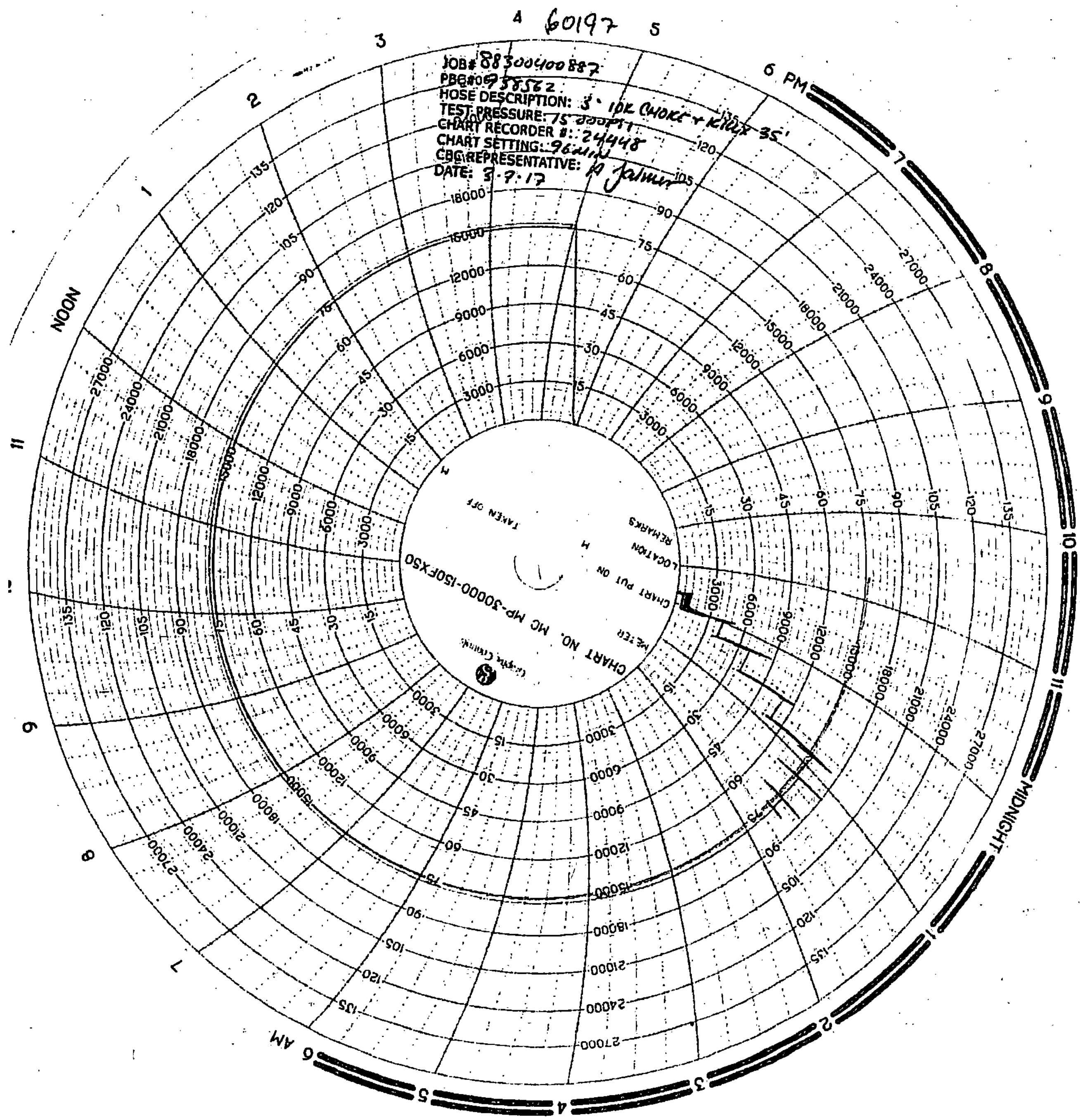
End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange	**End B:** 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange
• No damage	• No damage
Material: Carbon Steel	**Material:** Carbon Steel
Seal Face: BX155	**Seal Face:** BX155
Length Before Hydro Test: 35'	**Length After Hydro test:** 35'

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.



60197
JOB# 883004400887
HOSE DESCRIPTION: 3" 10K CHOKE + KILL 35'
CHART RECORDER #: 24448
CHART SETTING: 96MIN
CBG REPRESENTATIVE:
DATE: 3.7.17
6 PM
NOON
MIDNIGHT
6 AM
CHART NO. MC MP-30000-1SOFX50
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF
METER

Hose Inspection Report

ContiTech Oil & Marine

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

Hose Manufacturer	Contitech Rubber Industrial

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'

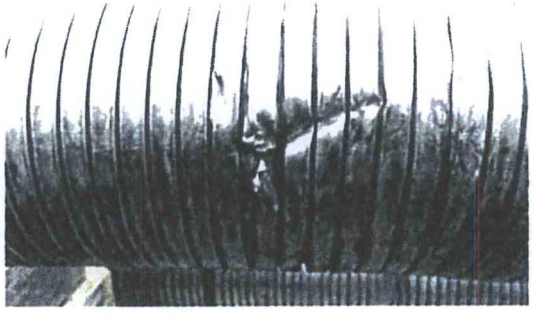
Conclusion: Hose #60197 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60197 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #60197 is suitable for continued service.**

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)

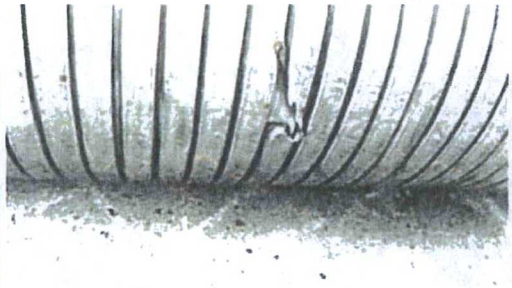
**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life,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

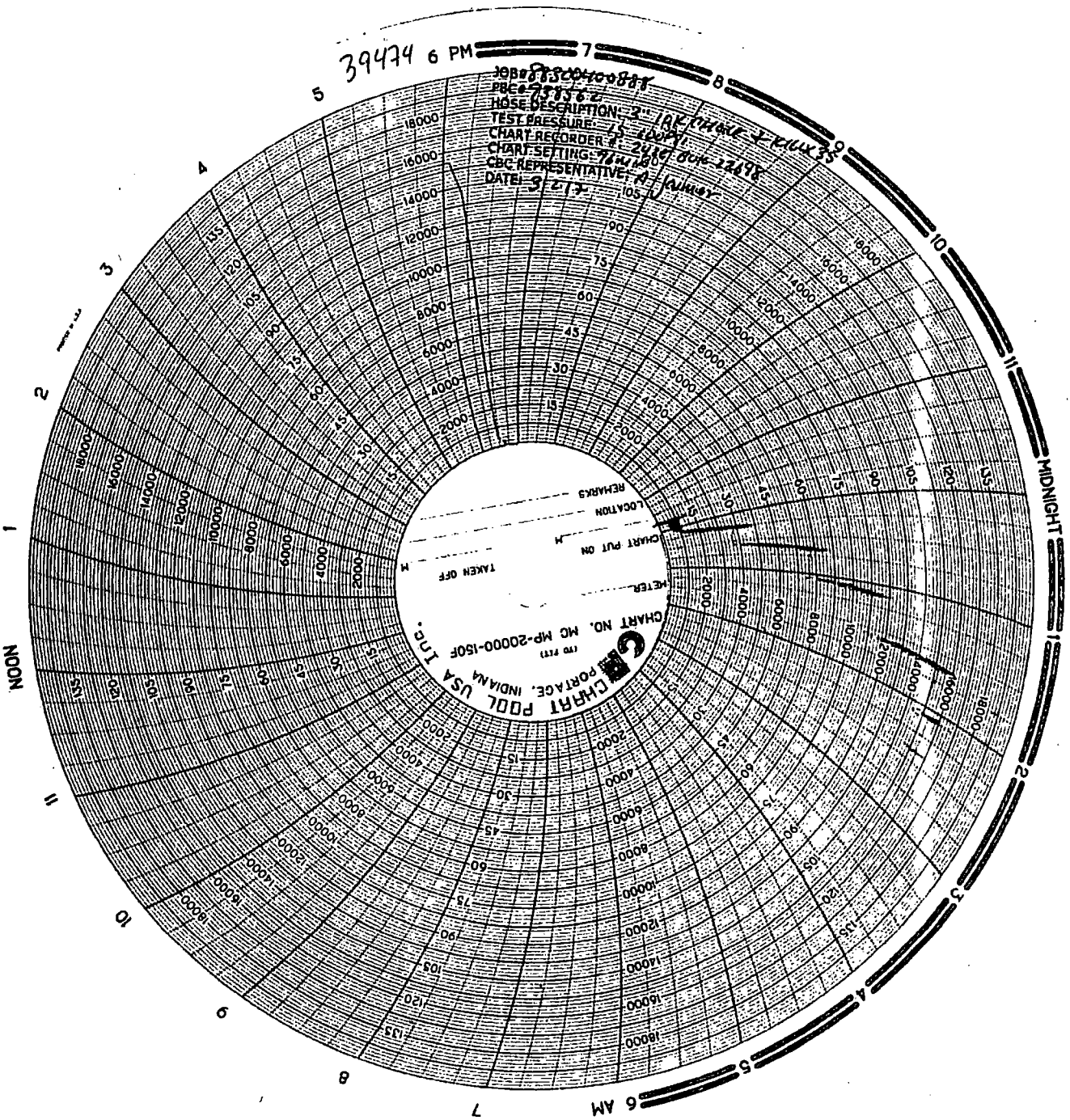
External Damage Post – Hydro test	
Approx. Distance from End A	6'
Width	1"
Length	1"
Depth	On armor
Notes	Crack on armor



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




39474
JOB
PBC
HOSE DESCRIPTION:
TEST PRESSURE:
CHART RECORDER #:
CHART SETTING:
CBC REPRESENTATIVE:
DATE:
CHART POOL USA Inc.
PORTAGE, INDIANA
CHART NO. MC MP-20000-150F
(To Fit)
METER
CHART PUT ON
M
LOCATION
REMARKS
TAKEN OFF
M
NOON
MIDNIGHT
6 PM
6 AM

Hose Inspection Report

ContiTech Oil & Marine

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

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'

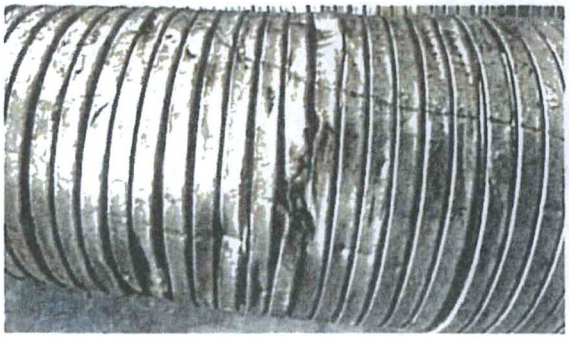
Conclusion: Hose #39474 passed the external inspection with minor damage to the hose armor. Internal borescope showed no damage to the liner. Hose #39474 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #39474 is suitable for continued service.**

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)

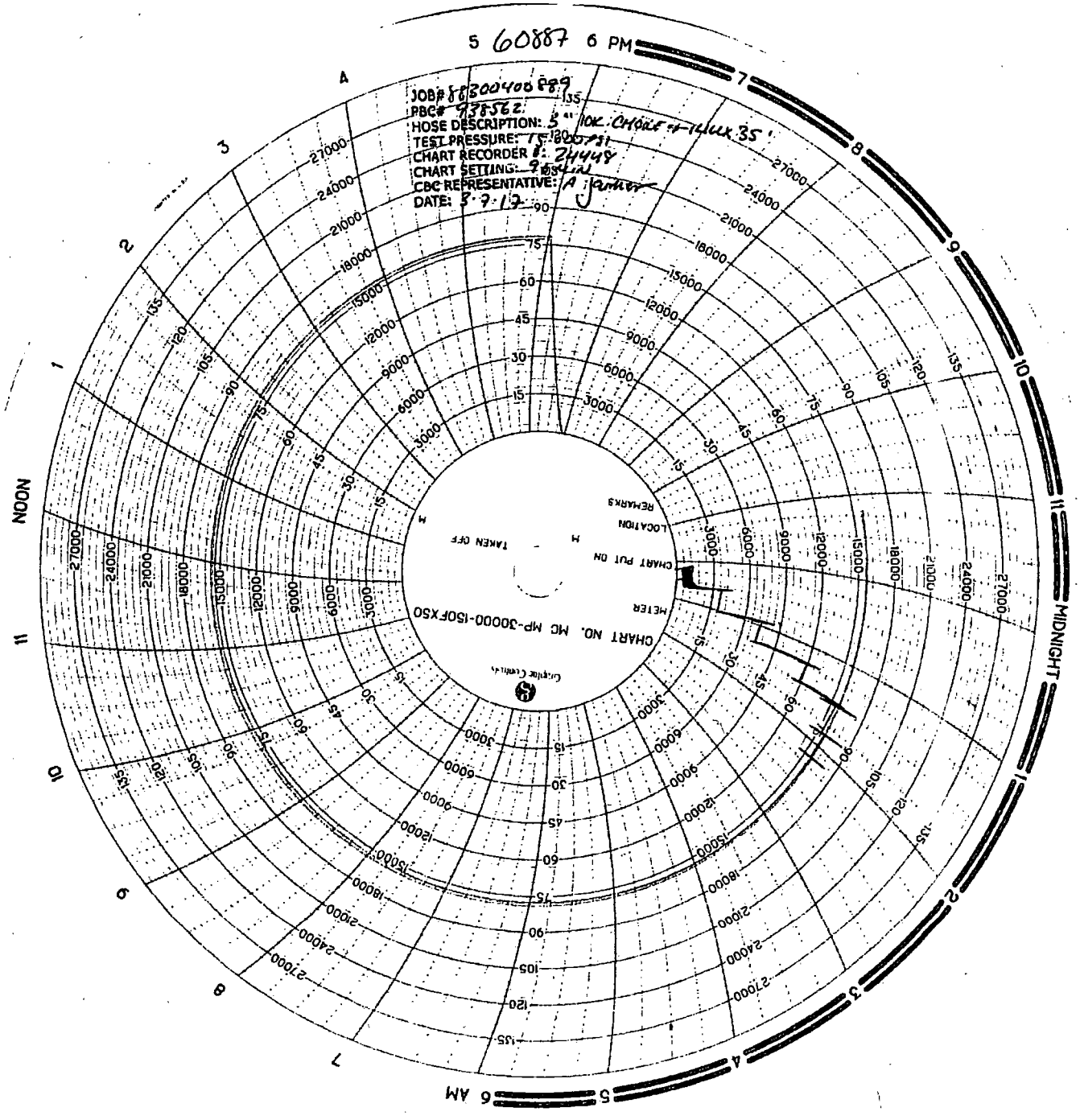
**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life,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



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

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


5 60887 6 PM
JOB# 18300400889
PBC# 938562
HOSE DESCRIPTION: 3" 10K CHOKE W-14MX 35'
TEST PRESSURE: 15,000 PSI
CHART RECORDER #: 2H448
CHART SETTING: 90 MIN
CBC REPRESENTATIVE: A Jones
DATE: 5-7-17
CHART NO. MC MP-30000-150FX50
METER
CHART PUT ON
LOCATION
REMARKS
TAKEN OFF
NOON
MIDNIGHT
6 AM

Hose Inspection Report

ContiTech Oil & Marine

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

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'

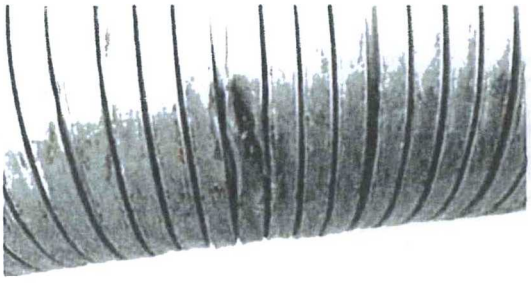
Conclusion: Hose #60887 passed the external inspection with minimal damage to the hose armor. Internal borescope showed no damage to the liner. Hose #60887 passed the hydrostatic pressure test by holding a pressure of 15,000PSI for 60 minutes. **Hose #60887 is suitable for continued service.**

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)

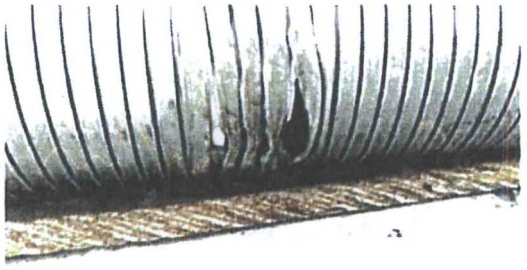
**NOTE: There are a number of critical elements in the hose that cannot be thoroughly checked through standard inspection techniques. Away from dissecting the hose body, the best way to evaluate the condition of the hose is through review of the operating conditions recorded during the hose service life,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



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



Tenaris

Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

Tenaris

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

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: **-** 2nd Band: **-** 3rd Band: **-**	1st Band: **White** 2nd Band: **-** 3rd Band: **-** 4th Band: **-**
		Type	**Casing**		

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

Tenaris

Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

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

TXP® BTC

SHARE EXPORT DATA PRINT

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

Clear Filters
Compare
Request Info

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

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

GEOMETRY

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

PERFORMANCE

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

MAKE-UP TORQUES

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

OPERATION LIMIT TORQUES

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

Casing Design Assumptions

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

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Hydrogen Sulfide Drilling

Operations Plan

Tap Rock Resources

1 H2S safety instructions to the following:

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

2 H2S Detection and Alarm Systems:

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

3 Windsocks and / Wind Streamers:

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

4 Condition Flags and Signs:

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

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

6 Communication:

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

7 Drilling Stem Testing:

- No DST cores are planned at this time

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

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

11 Emergency Contacts

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

TAP ROCK

SECTION 14, TOWNSHIP 24-S, RANGE 31-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
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

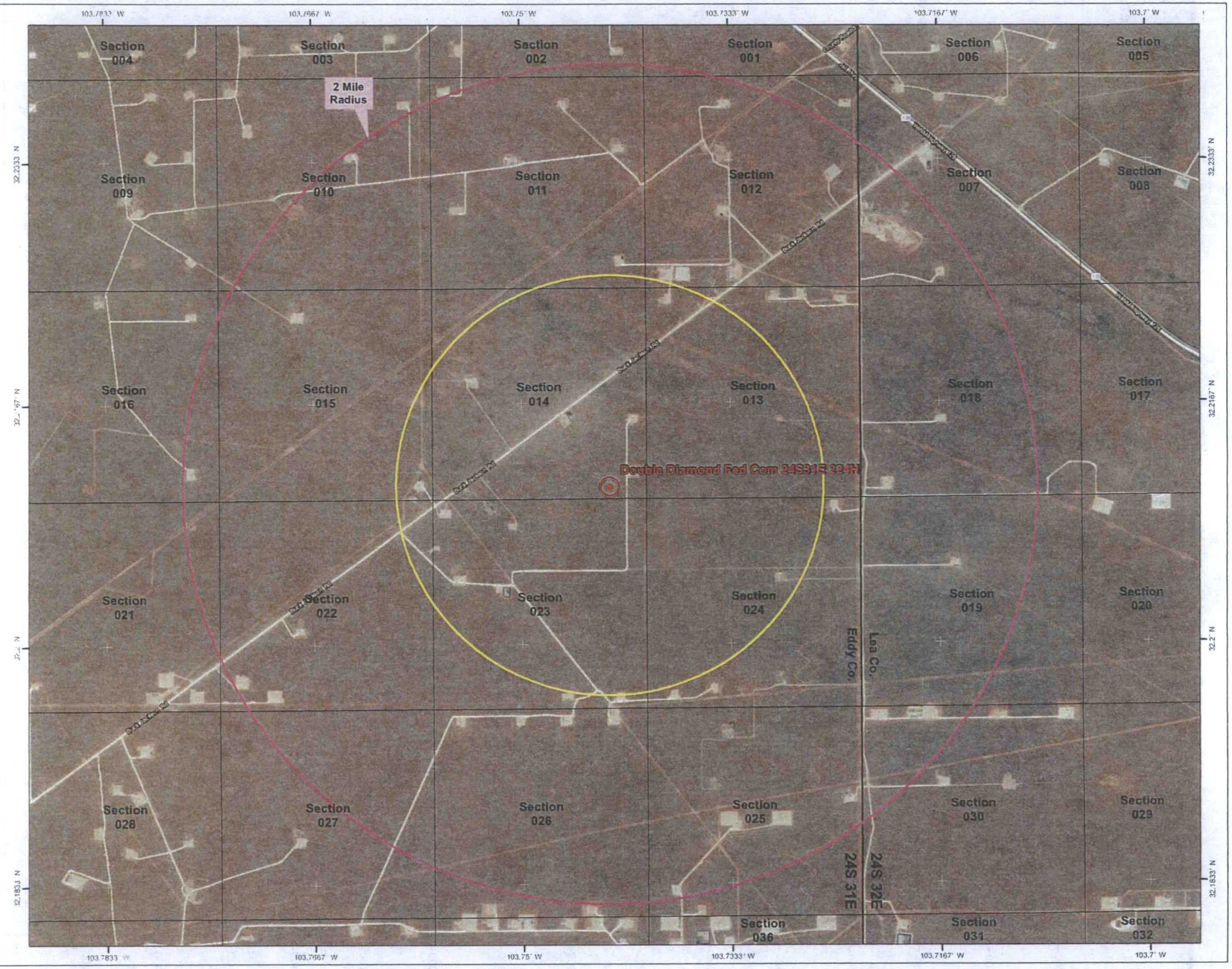
ORIGINAL DOCUMENT SIZE: 8.5" X 11"

S:\SURVEY\TAPROCK\DOUBLE_DIAMOND_UNIT\FINAL_PRODUCTS\LO_DOUBLE_DIAMOND_24S21E1414_238H.DWG 2/2/2018 3:56:34 PM ccaston

Taprock Operating LLC

Double Diamond Fed Com
24S31E #224H
H_2S Contingency Plan:
2 Mile Radius Map

Sec. 14, Township 24S, Range 31E
Eddy County, New Mexico



Surface Hole Location

1:27,000

0 0.25 0.5 1

Miles

N

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST, INC.

Prepared by Permits West, Inc., December 27, 2017
for Taprock Operating, LLC

Well: Double Diamond 24S 21E 1414 Well No. 224H
Site: Section 14-T24S-R31E
Project: Eddy County, New Mexico NAD83 NM east
Design: rev1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
3	1500.00	3.00	202.02	1499.86	-7.28	-2.94	1.00	-7.20	Begin 3.00° tangent
4	4400.00	3.00	202.02	4395.89	-147.98	-59.85	0.00	-146.27	Begin 1°/100' drop
5	4700.00	0.00	202.02	4695.75	-155.26	-62.79	1.00	-153.47	Begin vertical hold
6	10004.25	0.00	202.02	10000.00	-155.26	-62.79	0.00	-153.47	Begin 1.5°/100' build
7	10274.14	4.05	202.03	10269.67	-164.10	-66.37	1.50	-162.20	Begin 4.05° tangent
8	11537.96	4.05	202.03	11530.33	-246.81	-99.84	0.00	-243.95	Begin 1.5°/100' drop
9	11807.85	0.00	359.67	11800.00	-255.64	-103.41	1.50	-252.69	Begin vertical hold
10	11936.26	0.00	359.67	11928.41	-255.64	-103.41	0.00	-252.69	Begin 10°/100' build
11	12636.26	70.00	359.67	12466.81	121.35	-105.58	10.00	124.22	Begin 8°/100' build
12	12888.70	90.20	359.67	12510.00	368.74	-107.00	8.00	371.55	Begin 90.20° lateral
13	17296.07	90.20	359.67	12495.00	4776.01	-132.00	0.00	4777.83	PBHL/TD 17296.07 MD/12495.00 TVD

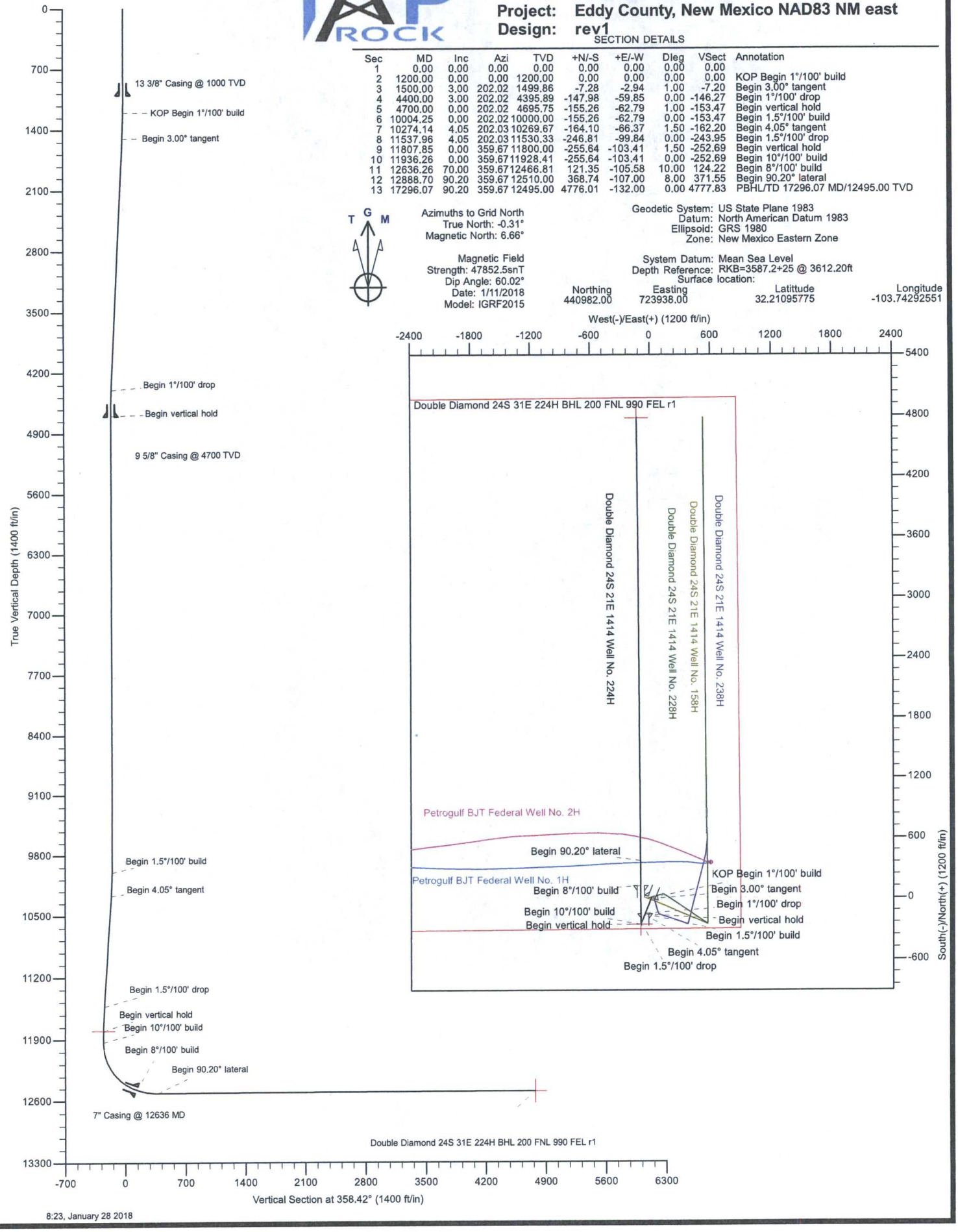
Azimuths to Grid North
True North: -0.31°
Magnetic North: 6.66°

Magnetic Field
Strength: 47852.5snT
Dip Angle: 60.02°
Date: 1/11/2018
Model: IGRF2015

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

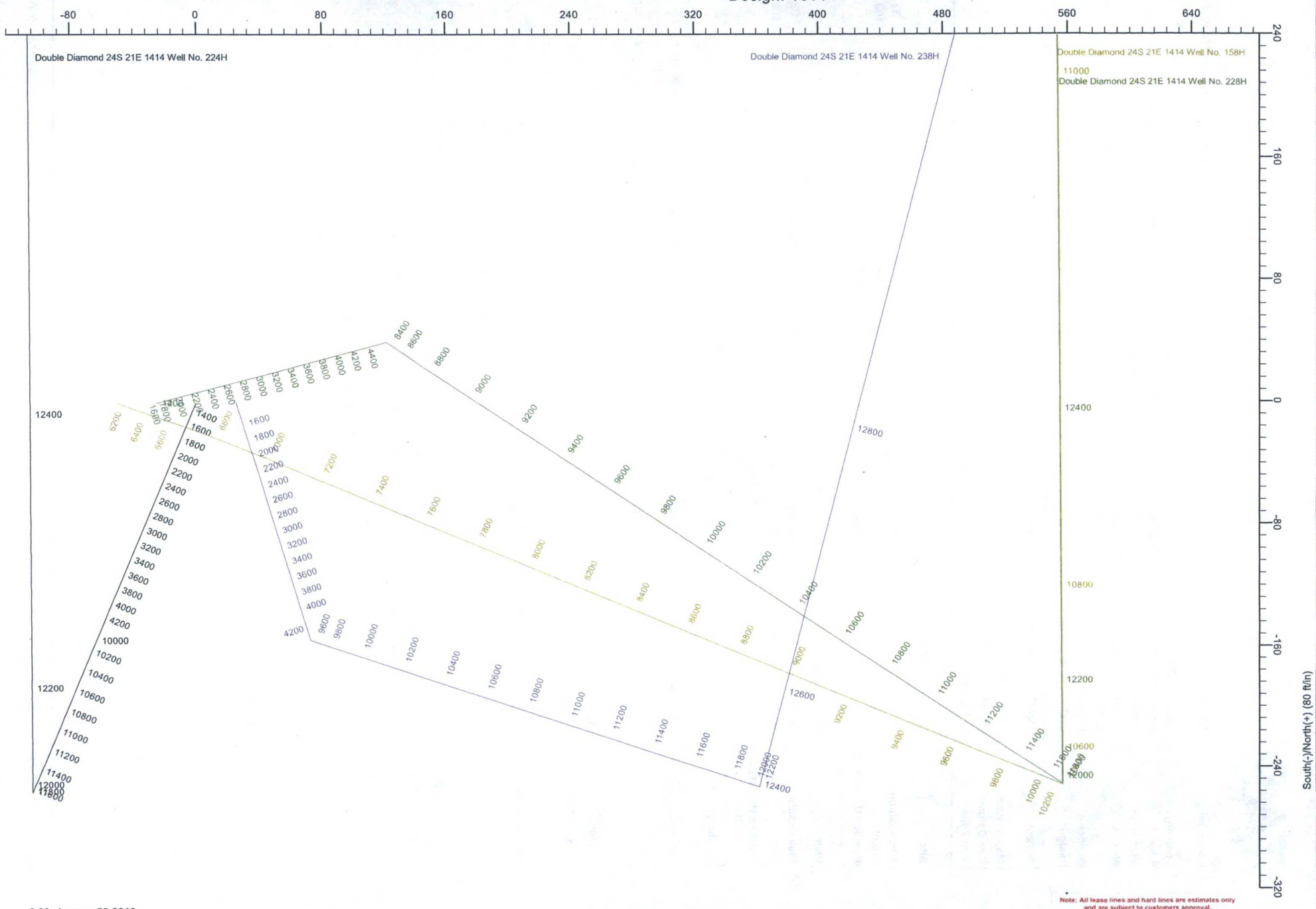
System Datum: Mean Sea Level
Depth Reference: RKB=3587.2+25 @ 3612.20ft
Surface location:

Northing	Easting	Latitude	Longitude
440982.00	723938.00	32.21095775	-103.74292551



8:23, January 28 2018

Project: Eddy County, New Mexico NAD83 NM east
Site: Section 14-T24S-R31E
Well: Double Diamond 24S 21E 1414 Well No. 224H
Wellbore: Original Hole
Design: rev1



8:20, January 28 2018

Note: All lease lines and hard lines are estimates only and are subject to customers approval.

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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

Site	Section 14-T24S-R31E				
Site Position:		**Northing:**	443,306.73 usft	**Latitude:**	32.21737448
From:	Map	**Easting:**	722,167.73 usft	**Longitude:**	-103.74860823
Position Uncertainty:	0.00 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.31 °

Well	Double Diamond 24S 21E 1414 Well No. 224H, Surf loc: 305 FSL 885 FEL Sec14-T24S-R31E					
Well Position	**+N/-S**	-2,324.73 ft	**Northing:**	440,982.00 usft	**Latitude:**	32.21095774
	+E/-W	1,770.27 ft	**Easting:**	723,938.00 usft	**Longitude:**	-103.74292552
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	3,587.20 ft

Wellbore	Original Hole				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2018	6.97	60.02	47,852.48129406

Design	rev1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	358.42	

Plan Survey Tool Program **Date** 1/28/2018

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	9,000.00	rev1 (Original Hole)	GYRO-NS OWSG Gyrocompass Gyro	
2	9,000.00	17,295.12	rev1 (Original Hole)	MWD OWSG MWD - Standard	

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
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Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	3.00	202.02	1,499.86	-7.28	-2.94	1.00	1.00	0.00	202.02	
4,400.00	3.00	202.02	4,395.89	-147.98	-59.85	0.00	0.00	0.00	0.00	
4,700.00	0.00	202.02	4,695.75	-155.26	-62.79	1.00	-1.00	0.00	180.00	
10,004.25	0.00	202.02	10,000.00	-155.26	-62.79	0.00	0.00	0.00	202.02	
10,274.14	4.05	202.03	10,269.67	-164.10	-66.37	1.50	1.50	0.00	202.03	
11,537.96	4.05	202.03	11,530.34	-246.81	-99.84	0.00	0.00	0.00	0.00	
11,807.85	0.00	359.67	11,800.00	-255.64	-103.41	1.50	-1.50	0.00	180.00	Double Diamond 24S
11,936.26	0.00	359.67	11,928.41	-255.64	-103.41	0.00	0.00	0.00	359.67	
12,636.26	70.00	359.67	12,466.81	121.35	-105.58	10.00	10.00	0.00	-0.33	
12,888.70	90.20	359.67	12,510.00	368.74	-107.00	8.00	8.00	0.00	0.01	
17,296.07	90.20	359.67	12,495.00	4,776.01	-132.00	0.00	0.00	0.00	0.00	Double Diamond 24S

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Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Begin 1°/100' build									
1,300.00	1.00	202.02	1,299.99	-0.81	-0.33	-0.80	1.00	1.00	0.00
1,400.00	2.00	202.02	1,399.96	-3.24	-1.31	-3.20	1.00	1.00	0.00
1,500.00	3.00	202.02	1,499.86	-7.28	-2.94	-7.20	1.00	1.00	0.00
Begin 3.00° tangent									
1,600.00	3.00	202.02	1,599.73	-12.13	-4.91	-11.99	0.00	0.00	0.00
1,700.00	3.00	202.02	1,699.59	-16.98	-6.87	-16.79	0.00	0.00	0.00
1,800.00	3.00	202.02	1,799.45	-21.83	-8.83	-21.58	0.00	0.00	0.00
1,900.00	3.00	202.02	1,899.31	-26.69	-10.79	-26.38	0.00	0.00	0.00
2,000.00	3.00	202.02	1,999.18	-31.54	-12.76	-31.17	0.00	0.00	0.00
2,100.00	3.00	202.02	2,099.04	-36.39	-14.72	-35.97	0.00	0.00	0.00
2,200.00	3.00	202.02	2,198.90	-41.24	-16.68	-40.77	0.00	0.00	0.00
2,300.00	3.00	202.02	2,298.77	-46.09	-18.64	-45.56	0.00	0.00	0.00
2,400.00	3.00	202.02	2,398.63	-50.95	-20.60	-50.36	0.00	0.00	0.00
2,500.00	3.00	202.02	2,498.49	-55.80	-22.57	-55.15	0.00	0.00	0.00
2,600.00	3.00	202.02	2,598.36	-60.65	-24.53	-59.95	0.00	0.00	0.00
2,700.00	3.00	202.02	2,698.22	-65.50	-26.49	-64.74	0.00	0.00	0.00
2,800.00	3.00	202.02	2,798.08	-70.35	-28.45	-69.54	0.00	0.00	0.00
2,900.00	3.00	202.02	2,897.94	-75.20	-30.42	-74.34	0.00	0.00	0.00
3,000.00	3.00	202.02	2,997.81	-80.06	-32.38	-79.13	0.00	0.00	0.00
3,100.00	3.00	202.02	3,097.67	-84.91	-34.34	-83.93	0.00	0.00	0.00
3,200.00	3.00	202.02	3,197.53	-89.76	-36.30	-88.72	0.00	0.00	0.00
3,300.00	3.00	202.02	3,297.40	-94.61	-38.26	-93.52	0.00	0.00	0.00
3,400.00	3.00	202.02	3,397.26	-99.46	-40.23	-98.31	0.00	0.00	0.00
3,500.00	3.00	202.02	3,497.12	-104.32	-42.19	-103.11	0.00	0.00	0.00
3,600.00	3.00	202.02	3,596.99	-109.17	-44.15	-107.91	0.00	0.00	0.00
3,700.00	3.00	202.02	3,696.85	-114.02	-46.11	-112.70	0.00	0.00	0.00
3,800.00	3.00	202.02	3,796.71	-118.87	-48.08	-117.50	0.00	0.00	0.00
3,900.00	3.00	202.02	3,896.57	-123.72	-50.04	-122.29	0.00	0.00	0.00
4,000.00	3.00	202.02	3,996.44	-128.57	-52.00	-127.09	0.00	0.00	0.00
4,100.00	3.00	202.02	4,096.30	-133.43	-53.96	-131.88	0.00	0.00	0.00
4,200.00	3.00	202.02	4,196.16	-138.28	-55.92	-136.68	0.00	0.00	0.00
4,300.00	3.00	202.02	4,296.03	-143.13	-57.89	-141.48	0.00	0.00	0.00
4,400.00	3.00	202.02	4,395.89	-147.98	-59.85	-146.27	0.00	0.00	0.00
Begin 1°/100' drop									
4,500.00	2.00	202.02	4,495.79	-152.03	-61.48	-150.27	1.00	-1.00	0.00
4,600.00	1.00	202.02	4,595.76	-154.45	-62.47	-152.67	1.00	-1.00	0.00
4,700.00	0.00	202.02	4,695.75	-155.26	-62.79	-153.47	1.00	-1.00	0.00
Begin vertical hold									

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,800.00	0.00	0.00	4,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
4,900.00	0.00	0.00	4,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,000.00	0.00	0.00	4,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,100.00	0.00	0.00	5,095.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,200.00	0.00	0.00	5,195.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,300.00	0.00	0.00	5,295.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,400.00	0.00	0.00	5,395.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,500.00	0.00	0.00	5,495.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,600.00	0.00	0.00	5,595.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,700.00	0.00	0.00	5,695.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,800.00	0.00	0.00	5,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
5,900.00	0.00	0.00	5,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,000.00	0.00	0.00	5,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,100.00	0.00	202.02	6,095.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,200.00	0.00	0.00	6,195.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,300.00	0.00	0.00	6,295.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,400.00	0.00	0.00	6,395.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,500.00	0.00	0.00	6,495.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,600.00	0.00	0.00	6,595.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,700.00	0.00	0.00	6,695.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,800.00	0.00	0.00	6,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
6,900.00	0.00	0.00	6,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,000.00	0.00	202.02	6,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,100.00	0.00	0.00	7,095.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,200.00	0.00	0.00	7,195.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,300.00	0.00	0.00	7,295.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,400.00	0.00	0.00	7,395.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,500.00	0.00	0.00	7,495.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,600.00	0.00	0.00	7,595.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,700.00	0.00	0.00	7,695.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,800.00	0.00	0.00	7,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
7,900.00	0.00	0.00	7,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,000.00	0.00	0.00	7,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,100.00	0.00	0.00	8,095.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,200.00	0.00	0.00	8,195.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,300.00	0.00	0.00	8,295.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,400.00	0.00	0.00	8,395.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,500.00	0.00	0.00	8,495.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,600.00	0.00	0.00	8,595.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,700.00	0.00	0.00	8,695.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,800.00	0.00	202.02	8,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
8,900.00	0.00	0.00	8,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,000.00	0.00	0.00	8,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,100.00	0.00	0.00	9,095.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,200.00	0.00	0.00	9,195.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,300.00	0.00	0.00	9,295.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,400.00	0.00	0.00	9,395.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,500.00	0.00	0.00	9,495.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,600.00	0.00	0.00	9,595.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,700.00	0.00	0.00	9,695.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,800.00	0.00	0.00	9,795.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
9,900.00	0.00	0.00	9,895.75	-155.26	-62.79	-153.47	0.00	0.00	0.00

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,000.00	0.00	0.00	9,995.75	-155.26	-62.79	-153.47	0.00	0.00	0.00
10,004.25	0.00	0.00	10,000.00	-155.26	-62.79	-153.47	0.00	0.00	0.00
Begin 1.5°/100' build									
10,100.00	1.44	202.03	10,095.74	-156.37	-63.24	-154.57	1.50	1.50	0.00
10,200.00	2.94	202.03	10,195.67	-159.91	-64.67	-158.06	1.50	1.50	0.00
10,274.14	4.05	202.03	10,269.67	-164.10	-66.37	-162.20	1.50	1.50	0.00
Begin 4.05° tangent									
10,300.00	4.05	202.03	10,295.46	-165.79	-67.05	-163.87	0.00	0.00	0.00
10,400.00	4.05	202.03	10,395.21	-172.33	-69.70	-170.34	0.00	0.00	0.00
10,500.00	4.05	202.03	10,494.96	-178.88	-72.35	-176.81	0.00	0.00	0.00
10,600.00	4.05	202.03	10,594.71	-185.42	-75.00	-183.28	0.00	0.00	0.00
10,700.00	4.05	202.03	10,694.46	-191.97	-77.65	-189.75	0.00	0.00	0.00
10,800.00	4.05	202.03	10,794.22	-198.51	-80.29	-196.22	0.00	0.00	0.00
10,900.00	4.05	202.03	10,893.97	-205.06	-82.94	-202.69	0.00	0.00	0.00
11,000.00	4.05	202.03	10,993.72	-211.60	-85.59	-209.15	0.00	0.00	0.00
11,100.00	4.05	202.03	11,093.47	-218.14	-88.24	-215.62	0.00	0.00	0.00
11,200.00	4.05	202.03	11,193.22	-224.69	-90.89	-222.09	0.00	0.00	0.00
11,300.00	4.05	202.03	11,292.97	-231.23	-93.53	-228.56	0.00	0.00	0.00
11,400.00	4.05	202.03	11,392.72	-237.78	-96.18	-235.03	0.00	0.00	0.00
11,500.00	4.05	202.03	11,492.47	-244.32	-98.83	-241.50	0.00	0.00	0.00
11,537.96	4.05	202.03	11,530.34	-246.81	-99.84	-243.95	0.00	0.00	0.00
Begin 1.5°/100' drop									
11,600.00	3.12	202.03	11,592.25	-250.40	-101.29	-247.51	1.50	-1.50	0.00
11,700.00	1.62	202.03	11,692.16	-254.23	-102.84	-251.29	1.50	-1.50	0.00
11,800.00	0.12	202.03	11,792.15	-255.63	-103.41	-252.68	1.50	-1.50	0.00
11,807.85	0.00	359.67	11,800.00	-255.64	-103.41	-252.69	1.50	-1.50	0.00
Begin vertical hold									
11,900.00	0.00	0.00	11,892.15	-255.64	-103.41	-252.69	0.00	0.00	0.00
11,936.26	0.00	0.00	11,928.41	-255.64	-103.41	-252.69	0.00	0.00	0.00
Begin 10°/100' build									
12,000.00	6.37	359.67	11,992.02	-252.10	-103.43	-249.15	10.00	10.00	0.00
12,100.00	16.37	359.67	12,089.93	-232.40	-103.54	-229.45	10.00	10.00	0.00
12,200.00	26.37	359.67	12,182.93	-196.00	-103.75	-193.06	10.00	10.00	0.00
12,300.00	36.37	359.67	12,268.20	-144.01	-104.05	-141.08	10.00	10.00	0.00
12,400.00	46.37	359.67	12,343.15	-78.00	-104.43	-75.08	10.00	10.00	0.00
12,500.00	56.37	359.67	12,405.49	0.03	-104.88	2.92	10.00	10.00	0.00
12,600.00	66.37	359.67	12,453.34	87.69	-105.39	90.57	10.00	10.00	0.00
12,636.26	70.00	359.67	12,466.81	121.35	-105.58	124.22	10.00	10.00	0.00
Begin 8°/100' build									
12,700.00	75.10	359.67	12,485.92	182.13	-105.93	184.99	8.00	8.00	0.00
12,800.00	83.10	359.67	12,504.82	280.25	-106.49	283.08	8.00	8.00	0.00
12,888.70	90.20	359.67	12,510.00	368.74	-107.00	371.55	8.00	8.00	0.00
Begin 90.20° lateral									
12,900.00	90.20	359.67	12,509.96	380.04	-107.06	382.85	0.00	0.00	0.00
13,000.00	90.20	359.67	12,509.62	480.03	-107.63	482.82	0.00	0.00	0.00
13,100.00	90.20	359.67	12,509.28	580.03	-108.19	582.80	0.00	0.00	0.00
13,200.00	90.20	359.67	12,508.94	680.03	-108.76	682.78	0.00	0.00	0.00
13,300.00	90.20	359.67	12,508.60	780.03	-109.33	782.75	0.00	0.00	0.00
13,400.00	90.20	359.67	12,508.26	880.03	-109.90	882.73	0.00	0.00	0.00
13,500.00	90.20	359.67	12,507.92	980.02	-110.46	982.70	0.00	0.00	0.00
13,600.00	90.20	359.67	12,507.58	1,080.02	-111.03	1,082.68	0.00	0.00	0.00
13,700.00	90.20	359.67	12,507.24	1,180.02	-111.60	1,182.65	0.00	0.00	0.00

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,800.00	90.20	359.67	12,506.90	1,280.02	-112.17	1,282.63	0.00	0.00	0.00
13,900.00	90.20	359.67	12,506.56	1,380.01	-112.73	1,382.60	0.00	0.00	0.00
14,000.00	90.20	359.67	12,506.22	1,480.01	-113.30	1,482.58	0.00	0.00	0.00
14,100.00	90.20	359.67	12,505.88	1,580.01	-113.87	1,582.55	0.00	0.00	0.00
14,200.00	90.20	359.67	12,505.54	1,680.01	-114.43	1,682.53	0.00	0.00	0.00
14,300.00	90.20	359.67	12,505.20	1,780.01	-115.00	1,782.50	0.00	0.00	0.00
14,400.00	90.20	359.67	12,504.86	1,880.00	-115.57	1,882.48	0.00	0.00	0.00
14,500.00	90.20	359.67	12,504.52	1,980.00	-116.14	1,982.45	0.00	0.00	0.00
14,600.00	90.20	359.67	12,504.18	2,080.00	-116.70	2,082.43	0.00	0.00	0.00
14,700.00	90.20	359.67	12,503.84	2,180.00	-117.27	2,182.41	0.00	0.00	0.00
14,800.00	90.20	359.67	12,503.50	2,280.00	-117.84	2,282.38	0.00	0.00	0.00
14,900.00	90.20	359.67	12,503.16	2,379.99	-118.41	2,382.36	0.00	0.00	0.00
15,000.00	90.20	359.67	12,502.82	2,479.99	-118.97	2,482.33	0.00	0.00	0.00
15,100.00	90.20	359.67	12,502.48	2,579.99	-119.54	2,582.31	0.00	0.00	0.00
15,200.00	90.20	359.67	12,502.13	2,679.99	-120.11	2,682.28	0.00	0.00	0.00
15,300.00	90.20	359.67	12,501.79	2,779.98	-120.68	2,782.26	0.00	0.00	0.00
15,400.00	90.20	359.67	12,501.45	2,879.98	-121.24	2,882.23	0.00	0.00	0.00
15,500.00	90.20	359.67	12,501.11	2,979.98	-121.81	2,982.21	0.00	0.00	0.00
15,600.00	90.20	359.67	12,500.77	3,079.98	-122.38	3,082.18	0.00	0.00	0.00
15,700.00	90.20	359.67	12,500.43	3,179.98	-122.95	3,182.16	0.00	0.00	0.00
15,800.00	90.20	359.67	12,500.09	3,279.97	-123.51	3,282.13	0.00	0.00	0.00
15,900.00	90.20	359.67	12,499.75	3,379.97	-124.08	3,382.11	0.00	0.00	0.00
16,000.00	90.20	359.67	12,499.41	3,479.97	-124.65	3,482.08	0.00	0.00	0.00
16,100.00	90.20	359.67	12,499.07	3,579.97	-125.21	3,582.06	0.00	0.00	0.00
16,200.00	90.20	359.67	12,498.73	3,679.96	-125.78	3,682.03	0.00	0.00	0.00
16,300.00	90.20	359.67	12,498.39	3,779.96	-126.35	3,782.01	0.00	0.00	0.00
16,400.00	90.20	359.67	12,498.05	3,879.96	-126.92	3,881.99	0.00	0.00	0.00
16,500.00	90.20	359.67	12,497.71	3,979.96	-127.48	3,981.96	0.00	0.00	0.00
16,600.00	90.20	359.67	12,497.37	4,079.96	-128.05	4,081.94	0.00	0.00	0.00
16,700.00	90.20	359.67	12,497.03	4,179.95	-128.62	4,181.91	0.00	0.00	0.00
16,800.00	90.20	359.67	12,496.69	4,279.95	-129.19	4,281.89	0.00	0.00	0.00
16,900.00	90.20	359.67	12,496.35	4,379.95	-129.75	4,381.86	0.00	0.00	0.00
17,000.00	90.20	359.67	12,496.01	4,479.95	-130.32	4,481.84	0.00	0.00	0.00
17,100.00	90.20	359.67	12,495.67	4,579.94	-130.89	4,581.81	0.00	0.00	0.00
17,200.00	90.20	359.67	12,495.33	4,679.94	-131.46	4,681.79	0.00	0.00	0.00
17,296.07	90.20	359.67	12,495.00	4,776.01	-132.00	4,777.83	0.00	0.00	0.00

PBHL/TD 17296.07 MD/12495.00 TVD

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Double Diamond 24S 31 - plan hits target center - Point	0.00	0.00	11,800.00	-255.64	-103.41	440,726.36	723,834.59	32.21025661	-103.74326440
Double Diamond 24S 31 - plan hits target center - Point	0.00	0.00	12,495.00	4,776.01	-132.00	445,758.00	723,806.00	32.22408783	-103.74326751

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,000.00	1,000.00	13 3/8" Casing @ 1000 TVD	13-3/8	17-1/2
4,704.25	4,700.00	9 5/8" Casing @ 4700 TVD	9-5/8	12-1/4
12,636.00	12,466.73	7" Casing @ 12636 MD	7	8-3/4

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,200.00	1,200.00	0.00	0.00	KOP Begin 1°/100' build
1,500.00	1,499.86	-7.28	-2.94	Begin 3.00° tangent
4,400.00	4,395.89	-147.98	-59.85	Begin 1°/100' drop
4,700.00	4,695.75	-155.26	-62.79	Begin vertical hold
10,004.25	10,000.00	-155.26	-62.79	Begin 1.5°/100' build
10,274.14	10,269.67	-164.10	-66.37	Begin 4.05° tangent
11,537.96	11,530.34	-246.81	-99.84	Begin 1.5°/100' drop
11,807.85	11,800.00	-255.64	-103.41	Begin vertical hold
11,936.26	11,928.41	-255.64	-103.41	Begin 10°/100' build
12,636.26	12,466.81	121.35	-105.58	Begin 8°/100' build
12,888.70	12,510.00	368.74	-107.00	Begin 90.20° lateral
17,296.07	12,495.00	4,776.01	-132.00	PBHL/TD 17296.07 MD/12495.00 TVD

Planning Report - Geographic

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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

Site	Section 14-T24S-R31E				
Site Position:		**Northing:**	443,306.73 usft	**Latitude:**	32.21737448
From:	Map	**Easting:**	722,167.73 usft	**Longitude:**	-103.74860823
Position Uncertainty:	0.00 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.31 °

Well	Double Diamond 24S 21E 1414 Well No. 224H, Surf loc: 305 FSL 885 FEL Sec14-T24S-R31E				
Well Position	**+N/-S**	0.00 ft	**Northing:**	440,982.00 usft	**Latitude:**	32.21095774
	+E/-W	0.00 ft	**Easting:**	723,938.00 usft	**Longitude:**	-103.74292552
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	3,587.20 ft

Wellbore	Original Hole			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	1/11/2018	6.97	60.02	47,852.48129406

Design	rev1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	358.42	

Plan Survey Tool Program **Date** 1/28/2018

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	9,000.00	rev1 (Original Hole)	GYRO-NS OWSG Gyrocompass Gyro	
2	9,000.00	17,295.12	rev1 (Original Hole)	MWD OWSG MWD - Standard	

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	3.00	202.02	1,499.86	-7.28	-2.94	1.00	1.00	0.00	202.02	
4,400.00	3.00	202.02	4,395.89	-147.98	-59.85	0.00	0.00	0.00	0.00	
4,700.00	0.00	202.02	4,695.75	-155.26	-62.79	1.00	-1.00	0.00	180.00	
10,004.25	0.00	202.02	10,000.00	-155.26	-62.79	0.00	0.00	0.00	202.02	
10,274.14	4.05	202.03	10,269.67	-164.10	-66.37	1.50	1.50	0.00	202.03	
11,537.96	4.05	202.03	11,530.34	-246.81	-99.84	0.00	0.00	0.00	0.00	
11,807.85	0.00	359.67	11,800.00	-255.64	-103.41	1.50	-1.50	0.00	180.00	Double Diamond 24S
11,936.26	0.00	359.67	11,928.41	-255.64	-103.41	0.00	0.00	0.00	359.67	
12,636.26	70.00	359.67	12,466.81	121.35	-105.58	10.00	10.00	0.00	-0.33	
12,888.70	90.20	359.67	12,510.00	368.74	-107.00	8.00	8.00	0.00	0.01	
17,296.07	90.20	359.67	12,495.00	4,776.01	-132.00	0.00	0.00	0.00	0.00	Double Diamond 24S

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
100.00	0.00	0.00	100.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
200.00	0.00	0.00	200.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
300.00	0.00	0.00	300.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
400.00	0.00	0.00	400.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
500.00	0.00	0.00	500.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
600.00	0.00	0.00	600.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
700.00	0.00	0.00	700.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
800.00	0.00	0.00	800.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
900.00	0.00	0.00	900.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
1,000.00	0.00	0.00	1,000.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
1,100.00	0.00	0.00	1,100.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
1,200.00	0.00	0.00	1,200.00	0.00	0.00	440,982.00	723,938.00	32.21095774	-103.74292552
KOP Begin 1°/100' build									
1,300.00	1.00	202.02	1,299.99	-0.81	-0.33	440,981.19	723,937.67	32.21095552	-103.74292659
1,400.00	2.00	202.02	1,399.96	-3.24	-1.31	440,978.76	723,936.69	32.21094887	-103.74292980
1,500.00	3.00	202.02	1,499.86	-7.28	-2.94	440,974.72	723,935.05	32.21093778	-103.74293516
Begin 3.00° tangent									
1,600.00	3.00	202.02	1,599.73	-12.13	-4.91	440,969.87	723,933.09	32.21092447	-103.74294159
1,700.00	3.00	202.02	1,699.59	-16.98	-6.87	440,965.02	723,931.13	32.21091116	-103.74294802
1,800.00	3.00	202.02	1,799.45	-21.83	-8.83	440,960.17	723,929.17	32.21089786	-103.74295445
1,900.00	3.00	202.02	1,899.31	-26.69	-10.79	440,955.31	723,927.20	32.21088455	-103.74296088
2,000.00	3.00	202.02	1,999.18	-31.54	-12.76	440,950.46	723,925.24	32.21087124	-103.74296732
2,100.00	3.00	202.02	2,099.04	-36.39	-14.72	440,945.61	723,923.28	32.21085794	-103.74297375
2,200.00	3.00	202.02	2,198.90	-41.24	-16.68	440,940.76	723,921.32	32.21084463	-103.74298018
2,300.00	3.00	202.02	2,298.77	-46.09	-18.64	440,935.91	723,919.35	32.21083132	-103.74298661
2,400.00	3.00	202.02	2,398.63	-50.95	-20.60	440,931.05	723,917.39	32.21081802	-103.74299304
2,500.00	3.00	202.02	2,498.49	-55.80	-22.57	440,926.20	723,915.43	32.21080471	-103.74299947
2,600.00	3.00	202.02	2,598.36	-60.65	-24.53	440,921.35	723,913.47	32.21079140	-103.74300590
2,700.00	3.00	202.02	2,698.22	-65.50	-26.49	440,916.50	723,911.51	32.21077809	-103.74301233
2,800.00	3.00	202.02	2,798.08	-70.35	-28.45	440,911.65	723,909.54	32.21076479	-103.74301876
2,900.00	3.00	202.02	2,897.94	-75.20	-30.42	440,906.80	723,907.58	32.21075148	-103.74302519
3,000.00	3.00	202.02	2,997.81	-80.06	-32.38	440,901.94	723,905.62	32.21073817	-103.74303162
3,100.00	3.00	202.02	3,097.67	-84.91	-34.34	440,897.09	723,903.66	32.21072487	-103.74303805
3,200.00	3.00	202.02	3,197.53	-89.76	-36.30	440,892.24	723,901.69	32.21071156	-103.74304448
3,300.00	3.00	202.02	3,297.40	-94.61	-38.26	440,887.39	723,899.73	32.21069825	-103.74305091
3,400.00	3.00	202.02	3,397.26	-99.46	-40.23	440,882.54	723,897.77	32.21068495	-103.74305734
3,500.00	3.00	202.02	3,497.12	-104.32	-42.19	440,877.68	723,895.81	32.21067164	-103.74306377
3,600.00	3.00	202.02	3,596.99	-109.17	-44.15	440,872.83	723,893.85	32.21065833	-103.74307020
3,700.00	3.00	202.02	3,696.85	-114.02	-46.11	440,867.98	723,891.88	32.21064503	-103.74307663
3,800.00	3.00	202.02	3,796.71	-118.87	-48.08	440,863.13	723,889.92	32.21063172	-103.74308306
3,900.00	3.00	202.02	3,896.57	-123.72	-50.04	440,858.28	723,887.96	32.21061841	-103.74308949
4,000.00	3.00	202.02	3,996.44	-128.57	-52.00	440,853.43	723,886.00	32.21060511	-103.74309592
4,100.00	3.00	202.02	4,096.30	-133.43	-53.96	440,848.57	723,884.03	32.21059180	-103.74310235
4,200.00	3.00	202.02	4,196.16	-138.28	-55.92	440,843.72	723,882.07	32.21057849	-103.74310878
4,300.00	3.00	202.02	4,296.03	-143.13	-57.89	440,838.87	723,880.11	32.21056518	-103.74311521
4,400.00	3.00	202.02	4,395.89	-147.98	-59.85	440,834.02	723,878.15	32.21055188	-103.74312164
Begin 1°/100' drop									
4,500.00	2.00	202.02	4,495.79	-152.03	-61.48	440,829.97	723,876.51	32.21054079	-103.74312700
4,600.00	1.00	202.02	4,595.76	-154.45	-62.47	440,827.55	723,875.53	32.21053413	-103.74313022
4,700.00	0.00	202.02	4,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
Begin vertical hold									

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,800.00	0.00	0.00	4,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
4,900.00	0.00	0.00	4,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,000.00	0.00	0.00	4,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,100.00	0.00	0.00	5,095.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,200.00	0.00	0.00	5,195.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,300.00	0.00	0.00	5,295.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,400.00	0.00	0.00	5,395.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,500.00	0.00	0.00	5,495.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,600.00	0.00	0.00	5,595.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,700.00	0.00	0.00	5,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,800.00	0.00	0.00	5,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
5,900.00	0.00	0.00	5,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,000.00	0.00	0.00	5,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,100.00	0.00	202.02	6,095.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,200.00	0.00	0.00	6,195.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,300.00	0.00	0.00	6,295.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,400.00	0.00	0.00	6,395.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,500.00	0.00	0.00	6,495.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,600.00	0.00	0.00	6,595.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,700.00	0.00	0.00	6,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,800.00	0.00	0.00	6,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
6,900.00	0.00	0.00	6,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,000.00	0.00	202.02	6,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,100.00	0.00	0.00	7,095.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,200.00	0.00	0.00	7,195.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,300.00	0.00	0.00	7,295.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,400.00	0.00	0.00	7,395.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,500.00	0.00	0.00	7,495.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,600.00	0.00	0.00	7,595.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,700.00	0.00	0.00	7,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,800.00	0.00	0.00	7,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
7,900.00	0.00	0.00	7,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,000.00	0.00	0.00	7,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,100.00	0.00	0.00	8,095.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,200.00	0.00	0.00	8,195.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,300.00	0.00	0.00	8,295.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,400.00	0.00	0.00	8,395.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,500.00	0.00	0.00	8,495.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,600.00	0.00	0.00	8,595.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,700.00	0.00	0.00	8,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,800.00	0.00	202.02	8,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
8,900.00	0.00	0.00	8,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,000.00	0.00	0.00	8,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,100.00	0.00	0.00	9,095.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,200.00	0.00	0.00	9,195.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,300.00	0.00	0.00	9,295.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,400.00	0.00	0.00	9,395.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,500.00	0.00	0.00	9,495.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,600.00	0.00	0.00	9,595.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,700.00	0.00	0.00	9,695.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,800.00	0.00	0.00	9,795.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
9,900.00	0.00	0.00	9,895.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
10,000.00	0.00	0.00	9,995.75	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,004.25	0.00	0.00	10,000.00	-155.26	-62.79	440,826.74	723,875.20	32.21053191	-103.74313129
Begin 1.5°/100' build									
10,100.00	1.44	202.03	10,095.74	-156.37	-63.24	440,825.63	723,874.75	32.21052886	-103.74313277
10,200.00	2.94	202.03	10,195.67	-159.91	-64.67	440,822.09	723,873.32	32.21051916	-103.74313746
10,274.14	4.05	202.03	10,269.67	-164.10	-66.37	440,817.90	723,871.63	32.21050768	-103.74314301
Begin 4.05° tangent									
10,300.00	4.05	202.03	10,295.46	-165.79	-67.05	440,816.21	723,870.94	32.21050304	-103.74314525
10,400.00	4.05	202.03	10,395.21	-172.33	-69.70	440,809.67	723,868.30	32.21048509	-103.74315393
10,500.00	4.05	202.03	10,494.96	-178.88	-72.35	440,803.12	723,865.65	32.21046714	-103.74316261
10,600.00	4.05	202.03	10,594.71	-185.42	-75.00	440,796.58	723,863.00	32.21044919	-103.74317129
10,700.00	4.05	202.03	10,694.46	-191.97	-77.65	440,790.03	723,860.35	32.21043124	-103.74317996
10,800.00	4.05	202.03	10,794.22	-198.51	-80.29	440,783.49	723,857.70	32.21041330	-103.74318864
10,900.00	4.05	202.03	10,893.97	-205.06	-82.94	440,776.95	723,855.06	32.21039535	-103.74319732
11,000.00	4.05	202.03	10,993.72	-211.60	-85.59	440,770.40	723,852.41	32.21037740	-103.74320600
11,100.00	4.05	202.03	11,093.47	-218.14	-88.24	440,763.86	723,849.76	32.21035945	-103.74321468
11,200.00	4.05	202.03	11,193.22	-224.69	-90.89	440,757.31	723,847.11	32.21034150	-103.74322335
11,300.00	4.05	202.03	11,292.97	-231.23	-93.53	440,750.77	723,844.46	32.21032355	-103.74323203
11,400.00	4.05	202.03	11,392.72	-237.78	-96.18	440,744.22	723,841.81	32.21030560	-103.74324071
11,500.00	4.05	202.03	11,492.47	-244.32	-98.83	440,737.68	723,839.17	32.21028765	-103.74324939
11,537.96	4.05	202.03	11,530.34	-246.81	-99.84	440,735.19	723,838.16	32.21028084	-103.74325268
Begin 1.5°/100' drop									
11,600.00	3.12	202.03	11,592.25	-250.40	-101.29	440,731.60	723,836.71	32.21027098	-103.74325745
11,700.00	1.62	202.03	11,692.16	-254.23	-102.84	440,727.77	723,835.16	32.21026048	-103.74326252
11,800.00	0.12	202.03	11,792.15	-255.63	-103.41	440,726.37	723,834.59	32.21025663	-103.74326439
11,807.85	0.00	359.67	11,800.00	-255.64	-103.41	440,726.36	723,834.59	32.21025661	-103.74326440
Begin vertical hold									
11,900.00	0.00	0.00	11,892.15	-255.64	-103.41	440,726.36	723,834.59	32.21025661	-103.74326440
11,936.26	0.00	0.00	11,928.41	-255.64	-103.41	440,726.36	723,834.59	32.21025661	-103.74326440
Begin 10°/100' build									
12,000.00	6.37	359.67	11,992.02	-252.10	-103.43	440,729.90	723,834.57	32.21026634	-103.74326440
12,100.00	16.37	359.67	12,089.93	-232.40	-103.54	440,749.60	723,834.45	32.21032048	-103.74326442
12,200.00	26.37	359.67	12,182.93	-196.00	-103.75	440,786.00	723,834.24	32.21042054	-103.74326445
12,300.00	36.37	359.67	12,268.20	-144.01	-104.05	440,837.99	723,833.94	32.21056346	-103.74326449
12,400.00	46.37	359.67	12,343.15	-78.00	-104.43	440,904.00	723,833.56	32.21074492	-103.74326455
12,500.00	56.37	359.67	12,405.49	0.03	-104.88	440,982.03	723,833.11	32.21095940	-103.74326462
12,600.00	66.37	359.67	12,453.34	87.69	-105.39	441,069.69	723,832.61	32.21120037	-103.74326470
12,636.26	70.00	359.67	12,466.81	121.35	-105.58	441,103.35	723,832.41	32.21129289	-103.74326473
Begin 8°/100' build									
12,700.00	75.10	359.67	12,485.92	182.13	-105.93	441,164.13	723,832.07	32.21145998	-103.74326478
12,800.00	83.10	359.67	12,504.82	280.25	-106.49	441,262.25	723,831.50	32.21172968	-103.74326485
12,888.70	90.20	359.67	12,510.00	368.74	-107.00	441,350.73	723,831.00	32.21197292	-103.74326491
Begin 90.20° lateral									
12,900.00	90.20	359.67	12,509.96	380.04	-107.06	441,362.04	723,830.94	32.21200399	-103.74326491
13,000.00	90.20	359.67	12,509.62	480.03	-107.63	441,462.03	723,830.37	32.21227887	-103.74326497
13,100.00	90.20	359.67	12,509.28	580.03	-108.19	441,562.03	723,829.80	32.21255374	-103.74326503
13,200.00	90.20	359.67	12,508.94	680.03	-108.76	441,662.03	723,829.23	32.21282862	-103.74326509
13,300.00	90.20	359.67	12,508.60	780.03	-109.33	441,762.03	723,828.67	32.21310350	-103.74326515
13,400.00	90.20	359.67	12,508.26	880.03	-109.90	441,862.02	723,828.10	32.21337838	-103.74326521
13,500.00	90.20	359.67	12,507.92	980.02	-110.46	441,962.02	723,827.53	32.21365326	-103.74326527
13,600.00	90.20	359.67	12,507.58	1,080.02	-111.03	442,062.02	723,826.97	32.21392814	-103.74326533
13,700.00	90.20	359.67	12,507.24	1,180.02	-111.60	442,162.02	723,826.40	32.21420302	-103.74326539
13,800.00	90.20	359.67	12,506.90	1,280.02	-112.17	442,262.01	723,825.83	32.21447789	-103.74326545

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,900.00	90.20	359.67	12,506.56	1,380.01	-112.73	442,362.01	723,825.26	32.21475277	-103.74326551
14,000.00	90.20	359.67	12,506.22	1,480.01	-113.30	442,462.01	723,824.70	32.21502765	-103.74326556
14,100.00	90.20	359.67	12,505.88	1,580.01	-113.87	442,562.01	723,824.13	32.21530253	-103.74326562
14,200.00	90.20	359.67	12,505.54	1,680.01	-114.43	442,662.00	723,823.56	32.21557741	-103.74326568
14,300.00	90.20	359.67	12,505.20	1,780.01	-115.00	442,762.00	723,822.99	32.21585229	-103.74326574
14,400.00	90.20	359.67	12,504.86	1,880.00	-115.57	442,862.00	723,822.43	32.21612716	-103.74326580
14,500.00	90.20	359.67	12,504.52	1,980.00	-116.14	442,962.00	723,821.86	32.21640204	-103.74326586
14,600.00	90.20	359.67	12,504.18	2,080.00	-116.70	443,062.00	723,821.29	32.21667692	-103.74326592
14,700.00	90.20	359.67	12,503.84	2,180.00	-117.27	443,161.99	723,820.72	32.21695180	-103.74326598
14,800.00	90.20	359.67	12,503.50	2,280.00	-117.84	443,261.99	723,820.16	32.21722668	-103.74326604
14,900.00	90.20	359.67	12,503.16	2,379.99	-118.41	443,361.99	723,819.59	32.21750156	-103.74326610
15,000.00	90.20	359.67	12,502.82	2,479.99	-118.97	443,461.99	723,819.02	32.21777644	-103.74326616
15,100.00	90.20	359.67	12,502.48	2,579.99	-119.54	443,561.98	723,818.46	32.21805131	-103.74326622
15,200.00	90.20	359.67	12,502.13	2,679.99	-120.11	443,661.98	723,817.89	32.21832619	-103.74326627
15,300.00	90.20	359.67	12,501.79	2,779.98	-120.68	443,761.98	723,817.32	32.21860107	-103.74326633
15,400.00	90.20	359.67	12,501.45	2,879.98	-121.24	443,861.98	723,816.75	32.21887595	-103.74326639
15,500.00	90.20	359.67	12,501.11	2,979.98	-121.81	443,961.97	723,816.19	32.21915083	-103.74326645
15,600.00	90.20	359.67	12,500.77	3,079.98	-122.38	444,061.97	723,815.62	32.21942570	-103.74326651
15,700.00	90.20	359.67	12,500.43	3,179.98	-122.95	444,161.97	723,815.05	32.21970058	-103.74326657
15,800.00	90.20	359.67	12,500.09	3,279.97	-123.51	444,261.97	723,814.48	32.21997546	-103.74326663
15,900.00	90.20	359.67	12,499.75	3,379.97	-124.08	444,361.96	723,813.92	32.22025034	-103.74326669
16,000.00	90.20	359.67	12,499.41	3,479.97	-124.65	444,461.96	723,813.35	32.22052522	-103.74326675
16,100.00	90.20	359.67	12,499.07	3,579.97	-125.21	444,561.96	723,812.78	32.22080010	-103.74326681
16,200.00	90.20	359.67	12,498.73	3,679.96	-125.78	444,661.96	723,812.21	32.22107497	-103.74326686
16,300.00	90.20	359.67	12,498.39	3,779.96	-126.35	444,761.95	723,811.65	32.22134985	-103.74326692
16,400.00	90.20	359.67	12,498.05	3,879.96	-126.92	444,861.95	723,811.08	32.22162473	-103.74326698
16,500.00	90.20	359.67	12,497.71	3,979.96	-127.48	444,961.95	723,810.51	32.22189961	-103.74326704
16,600.00	90.20	359.67	12,497.37	4,079.96	-128.05	445,061.95	723,809.95	32.22217449	-103.74326710
16,700.00	90.20	359.67	12,497.03	4,179.95	-128.62	445,161.94	723,809.38	32.22244937	-103.74326716
16,800.00	90.20	359.67	12,496.69	4,279.95	-129.19	445,261.94	723,808.81	32.22272424	-103.74326722
16,900.00	90.20	359.67	12,496.35	4,379.95	-129.75	445,361.94	723,808.24	32.22299912	-103.74326728
17,000.00	90.20	359.67	12,496.01	4,479.95	-130.32	445,461.94	723,807.68	32.22327400	-103.74326734
17,100.00	90.20	359.67	12,495.67	4,579.94	-130.89	445,561.94	723,807.11	32.22354888	-103.74326739
17,200.00	90.20	359.67	12,495.33	4,679.94	-131.46	445,661.93	723,806.54	32.22382376	-103.74326745
17,296.07	90.20	359.67	12,495.00	4,776.01	-132.00	445,758.00	723,806.00	32.22408783	-103.74326751
PBHL/TD 17296.07 MD/12495.00 TVD									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Double Diamond 24S 31 - plan hits target center - Point	0.00	0.00	11,800.00	-255.64	-103.41	440,726.36	723,834.59	32.21025661	-103.74326440
Double Diamond 24S 31 - plan hits target center - Point	0.00	0.00	12,495.00	4,776.01	-132.00	445,758.00	723,806.00	32.22408783	-103.74326751

Database:	DB_Jul2216dt_v14	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Company:	Tap Rock Operating LLC	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Project:	Eddy County, New Mexico NAD83 NM east	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site:	Section 14-T24S-R31E	**North Reference:**	Grid
Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,000.00	1,000.00	13 3/8" Casing @ 1000 TVD	13-3/8	17-1/2
4,704.25	4,700.00	9 5/8" Casing @ 4700 TVD	9-5/8	12-1/4
12,636.00	12,466.73	7" Casing @ 12636 MD	7	8-3/4

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,200.00	1,200.00	0.00	0.00	KOP Begin 1°/100' build
1,500.00	1,499.86	-7.28	-2.94	Begin 3.00° tangent
4,400.00	4,395.89	-147.98	-59.85	Begin 1°/100' drop
4,700.00	4,695.75	-155.26	-62.79	Begin vertical hold
10,004.25	10,000.00	-155.26	-62.79	Begin 1.5°/100' build
10,274.14	10,269.67	-164.10	-66.37	Begin 4.05° tangent
11,537.96	11,530.34	-246.81	-99.84	Begin 1.5°/100' drop
11,807.85	11,800.00	-255.64	-103.41	Begin vertical hold
11,936.26	11,928.41	-255.64	-103.41	Begin 10°/100' build
12,636.26	12,466.81	121.35	-105.58	Begin 8°/100' build
12,888.70	12,510.00	368.74	-107.00	Begin 90.20° lateral
17,296.07	12,495.00	4,776.01	-132.00	PBHL/TD 17296.07 MD/12495.00 TVD

Anticollision Report

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Reference	rev1		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
Interpolation Method:	MD Interval 100.00ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,929.61 ft	**Error Surface:**	Ellipsoid Separation
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 1/28/2018

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	9,000.00	rev1 (Original Hole)	GYRO-NS	OWSG Gyrocompass Gyro
9,000.00	17,295.12	rev1 (Original Hole)	MWD	OWSG MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Section 14-T24S-R31E						
Double Diamond 24S 21E 1414 Well No. 158H - Original	1,708.16	1,706.54	46.35	34.83	4.024	CC
Double Diamond 24S 21E 1414 Well No. 158H - Original	1,800.00	1,801.75	46.60	34.42	3.825	ES
Double Diamond 24S 21E 1414 Well No. 158H - Original	6,700.00	6,696.13	150.37	105.72	3.368	SF
Double Diamond 24S 21E 1414 Well No. 228H - Original	1,625.10	1,623.80	22.87	11.93	2.091	CC
Double Diamond 24S 21E 1414 Well No. 228H - Original	1,700.00	1,698.66	23.21	11.74	2.024	ES, SF
Double Diamond 24S 21E 1414 Well No. 238H - Original	1,200.00	1,198.80	25.00	17.06	3.150	CC
Double Diamond 24S 21E 1414 Well No. 238H - Original	1,300.00	1,298.67	25.58	16.94	2.962	ES
Double Diamond 24S 21E 1414 Well No. 238H - Original	9,500.00	9,498.66	135.23	70.93	2.103	SF
Petrogulf BJT Federal Well No. 1H - Horizontal - Surveys	8,356.70	8,762.35	502.40	458.82	11.530	CC, ES, SF
Petrogulf BJT Federal Well No. 2H - Original Hole - Surv	619.72	606.52	657.35	653.66	178.586	CC
Petrogulf BJT Federal Well No. 2H - Original Hole - Surv	8,379.75	8,578.20	706.41	649.13	12.334	ES
Petrogulf BJT Federal Well No. 2H - Original Hole - Surv	8,400.00	8,585.93	706.66	649.28	12.316	SF

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 158H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 6100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	1.20	-1.20	0.00	0.00	-90.00	0.00	-50.00	50.00				
100.00	100.00	101.20	98.80	0.13	0.14	-90.00	0.00	-50.00	50.00	49.73	0.27	187.978	
200.00	200.00	201.20	198.80	0.48	0.49	-90.00	0.00	-50.00	50.00	49.04	0.96	51.861	
300.00	300.00	301.20	298.80	0.83	0.84	-90.00	0.00	-50.00	50.00	48.34	1.66	30.080	
400.00	400.00	401.20	398.80	1.18	1.19	-90.00	0.00	-50.00	50.00	47.64	2.36	21.183	
500.00	500.00	501.20	498.80	1.53	1.54	-90.00	0.00	-50.00	50.00	46.94	3.06	16.348	
600.00	600.00	601.20	598.80	1.88	1.89	-90.00	0.00	-50.00	50.00	46.24	3.76	13.310	
700.00	700.00	701.20	698.80	2.24	2.24	-90.00	0.00	-50.00	50.00	45.55	4.45	11.224	
800.00	800.00	801.20	798.80	2.59	2.59	-90.00	0.00	-50.00	50.00	44.85	5.15	9.703	
900.00	900.00	901.20	898.80	2.94	2.94	-90.00	0.00	-50.00	50.00	44.15	5.85	8.546	
1,000.00	1,000.00	1,001.20	998.80	3.29	3.29	-90.00	0.00	-50.00	50.00	43.45	6.55	7.635	
1,100.00	1,100.00	1,101.20	1,098.80	3.64	3.64	-90.00	0.00	-50.00	50.00	42.75	7.25	6.899	
1,200.00	1,200.00	1,201.20	1,198.80	3.99	3.99	-90.00	0.00	-50.00	50.00	42.05	7.95	6.293	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 158H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 6100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,300.00	1,299.99	1,301.21	1,298.79	4.34	4.34	68.92	0.00	-50.00	49.68	41.04	8.64	5.747	
1,400.00	1,399.96	1,401.24	1,398.76	4.68	4.69	71.79	0.00	-50.00	48.80	39.45	9.35	5.222	
1,500.00	1,499.86	1,501.34	1,498.66	5.03	5.05	76.79	0.00	-50.00	47.62	37.56	10.05	4.737	
1,600.00	1,599.73	1,601.47	1,598.53	5.39	5.40	83.05	0.00	-50.00	46.70	35.93	10.76	4.338	
1,700.00	1,699.59	1,701.61	1,698.39	5.75	5.75	89.47	0.00	-50.00	46.35	34.88	11.47	4.040	
1,708.16	1,707.74	1,706.54	1,706.54	5.78	5.76	90.00	0.00	-50.00	46.35	34.83	11.52	4.024	CC
1,800.00	1,799.45	1,801.75	1,798.25	6.11	6.10	95.91	0.00	-50.00	46.60	34.42	12.18	3.825	ES
1,900.00	1,899.31	1,901.89	1,898.11	6.46	6.45	102.21	0.00	-50.00	47.43	34.54	12.89	3.679	
2,000.00	1,999.18	2,002.02	1,997.98	6.82	6.80	108.21	0.00	-50.00	48.80	35.21	13.60	3.590	
2,100.00	2,099.04	2,102.16	2,097.84	7.17	7.15	113.84	0.00	-50.00	50.69	36.39	14.30	3.545	
2,200.00	2,198.90	2,202.30	2,197.70	7.53	7.50	119.01	0.00	-50.00	53.02	38.02	15.00	3.534	
2,300.00	2,298.77	2,302.43	2,297.57	7.88	7.85	123.72	0.00	-50.00	55.75	40.05	15.70	3.550	
2,400.00	2,398.63	2,402.57	2,397.43	8.23	8.21	127.96	0.00	-50.00	58.82	42.42	16.40	3.586	
2,500.00	2,498.49	2,502.71	2,497.29	8.59	8.56	131.76	0.00	-50.00	62.18	45.07	17.10	3.636	
2,600.00	2,598.36	2,602.84	2,597.16	8.94	8.91	135.16	0.00	-50.00	65.78	47.98	17.80	3.695	
2,700.00	2,698.22	2,702.98	2,697.02	9.29	9.26	138.20	0.00	-50.00	69.59	51.09	18.50	3.761	
2,800.00	2,798.08	2,803.12	2,796.88	9.65	9.61	140.91	0.00	-50.00	73.58	54.38	19.20	3.832	
2,900.00	2,897.94	2,903.26	2,896.74	10.00	9.96	143.35	0.00	-50.00	77.71	57.81	19.90	3.905	
3,000.00	2,997.81	3,003.39	2,996.61	10.35	10.31	145.53	0.00	-50.00	81.97	61.37	20.60	3.979	
3,100.00	3,097.67	3,103.53	3,096.47	10.70	10.66	147.49	0.00	-50.00	86.34	65.04	21.30	4.054	
3,200.00	3,197.53	3,203.67	3,196.33	11.05	11.01	149.27	0.00	-50.00	90.80	68.80	22.00	4.127	
3,300.00	3,297.40	3,303.80	3,296.20	11.40	11.37	150.88	0.00	-50.00	95.34	72.64	22.70	4.200	
3,400.00	3,397.26	3,403.94	3,396.06	11.76	11.72	152.34	0.00	-50.00	99.94	76.54	23.40	4.271	
3,500.00	3,497.12	3,504.08	3,495.92	12.11	12.07	153.67	0.00	-50.00	104.61	80.51	24.10	4.340	
3,600.00	3,596.99	3,604.22	3,595.79	12.46	12.42	154.88	0.00	-50.00	109.32	84.52	24.80	4.408	
3,700.00	3,696.85	3,704.35	3,695.65	12.81	12.77	156.00	0.00	-50.00	114.09	88.58	25.50	4.473	
3,800.00	3,796.71	3,804.49	3,795.51	13.16	13.12	157.02	0.00	-50.00	118.89	92.68	26.20	4.537	
3,900.00	3,896.57	3,904.63	3,895.37	13.51	13.47	157.97	0.00	-50.00	123.72	96.82	26.91	4.598	
4,000.00	3,996.44	4,004.76	3,995.24	13.86	13.82	158.84	0.00	-50.00	128.59	100.98	27.61	4.658	
4,100.00	4,096.30	4,104.90	4,095.10	14.21	14.17	159.66	0.00	-50.00	133.49	105.18	28.31	4.715	
4,200.00	4,196.16	4,205.04	4,194.96	14.56	14.53	160.41	0.00	-50.00	138.41	109.40	29.01	4.771	
4,300.00	4,296.03	4,305.17	4,294.83	14.91	14.88	161.11	0.00	-50.00	143.35	113.64	29.71	4.825	
4,400.00	4,395.89	4,405.31	4,394.69	15.26	15.23	161.76	0.00	-50.00	148.31	117.90	30.41	4.876	
4,500.00	4,495.79	4,505.41	4,494.59	15.61	15.58	162.29	0.00	-50.00	152.46	121.34	31.11	4.900	
4,600.00	4,595.76	4,605.44	4,594.56	15.96	15.93	162.59	0.00	-50.00	154.95	123.14	31.82	4.870	
4,700.00	4,695.75	4,705.45	4,694.55	16.31	16.28	4.71	0.00	-50.00	155.79	123.27	32.51	4.791	
4,800.00	4,795.75	4,805.45	4,794.55	16.65	16.63	4.71	0.00	-50.00	155.79	122.57	33.21	4.690	
4,900.00	4,895.75	4,905.45	4,894.55	17.00	16.98	4.71	0.00	-50.00	155.79	121.87	33.91	4.594	
5,000.00	4,995.75	5,005.45	4,994.55	17.35	17.33	4.71	0.00	-50.00	155.79	121.17	34.61	4.501	
5,100.00	5,095.75	5,105.45	5,094.55	17.69	17.68	4.71	0.00	-50.00	155.79	120.47	35.31	4.412	
5,200.00	5,195.75	5,205.45	5,194.55	18.04	18.03	4.71	0.00	-50.00	155.79	119.77	36.01	4.326	
5,300.00	5,295.75	5,305.45	5,294.55	18.39	18.38	4.71	0.00	-50.00	155.79	119.08	36.71	4.243	
5,400.00	5,395.75	5,405.45	5,394.55	18.73	18.73	4.71	0.00	-50.00	155.79	118.38	37.41	4.164	
5,500.00	5,495.75	5,505.45	5,494.55	19.08	19.09	4.71	0.00	-50.00	155.79	117.68	38.11	4.088	
5,600.00	5,595.75	5,605.45	5,594.55	19.43	19.44	4.71	0.00	-50.00	155.79	116.98	38.81	4.014	
5,700.00	5,695.75	5,705.45	5,694.55	19.77	19.79	4.71	0.00	-50.00	155.79	116.28	39.51	3.943	
5,800.00	5,795.75	5,805.45	5,794.55	20.12	20.14	4.71	0.00	-50.00	155.79	115.58	40.21	3.874	
5,900.00	5,895.75	5,905.45	5,894.55	20.47	20.49	4.71	0.00	-50.00	155.79	114.88	40.91	3.808	
6,000.00	5,995.75	6,005.45	5,994.55	20.82	20.84	4.71	0.00	-50.00	155.79	114.18	41.61	3.744	
6,100.00	6,095.75	6,094.55	6,094.55	21.16	21.15	4.71	0.00	-50.00	155.79	113.51	42.27	3.685	
6,200.00	6,195.75	6,195.56	6,195.55	21.51	21.34	5.14	-0.41	-48.88	155.48	112.67	42.81	3.632	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 158H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 6100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,300.00	6,295.75	6,296.49	6,296.41	21.86	21.35	6.52	-1.73	-45.25	154.54	111.37	43.18	3.579	
6,400.00	6,395.75	6,397.15	6,396.85	22.21	21.36	8.88	-3.95	-39.14	153.16	109.63	43.54	3.518	
6,500.00	6,495.75	6,497.40	6,496.68	22.55	21.38	12.26	-7.06	-30.59	151.67	107.77	43.91	3.455	
6,600.00	6,595.75	6,597.10	6,595.70	22.90	21.41	16.66	-11.05	-19.65	150.53	106.26	44.28	3.400	
6,664.16	6,659.91	6,660.72	6,658.71	23.12	21.43	20.00	-14.05	-11.40	150.27	105.75	44.52	3.375	
6,700.00	6,695.75	6,696.13	6,693.71	23.25	21.45	22.04	-15.88	-6.38	150.37	105.72	44.65	3.368	SF
6,800.00	6,795.75	6,795.40	6,791.57	23.60	21.49	28.33	-21.66	9.24	151.81	106.79	45.02	3.372	
6,900.00	6,895.75	6,905.91	6,888.67	23.94	21.55	34.86	-28.49	25.52	154.61	109.22	45.39	3.406	
7,000.00	6,995.75	7,007.52	6,985.47	24.29	21.62	41.07	-35.31	41.75	159.38	113.63	45.75	3.484	
7,100.00	7,095.75	7,090.86	7,082.27	24.64	21.69	46.87	-42.13	57.99	165.94	119.85	46.09	3.600	
7,200.00	7,195.75	7,189.25	7,179.07	24.99	21.77	52.19	-48.95	74.22	174.11	127.66	46.45	3.748	
7,300.00	7,295.75	7,287.63	7,275.86	25.34	21.86	57.01	-55.77	90.45	183.66	136.85	46.81	3.923	
7,400.00	7,395.75	7,386.02	7,372.66	25.68	21.96	61.33	-62.59	106.69	194.40	147.21	47.19	4.119	
7,500.00	7,495.75	7,484.40	7,469.46	26.03	22.07	65.19	-69.41	122.92	206.13	158.55	47.58	4.332	
7,600.00	7,595.75	7,582.79	7,566.25	26.38	22.19	68.63	-76.23	139.15	218.70	170.72	47.98	4.558	
7,700.00	7,695.75	7,681.18	7,663.05	26.73	22.32	71.69	-83.05	155.38	231.97	183.58	48.39	4.794	
7,800.00	7,795.75	7,779.56	7,759.85	27.08	22.46	74.41	-89.87	171.62	245.82	197.01	48.81	5.036	
7,900.00	7,895.75	7,877.95	7,856.64	27.43	22.60	76.85	-96.69	187.85	260.17	210.93	49.24	5.283	
8,000.00	7,995.75	7,976.33	7,953.44	27.78	22.76	79.03	-103.51	204.08	274.94	225.25	49.69	5.534	
8,100.00	8,095.75	8,074.72	8,050.24	28.13	22.92	80.98	-110.33	220.32	290.06	239.92	50.13	5.786	
8,200.00	8,195.75	8,173.10	8,147.04	28.48	23.09	82.74	-117.15	236.55	305.48	254.89	50.59	6.038	
8,300.00	8,295.75	8,271.49	8,243.83	28.83	23.26	84.34	-123.97	252.78	321.15	270.10	51.06	6.290	
8,400.00	8,395.75	8,369.87	8,340.63	29.18	23.45	85.78	-130.79	269.02	337.05	285.52	51.53	6.541	
8,500.00	8,495.75	8,468.26	8,437.43	29.53	23.64	87.10	-137.61	285.25	353.14	301.13	52.01	6.790	
8,600.00	8,595.75	8,566.65	8,534.22	29.88	23.84	88.30	-144.43	301.48	369.40	316.90	52.49	7.037	
8,700.00	8,695.75	8,665.03	8,631.02	30.23	24.05	89.40	-151.25	317.72	385.80	332.81	52.98	7.281	
8,800.00	8,795.75	8,763.42	8,727.82	30.58	24.26	90.41	-158.07	333.95	402.32	348.84	53.48	7.523	
8,900.00	8,895.75	8,861.80	8,824.62	30.93	24.48	91.34	-164.89	350.18	418.97	364.98	53.99	7.761	
9,000.00	8,995.75	8,960.19	8,921.41	31.28	24.70	92.19	-171.71	366.42	435.71	381.21	54.49	7.996	
9,100.00	9,095.75	9,058.57	9,018.21	31.45	24.94	92.99	-178.53	382.65	452.53	397.70	54.83	8.253	
9,200.00	9,195.75	9,156.96	9,115.01	31.46	25.17	93.73	-185.35	398.88	469.44	414.43	55.02	8.533	
9,300.00	9,295.75	9,255.34	9,211.80	31.46	25.42	94.42	-192.17	415.11	486.42	431.21	55.21	8.811	
9,400.00	9,395.75	9,353.73	9,308.60	31.48	25.67	95.06	-198.99	431.35	503.46	448.06	55.41	9.087	
9,500.00	9,495.75	9,452.12	9,405.40	31.49	25.92	95.66	-205.81	447.58	520.56	464.95	55.61	9.360	
9,600.00	9,595.75	9,550.50	9,502.20	31.51	26.18	96.22	-212.63	463.81	537.71	481.88	55.83	9.631	
9,700.00	9,695.75	9,648.89	9,598.99	31.54	26.45	96.74	-219.45	480.05	554.91	498.86	56.06	9.899	
9,800.00	9,795.75	9,747.27	9,695.79	31.57	26.72	97.24	-226.27	496.28	572.15	515.86	56.29	10.164	
9,900.00	9,895.75	9,859.22	9,806.11	31.60	27.03	97.74	-233.62	513.77	588.54	531.85	56.69	10.382	
10,000.00	9,995.75	9,975.81	9,921.54	31.63	27.33	98.15	-239.96	528.86	602.12	545.01	57.11	10.543	
10,100.00	10,095.74	10,093.29	10,038.31	31.67	27.62	-103.55	-244.96	540.77	613.06	555.55	57.50	10.661	
10,200.00	10,195.67	10,211.39	10,156.03	31.72	27.90	-103.62	-248.59	549.40	621.63	563.76	57.88	10.741	
10,300.00	10,295.46	10,329.81	10,274.31	31.77	28.15	-104.08	-250.81	554.68	627.84	569.61	58.23	10.783	
10,400.00	10,395.21	10,448.40	10,392.88	31.82	28.39	-104.77	-251.61	556.59	631.28	572.74	58.54	10.783	
10,500.00	10,494.96	10,558.09	10,502.41	31.88	28.58	-105.81	-247.56	556.57	632.71	573.90	58.82	10.757	
10,600.00	10,594.71	10,665.42	10,607.16	31.94	28.74	-108.49	-224.94	556.44	632.82	573.72	59.09	10.709	
10,700.00	10,694.46	10,759.19	10,693.86	32.00	28.85	-112.21	-189.50	556.23	633.88	574.52	59.37	10.677	
10,800.00	10,794.22	10,837.81	10,761.30	32.07	28.92	-116.22	-149.20	556.00	638.99	579.41	59.58	10.726	
10,900.00	10,893.97	10,902.39	10,812.16	32.15	28.96	-120.04	-109.45	555.77	650.84	591.23	59.61	10.918	
11,000.00	10,993.72	10,955.13	10,850.15	32.22	28.98	-123.44	-72.90	555.56	671.25	611.86	59.39	11.302	
11,100.00	11,093.47	11,000.00	10,879.72	32.30	29.00	-126.47	-39.17	555.37	701.02	642.10	58.92	11.898	

Anticollision Report

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 158H - Original Hole - rev0

Offset Site Error: 0.00 ft

Survey Program: 0-GYRO-NS, 6100-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,200.00	11,193.22	11,033.97	10,900.30	32.39	29.01	-128.82	-12.15	555.21	740.08	681.87	58.20	12.715	
11,300.00	11,292.97	11,063.67	10,916.96	32.48	29.01	-130.89	12.44	555.07	787.75	730.36	57.39	13.727	
11,400.00	11,392.72	11,088.68	10,929.97	32.58	29.02	-132.65	33.79	554.95	843.05	786.51	56.55	14.909	
11,500.00	11,492.47	11,100.00	10,935.56	32.68	29.02	-133.44	43.63	554.89	905.03	849.38	55.65	16.263	
11,600.00	11,592.25	11,128.40	10,948.70	32.78	29.02	-136.03	68.80	554.75	972.05	917.00	55.05	17.658	
11,700.00	11,692.16	11,150.00	10,957.85	32.88	29.03	-138.48	88.37	554.63	1,042.64	988.16	54.48	19.137	
11,800.00	11,792.15	11,160.87	10,962.18	32.99	29.03	-140.23	98.34	554.58	1,115.84	1,061.92	53.92	20.695	
11,900.00	11,892.15	11,175.11	10,967.56	33.08	29.03	60.83	111.53	554.50	1,191.77	1,138.27	53.50	22.276	
12,000.00	11,992.02	11,189.92	10,972.80	33.18	29.04	53.72	125.38	554.42	1,269.49	1,216.31	53.18	23.869	
12,100.00	12,089.93	11,200.00	10,976.18	33.28	29.04	44.90	134.87	554.37	1,343.69	1,290.82	52.86	25.419	
12,200.00	12,182.93	11,231.89	10,986.00	33.37	29.05	37.78	165.21	554.19	1,411.79	1,359.07	52.72	26.779	
12,300.00	12,268.20	11,250.00	10,990.96	33.48	29.06	32.99	182.63	554.09	1,472.46	1,419.94	52.52	28.038	
12,400.00	12,343.15	11,300.00	11,002.37	33.60	29.09	29.21	231.30	553.81	1,524.28	1,471.75	52.52	29.022	
12,500.00	12,405.49	11,316.42	11,005.37	33.77	29.11	26.92	247.44	553.72	1,565.87	1,513.44	52.43	29.867	
12,600.00	12,453.34	11,350.00	11,010.36	33.99	29.16	25.29	280.64	553.53	1,596.92	1,544.44	52.48	30.430	
12,700.00	12,485.92	11,379.61	11,013.46	34.27	29.22	24.42	310.09	553.36	1,617.30	1,564.70	52.60	30.747	
12,800.00	12,504.82	11,400.00	11,014.88	34.62	29.27	23.98	330.43	553.25	1,629.14	1,576.34	52.80	30.855	
12,900.00	12,509.96	11,450.67	11,015.98	35.03	29.43	23.85	381.07	552.96	1,632.19	1,579.04	53.14	30.712	
13,000.00	12,509.62	11,550.67	11,015.80	35.51	29.86	23.85	481.07	552.39	1,632.04	1,578.42	53.62	30.435	
13,100.00	12,509.28	11,650.67	11,015.62	36.06	30.40	23.86	581.07	551.82	1,631.90	1,577.73	54.17	30.127	
13,200.00	12,508.94	11,750.67	11,015.43	36.67	31.02	23.86	681.07	551.26	1,631.75	1,576.98	54.77	29.792	
13,300.00	12,508.60	11,850.67	11,015.25	37.35	31.72	23.86	781.07	550.69	1,631.61	1,576.17	55.44	29.431	
13,400.00	12,508.26	11,950.67	11,015.07	38.09	32.50	23.86	881.06	550.12	1,631.46	1,575.29	56.17	29.048	
13,500.00	12,507.92	12,050.67	11,014.89	38.89	33.33	23.87	981.06	549.55	1,631.31	1,574.37	56.95	28.646	
13,600.00	12,507.58	12,150.67	11,014.71	39.73	34.22	23.87	1,081.06	548.99	1,631.17	1,573.38	57.78	28.228	
13,700.00	12,507.24	12,250.67	11,014.53	40.63	35.17	23.87	1,181.06	548.42	1,631.02	1,572.35	58.67	27.798	
13,800.00	12,506.90	12,350.67	11,014.35	41.58	36.17	23.87	1,281.06	547.85	1,630.88	1,571.26	59.61	27.358	
13,900.00	12,506.56	12,450.67	11,014.16	42.56	37.21	23.87	1,381.05	547.29	1,630.73	1,570.13	60.60	26.910	
14,000.00	12,506.22	12,550.67	11,013.98	43.59	38.29	23.88	1,481.05	546.72	1,630.59	1,568.96	61.63	26.457	
14,100.00	12,505.88	12,650.67	11,013.80	44.66	39.42	23.88	1,581.05	546.15	1,630.44	1,567.74	62.70	26.003	
14,200.00	12,505.54	12,750.67	11,013.62	45.76	40.58	23.88	1,681.05	545.58	1,630.30	1,566.48	63.81	25.547	
14,300.00	12,505.20	12,850.67	11,013.44	46.89	41.77	23.88	1,781.05	545.02	1,630.15	1,565.19	64.97	25.093	
14,400.00	12,504.86	12,950.67	11,013.26	48.05	42.99	23.89	1,881.05	544.45	1,630.01	1,563.85	66.15	24.640	
14,500.00	12,504.52	13,050.67	11,013.08	49.24	44.24	23.89	1,981.04	543.88	1,629.86	1,562.49	67.37	24.192	
14,600.00	12,504.18	13,150.67	11,012.90	50.46	45.51	23.89	2,081.04	543.31	1,629.71	1,561.09	68.62	23.749	
14,700.00	12,503.84	13,250.67	11,012.71	51.70	46.81	23.89	2,181.04	542.75	1,629.57	1,559.67	69.90	23.311	
14,800.00	12,503.50	13,350.67	11,012.53	52.96	48.13	23.89	2,281.04	542.18	1,629.42	1,558.21	71.21	22.881	
14,900.00	12,503.16	13,450.67	11,012.35	54.25	49.47	23.90	2,381.04	541.61	1,629.28	1,556.73	72.55	22.457	
15,000.00	12,502.82	13,550.67	11,012.17	55.55	50.83	23.90	2,481.03	541.04	1,629.13	1,555.22	73.91	22.042	
15,100.00	12,502.48	13,650.67	11,011.99	56.87	52.20	23.90	2,581.03	540.48	1,628.99	1,553.69	75.30	21.634	
15,200.00	12,502.13	13,750.67	11,011.81	58.21	53.59	23.90	2,681.03	539.91	1,628.84	1,552.14	76.70	21.236	
15,300.00	12,501.79	13,850.67	11,011.63	59.57	55.00	23.91	2,781.03	539.34	1,628.70	1,550.57	78.13	20.846	
15,400.00	12,501.45	13,950.67	11,011.44	60.94	56.42	23.91	2,881.03	538.78	1,628.55	1,548.97	79.58	20.465	
15,500.00	12,501.11	14,050.67	11,011.26	62.32	57.85	23.91	2,981.02	538.21	1,628.41	1,547.36	81.04	20.093	
15,600.00	12,500.77	14,150.67	11,011.08	63.72	59.29	23.91	3,081.02	537.64	1,628.26	1,545.73	82.53	19.730	
15,700.00	12,500.43	14,250.67	11,010.90	65.13	60.74	23.92	3,181.02	537.07	1,628.12	1,544.09	84.03	19.376	
15,800.00	12,500.09	14,350.67	11,010.72	66.54	62.20	23.92	3,281.02	536.51	1,627.97	1,542.43	85.54	19.031	
15,900.00	12,499.75	14,450.67	11,010.54	67.97	63.67	23.92	3,381.02	535.94	1,627.82	1,540.75	87.07	18.695	
16,000.00	12,499.41	14,550.67	11,010.36	69.41	65.15	23.92	3,481.02	535.37	1,627.68	1,539.06	88.62	18.367	
16,100.00	12,499.07	14,650.67	11,010.17	70.86	66.64	23.92	3,581.01	534.80	1,627.53	1,537.36	90.17	18.049	
16,200.00	12,498.73	14,750.67	11,009.99	72.32	68.14	23.93	3,681.01	534.24	1,627.39	1,535.64	91.74	17.738	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 158H - Original Hole - rev0 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 6100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
16,300.00	12,498.39	14,850.66	11,009.81	73.79	69.64	23.93	3,781.01	533.67	1,627.24	1,533.92	93.32	17.437	
16,400.00	12,498.05	14,950.66	11,009.63	75.26	71.15	23.93	3,881.01	533.10	1,627.10	1,532.18	94.92	17.143	
16,500.00	12,497.71	15,050.66	11,009.45	76.74	72.67	23.93	3,981.01	532.53	1,626.95	1,530.43	96.52	16.856	
16,600.00	12,497.37	15,150.66	11,009.27	78.23	74.19	23.94	4,081.00	531.97	1,626.81	1,528.68	98.13	16.578	
16,700.00	12,497.03	15,250.66	11,009.09	79.73	75.72	23.94	4,181.00	531.40	1,626.66	1,526.91	99.75	16.307	
16,800.00	12,496.69	15,350.66	11,008.91	81.23	77.25	23.94	4,281.00	530.83	1,626.52	1,525.13	101.38	16.043	
16,900.00	12,496.35	15,450.66	11,008.72	82.73	78.78	23.94	4,381.00	530.26	1,626.37	1,523.35	103.02	15.787	
17,000.00	12,496.01	15,550.66	11,008.54	84.25	80.33	23.94	4,481.00	529.70	1,626.23	1,521.56	104.66	15.537	
17,100.00	12,495.67	15,650.66	11,008.36	85.76	81.87	23.95	4,580.99	529.13	1,626.08	1,519.76	106.32	15.294	
17,200.00	12,495.33	15,750.66	11,008.18	87.28	83.42	23.95	4,680.99	528.56	1,625.94	1,517.96	107.98	15.058	
17,296.07	12,495.00	15,846.73	11,008.01	88.75	84.91	23.95	4,777.06	528.02	1,625.80	1,516.22	109.58	14.837	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 228H - Original Hole - rev1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 8300-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	1.30	-1.30	0.00	0.00	-90.00	0.00	-25.00	25.00				
100.00	100.00	101.30	98.70	0.13	0.14	-90.00	0.00	-25.00	25.00	24.73	0.27	93.866	
200.00	200.00	201.30	198.70	0.48	0.49	-90.00	0.00	-25.00	25.00	24.04	0.96	25.921	
300.00	300.00	301.30	298.70	0.83	0.84	-90.00	0.00	-25.00	25.00	23.34	1.66	15.037	
400.00	400.00	401.30	398.70	1.18	1.19	-90.00	0.00	-25.00	25.00	22.64	2.36	10.590	
500.00	500.00	501.30	498.70	1.53	1.54	-90.00	0.00	-25.00	25.00	21.94	3.06	8.173	
600.00	600.00	601.30	598.70	1.88	1.89	-90.00	0.00	-25.00	25.00	21.24	3.76	6.654	
700.00	700.00	701.30	698.70	2.24	2.24	-90.00	0.00	-25.00	25.00	20.54	4.46	5.612	
800.00	800.00	801.30	798.70	2.59	2.59	-90.00	0.00	-25.00	25.00	19.85	5.15	4.851	
900.00	900.00	901.30	898.70	2.94	2.94	-90.00	0.00	-25.00	25.00	19.15	5.85	4.272	
1,000.00	1,000.00	1,001.30	998.70	3.29	3.29	-90.00	0.00	-25.00	25.00	18.45	6.55	3.817	
1,100.00	1,100.00	1,101.30	1,098.70	3.64	3.64	-90.00	0.00	-25.00	25.00	17.75	7.25	3.449	
1,200.00	1,200.00	1,201.30	1,198.70	3.99	3.99	-90.00	0.00	-25.00	25.00	17.05	7.95	3.146	
1,300.00	1,299.99	1,301.31	1,298.69	4.34	4.34	69.86	0.00	-25.00	24.69	16.04	8.64	2.856	
1,400.00	1,399.96	1,401.34	1,398.66	4.68	4.69	75.77	0.00	-25.00	23.91	14.56	9.35	2.558	
1,500.00	1,499.86	1,498.56	1,498.56	5.03	5.04	86.25	0.00	-25.00	23.23	13.18	10.05	2.312	
1,600.00	1,599.73	1,598.70	1,598.69	5.39	5.39	100.65	0.22	-24.18	22.89	12.13	10.76	2.128	
1,625.10	1,624.79	1,623.80	1,623.79	5.48	5.47	104.79	0.35	-23.71	22.87	11.93	10.94	2.091	CC
1,700.00	1,699.59	1,698.66	1,698.62	5.75	5.74	118.35	0.89	-21.67	23.21	11.74	11.47	2.024	ES, SF
1,800.00	1,799.45	1,798.40	1,798.27	6.11	6.09	137.98	2.01	-17.50	25.37	13.20	12.17	2.084	
1,900.00	1,899.31	1,902.04	1,897.69	6.46	6.46	154.75	3.36	-12.46	30.09	17.21	12.88	2.336	
2,000.00	1,999.18	2,002.48	1,997.12	6.82	6.82	166.31	4.71	-7.43	36.64	23.06	13.58	2.698	
2,100.00	2,099.04	2,102.91	2,096.54	7.17	7.17	174.15	6.06	-2.40	44.21	29.94	14.28	3.097	
2,200.00	2,198.90	2,203.35	2,195.97	7.53	7.53	179.63	7.41	2.64	52.37	37.39	14.98	3.497	
2,300.00	2,298.77	2,303.79	2,295.39	7.88	7.89	-176.38	8.75	7.67	60.87	45.19	15.67	3.883	
2,400.00	2,398.63	2,404.23	2,394.82	8.23	8.24	-173.38	10.10	12.70	69.59	53.21	16.38	4.249	
2,500.00	2,498.49	2,504.67	2,494.24	8.59	8.60	-171.06	11.45	17.74	78.46	61.38	17.08	4.594	
2,600.00	2,598.36	2,605.11	2,593.66	8.94	8.95	-169.20	12.80	22.77	87.43	69.65	17.78	4.917	
2,700.00	2,698.22	2,705.55	2,693.09	9.29	9.31	-167.70	14.15	27.80	96.47	77.99	18.48	5.220	
2,800.00	2,798.08	2,805.99	2,792.51	9.65	9.66	-166.45	15.50	32.83	105.57	86.38	19.18	5.503	
2,900.00	2,897.94	2,906.43	2,891.94	10.00	10.02	-165.40	16.85	37.87	114.71	94.82	19.89	5.768	
3,000.00	2,997.81	3,006.86	2,991.36	10.35	10.37	-164.51	18.19	42.90	123.88	103.29	20.59	6.017	
3,100.00	3,097.67	3,107.30	3,090.79	10.70	10.73	-163.74	19.54	47.93	133.08	111.79	21.29	6.250	
3,200.00	3,197.53	3,207.74	3,190.21	11.05	11.08	-163.07	20.89	52.97	142.30	120.30	22.00	6.469	
3,300.00	3,297.40	3,308.18	3,289.64	11.40	11.43	-162.48	22.24	58.00	151.54	128.84	22.70	6.676	
3,400.00	3,397.26	3,408.62	3,389.06	11.76	11.79	-161.96	23.59	63.03	160.79	137.38	23.40	6.870	
3,500.00	3,497.12	3,509.06	3,488.49	12.11	12.14	-161.49	24.94	68.07	170.05	145.94	24.11	7.054	
3,600.00	3,596.99	3,609.50	3,587.91	12.46	12.49	-161.07	26.29	73.10	179.32	154.51	24.81	7.228	
3,700.00	3,696.85	3,709.94	3,687.34	12.81	12.85	-160.70	27.63	78.13	188.60	163.09	25.51	7.392	
3,800.00	3,796.71	3,789.63	3,786.76	13.16	13.13	-160.36	28.98	83.17	197.89	171.74	26.14	7.569	
3,900.00	3,896.57	3,889.19	3,886.19	13.51	13.48	-160.05	30.33	88.20	207.18	180.34	26.84	7.718	
4,000.00	3,996.44	3,988.75	3,985.61	13.86	13.83	-159.76	31.68	93.23	216.48	188.94	27.55	7.859	
4,100.00	4,096.30	4,088.31	4,085.04	14.21	14.18	-159.50	33.03	98.26	225.79	197.54	28.25	7.994	
4,200.00	4,196.16	4,187.87	4,184.46	14.56	14.53	-159.26	34.38	103.30	235.10	206.15	28.95	8.122	
4,300.00	4,296.03	4,287.43	4,283.89	14.91	14.88	-159.04	35.73	108.33	244.41	214.76	29.65	8.244	
4,400.00	4,395.89	4,386.99	4,383.31	15.26	15.23	-158.84	37.07	113.36	253.72	223.38	30.35	8.360	
4,500.00	4,495.79	4,490.13	4,486.34	15.61	15.59	-158.68	38.29	117.89	261.65	230.58	31.08	8.420	
4,600.00	4,595.76	4,594.09	4,590.26	15.96	15.95	-158.59	39.03	120.66	266.44	234.63	31.80	8.378	
4,700.00	4,695.75	4,698.22	4,694.38	16.31	16.31	43.47	39.28	121.61	268.05	235.53	32.52	8.243	
4,800.00	4,795.75	4,801.71	4,794.45	16.65	16.67	43.47	39.28	121.61	268.05	234.82	33.23	8.067	
4,900.00	4,895.75	4,901.71	4,894.45	17.00	17.02	43.47	39.28	121.61	268.05	234.12	33.93	7.901	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 228H - Original Hole - rev1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 8300-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,995.75	5,001.71	4,994.45	17.35	17.36	43.47	39.28	121.61	268.05	233.43	34.62	7.742	
5,100.00	5,095.75	5,101.71	5,094.45	17.69	17.71	43.47	39.28	121.61	268.05	232.73	35.32	7.589	
5,200.00	5,195.75	5,201.71	5,194.45	18.04	18.06	43.47	39.28	121.61	268.05	232.03	36.02	7.442	
5,300.00	5,295.75	5,301.71	5,294.45	18.39	18.40	43.47	39.28	121.61	268.05	231.33	36.72	7.300	
5,400.00	5,395.75	5,401.71	5,394.45	18.73	18.75	43.47	39.28	121.61	268.05	230.63	37.42	7.164	
5,500.00	5,495.75	5,501.71	5,494.45	19.08	19.10	43.47	39.28	121.61	268.05	229.93	38.11	7.033	
5,600.00	5,595.75	5,601.71	5,594.45	19.43	19.44	43.47	39.28	121.61	268.05	229.24	38.81	6.906	
5,700.00	5,695.75	5,701.71	5,694.45	19.77	19.79	43.47	39.28	121.61	268.05	228.54	39.51	6.784	
5,800.00	5,795.75	5,801.71	5,794.45	20.12	20.14	43.47	39.28	121.61	268.05	227.84	40.21	6.666	
5,900.00	5,895.75	5,901.71	5,894.45	20.47	20.49	43.47	39.28	121.61	268.05	227.14	40.91	6.552	
6,000.00	5,995.75	6,001.71	5,994.45	20.82	20.84	43.47	39.28	121.61	268.05	226.44	41.61	6.442	
6,100.00	6,095.75	6,101.71	6,094.45	21.16	21.18	43.47	39.28	121.61	268.05	225.74	42.31	6.336	
6,200.00	6,195.75	6,201.71	6,194.45	21.51	21.53	43.47	39.28	121.61	268.05	225.04	43.00	6.233	
6,300.00	6,295.75	6,301.71	6,294.45	21.86	21.88	43.47	39.28	121.61	268.05	224.35	43.70	6.133	
6,400.00	6,395.75	6,401.71	6,394.45	22.21	22.23	43.47	39.28	121.61	268.05	223.65	44.40	6.037	
6,500.00	6,495.75	6,501.71	6,494.45	22.55	22.58	43.47	39.28	121.61	268.05	222.95	45.10	5.943	
6,600.00	6,595.75	6,601.71	6,594.45	22.90	22.93	43.47	39.28	121.61	268.05	222.25	45.80	5.853	
6,700.00	6,695.75	6,701.71	6,694.45	23.25	23.27	43.47	39.28	121.61	268.05	221.55	46.50	5.765	
6,800.00	6,795.75	6,801.71	6,794.45	23.60	23.62	43.47	39.28	121.61	268.05	220.85	47.20	5.679	
6,900.00	6,895.75	6,901.71	6,894.45	23.94	23.97	43.47	39.28	121.61	268.05	220.15	47.90	5.596	
7,000.00	6,995.75	7,001.71	6,994.45	24.29	24.32	43.47	39.28	121.61	268.05	219.45	48.60	5.516	
7,100.00	7,095.75	7,101.71	7,094.45	24.64	24.67	43.47	39.28	121.61	268.05	218.75	49.30	5.437	
7,200.00	7,195.75	7,201.71	7,194.45	24.99	25.02	43.47	39.28	121.61	268.05	218.05	50.00	5.361	
7,300.00	7,295.75	7,301.71	7,294.45	25.34	25.37	43.47	39.28	121.61	268.05	217.35	50.70	5.287	
7,400.00	7,395.75	7,401.71	7,394.45	25.68	25.72	43.47	39.28	121.61	268.05	216.66	51.39	5.216	
7,500.00	7,495.75	7,501.71	7,494.45	26.03	26.07	43.47	39.28	121.61	268.05	215.96	52.09	5.146	
7,600.00	7,595.75	7,601.71	7,594.45	26.38	26.42	43.47	39.28	121.61	268.05	215.26	52.79	5.077	
7,700.00	7,695.75	7,701.71	7,694.45	26.73	26.77	43.47	39.28	121.61	268.05	214.56	53.49	5.011	
7,800.00	7,795.75	7,801.71	7,794.45	27.08	27.12	43.47	39.28	121.61	268.05	213.86	54.19	4.946	
7,900.00	7,895.75	7,901.71	7,894.45	27.43	27.47	43.47	39.28	121.61	268.05	213.16	54.89	4.883	
8,000.00	7,995.75	8,001.71	7,994.45	27.78	27.82	43.47	39.28	121.61	268.05	212.46	55.59	4.822	
8,100.00	8,095.75	8,101.71	8,094.45	28.13	28.17	43.47	39.28	121.61	268.05	211.76	56.29	4.762	
8,200.00	8,195.75	8,201.71	8,194.45	28.48	28.51	43.47	39.28	121.61	268.05	211.06	56.99	4.704	
8,300.00	8,295.75	8,298.29	8,294.45	28.83	28.68	43.47	39.28	121.61	268.05	210.54	57.51	4.661	
8,400.00	8,395.75	8,397.16	8,393.32	29.18	28.70	43.71	38.65	122.55	268.25	210.38	57.87	4.635	
8,500.00	8,495.75	8,495.85	8,491.93	29.53	28.70	44.48	36.60	125.62	268.92	210.69	58.23	4.618	
8,600.00	8,595.75	8,594.28	8,590.16	29.88	28.72	45.77	33.15	130.78	270.17	211.58	58.59	4.611	
8,700.00	8,695.75	8,692.32	8,687.81	30.23	28.74	47.57	28.32	138.02	272.16	213.22	58.95	4.617	
8,800.00	8,795.75	8,789.85	8,784.70	30.58	28.76	49.82	22.14	147.29	275.13	215.83	59.30	4.639	
8,900.00	8,895.75	8,886.75	8,880.65	30.93	28.79	52.49	14.63	158.52	279.35	219.70	59.65	4.683	
9,000.00	8,995.75	8,982.99	8,975.58	31.28	28.83	55.51	5.84	171.69	285.12	225.13	59.99	4.753	
9,100.00	9,095.75	9,081.43	9,072.49	31.45	28.87	58.67	-3.78	186.09	292.19	232.02	60.17	4.856	
9,200.00	9,195.75	9,179.87	9,169.39	31.46	28.92	61.68	-13.40	200.50	300.13	239.93	60.19	4.986	
9,300.00	9,295.75	9,278.31	9,266.29	31.46	28.98	64.54	-23.02	214.91	308.87	248.64	60.23	5.128	
9,400.00	9,395.75	9,376.75	9,363.20	31.48	29.05	67.23	-32.64	229.31	318.34	258.07	60.27	5.282	
9,500.00	9,495.75	9,475.19	9,460.10	31.49	29.12	69.76	-42.26	243.72	328.48	268.16	60.32	5.445	
9,600.00	9,595.75	9,573.63	9,557.00	31.51	29.20	72.14	-51.87	258.13	339.23	278.85	60.39	5.618	
9,700.00	9,695.75	9,672.07	9,653.91	31.54	29.29	74.38	-61.49	272.53	350.54	290.08	60.46	5.798	
9,800.00	9,795.75	9,770.51	9,750.81	31.57	29.38	76.47	-71.11	286.94	362.35	301.80	60.55	5.985	
9,900.00	9,895.75	9,868.95	9,847.71	31.60	29.48	78.43	-80.73	301.35	374.61	313.97	60.64	6.177	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 228H - Original Hole - rev1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 8300-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,000.00	9,995.75	9,967.39	9,944.62	31.63	29.59	80.27	-90.35	315.75	387.29	326.54	60.75	6.375	
10,100.00	10,095.74	10,065.86	10,041.55	31.67	29.70	-120.02	-99.98	330.16	400.93	340.06	60.87	6.587	
10,200.00	10,195.67	10,164.36	10,138.52	31.72	29.82	-118.66	-109.60	344.58	416.10	355.10	61.00	6.821	
10,300.00	10,295.46	10,262.83	10,235.45	31.77	29.94	-117.72	-119.22	358.99	432.58	371.43	61.15	7.074	
10,400.00	10,395.21	10,361.27	10,332.35	31.82	30.08	-117.08	-128.84	373.40	449.46	388.15	61.32	7.330	
10,500.00	10,494.96	10,459.72	10,429.26	31.88	30.21	-116.49	-138.47	387.81	466.39	404.91	61.49	7.585	
10,600.00	10,594.71	10,558.17	10,526.17	31.94	30.36	-115.94	-148.09	402.21	483.37	421.70	61.67	7.838	
10,700.00	10,694.46	10,656.61	10,623.08	32.00	30.51	-115.42	-157.71	416.62	500.38	438.53	61.86	8.090	
10,800.00	10,794.22	10,755.06	10,719.99	32.07	30.67	-114.94	-167.33	431.03	517.44	455.38	62.05	8.338	
10,900.00	10,893.97	10,853.50	10,816.90	32.15	30.83	-114.49	-176.95	445.44	534.52	472.26	62.26	8.585	
11,000.00	10,993.72	10,951.95	10,913.81	32.22	30.99	-114.07	-186.57	459.84	551.64	489.16	62.48	8.829	
11,100.00	11,093.47	11,050.39	11,010.72	32.30	31.17	-113.68	-196.19	474.25	568.78	506.07	62.70	9.071	
11,200.00	11,193.22	11,148.84	11,107.63	32.39	31.35	-113.30	-205.81	488.66	585.95	523.01	62.94	9.310	
11,300.00	11,292.97	11,247.29	11,204.54	32.48	31.53	-112.95	-215.43	503.07	603.14	539.96	63.18	9.546	
11,400.00	11,392.72	11,357.28	11,312.98	32.58	31.74	-112.63	-225.64	518.36	619.65	556.12	63.53	9.754	
11,500.00	11,492.47	11,471.74	11,426.33	32.68	31.95	-112.49	-234.47	531.58	633.81	569.92	63.89	9.920	
11,600.00	11,592.25	11,587.00	11,540.90	32.78	32.15	-112.57	-241.45	542.03	645.33	581.08	64.25	10.045	
11,700.00	11,692.16	11,702.94	11,656.47	32.88	32.35	-112.62	-246.53	549.64	653.43	588.85	64.58	10.119	
11,800.00	11,792.15	11,819.33	11,772.72	32.99	32.53	-112.55	-249.66	554.34	658.02	593.14	64.88	10.142	
11,900.00	11,892.15	11,935.96	11,889.32	33.08	32.70	89.58	-250.83	556.09	659.52	594.35	65.16	10.121	
12,000.00	11,992.02	12,037.38	11,990.63	33.18	32.83	89.93	-247.45	556.08	659.53	594.13	65.39	10.085	
12,100.00	12,089.93	12,137.26	12,088.46	33.28	32.94	89.95	-228.03	555.97	659.53	593.94	65.59	10.055	
12,200.00	12,182.93	12,237.17	12,181.49	33.37	33.01	89.97	-191.92	555.76	659.53	593.76	65.77	10.028	
12,300.00	12,268.20	12,337.14	12,266.88	33.48	33.06	90.00	-140.18	555.46	659.53	593.59	65.94	10.002	
12,313.17	12,278.71	12,350.31	12,277.41	33.49	33.07	90.00	-132.28	555.42	659.53	593.56	65.97	9.998	
12,400.00	12,343.15	12,437.16	12,342.03	33.60	33.09	90.02	-74.37	555.08	659.53	593.39	66.14	9.972	
12,500.00	12,405.49	12,537.23	12,404.63	33.77	33.10	90.05	3.53	554.64	659.53	593.13	66.40	9.932	
12,600.00	12,453.34	12,637.34	12,452.76	33.99	33.09	90.07	91.17	554.13	659.53	592.77	66.75	9.880	
12,700.00	12,485.92	12,737.45	12,485.58	34.27	33.06	90.09	185.64	553.59	659.53	592.31	67.22	9.812	
12,800.00	12,504.82	12,837.55	12,504.67	34.62	33.22	90.10	283.82	553.03	659.53	591.72	67.81	9.726	
12,900.00	12,509.96	12,937.66	12,509.97	35.03	33.57	90.11	383.71	552.47	659.54	591.01	68.53	9.624	
13,000.00	12,509.62	13,037.66	12,509.61	35.51	33.99	90.11	483.71	551.92	659.55	590.16	69.40	9.504	
13,100.00	12,509.28	13,137.66	12,509.26	36.06	34.47	90.11	583.71	551.36	659.57	589.16	70.40	9.369	
13,200.00	12,508.94	13,237.66	12,508.91	36.67	35.02	90.11	683.71	550.80	659.58	588.03	71.55	9.219	
13,300.00	12,508.60	13,337.66	12,508.56	37.35	35.63	90.11	783.70	550.25	659.59	586.76	72.82	9.058	
13,400.00	12,508.26	13,437.66	12,508.21	38.09	36.30	90.11	883.70	549.69	659.60	585.37	74.22	8.887	
13,500.00	12,507.92	13,537.66	12,507.86	38.89	37.04	90.11	983.70	549.13	659.61	583.87	75.74	8.709	
13,600.00	12,507.58	13,637.66	12,507.50	39.73	37.83	90.11	1,083.70	548.58	659.62	582.24	77.37	8.525	
13,700.00	12,507.24	13,737.66	12,507.15	40.63	38.67	90.11	1,183.70	548.02	659.63	580.52	79.11	8.338	
13,800.00	12,506.90	13,837.66	12,506.80	41.58	39.57	90.10	1,283.69	547.46	659.64	578.70	80.94	8.149	
13,900.00	12,506.56	13,937.66	12,506.45	42.56	40.51	90.10	1,383.69	546.91	659.65	576.78	82.87	7.960	
14,000.00	12,506.22	14,037.66	12,506.10	43.59	41.49	90.10	1,483.69	546.35	659.66	574.78	84.88	7.772	
14,100.00	12,505.88	14,137.66	12,505.75	44.66	42.52	90.10	1,583.69	545.79	659.67	572.70	86.97	7.585	
14,200.00	12,505.54	14,237.66	12,505.39	45.76	43.58	90.10	1,683.68	545.24	659.68	570.55	89.13	7.401	
14,300.00	12,505.20	14,337.66	12,505.04	46.89	44.68	90.10	1,783.68	544.68	659.69	568.33	91.36	7.220	
14,400.00	12,504.86	14,437.66	12,504.69	48.05	45.81	90.10	1,883.68	544.12	659.70	566.04	93.66	7.044	
14,500.00	12,504.52	14,537.66	12,504.34	49.24	46.98	90.10	1,983.68	543.57	659.71	563.70	96.01	6.871	
14,600.00	12,504.18	14,637.66	12,503.99	50.46	48.17	90.10	2,083.68	543.01	659.73	561.30	98.42	6.703	
14,700.00	12,503.84	14,737.66	12,503.63	51.70	49.38	90.10	2,183.67	542.45	659.74	558.85	100.88	6.539	
14,800.00	12,503.50	14,837.66	12,503.28	52.96	50.63	90.09	2,283.67	541.90	659.75	556.35	103.39	6.381	
14,900.00	12,503.16	14,937.66	12,502.93	54.25	51.89	90.09	2,383.67	541.34	659.76	553.81	105.94	6.227	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 228H - Original Hole - rev1

Survey Program: 0-GYRO-NS, 8300-MWD

Offset Site Error: 0.00 ft

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
15,000.00	12,502.82	15,037.66	12,502.58	55.55	53.18	90.09	2,483.67	540.78	659.77	551.23	108.54	6.079	
15,100.00	12,502.48	15,137.66	12,502.23	56.87	54.48	90.09	2,583.66	540.23	659.78	548.61	111.17	5.935	
15,200.00	12,502.13	15,237.66	12,501.88	58.21	55.81	90.09	2,683.66	539.67	659.79	545.96	113.83	5.796	
15,300.00	12,501.79	15,337.66	12,501.52	59.57	57.15	90.09	2,783.66	539.11	659.80	543.27	116.53	5.662	
15,400.00	12,501.45	15,437.66	12,501.17	60.94	58.50	90.09	2,883.66	538.56	659.81	540.55	119.26	5.533	
15,500.00	12,501.11	15,537.66	12,500.82	62.32	59.88	90.09	2,983.66	538.00	659.82	537.81	122.02	5.408	
15,600.00	12,500.77	15,637.66	12,500.47	63.72	61.26	90.09	3,083.65	537.44	659.83	535.03	124.80	5.287	
15,700.00	12,500.43	15,737.66	12,500.12	65.13	62.66	90.09	3,183.65	536.89	659.84	532.23	127.61	5.171	
15,800.00	12,500.09	15,837.66	12,499.76	66.54	64.07	90.08	3,283.65	536.33	659.85	529.41	130.44	5.059	
15,900.00	12,499.75	15,937.66	12,499.41	67.97	65.49	90.08	3,383.65	535.77	659.86	526.57	133.30	4.950	
16,000.00	12,499.41	16,037.66	12,499.06	69.41	66.93	90.08	3,483.65	535.22	659.88	523.71	136.17	4.846	
16,100.00	12,499.07	16,137.66	12,498.71	70.86	68.37	90.08	3,583.64	534.66	659.89	520.82	139.06	4.745	
16,200.00	12,498.73	16,237.66	12,498.36	72.32	69.82	90.08	3,683.64	534.10	659.90	517.92	141.98	4.648	
16,300.00	12,498.39	16,337.66	12,498.01	73.79	71.28	90.08	3,783.64	533.55	659.91	515.00	144.90	4.554	
16,400.00	12,498.05	16,437.66	12,497.65	75.26	72.75	90.08	3,883.64	532.99	659.92	512.07	147.85	4.463	
16,500.00	12,497.71	16,537.66	12,497.30	76.74	74.22	90.08	3,983.63	532.43	659.93	509.12	150.81	4.376	
16,600.00	12,497.37	16,637.66	12,496.95	78.23	75.71	90.08	4,083.63	531.88	659.94	506.16	153.78	4.291	
16,700.00	12,497.03	16,737.66	12,496.60	79.73	77.20	90.08	4,183.63	531.32	659.95	503.18	156.77	4.210	
16,800.00	12,496.69	16,837.66	12,496.25	81.23	78.70	90.07	4,283.63	530.76	659.96	500.19	159.77	4.131	
16,900.00	12,496.35	16,937.66	12,495.89	82.73	80.20	90.07	4,383.63	530.21	659.97	497.19	162.78	4.054	
17,000.00	12,496.01	17,037.66	12,495.54	84.25	81.71	90.07	4,483.62	529.65	659.98	494.18	165.80	3.981	
17,100.00	12,495.67	17,137.66	12,495.19	85.76	83.22	90.07	4,583.62	529.09	659.99	491.16	168.84	3.909	
17,200.00	12,495.33	17,237.66	12,494.84	87.28	84.74	90.07	4,683.62	528.54	660.00	488.12	171.88	3.840	
17,296.07	12,495.00	17,333.73	12,494.50	88.75	86.20	90.07	4,779.69	528.00	660.01	485.20	174.81	3.776	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 238H - Original Hole - rev1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 9500-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	1.20	-1.20	0.00	0.00	90.00	0.00	25.00	25.00				
100.00	100.00	101.20	98.80	0.13	0.14	90.00	0.00	25.00	25.00	24.73	0.27	93.989	
200.00	200.00	201.20	198.80	0.48	0.49	90.00	0.00	25.00	25.00	24.04	0.96	25.930	
300.00	300.00	301.20	298.80	0.83	0.84	90.00	0.00	25.00	25.00	23.34	1.66	15.040	
400.00	400.00	401.20	398.80	1.18	1.19	90.00	0.00	25.00	25.00	22.64	2.36	10.592	
500.00	500.00	501.20	498.80	1.53	1.54	90.00	0.00	25.00	25.00	21.94	3.06	8.174	
600.00	600.00	601.20	598.80	1.88	1.89	90.00	0.00	25.00	25.00	21.24	3.76	6.655	
700.00	700.00	701.20	698.80	2.24	2.24	90.00	0.00	25.00	25.00	20.55	4.45	5.612	
800.00	800.00	801.20	798.80	2.59	2.59	90.00	0.00	25.00	25.00	19.85	5.15	4.852	
900.00	900.00	901.20	898.80	2.94	2.94	90.00	0.00	25.00	25.00	19.15	5.85	4.273	
1,000.00	1,000.00	1,001.20	998.80	3.29	3.29	90.00	0.00	25.00	25.00	18.45	6.55	3.817	
1,100.00	1,100.00	1,101.20	1,098.80	3.64	3.64	90.00	0.00	25.00	25.00	17.75	7.25	3.450	
1,200.00	1,200.00	1,198.80	1,198.80	3.99	3.98	90.00	0.00	25.00	25.00	17.06	7.94	3.150	CC
1,300.00	1,299.99	1,298.67	1,298.67	4.34	4.33	-112.00	-0.81	25.25	25.58	16.94	8.64	2.962	ES
1,400.00	1,399.96	1,398.52	1,398.48	4.68	4.68	-111.88	-3.29	26.01	27.32	17.98	9.34	2.925	
1,500.00	1,499.86	1,501.67	1,498.19	5.03	5.04	-111.67	-7.43	27.27	30.22	20.16	10.06	3.003	
1,600.00	1,599.73	1,601.73	1,597.99	5.39	5.40	-111.45	-12.43	28.80	33.71	22.93	10.78	3.128	
1,700.00	1,699.59	1,701.79	1,697.80	5.75	5.75	-111.26	-17.43	30.33	37.20	25.71	11.49	3.237	
1,800.00	1,799.45	1,801.86	1,797.60	6.11	6.11	-111.11	-22.43	31.86	40.70	28.49	12.21	3.334	
1,900.00	1,899.31	1,901.92	1,897.40	6.46	6.47	-110.98	-27.43	33.39	44.19	31.28	12.92	3.421	
2,000.00	1,999.18	2,001.98	1,997.20	6.82	6.82	-110.87	-32.43	34.92	47.69	34.06	13.63	3.499	
2,100.00	2,099.04	2,102.04	2,097.00	7.17	7.18	-110.78	-37.44	36.45	51.18	36.84	14.34	3.570	
2,200.00	2,198.90	2,202.10	2,196.81	7.53	7.53	-110.69	-42.44	37.97	54.67	39.63	15.04	3.634	
2,300.00	2,298.77	2,302.16	2,296.61	7.88	7.89	-110.62	-47.44	39.50	58.17	42.42	15.75	3.693	
2,400.00	2,398.63	2,402.22	2,396.41	8.23	8.24	-110.56	-52.44	41.03	61.66	45.21	16.46	3.747	
2,500.00	2,498.49	2,502.28	2,496.21	8.59	8.59	-110.50	-57.44	42.56	65.16	48.00	17.16	3.796	
2,600.00	2,598.36	2,602.34	2,596.01	8.94	8.95	-110.45	-62.45	44.09	68.65	50.78	17.87	3.842	
2,700.00	2,698.22	2,702.41	2,695.82	9.29	9.30	-110.40	-67.45	45.62	72.15	53.57	18.57	3.884	
2,800.00	2,798.08	2,802.47	2,795.62	9.65	9.65	-110.36	-72.45	47.15	75.64	56.36	19.28	3.924	
2,900.00	2,897.94	2,902.53	2,895.42	10.00	10.01	-110.32	-77.45	48.68	79.14	59.15	19.98	3.960	
3,000.00	2,997.81	3,002.59	2,995.22	10.35	10.36	-110.29	-82.45	50.21	82.63	61.95	20.69	3.994	
3,100.00	3,097.67	3,102.65	3,095.02	10.70	10.71	-110.25	-87.46	51.74	86.13	64.74	21.39	4.026	
3,200.00	3,197.53	3,202.71	3,194.83	11.05	11.06	-110.22	-92.46	53.27	89.62	67.53	22.09	4.056	
3,300.00	3,297.40	3,302.77	3,294.63	11.40	11.41	-110.20	-97.46	54.80	93.12	70.32	22.80	4.085	
3,400.00	3,397.26	3,402.83	3,394.43	11.76	11.76	-110.17	-102.46	56.33	96.61	73.11	23.50	4.111	
3,500.00	3,497.12	3,502.89	3,494.23	12.11	12.12	-110.15	-107.46	57.85	100.11	75.90	24.20	4.136	
3,600.00	3,596.99	3,602.96	3,594.03	12.46	12.47	-110.12	-112.46	59.38	103.60	78.70	24.90	4.160	
3,700.00	3,696.85	3,703.02	3,693.84	12.81	12.82	-110.10	-117.47	60.91	107.10	81.49	25.61	4.182	
3,800.00	3,796.71	3,803.08	3,793.64	13.16	13.17	-110.08	-122.47	62.44	110.59	84.28	26.31	4.204	
3,900.00	3,896.57	3,903.14	3,893.44	13.51	13.52	-110.06	-127.47	63.97	114.09	87.08	27.01	4.224	
4,000.00	3,996.44	4,003.20	3,993.24	13.86	13.87	-110.05	-132.47	65.50	117.58	89.87	27.71	4.243	
4,100.00	4,096.30	4,103.26	4,093.04	14.21	14.22	-110.03	-137.47	67.03	121.08	92.66	28.41	4.261	
4,200.00	4,196.16	4,203.32	4,192.85	14.56	14.57	-110.02	-142.48	68.56	124.57	95.46	29.12	4.278	
4,300.00	4,296.03	4,296.62	4,292.65	14.91	14.90	-110.00	-147.48	70.09	128.07	98.27	29.79	4.298	
4,400.00	4,395.89	4,397.27	4,393.20	15.26	15.25	-110.33	-151.73	71.39	131.30	100.80	30.50	4.305	
4,500.00	4,495.79	4,497.96	4,493.86	15.61	15.60	-111.03	-154.29	72.17	133.68	102.48	31.20	4.284	
4,600.00	4,595.76	4,598.66	4,594.55	15.96	15.95	-111.72	-155.16	72.44	134.90	103.01	31.90	4.229	
4,700.00	4,695.75	4,701.34	4,694.55	16.31	16.31	89.96	-155.16	72.44	135.23	102.63	32.60	4.148	
4,800.00	4,795.75	4,801.34	4,794.55	16.65	16.65	89.96	-155.16	72.44	135.23	101.94	33.29	4.062	
4,900.00	4,895.75	4,901.34	4,894.55	17.00	17.00	89.96	-155.16	72.44	135.23	101.24	33.99	3.979	
5,000.00	4,995.75	5,001.34	4,994.55	17.35	17.35	89.96	-155.16	72.44	135.23	100.55	34.68	3.899	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 238H - Original Hole - rev1

Offset Site Error: 0.00 ft

Survey Program: 0-GYRO-NS, 9500-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,095.75	5,101.34	5,094.55	17.69	17.69	89.96	-155.16	72.44	135.23	99.85	35.37	3.823	
5,200.00	5,195.75	5,201.34	5,194.55	18.04	18.04	89.96	-155.16	72.44	135.23	99.16	36.07	3.749	
5,300.00	5,295.75	5,301.34	5,294.55	18.39	18.39	89.96	-155.16	72.44	135.23	98.47	36.76	3.678	
5,400.00	5,395.75	5,401.34	5,394.55	18.73	18.73	89.96	-155.16	72.44	135.23	97.77	37.46	3.610	
5,500.00	5,495.75	5,501.34	5,494.55	19.08	19.08	89.96	-155.16	72.44	135.23	97.08	38.15	3.544	
5,600.00	5,595.75	5,601.34	5,594.55	19.43	19.43	89.96	-155.16	72.44	135.23	96.38	38.85	3.481	
5,700.00	5,695.75	5,701.34	5,694.55	19.77	19.77	89.96	-155.16	72.44	135.23	95.69	39.54	3.420	
5,800.00	5,795.75	5,801.34	5,794.55	20.12	20.12	89.96	-155.16	72.44	135.23	94.99	40.24	3.361	
5,900.00	5,895.75	5,901.34	5,894.55	20.47	20.47	89.96	-155.16	72.44	135.23	94.30	40.93	3.304	
6,000.00	5,995.75	6,001.34	5,994.55	20.82	20.82	89.96	-155.16	72.44	135.23	93.60	41.63	3.249	
6,100.00	6,095.75	6,101.34	6,094.55	21.16	21.16	89.96	-155.16	72.44	135.23	92.91	42.32	3.195	
6,200.00	6,195.75	6,201.34	6,194.55	21.51	21.51	89.96	-155.16	72.44	135.23	92.21	43.02	3.144	
6,300.00	6,295.75	6,301.34	6,294.55	21.86	21.86	89.96	-155.16	72.44	135.23	91.52	43.71	3.094	
6,400.00	6,395.75	6,401.34	6,394.55	22.21	22.21	89.96	-155.16	72.44	135.23	90.82	44.41	3.045	
6,500.00	6,495.75	6,501.34	6,494.55	22.55	22.55	89.96	-155.16	72.44	135.23	90.12	45.10	2.998	
6,600.00	6,595.75	6,601.34	6,594.55	22.90	22.90	89.96	-155.16	72.44	135.23	89.43	45.80	2.953	
6,700.00	6,695.75	6,701.34	6,694.55	23.25	23.25	89.96	-155.16	72.44	135.23	88.73	46.50	2.908	
6,800.00	6,795.75	6,801.34	6,794.55	23.60	23.60	89.96	-155.16	72.44	135.23	88.04	47.19	2.865	
6,900.00	6,895.75	6,901.34	6,894.55	23.94	23.94	89.96	-155.16	72.44	135.23	87.34	47.89	2.824	
7,000.00	6,995.75	7,001.34	6,994.55	24.29	24.29	89.96	-155.16	72.44	135.23	86.64	48.58	2.783	
7,100.00	7,095.75	7,101.34	7,094.55	24.64	24.64	89.96	-155.16	72.44	135.23	85.95	49.28	2.744	
7,200.00	7,195.75	7,201.34	7,194.55	24.99	24.99	89.96	-155.16	72.44	135.23	85.25	49.98	2.706	
7,300.00	7,295.75	7,301.34	7,294.55	25.34	25.34	89.96	-155.16	72.44	135.23	84.56	50.67	2.669	
7,400.00	7,395.75	7,401.34	7,394.55	25.68	25.69	89.96	-155.16	72.44	135.23	83.86	51.37	2.632	
7,500.00	7,495.75	7,501.34	7,494.55	26.03	26.03	89.96	-155.16	72.44	135.23	83.16	52.07	2.597	
7,600.00	7,595.75	7,601.34	7,594.55	26.38	26.38	89.96	-155.16	72.44	135.23	82.47	52.76	2.563	
7,700.00	7,695.75	7,701.34	7,694.55	26.73	26.73	89.96	-155.16	72.44	135.23	81.77	53.46	2.530	
7,800.00	7,795.75	7,801.34	7,794.55	27.08	27.08	89.96	-155.16	72.44	135.23	81.07	54.16	2.497	
7,900.00	7,895.75	7,901.34	7,894.55	27.43	27.43	89.96	-155.16	72.44	135.23	80.38	54.85	2.465	
8,000.00	7,995.75	8,001.34	7,994.55	27.78	27.78	89.96	-155.16	72.44	135.23	79.68	55.55	2.434	
8,100.00	8,095.75	8,101.34	8,094.55	28.13	28.13	89.96	-155.16	72.44	135.23	78.98	56.25	2.404	
8,200.00	8,195.75	8,201.34	8,194.55	28.48	28.48	89.96	-155.16	72.44	135.23	78.29	56.94	2.375	
8,300.00	8,295.75	8,301.34	8,294.55	28.83	28.83	89.96	-155.16	72.44	135.23	77.59	57.64	2.346	
8,400.00	8,395.75	8,401.34	8,394.55	29.18	29.18	89.96	-155.16	72.44	135.23	76.89	58.34	2.318	
8,500.00	8,495.75	8,501.34	8,494.55	29.53	29.53	89.96	-155.16	72.44	135.23	76.20	59.03	2.291	
8,600.00	8,595.75	8,601.34	8,594.55	29.88	29.88	89.96	-155.16	72.44	135.23	75.50	59.73	2.264	
8,700.00	8,695.75	8,701.34	8,694.55	30.23	30.23	89.96	-155.16	72.44	135.23	74.80	60.43	2.238	
8,800.00	8,795.75	8,801.34	8,794.55	30.58	30.58	89.96	-155.16	72.44	135.23	74.11	61.12	2.212	
8,900.00	8,895.75	8,901.34	8,894.55	30.93	30.93	89.96	-155.16	72.44	135.23	73.41	61.82	2.187	
9,000.00	8,995.75	9,001.34	8,994.55	31.28	31.28	89.96	-155.16	72.44	135.23	72.71	62.52	2.163	
9,100.00	9,095.75	9,101.34	9,094.55	31.45	31.63	89.96	-155.16	72.44	135.23	72.19	63.04	2.145	
9,200.00	9,195.75	9,201.34	9,194.55	31.46	31.98	89.96	-155.16	72.44	135.23	71.84	63.39	2.133	
9,300.00	9,295.75	9,301.34	9,294.55	31.46	32.33	89.96	-155.16	72.44	135.23	71.48	63.75	2.121	
9,400.00	9,395.75	9,401.34	9,394.55	31.48	32.68	89.96	-155.16	72.44	135.23	71.12	64.11	2.109	
9,500.00	9,495.75	9,498.66	9,494.55	31.49	32.85	89.96	-155.16	72.44	135.23	70.93	64.30	2.103	SF
9,600.00	9,595.75	9,595.58	9,591.46	31.51	32.86	90.10	-155.51	73.47	136.30	71.99	64.31	2.119	
9,700.00	9,695.75	9,692.20	9,688.01	31.54	32.87	90.56	-156.64	76.82	139.78	75.49	64.29	2.174	
9,800.00	9,795.75	9,788.58	9,784.20	31.57	32.88	91.29	-158.54	82.47	145.67	81.43	64.24	2.268	
9,900.00	9,895.75	9,884.60	9,879.86	31.60	32.89	92.22	-161.21	90.38	153.99	89.81	64.17	2.400	
10,000.00	9,995.75	9,980.14	9,974.79	31.63	32.91	93.28	-164.63	100.50	164.75	100.66	64.09	2.571	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 238H - Original Hole - rev1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-GYRO-NS, 9500-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.00	10,095.74	10,076.66	10,070.44	31.67	32.94	-107.80	-168.80	112.85	178.17	114.10	64.06	2.781	
10,200.00	10,195.67	10,175.58	10,168.38	31.72	32.97	-107.63	-173.22	125.94	192.85	128.70	64.15	3.006	
10,300.00	10,295.46	10,274.34	10,266.17	31.77	33.00	-108.18	-177.63	139.02	208.32	144.06	64.25	3.242	
10,400.00	10,395.21	10,373.06	10,363.92	31.82	33.04	-108.96	-182.04	152.09	224.03	159.68	64.36	3.481	
10,500.00	10,494.96	10,471.77	10,461.66	31.88	33.09	-109.64	-186.45	165.16	239.79	175.32	64.47	3.720	
10,600.00	10,594.71	10,570.48	10,559.41	31.94	33.14	-110.24	-190.86	178.23	255.57	190.98	64.59	3.957	
10,700.00	10,694.46	10,669.20	10,657.16	32.00	33.19	-110.77	-195.27	191.30	271.38	206.67	64.71	4.194	
10,800.00	10,794.22	10,767.91	10,754.90	32.07	33.26	-111.24	-199.69	204.37	287.20	222.36	64.85	4.429	
10,900.00	10,893.97	10,866.62	10,852.65	32.15	33.32	-111.66	-204.10	217.44	303.05	238.06	64.99	4.663	
11,000.00	10,993.72	10,965.34	10,950.39	32.22	33.40	-112.04	-208.51	230.51	318.91	253.77	65.14	4.896	
11,100.00	11,093.47	11,064.05	11,048.14	32.30	33.47	-112.38	-212.92	243.58	334.78	269.48	65.29	5.127	
11,200.00	11,193.22	11,162.76	11,145.88	32.39	33.56	-112.70	-217.33	256.65	350.66	285.20	65.46	5.357	
11,300.00	11,292.97	11,261.48	11,243.63	32.48	33.64	-112.98	-221.74	269.71	366.55	300.92	65.63	5.585	
11,400.00	11,392.72	11,360.19	11,341.37	32.58	33.74	-113.24	-226.15	282.78	382.45	316.63	65.81	5.811	
11,500.00	11,492.47	11,458.91	11,439.12	32.68	33.83	-113.48	-230.57	295.85	398.35	332.35	66.00	6.036	
11,600.00	11,592.25	11,557.66	11,536.90	32.78	33.94	-113.78	-234.98	308.93	414.06	347.87	66.20	6.255	
11,700.00	11,692.16	11,656.55	11,634.83	32.88	34.04	-113.83	-239.40	322.02	428.81	362.41	66.40	6.458	
11,800.00	11,792.15	11,763.75	11,741.07	32.99	34.16	-113.54	-243.95	335.51	441.90	375.22	66.68	6.627	
11,900.00	11,892.15	11,875.49	11,852.19	33.08	34.29	88.99	-247.73	346.70	451.84	384.86	66.99	6.745	
12,000.00	11,992.02	11,987.61	11,963.97	33.18	34.41	89.75	-250.47	354.81	459.03	391.77	67.27	6.824	
12,100.00	12,089.93	12,097.81	12,074.04	33.28	34.53	92.15	-252.14	359.76	463.96	396.44	67.51	6.872	
12,200.00	12,182.93	12,203.03	12,179.24	33.37	34.64	96.40	-252.78	361.68	468.89	401.16	67.73	6.923	
12,300.00	12,268.20	12,290.80	12,267.00	33.48	34.72	100.92	-252.80	361.73	478.32	410.41	67.91	7.043	
12,400.00	12,343.15	12,367.13	12,343.34	33.60	34.80	104.85	-252.61	361.78	497.84	429.74	68.10	7.310	
12,500.00	12,405.49	12,449.24	12,424.98	33.77	34.88	108.28	-244.87	363.76	529.18	460.87	68.30	7.747	
12,600.00	12,453.34	12,542.40	12,515.14	33.99	34.98	111.16	-222.52	369.48	570.70	502.30	68.40	8.343	
12,700.00	12,485.92	12,655.14	12,617.44	34.27	35.10	114.53	-177.05	381.11	619.54	551.31	68.23	9.080	
12,800.00	12,504.82	12,806.46	12,736.58	34.62	35.27	118.48	-87.36	404.06	670.87	603.20	67.67	9.914	
12,900.00	12,509.96	13,023.55	12,856.40	35.03	35.66	122.04	86.51	448.54	718.12	651.10	67.02	10.716	
13,000.00	12,509.62	13,238.01	12,907.21	35.51	36.37	123.28	287.55	499.97	751.83	684.27	67.56	11.129	
13,100.00	12,509.28	13,463.19	12,909.53	36.06	37.43	121.57	507.84	545.04	770.12	700.97	69.16	11.136	
13,200.00	12,508.94	13,640.93	12,908.91	36.67	38.42	121.26	685.31	551.98	773.01	702.51	70.50	10.965	
13,300.00	12,508.60	13,740.93	12,908.56	37.35	39.04	121.26	785.31	551.40	772.99	701.44	71.55	10.804	
13,400.00	12,508.26	13,840.93	12,908.20	38.09	39.72	121.26	885.31	550.81	772.97	700.26	72.71	10.631	
13,500.00	12,507.92	13,940.93	12,907.85	38.89	40.45	121.26	985.30	550.22	772.94	698.99	73.96	10.451	
13,600.00	12,507.58	14,040.93	12,907.50	39.73	41.24	121.26	1,085.30	549.64	772.92	697.62	75.30	10.265	
13,700.00	12,507.24	14,140.93	12,907.15	40.63	42.08	121.26	1,185.30	549.05	772.90	696.18	76.73	10.074	
13,800.00	12,506.90	14,240.93	12,906.80	41.58	42.96	121.26	1,285.30	548.47	772.88	694.65	78.23	9.879	
13,900.00	12,506.56	14,340.93	12,906.44	42.56	43.89	121.26	1,385.29	547.88	772.86	693.04	79.82	9.683	
14,000.00	12,506.22	14,440.93	12,906.09	43.59	44.86	121.26	1,485.29	547.30	772.84	691.36	81.47	9.486	
14,100.00	12,505.88	14,540.93	12,905.74	44.66	45.87	121.26	1,585.29	546.71	772.81	689.62	83.20	9.289	
14,200.00	12,505.54	14,640.93	12,905.39	45.76	46.92	121.26	1,685.29	546.12	772.79	687.81	84.98	9.094	
14,300.00	12,505.20	14,740.93	12,905.04	46.89	48.00	121.26	1,785.29	545.54	772.77	685.95	86.82	8.900	
14,400.00	12,504.86	14,840.93	12,904.69	48.05	49.11	121.26	1,885.28	544.95	772.75	684.03	88.72	8.710	
14,500.00	12,504.52	14,940.93	12,904.33	49.24	50.25	121.26	1,985.28	544.37	772.73	682.06	90.67	8.522	
14,600.00	12,504.18	15,040.93	12,903.98	50.46	51.42	121.26	2,085.28	543.78	772.71	680.04	92.67	8.338	
14,700.00	12,503.84	15,140.93	12,903.63	51.70	52.62	121.26	2,185.28	543.20	772.68	677.97	94.71	8.158	
14,800.00	12,503.50	15,240.93	12,903.28	52.96	53.84	121.26	2,285.27	542.61	772.66	675.87	96.79	7.983	
14,900.00	12,503.16	15,340.93	12,902.93	54.25	55.08	121.26	2,385.27	542.03	772.64	673.73	98.91	7.811	
15,000.00	12,502.82	15,440.93	12,902.57	55.55	56.35	121.26	2,485.27	541.44	772.62	671.55	101.07	7.644	
15,100.00	12,502.48	15,540.93	12,902.22	56.87	57.63	121.26	2,585.27	540.85	772.60	669.34	103.26	7.482	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Double Diamond 24S 21E 1414 Well No. 238H - Original Hole - rev1

Offset Site Error: 0.00 ft

Survey Program: 0-GYRO-NS, 9500-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
15,200.00	12,502.13	15,640.93	12,901.87	58.21	58.93	121.26	2,685.26	540.27	772.58	667.10	105.48	7.324	
15,300.00	12,501.79	15,740.93	12,901.52	59.57	60.25	121.26	2,785.26	539.68	772.56	664.83	107.73	7.171	
15,400.00	12,501.45	15,840.93	12,901.17	60.94	61.59	121.26	2,885.26	539.10	772.53	662.53	110.00	7.023	
15,500.00	12,501.11	15,940.93	12,900.82	62.32	62.94	121.26	2,985.26	538.51	772.51	660.21	112.30	6.879	
15,600.00	12,500.77	16,040.93	12,900.46	63.72	64.30	121.26	3,085.26	537.93	772.49	657.86	114.63	6.739	
15,700.00	12,500.43	16,140.93	12,900.11	65.13	65.68	121.26	3,185.25	537.34	772.47	655.49	116.98	6.604	
15,800.00	12,500.09	16,240.93	12,899.76	66.54	67.07	121.26	3,285.25	536.75	772.45	653.11	119.34	6.473	
15,900.00	12,499.75	16,340.93	12,899.41	67.97	68.47	121.26	3,385.25	536.17	772.43	650.70	121.73	6.346	
16,000.00	12,499.41	16,440.93	12,899.06	69.41	69.88	121.26	3,485.25	535.58	772.40	648.28	124.13	6.223	
16,100.00	12,499.07	16,540.93	12,898.70	70.86	71.31	121.26	3,585.24	535.00	772.38	645.84	126.55	6.104	
16,200.00	12,498.73	16,640.93	12,898.35	72.32	72.74	121.26	3,685.24	534.41	772.36	643.38	128.98	5.988	
16,300.00	12,498.39	16,740.93	12,898.00	73.79	74.18	121.26	3,785.24	533.83	772.34	640.91	131.43	5.876	
16,400.00	12,498.05	16,840.93	12,897.65	75.26	75.63	121.26	3,885.24	533.24	772.32	638.43	133.89	5.768	
16,500.00	12,497.71	16,940.93	12,897.30	76.74	77.09	121.26	3,985.23	532.66	772.30	635.93	136.36	5.664	
16,600.00	12,497.37	17,040.93	12,896.94	78.23	78.56	121.26	4,085.23	532.07	772.27	633.43	138.85	5.562	
16,700.00	12,497.03	17,140.93	12,896.59	79.73	80.03	121.26	4,185.23	531.48	772.25	630.91	141.34	5.464	
16,800.00	12,496.69	17,240.93	12,896.24	81.23	81.51	121.26	4,285.23	530.90	772.23	628.38	143.85	5.368	
16,900.00	12,496.35	17,340.93	12,895.89	82.73	83.00	121.26	4,385.22	530.31	772.21	625.85	146.36	5.276	
17,000.00	12,496.01	17,440.93	12,895.54	84.25	84.49	121.26	4,485.22	529.73	772.19	623.30	148.89	5.186	
17,100.00	12,495.67	17,540.93	12,895.19	85.76	85.99	121.26	4,585.22	529.14	772.17	620.75	151.42	5.100	
17,200.00	12,495.33	17,640.93	12,894.83	87.28	87.50	121.26	4,685.22	528.56	772.15	618.19	153.96	5.015	
17,296.07	12,495.00	17,737.00	12,894.50	88.75	88.95	121.26	4,781.28	527.99	772.12	615.72	156.40	4.937	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Petrogulf BJT Federal Well No. 1H - Horizontal - Surveys Horizontal

Offset Site Error: 0.00 ft

Survey Program: 7833-MWD **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,000.00	5,995.75	7,700.00	7,699.24	20.82	0.00	52.08	348.55	583.97	1,893.84	1,881.48	12.35	153.287	
6,100.00	6,095.75	7,700.00	7,699.24	21.16	0.00	52.08	348.55	583.97	1,804.21	1,791.35	12.86	140.254	
6,200.00	6,195.75	7,700.00	7,699.24	21.51	0.00	52.08	348.55	583.97	1,715.74	1,702.32	13.41	127.925	
6,300.00	6,295.75	7,700.00	7,699.24	21.86	0.00	52.08	348.55	583.97	1,628.59	1,614.59	14.01	116.277	
6,400.00	6,395.75	7,700.00	7,699.24	22.21	0.00	52.08	348.55	583.97	1,543.01	1,528.36	14.65	105.305	
6,500.00	6,495.75	7,700.00	7,699.24	22.55	0.00	52.08	348.55	583.97	1,459.26	1,443.90	15.36	95.014	
6,600.00	6,595.75	7,700.00	7,699.24	22.90	0.00	52.08	348.55	583.97	1,377.68	1,361.55	16.13	85.419	
6,700.00	6,695.75	7,700.00	7,699.24	23.25	0.00	52.08	348.55	583.97	1,298.68	1,281.71	16.97	76.533	
6,800.00	6,795.75	7,700.00	7,699.24	23.60	0.00	52.08	348.55	583.97	1,222.75	1,204.87	17.89	68.364	
6,900.00	6,895.75	7,700.00	7,699.24	23.94	0.00	52.08	348.55	583.97	1,150.52	1,131.64	18.88	60.936	
7,000.00	6,995.75	7,700.00	7,699.24	24.29	0.00	52.08	348.55	583.97	1,082.71	1,062.75	19.95	54.269	
7,100.00	7,095.75	7,700.00	7,699.24	24.64	0.00	52.08	348.55	583.97	1,020.20	999.12	21.08	48.390	
7,200.00	7,195.75	7,700.00	7,699.24	24.99	0.00	52.08	348.55	583.97	964.04	941.79	22.25	43.319	
7,300.00	7,295.75	7,700.00	7,699.24	25.34	0.00	52.08	348.55	583.97	915.39	891.97	23.42	39.080	
7,400.00	7,395.75	7,700.00	7,699.24	25.68	0.00	52.08	348.55	583.97	875.50	850.97	24.53	35.690	
7,500.00	7,495.75	7,700.00	7,699.24	26.03	0.00	52.08	348.55	583.97	845.61	820.11	25.50	33.160	
7,600.00	7,595.75	7,700.00	7,699.24	26.38	0.00	52.08	348.55	583.97	826.82	800.56	26.26	31.489	
7,700.00	7,695.75	7,700.00	7,699.24	26.73	0.00	52.08	348.55	583.97	819.87	793.14	26.73	30.672	
7,800.00	7,795.75	8,763.88	8,348.75	27.08	14.60	-1.56	346.95	-76.46	749.88	714.66	35.22	21.293	
7,900.00	7,895.75	8,763.60	8,348.75	27.43	14.59	-1.53	346.96	-76.18	678.95	642.14	36.81	18.446	
8,000.00	7,995.75	8,763.33	8,348.75	27.78	14.58	-1.50	346.96	-75.90	616.15	577.57	38.58	15.971	
8,100.00	8,095.75	8,763.05	8,348.75	28.13	14.58	-1.46	346.97	-75.63	564.18	523.76	40.42	13.958	
8,200.00	8,195.75	8,762.78	8,348.75	28.48	14.57	-1.43	346.98	-75.35	526.27	484.17	42.09	12.502	
8,300.00	8,295.75	8,762.51	8,348.75	28.83	14.56	-1.40	346.98	-75.08	505.59	462.33	43.26	11.687	
8,356.70	8,352.45	8,762.35	8,348.75	29.02	14.56	-1.38	346.99	-74.93	502.40	458.82	43.57	11.530	CC, ES, SF
8,400.00	8,395.75	8,762.23	8,348.75	29.18	14.56	-1.37	346.99	-74.81	504.26	460.64	43.62	11.561	
8,500.00	8,495.75	8,761.96	8,348.75	29.53	14.55	-1.34	347.00	-74.54	522.43	479.30	43.13	12.112	
8,600.00	8,595.75	8,761.69	8,348.75	29.88	14.54	-1.31	347.00	-74.27	558.21	516.15	42.05	13.273	
8,700.00	8,695.75	8,761.42	8,348.75	30.23	14.54	-1.28	347.01	-74.00	608.49	567.76	40.73	14.940	
8,800.00	8,795.75	8,761.16	8,348.75	30.58	14.53	-1.25	347.02	-73.73	670.01	630.59	39.43	16.994	
8,900.00	8,895.75	8,760.89	8,348.76	30.93	14.53	-1.22	347.02	-73.46	739.98	701.70	38.29	19.327	
9,000.00	8,995.75	8,760.62	8,348.76	31.28	14.52	-1.19	347.03	-73.20	816.23	778.88	37.36	21.850	
9,100.00	9,095.75	8,760.36	8,348.76	31.45	14.51	-1.16	347.04	-72.93	897.16	860.64	36.52	24.566	
9,200.00	9,195.75	8,760.09	8,348.76	31.46	14.51	-1.13	347.04	-72.67	981.61	945.75	35.86	27.374	
9,300.00	9,295.75	8,759.83	8,348.76	31.46	14.50	-1.10	347.05	-72.40	1,068.74	1,033.36	35.38	30.205	
9,400.00	9,395.75	8,759.56	8,348.76	31.48	14.49	-1.07	347.06	-72.14	1,157.96	1,122.90	35.06	33.029	
9,500.00	9,495.75	8,759.30	8,348.76	31.49	14.49	-1.04	347.06	-71.88	1,248.81	1,213.96	34.85	35.832	
9,600.00	9,595.75	8,759.04	8,348.76	31.51	14.48	-1.01	347.07	-71.62	1,340.97	1,306.22	34.74	38.599	
9,700.00	9,695.75	8,758.78	8,348.76	31.54	14.48	-0.98	347.07	-71.36	1,434.17	1,399.47	34.71	41.324	
9,800.00	9,795.75	8,758.52	8,348.76	31.57	14.47	-0.95	347.08	-71.10	1,528.24	1,493.50	34.73	44.000	
9,900.00	9,895.75	8,758.26	8,348.76	31.60	14.46	-0.92	347.09	-70.84	1,623.01	1,588.20	34.81	46.629	
10,000.00	9,995.75	8,758.01	8,348.76	31.63	14.46	-0.89	347.09	-70.58	1,718.38	1,683.45	34.92	49.204	
10,100.00	10,095.74	8,758.24	8,348.76	31.67	14.46	155.00	347.09	-70.81	1,814.54	1,779.46	35.08	51.723	
10,200.00	10,195.67	8,759.53	8,348.76	31.72	14.49	152.10	347.06	-72.11	1,911.67	1,876.39	35.28	54.184	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Petrogulf BJT Federal Well No. 2H - Original Hole - Surveys Original Hole — **Offset Site Error:** 0.00 ft

Survey Program: 200-GYRO-NS, 7746-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	57.09	357.93	553.05	658.91				
100.00	100.00	88.06	88.06	0.13	0.14	57.09	357.88	552.98	658.69	658.42	0.27	2,452.439	
200.00	200.00	189.52	189.52	0.48	0.30	57.09	357.71	552.73	658.39	657.61	0.78	847.976	
300.00	300.00	289.19	289.19	0.83	0.62	57.10	357.42	552.44	657.99	656.53	1.45	452.323	
400.00	400.00	388.66	388.66	1.18	0.97	57.12	357.05	552.30	657.66	655.51	2.15	305.529	
500.00	500.00	487.84	487.83	1.53	1.32	57.13	356.77	552.21	657.44	654.59	2.85	230.822	
600.00	600.00	586.97	586.97	1.88	1.67	57.12	356.88	552.03	657.35	653.80	3.54	185.497	
619.72	619.72	606.52	606.52	1.95	1.73	57.11	356.95	551.99	657.35	653.66	3.68	178.586	CC
700.00	700.00	685.68	685.68	2.24	2.01	57.09	357.19	551.92	657.42	653.18	4.24	155.171	
800.00	800.00	784.32	784.32	2.59	2.35	57.09	357.37	552.12	657.69	652.76	4.93	133.415	
900.00	900.00	885.12	885.12	2.94	2.70	57.10	357.39	552.52	658.03	652.40	5.63	116.868	
1,000.00	1,000.00	986.34	986.33	3.29	3.06	57.13	357.19	552.85	658.20	651.86	6.33	103.930	
1,100.00	1,100.00	1,087.87	1,087.86	3.64	3.41	57.17	356.85	553.01	658.16	651.12	7.04	93.525	
1,200.00	1,200.00	1,189.45	1,189.44	3.99	3.77	57.18	356.53	552.88	657.87	650.13	7.74	84.981	
1,228.09	1,228.09	1,217.98	1,217.97	4.09	3.87	-144.84	356.44	552.79	657.81	649.87	7.94	82.857	
1,300.00	1,299.99	1,286.21	1,286.20	4.34	4.10	-144.85	356.20	552.87	658.39	649.97	8.43	78.119	
1,400.00	1,399.96	1,382.37	1,382.36	4.68	4.44	-144.90	355.80	553.56	660.91	651.80	9.11	72.524	
1,500.00	1,499.86	1,481.47	1,481.45	5.03	4.79	-145.00	355.34	554.76	665.25	655.44	9.81	67.812	
1,600.00	1,599.73	1,581.20	1,581.17	5.39	5.14	-145.17	354.90	555.99	670.33	659.82	10.51	63.778	
1,700.00	1,699.59	1,678.92	1,678.88	5.75	5.48	-145.34	354.60	557.28	675.56	664.36	11.20	60.302	
1,800.00	1,799.45	1,776.13	1,776.08	6.11	5.82	-145.51	354.61	558.78	681.18	669.28	11.89	57.275	
1,900.00	1,899.31	1,871.18	1,871.11	6.46	6.16	-145.68	354.93	560.62	687.29	674.72	12.57	54.656	
2,000.00	1,999.18	1,965.46	1,965.36	6.82	6.49	-145.83	355.47	563.18	694.20	680.94	13.25	52.382	
2,100.00	2,099.04	2,061.91	2,061.75	7.17	6.83	-145.97	356.27	566.44	701.79	687.85	13.94	50.348	
2,200.00	2,198.90	2,159.62	2,159.39	7.53	7.18	-146.12	357.38	569.91	709.70	695.07	14.63	48.510	
2,300.00	2,298.77	2,261.19	2,260.88	7.88	7.54	-146.29	358.75	573.50	717.73	702.39	15.34	46.798	
2,400.00	2,398.63	2,365.57	2,365.21	8.23	7.91	-146.47	360.01	576.57	725.20	709.14	16.06	45.168	
2,500.00	2,498.49	2,472.75	2,472.37	8.59	8.28	-146.70	361.23	578.77	731.90	715.12	16.78	43.606	
2,600.00	2,598.36	2,581.35	2,580.95	8.94	8.66	-147.02	362.76	579.24	737.45	719.94	17.52	42.098	
2,700.00	2,698.22	2,682.68	2,682.27	9.29	9.01	-147.35	364.12	578.77	742.24	724.02	18.22	40.732	
2,800.00	2,798.08	2,782.57	2,782.16	9.65	9.36	-147.59	364.67	578.83	747.02	728.10	18.92	39.478	
2,900.00	2,897.94	2,881.84	2,881.42	10.00	9.71	-147.78	364.58	579.37	751.84	732.22	19.62	38.320	
3,000.00	2,997.81	2,980.98	2,980.56	10.35	10.05	-147.92	364.18	580.27	756.76	736.45	20.32	37.247	
3,100.00	3,097.67	3,082.97	3,082.55	10.70	10.41	-148.05	363.51	581.29	761.63	740.61	21.03	36.225	
3,200.00	3,197.53	3,185.67	3,185.24	11.05	10.77	-148.19	362.75	581.93	766.15	744.41	21.74	35.249	
3,300.00	3,297.40	3,282.98	3,282.54	11.40	11.10	-148.33	362.13	582.38	770.60	748.17	22.43	34.362	
3,400.00	3,397.26	3,379.36	3,378.92	11.76	11.44	-148.49	361.94	583.05	775.50	752.38	23.11	33.554	
3,500.00	3,497.12	3,478.43	3,477.99	12.11	11.79	-148.66	362.14	583.83	780.71	756.90	23.81	32.791	
3,600.00	3,596.99	3,578.24	3,577.79	12.46	12.13	-148.87	362.69	584.36	785.95	761.44	24.51	32.068	
3,700.00	3,696.85	3,676.42	3,675.97	12.81	12.48	-149.09	363.47	584.81	791.28	766.08	25.20	31.398	
3,800.00	3,796.71	3,774.14	3,773.68	13.16	12.82	-149.30	364.31	585.52	796.88	770.98	25.89	30.775	
3,900.00	3,896.57	3,871.32	3,870.86	13.51	13.15	-149.47	364.99	586.70	802.77	776.19	26.58	30.199	
4,000.00	3,996.44	3,968.32	3,967.84	13.86	13.49	-149.56	364.99	588.82	809.01	781.74	27.27	29.666	
4,100.00	4,096.30	4,076.30	4,075.77	14.21	13.87	-149.60	364.17	591.64	815.14	787.14	28.01	29.106	
4,200.00	4,196.16	4,189.77	4,189.21	14.56	14.27	-149.64	362.34	593.15	819.73	790.97	28.76	28.504	
4,300.00	4,296.03	4,285.93	4,285.35	14.91	14.60	-149.68	360.44	593.84	823.62	794.17	29.45	27.971	
4,400.00	4,395.89	4,380.32	4,379.72	15.26	14.93	-149.72	358.91	595.06	828.16	798.04	30.13	27.491	
4,500.00	4,495.79	4,474.47	4,473.85	15.61	15.26	-149.75	357.78	596.77	832.63	801.83	30.80	27.032	
4,600.00	4,595.76	4,568.58	4,567.94	15.96	15.59	-149.73	357.19	598.89	836.29	804.82	31.48	26.569	
4,700.00	4,695.75	4,668.40	4,667.72	16.31	15.94	52.36	356.97	601.42	838.92	806.74	32.17	26.074	
4,800.00	4,795.75	4,771.10	4,770.39	16.65	16.30	52.48	356.59	603.80	840.52	807.64	32.89	25.559	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Petrogulf BJT Federal Well No. 2H - Original Hole - Surveys Original Hole — **Offset Site Error:** 0.00 ft

Survey Program: 200-GYRO-NS, 7746-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.00	4,895.75	4,876.79	4,876.06	17.00	16.67	52.61	355.84	605.91	841.68	808.08	33.61	25.044	
5,000.00	4,995.75	4,983.64	4,982.89	17.35	17.04	52.75	354.37	607.52	842.05	807.72	34.33	24.525	
5,100.00	5,095.75	5,085.38	5,084.61	17.69	17.40	52.89	352.69	608.55	841.86	806.82	35.04	24.027	
5,200.00	5,195.75	5,186.21	5,185.43	18.04	17.75	52.97	351.52	609.07	841.57	805.83	35.74	23.548	
5,300.00	5,295.75	5,288.82	5,288.04	18.39	18.11	53.04	350.47	609.24	841.09	804.64	36.45	23.078	
5,400.00	5,395.75	5,391.71	5,390.91	18.73	18.47	53.12	348.94	609.33	840.26	803.11	37.15	22.616	
5,500.00	5,495.75	5,488.75	5,487.95	19.08	18.81	53.20	347.51	609.37	839.41	801.57	37.84	22.184	
5,600.00	5,595.75	5,585.30	5,584.49	19.43	19.15	53.25	346.70	609.45	838.98	800.45	38.52	21.778	
5,700.00	5,695.75	5,684.18	5,683.37	19.77	19.49	53.27	346.35	609.54	838.83	799.62	39.22	21.389	
5,800.00	5,795.75	5,783.48	5,782.67	20.12	19.84	53.28	346.21	609.57	838.78	798.87	39.91	21.016	
5,900.00	5,895.75	5,884.74	5,883.93	20.47	20.19	53.28	346.20	609.49	838.71	798.09	40.61	20.650	
6,000.00	5,995.75	5,986.39	5,985.57	20.82	20.54	53.27	346.15	609.20	838.45	797.13	41.32	20.292	
6,100.00	6,095.75	6,086.77	6,085.96	21.16	20.89	53.26	346.05	608.78	838.05	796.04	42.02	19.946	
6,200.00	6,195.75	6,186.96	6,186.15	21.51	21.24	53.25	345.89	608.38	837.64	794.92	42.71	19.610	
6,300.00	6,295.75	6,286.78	6,285.97	21.86	21.59	53.25	345.71	607.99	837.21	793.80	43.41	19.286	
6,400.00	6,395.75	6,386.54	6,385.73	22.21	21.94	53.23	345.61	607.57	836.82	792.71	44.11	18.972	
6,500.00	6,495.75	6,488.30	6,487.49	22.55	22.29	53.22	345.49	607.07	836.35	791.54	44.81	18.664	
6,600.00	6,595.75	6,590.37	6,589.55	22.90	22.65	53.21	345.19	606.38	835.64	790.12	45.52	18.359	
6,700.00	6,695.75	6,688.67	6,687.85	23.25	22.99	53.20	344.87	605.68	834.88	788.67	46.21	18.068	
6,800.00	6,795.75	6,786.59	6,785.76	23.60	23.33	53.18	344.75	605.15	834.37	787.47	46.90	17.791	
6,900.00	6,895.75	6,886.39	6,885.57	23.94	23.68	53.16	344.74	604.72	834.01	786.42	47.59	17.523	
7,000.00	6,995.75	6,986.50	6,985.67	24.29	24.03	53.15	344.70	604.28	833.65	785.35	48.29	17.262	
7,100.00	7,095.75	7,097.32	7,096.48	24.64	24.41	53.13	344.28	603.29	832.71	783.68	49.03	16.985	
7,200.00	7,195.75	7,209.75	7,208.88	24.99	24.80	53.11	342.89	600.93	830.29	780.53	49.76	16.686	
7,300.00	7,295.75	7,308.54	7,307.63	25.34	25.15	53.09	341.35	598.35	827.26	776.80	50.45	16.396	
7,400.00	7,395.75	7,408.42	7,407.46	25.68	25.50	53.06	339.85	595.69	824.23	773.08	51.15	16.114	
7,500.00	7,495.75	7,506.52	7,505.52	26.03	25.84	53.05	338.31	593.28	821.33	769.48	51.84	15.842	
7,600.00	7,595.75	7,605.17	7,604.13	26.38	26.19	53.06	336.60	591.25	818.64	766.10	52.54	15.582	
7,700.00	7,695.75	7,711.38	7,710.29	26.73	26.56	53.11	334.03	589.17	815.62	762.36	53.25	15.316	
7,800.00	7,795.75	7,811.79	7,810.65	27.08	26.60	53.15	331.63	586.95	812.42	758.78	53.64	15.145	
7,900.00	7,895.75	7,910.79	7,909.57	27.43	26.61	53.08	330.54	583.67	809.10	755.10	54.00	14.983	
8,000.00	7,995.75	8,393.73	8,293.09	27.78	27.15	35.13	438.26	354.86	789.39	737.80	51.58	15.303	
8,100.00	8,095.75	8,483.04	8,328.21	28.13	27.57	28.68	469.72	279.06	753.54	700.12	53.42	14.106	
8,200.00	8,195.75	8,517.98	8,341.15	28.48	27.78	26.08	481.25	248.71	726.17	670.92	55.26	13.142	
8,300.00	8,295.75	8,548.09	8,351.86	28.83	27.97	23.80	491.51	222.52	710.30	653.68	56.61	12.546	
8,379.75	8,375.50	8,578.20	8,362.30	29.10	28.17	21.51	501.93	196.26	706.41	649.13	57.27	12.334 ES	
8,400.00	8,395.75	8,585.93	8,364.94	29.18	28.23	20.92	504.59	189.51	706.66	649.28	57.38	12.316 SF	
8,500.00	8,495.75	8,614.28	8,374.38	29.53	28.44	18.76	514.45	164.66	715.50	658.14	57.36	12.474	
8,600.00	8,595.75	8,643.93	8,383.36	29.88	28.68	16.48	524.79	138.37	736.63	679.94	56.69	12.994	
8,700.00	8,695.75	8,665.39	8,388.89	30.23	28.86	14.81	532.18	118.99	769.32	713.93	55.39	13.888	
8,800.00	8,795.75	8,678.00	8,391.68	30.58	28.97	13.83	536.45	107.46	812.55	758.90	53.65	15.145	
8,900.00	8,895.75	8,691.00	8,394.16	30.93	29.09	12.81	540.81	95.47	864.92	813.13	51.79	16.700	
9,000.00	8,995.75	8,699.19	8,395.52	31.28	29.17	12.17	543.54	87.87	925.00	875.09	49.91	18.533	
9,100.00	9,095.75	8,709.00	8,396.93	31.45	29.26	11.40	546.78	78.71	991.44	943.40	48.04	20.637	
9,200.00	9,195.75	8,709.00	8,396.93	31.46	29.26	11.40	546.78	78.71	1,063.05	1,016.83	46.22	22.999	
9,300.00	9,295.75	8,709.00	8,396.93	31.46	29.26	11.40	546.78	78.71	1,138.95	1,094.29	44.66	25.503	
9,400.00	9,395.75	8,709.00	8,396.93	31.48	29.26	11.40	546.78	78.71	1,218.33	1,174.99	43.34	28.111	
9,500.00	9,495.75	8,709.00	8,396.93	31.49	29.26	11.40	546.78	78.71	1,300.56	1,258.32	42.24	30.788	
9,600.00	9,595.75	8,709.00	8,396.93	31.51	29.26	11.40	546.78	78.71	1,385.13	1,343.78	41.34	33.504	
9,700.00	9,695.75	8,709.00	8,396.93	31.54	29.26	11.40	546.78	78.71	1,471.63	1,431.02	40.61	36.237	

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

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Offset Design Section 14-T24S-R31E - Petrogulf BJT Federal Well No. 2H - Original Hole - Surveys Original Hole

Offset Site Error: 0.00 ft

Survey Program: 200-GYRO-NS, 7746-MWD

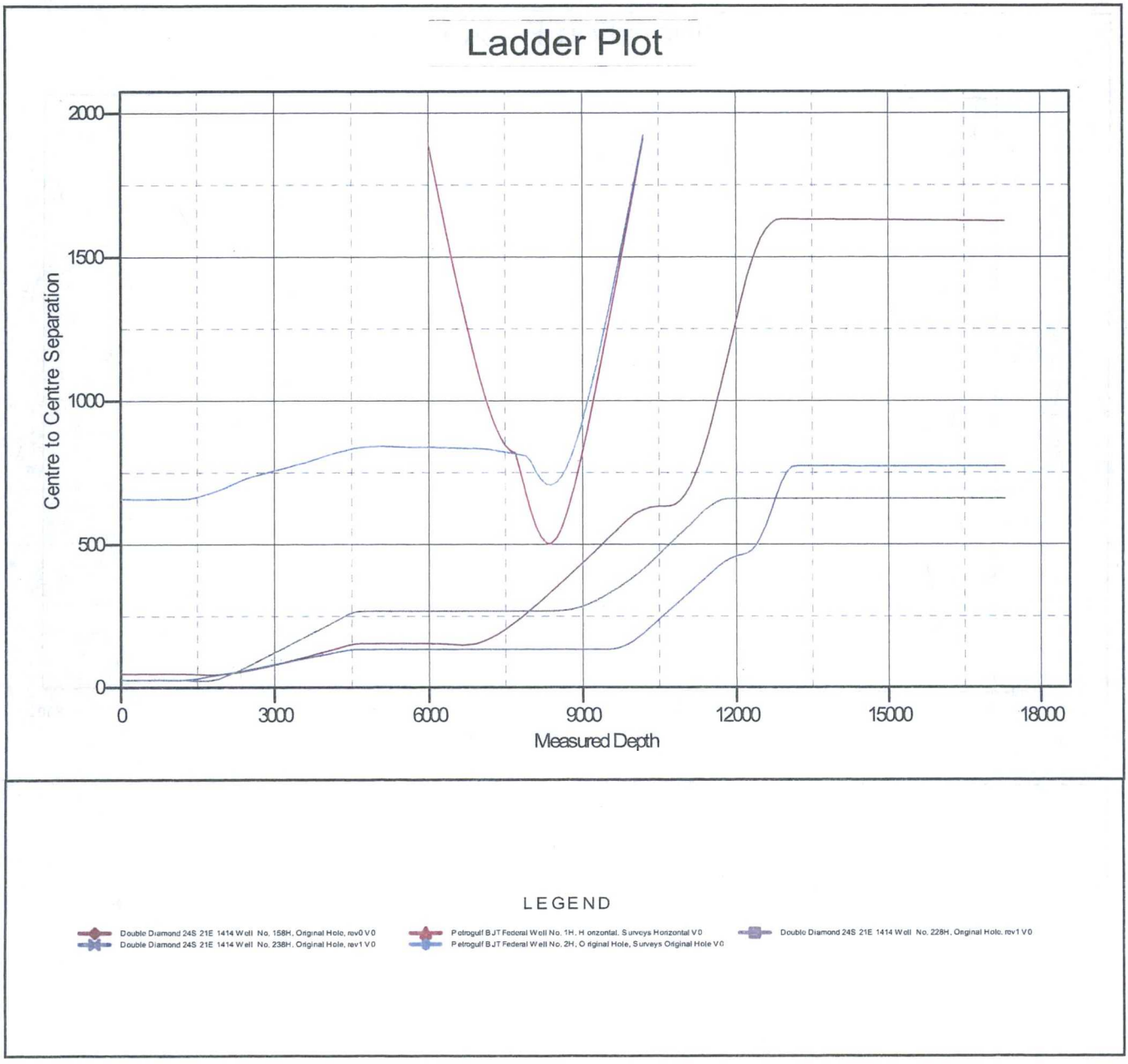
Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,800.00	9,795.75	8,738.46	8,400.09	31.57	29.57	9.09	556.20	50.98	1,558.95	1,518.72	40.23	38.754	
9,900.00	9,895.75	8,741.14	8,400.30	31.60	29.59	8.88	557.03	48.45	1,648.27	1,608.50	39.77	41.445	
10,000.00	9,995.75	8,743.53	8,400.48	31.63	29.62	8.69	557.76	46.18	1,738.74	1,699.33	39.42	44.114	
10,100.00	10,095.74	8,745.71	8,400.64	31.67	29.64	165.68	558.43	44.11	1,830.65	1,791.48	39.17	46.740	
10,200.00	10,195.67	8,747.72	8,400.77	31.72	29.66	164.48	559.05	42.19	1,924.25	1,885.23	39.02	49.309	

Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB=3587.2+25 @ 3612.20ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Double Diamond 24S 21E 1414 Well No. 224H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.31°

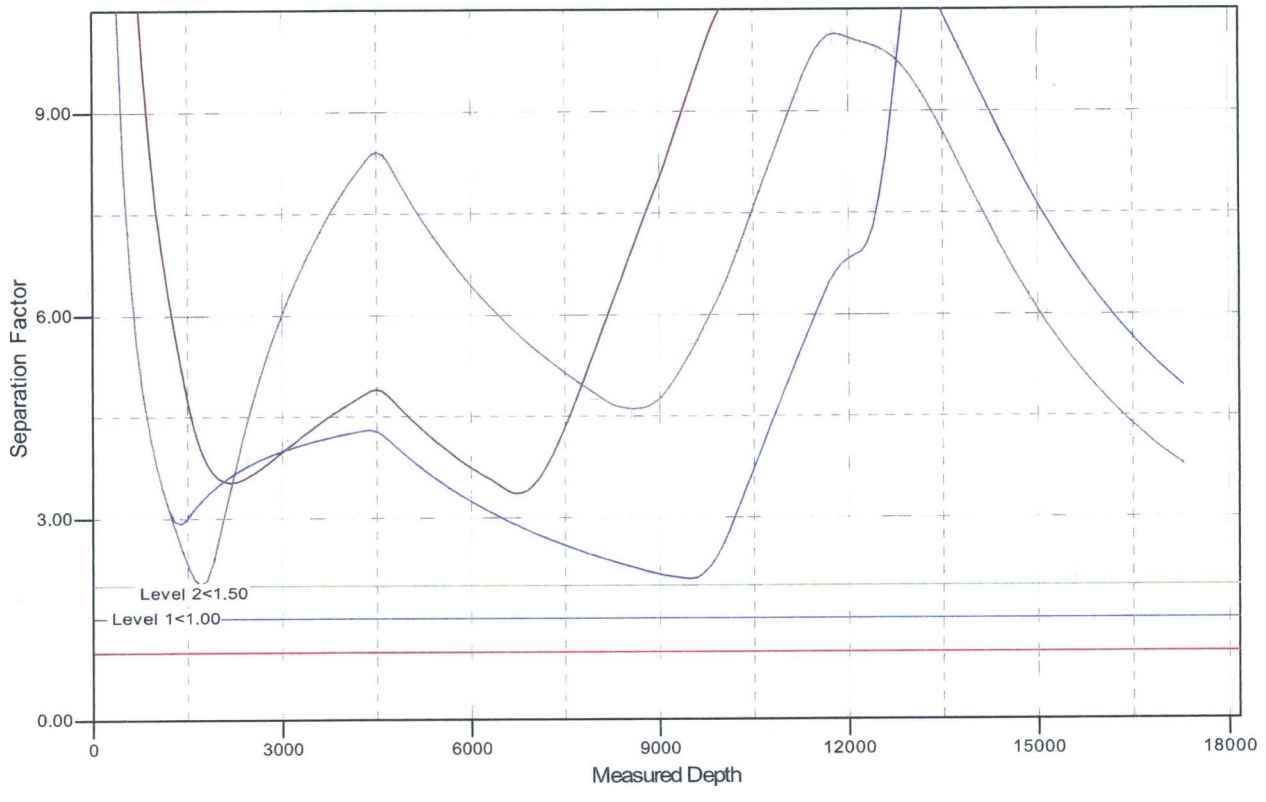


Company:	Tap Rock Operating LLC	**Local Co-ordinate Reference:**	Well Double Diamond 24S 21E 1414 Well No. 224H
Project:	Eddy County, New Mexico NAD83 NM east	**TVD Reference:**	RKB=3587.2+25 @ 3612.20ft
Reference Site:	Section 14-T24S-R31E	**MD Reference:**	RKB=3587.2+25 @ 3612.20ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Double Diamond 24S 21E 1414 Well No. 224H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	DB_Jul2216dt_v14
Reference Design:	rev1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB=3587.2+25 @ 3612.20ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Double Diamond 24S 21E 1414 Well No. 224H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.31°

Separation Factor Plot



LEGEND

Double Diamond 24S 21E 1414 Well No. 158H, Original Hole, rev0 V0
Double Diamond 24S 21E 1414 Well No. 238H, Original Hole, rev1 V0
Petrogulf BJT Federal Well No. 1H, Horizontal, Surveys Horizontal V0
Petrogulf BJT Federal Well No. 2H, Original Hole, Surveys Original Hole V0
Double Diamond 24S 21E 1414 Well No. 228H, Original Hole, rev1 V0

Tap Rock Operating, LLC **DRILL PLAN PAGE 1**
Double Diamond Fed Com 224H
SHL 305' FSL & 885' FEL
BHL 200' FNL & 990' FEL
Sec. 14, T. 24 S., R. 31 E., Eddy County, NM

Drilling Program

1. ESTIMATED TOPS

Formation Name	TVD	MD	Bearing
Quaternary caliche	0'	0'	water
Rustler anhydrite	731'	731'	N/A
Salado salt	1067'	1067'	N/A
Base salt	2815'	2817'	N/A
Bell Canyon sandstone	4613'	4618'	hydrocarbons
Brushy Canyon sandstone	6723'	6728'	hydrocarbons
Bone Spring limestone	8443'	8448'	hydrocarbons
1st Bone Spring sandstone	9443'	9448'	hydrocarbons
2nd Bone Spring sandstone	10083'	10088'	hydrocarbons
3rd Bone Spring sandstone	11343'	11351'	hydrocarbons
Wolfcamp A carbonate	11823'	11831'	hydrocarbons
(KOP	11936'	11936'	hydrocarbons)
Wolfcamp A Fat carbonate	12003'	12014'	hydrocarbons
Wolfcamp B1 carbonate (goal)	12193'	12203'	hydrocarbons
TD	**12495'**	**17296'**	

2. NOTABLE ZONES

Wolfcamp B1 is the goal. Hole will extend north of the last perforation point to allow for pump installation. All perforations will be ≥330' from the dedication perimeter. Closest water well (C 02440) in State Engineer records is 10,368' northwest. Well was drilled to 350'. No water was encountered.

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 nippled 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.

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	Axial
17.5"	0' - 1000'	0' - 1000'	13.375" surface	54.5	J-55	BTC	1.13	1.15	1.51
12.25"	0' - 4700'	0' - 4695'	9.625" inter. 1	40.0	J-55	BTC	1.13	1.15	1.51
8.75"	0' - 4000'	0' - 3995'	7.625" inter. 2 top	29.7	P-110	BTC	1.13	1.15	1.51
8.75"	4000' - 11936'	3995' - 11928'	7.625" inter. 2 middle	29.7	P-110	flush	1.13	1.15	1.51
8.75"	11936' - 12636'	11928' - 12466'	7.0" inter. 2 bottom	29.0	P-110	BTC	1.13	1.15	1.51
6.125"	0' - 11936'	0' - 11928'	5.5" product. top	20.0	P-110	BTC	1.13	1.15	1.51
6.125"	11936' - 17296'	11928' - 12495'	4.5" product. bottom	13.5	P-110	BTC	1.13	1.15	1.51

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	1000	1.38	1380	14.8	Class C + 5% NaCl + LCM
TOC = GL		100% Excess			Centralizers per Onshore Order 2 III. B. 1f	
Intermediate 1	Lead	1300	1.81	2353	13.5	Class C + bentonite + 1% $CaCl_2$ + 8% NaCl + LCM
	Tail	427	1.38	589	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	823	2.35	1934	11.5	TXI + fluid loss + dispersant + retarder + LCM
	Tail	100	1.39	139	13.2	TXI + fluid loss + dispersant + retarder + LCM
TOC = GL		35% Excess			2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement (500' above TOC)	
Production	Tail	470	1.17	550	15.8	Class H + fluid loss + dispersant + retarder + LCM
TOC = 11936'		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' - 1000'	8.3	28	NC
brine water	1000' - 4700'	10.0	30 - 32	NC
fresh water & cut brine	4700' - 12636'	9.0	30 - 32	NC
OBM	12636' – 17296'	12.5	15 - 20	<10

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 intermediate casing to TD. CBL with CCL will be run as far as gravity will let it fall to TOC.

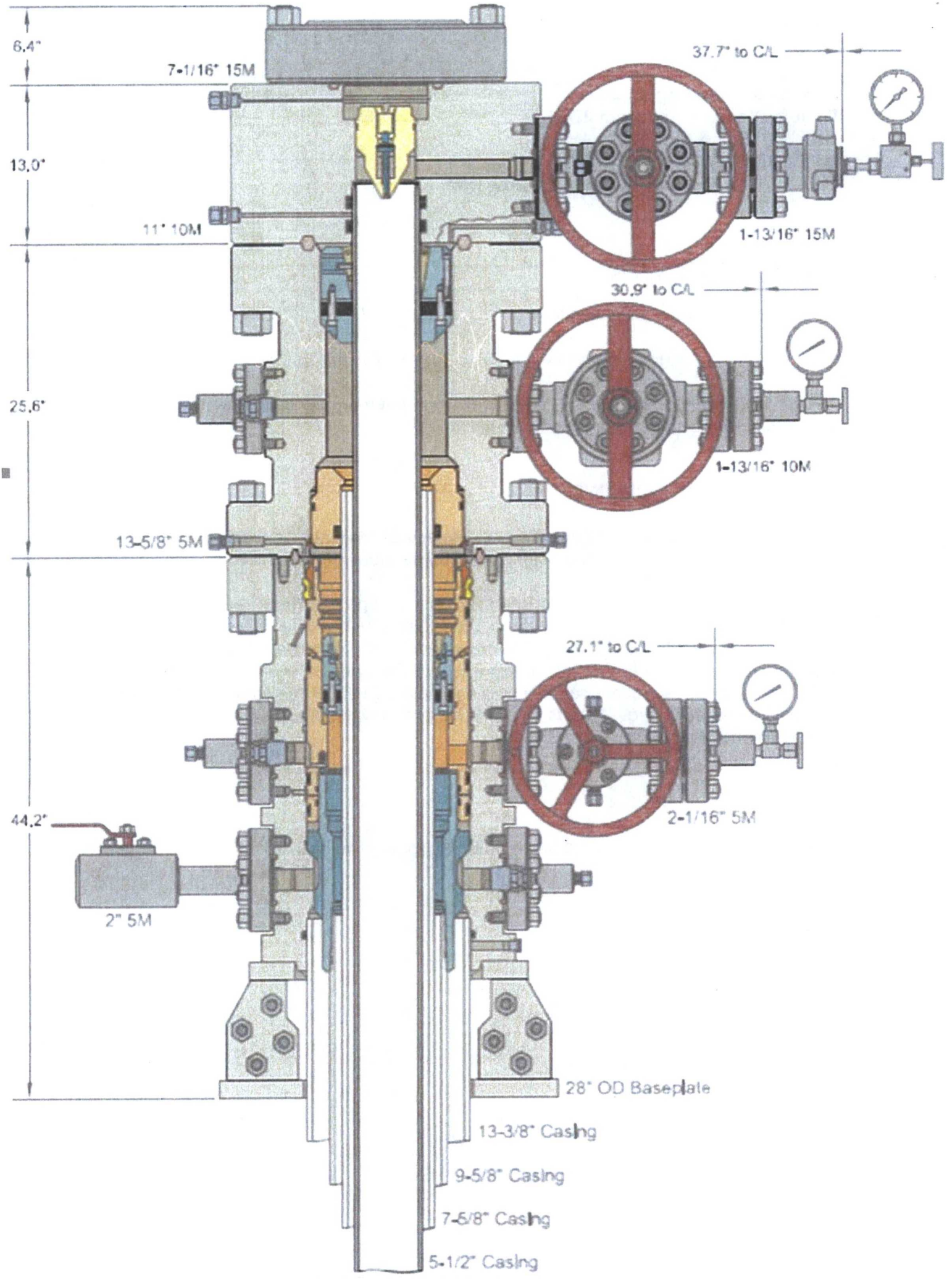
7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈8450 psi. Expected bottom hole temperature is ≈176° F.

Tap Rock does not anticipate that there will be enough H_2S from the surface to the Bone Spring to meet the BLM's Onshore Order 6 requirements for the submission of an "H_2S Drilling Operation Plan" or "Public Protection Plan" for drilling and completing this well. Tap Rock has an H_2S safety package on all wells and an "H_2S 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.


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

Tenaris

Casing and Tubing Performance Data

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

Size | Wall | Grade | Connection | Unit

Pipe Body Data

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

Connection Data

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

TenarisHydril Premium Connections

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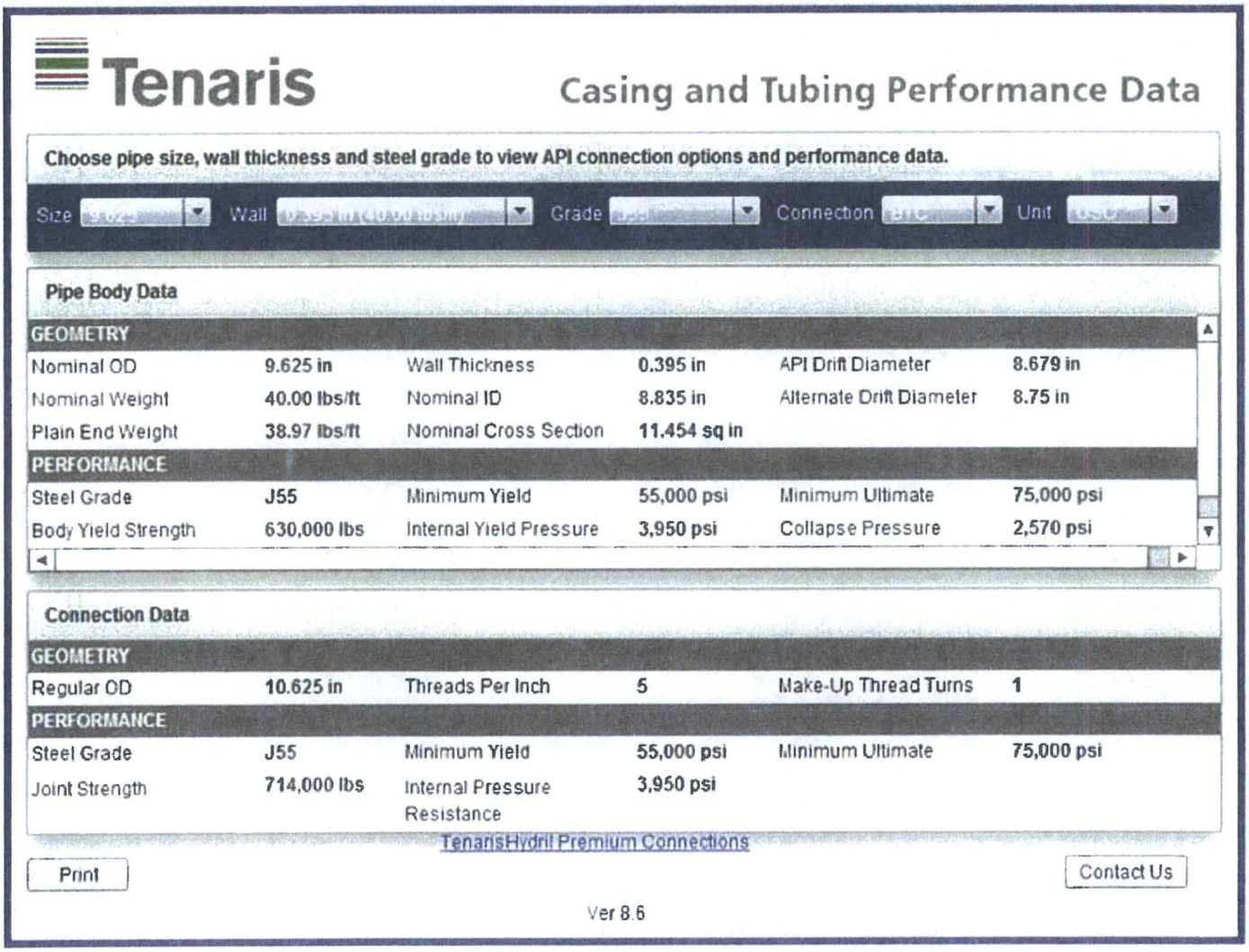
Tenaris
Casing and Tubing Performance Data
Choose pipe size, wall thickness and steel grade to view API connection options and performance data.
Size
Wall
Grade
Connection
Unit
Pipe Body Data
GEOMETRY
Nominal OD 9.625 in
Wall Thickness 0.395 in
API Drift Diameter 8.679 in
Nominal Weight 40.00 lbs/ft
Nominal ID 8.835 in
Alternate Drift Diameter 8.75 in
Plain End Weight 38.97 lbs/ft
Nominal Cross Section 11.454 sq in
PERFORMANCE
Steel Grade J55
Minimum Yield 55,000 psi
Minimum Ultimate 75,000 psi
Body Yield Strength 630,000 lbs
Internal Yield Pressure 3,950 psi
Collapse Pressure 2,570 psi
Connection Data
GEOMETRY
Regular OD 10.625 in
Threads Per Inch 5
Make-Up Thread Turns 1
PERFORMANCE
Steel Grade J55
Minimum Yield 55,000 psi
Minimum Ultimate 75,000 psi
Joint Strength 714,000 lbs
Internal Pressure Resistance 3,950 psi
TenarisHydril Premium Connections
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Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

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: - 2nd Band: -	1st Band: White 2nd Band: - 3rd Band: -
		Type	Casing	3rd Band: -	4th Band: -

GEOMETRY

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

PERFORMANCE

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

GEOMETRY

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

PERFORMANCE

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

MAKE-UP TORQUES

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

OPERATION LIMIT TORQUES

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

Notes

This connection is fully interchangeable with:

Wedge 523® - 7.625 in. - 29.7 lbs/ft

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

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

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Casing and Tubing Performance Data

PIPE BODY DATA

GEOMETRY

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

PERFORMANCE

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

CONNECTION DATA

TYPE: BTC

GEOMETRY

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

PERFORMANCE

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

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

TXP® BTC

SHARE EXPORT DATA PRINT

Outside Diameter	5.500 in	Min. Wall Thickness	87.5%		
		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 [1] 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

Tenaris

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

APD ID: 10400027216 **Submission Date:** 02/13/2018

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

DD_224H_Road_Map_20180212152155.pdf
DD_224H_Road_Plat_033018_20180330161446.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? YES

New Road Map:

DD_224H_New_Road_Map_20180212152207.pdf
DD_224H_Road_Plat_033018_20180330161324.PDF

New road type: RESOURCE

Length: 227 Feet **Width (ft.):** 30

Max slope (%): 0 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Crowned and ditched

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information:

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and ditched

Road Drainage Control Structures (DCS) description: None

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

DD_224H_Well_Map_20180213112553.pdf

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 map:

DD_224H_Production_Facilities_20180212152259.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: FEDERAL

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:

DD_224H_Water_Source_Map_20180212152333.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:

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:

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: NM One Call (811) will be notified before construction starts. Top 6" of soil and brush will be stockpiled north of the pad. Pipe racks will be to the south. A closed loop drilling system will be used. Caliche will be hauled from existing pit on private land in NENE 7-23s-31e.
Construction Materials source location attachment:

DD_224H_Construction_Methods_20180212152404.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

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

Amount of waste: 2000 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.)**

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:

DD_224H_Well_Site_Layout_20180212152432.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** DOUBLE DIAMOND

Multiple Well Pad Number: 238H

Recontouring attachment:

DD_224H_Recontour_Plat_20180212152447.pdf
DD_224H_Interim_Reclamation_Diagram_20180212152455.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres): 5.11
Road proposed disturbance (acres): 0.16
Powerline proposed disturbance (acres): 0
Pipeline proposed disturbance (acres): 0
Other proposed disturbance (acres): 0

Total proposed disturbance: 5.27

Well pad interim reclamation (acres): 1.35
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0

Total interim reclamation: 1.35

Well pad long term disturbance (acres): 3.76
Road long term disturbance (acres): 0.16
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0

Total long term disturbance: 3.92

Reconstruction method: Interim reclamation will shrink the well pad 26% by removing caliche and reclaiming the north 40' and west 100', leaving 3.76 acres for producing 5 wells and truck turn arounds.

Topsoil redistribution: Enough stockpiled topsoil will be retained to cover the remainder of the pad when the wells are plugged. Once the last well is plugged, then the remainder of the pad and new road will be similarly reclaimed. Noxious weeds will be controlled.
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:

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:

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

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:

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: 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:

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: NEW 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:

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: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

Operator Name: TAP ROCK OPERATING LLC

Well Name: DOUBLE DIAMOND FED COM **Well Number:** 224H

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information: Deficiency letter dated 3/29/18 requested road plat - see attached

Use a previously conducted onsite? YES

Previous Onsite information: On-site inspection was held with Vance Wolfe (BLM) on December 7, 2017. Lone Mountain filed archaeology report NMCRIS 139066 on October 3, 2017.

Other SUPO Attachment

DD_224H_General_SUPO_20180212152608.pdf

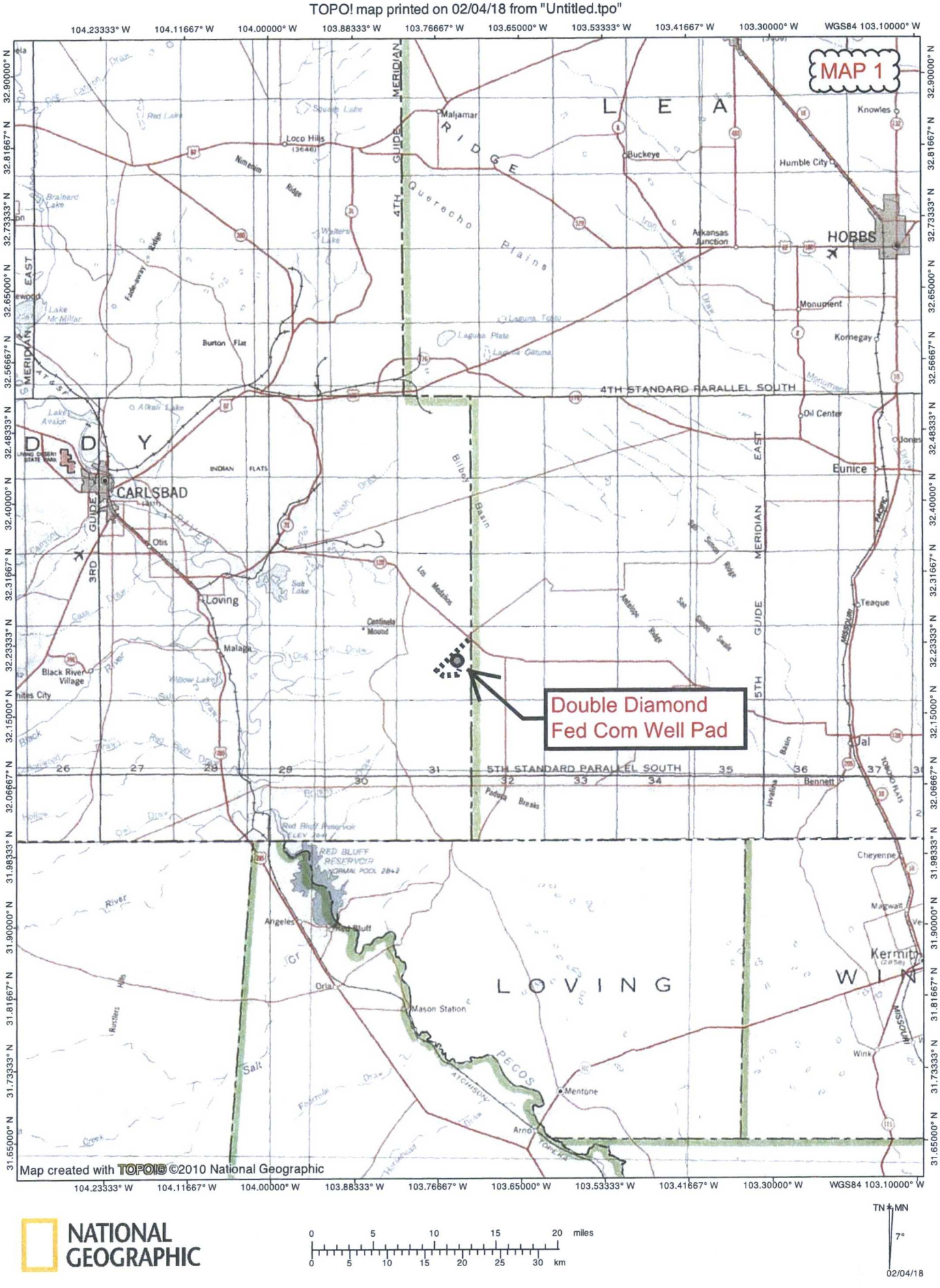
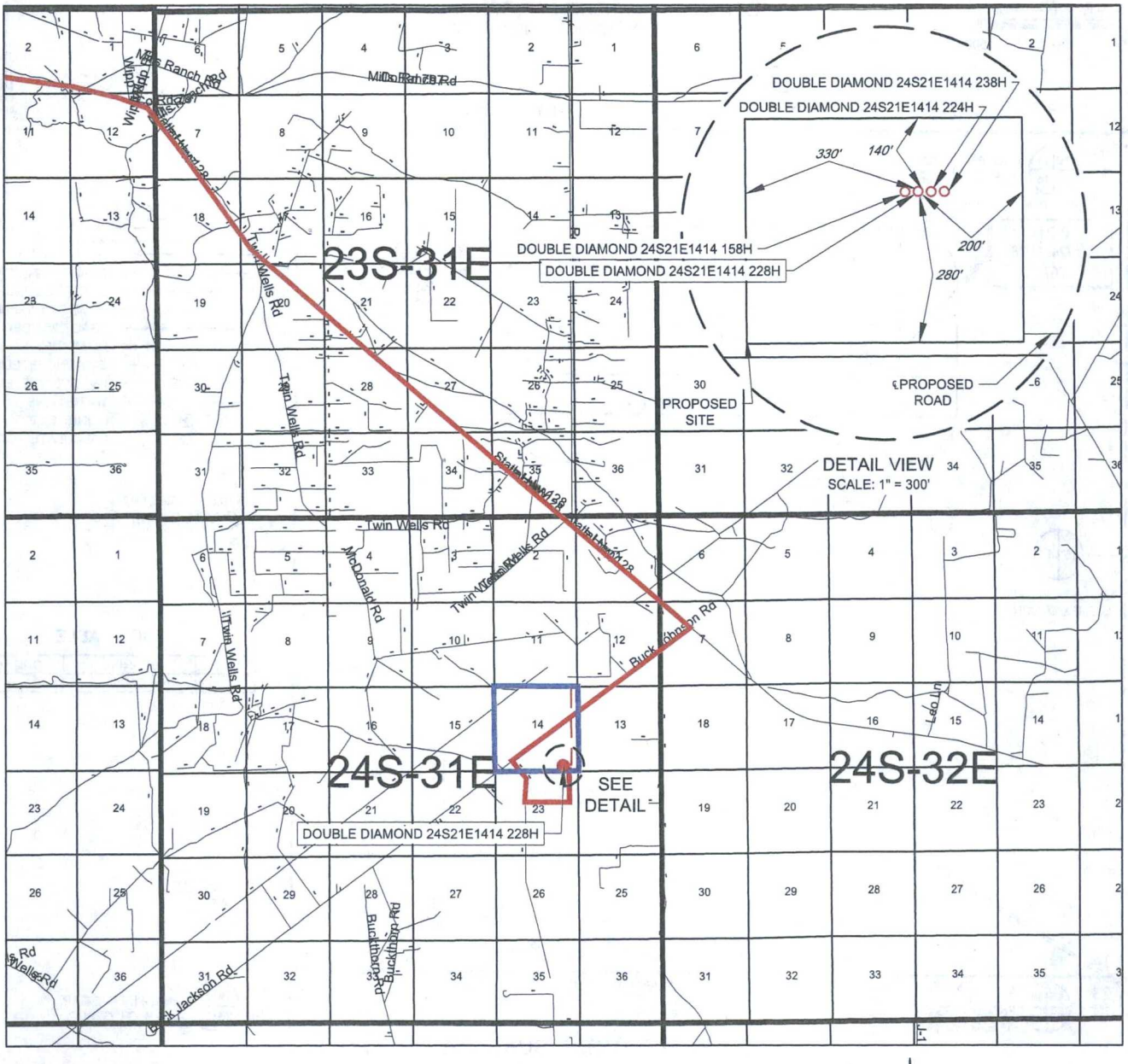

TOPO! map printed on 02/04/18 from "Untitled.tpo"
MAP 1
Double Diamond
Fed Com Well Pad
CARLSBAD
HOBBS
Eunice
Jal
Loving
Malaga
Black River Village
Maljamar
Loco Hills
Buckeye
Humble City
Knowles
Monument
Komegay
Oil Center
Jones
Teague
Bennett
Cheyenne
Magwall
Kermit
Wink
Mentone
Mason Station
Orla
Angeles
Red Bluff
Arno
Otis
Centinela Mound
Salt Lake
Red Bluff Reservoir
Lake Avalon
Lake McMillan
Brainard Lake
Walters Lake
Laguna Plata
Laguna Tasau
Laguna Gatuna
Burton Flat
Arkansas Junction
Iron Draw
Monument Draw
Bilbo Basin
Pedaja Breaks
Antelope Ridge
Salt Creek Saddle
Salt Draw
Salt Spring Ridge
Los Medaños
Nimbim Ridge
Fadeaway Ridge
Querecho Plains
RIDGE
LEA
LOVING
WIN
DDY
INDIAN FLATS
GUIDE MERIDIAN
4TH STANDARD PARALLEL SOUTH
5TH STANDARD PARALLEL SOUTH
EAST
RED BLUFF RESERVOIR
NORMAL POOL 2842
Map created with TOPO!® ©2010 National Geographic
NATIONAL GEOGRAPHIC
0 5 10 15 20 miles
0 5 10 15 20 25 30 km
TN + MN
7°
02/04/18

EXHIBIT 2
VICINITY MAP



TAP ROCK

LEASE NAME & WELL NO.: DOUBLE DIAMOND 24S21E1414 228H

SECTION 14 TWP 24-S RGE 31-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 305' FSL & 910' FEL

DISTANCE & DIRECTION
FROM INT. OF NM-31, & NM-128-E, HEAD EAST ON NM-128 E ±19.6 MILES, THENCE SOUTHWEST (RIGHT) ON BUCK JACKSON RD. ±1.1 MILES, THENCE SOUTHEAST, (LEFT) ON LEASE RD ±1.6 MILES, THENCE WEST ON PROPOSED RD ±215 FEET TO A POINT ±332 FEET SOUTHEAST OF THE LOCATION.

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

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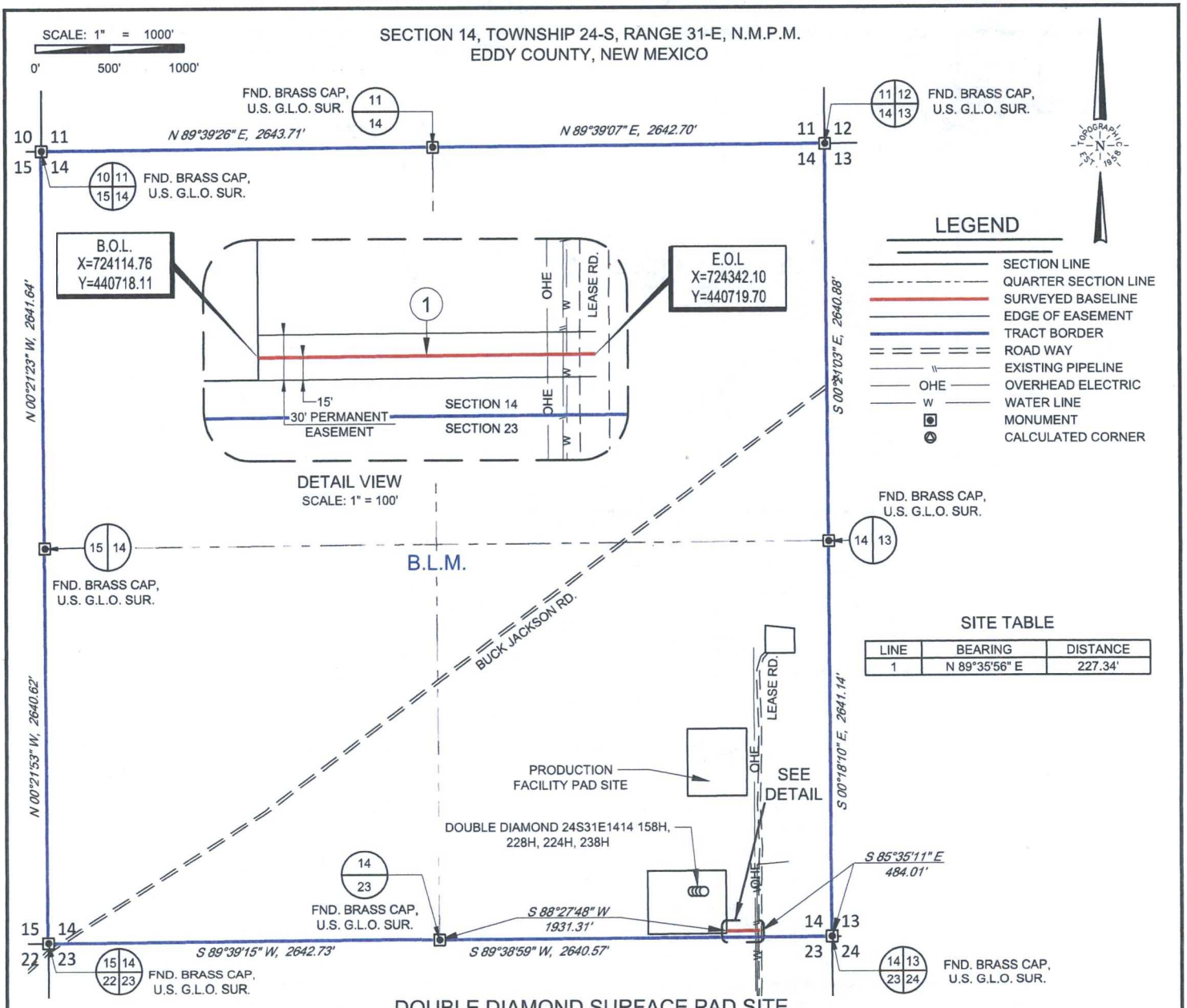

SITE TABLE

LINE	BEARING	DISTANCE
1	N 89°35'56" E	227.34'

DOUBLE DIAMOND SURFACE PAD SITE ROAD EASEMENT

Being a proposed road easement being 30 feet in width, 15 feet left, and 15 feet right of the above platted centerline total line footage containing 227.34 feet or 13.78 rods, containing 0.16 acres more or less.

STAN W. LLOYD NEW MEXICO 19642 PROFESSIONAL SURVEYOR

Stan W. Lloyd

Stan W. Lloyd, P.S. No. 19642
MARCH 30, 2018

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TAP ROCK

DOUBLE DIAMOND SURFACE PAD SITE ROAD EASEMENT	REVISION: INT	DATE
DATE: 03/30/18		
FILE: EP_DOUBLE_DIAMOND_SURFACE_PAD_SITE_RD		
DRAWN BY: AMD		
SHEET : 1 OF 1		

NOTES:
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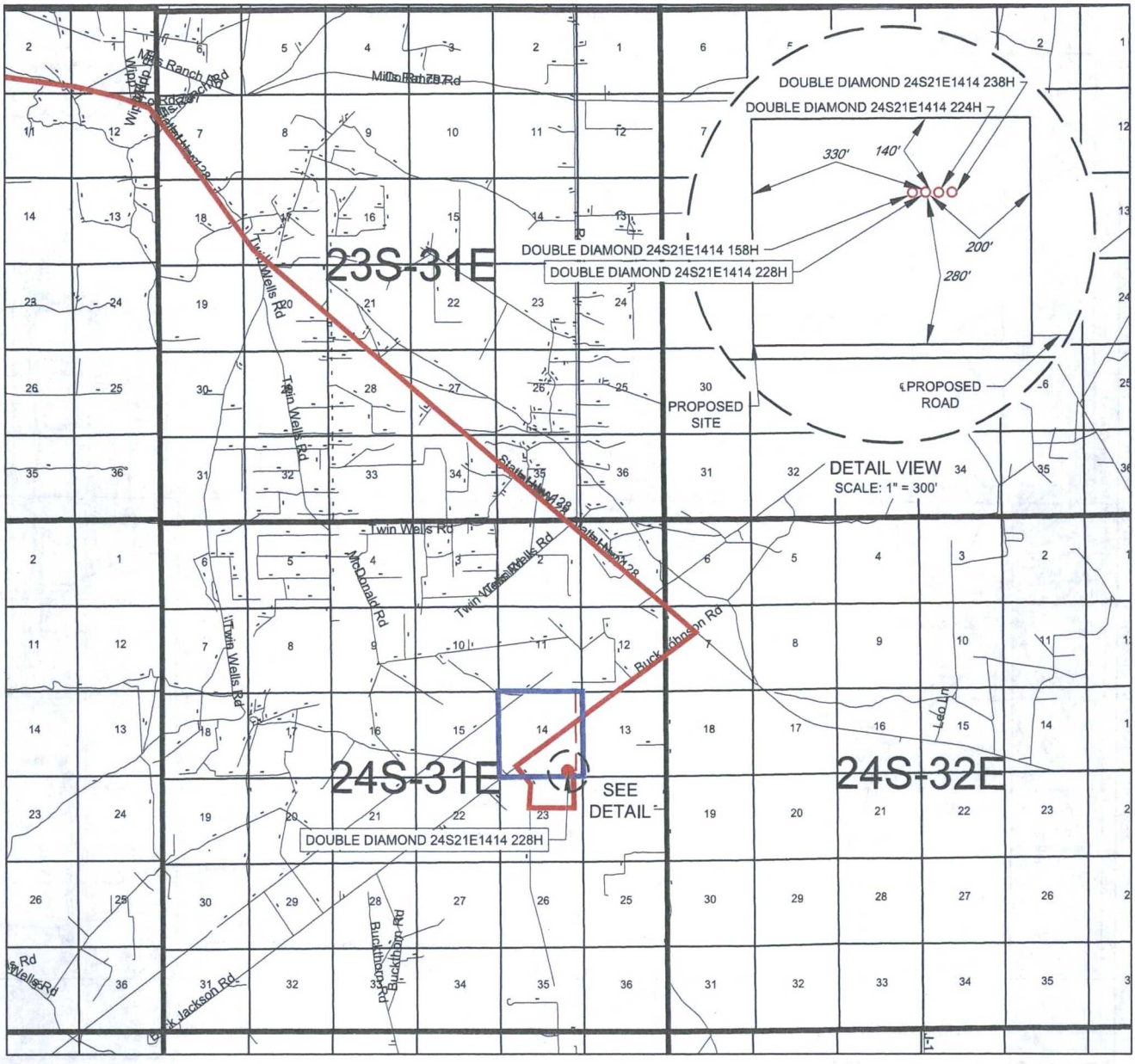
EXHIBIT 2

VICINITY MAP



TAP ROCK

LEASE NAME & WELL NO.: DOUBLE DIAMOND 24S21E1414 228H

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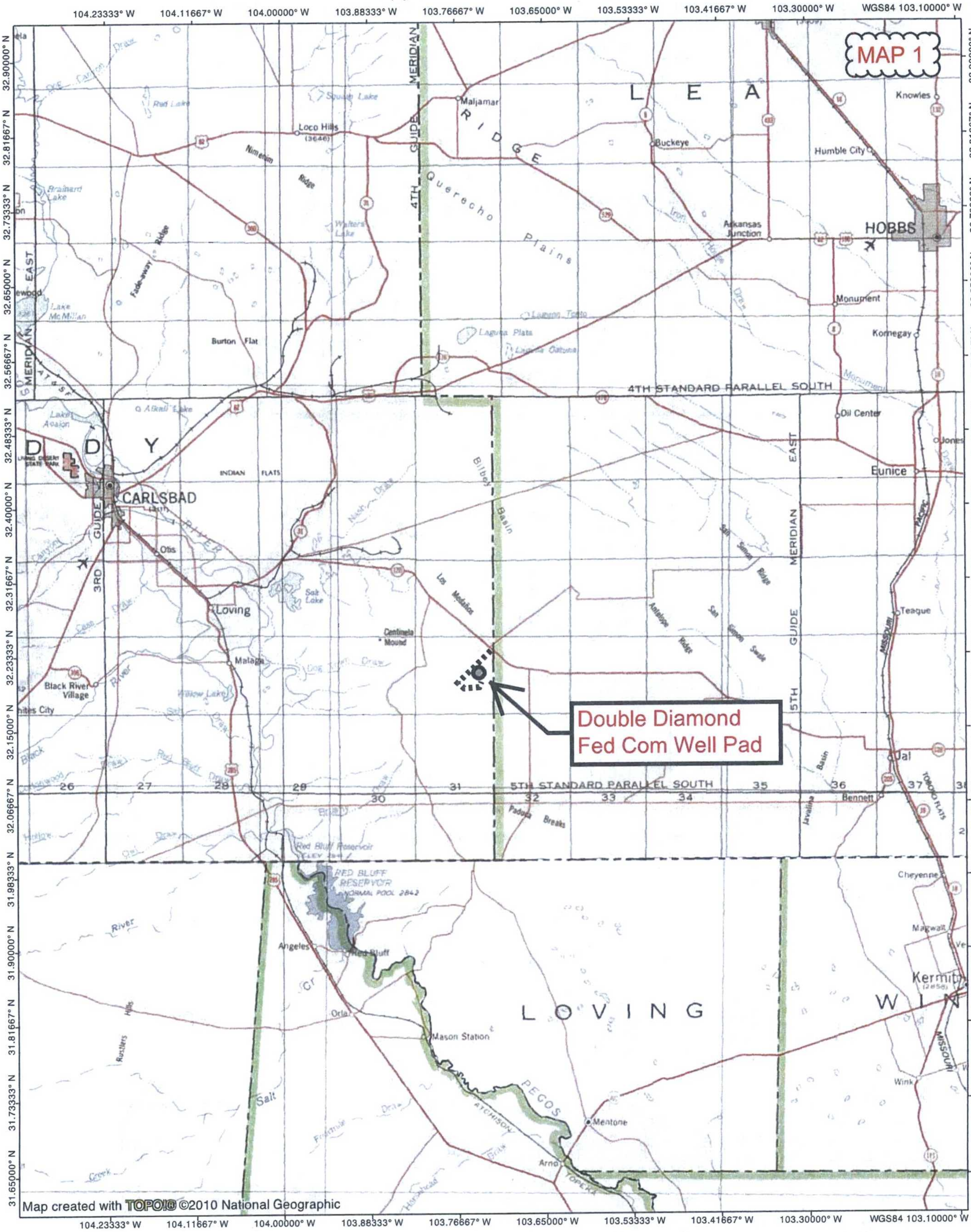


NATIONAL GEOGRAPHIC

0 5 10 15 20 miles

0 5 10 15 20 25 30 km

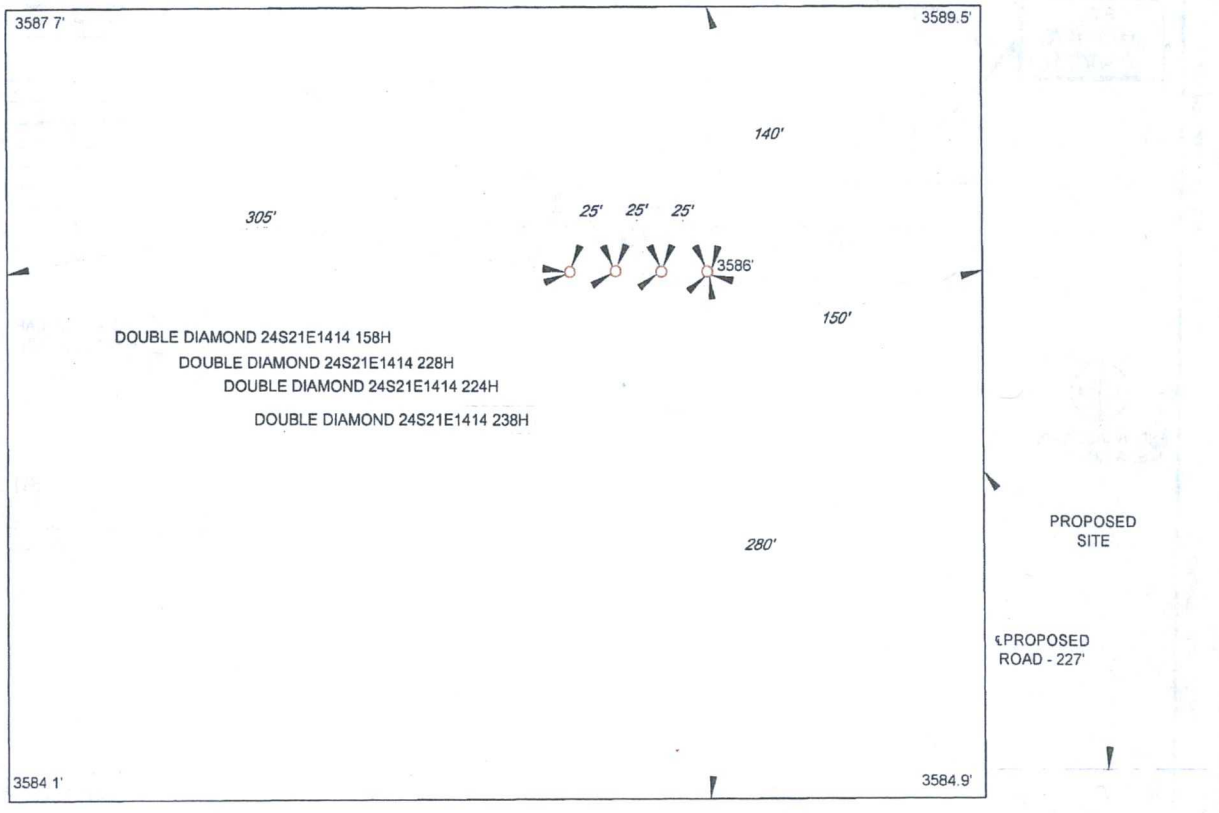
TN MN 7°

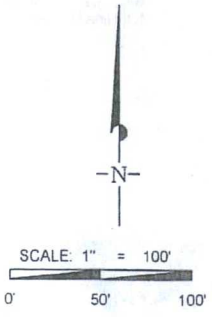
02/04/18

MAP 4

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'





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SCALE: 1" = 1000'

0' 500' 1000'

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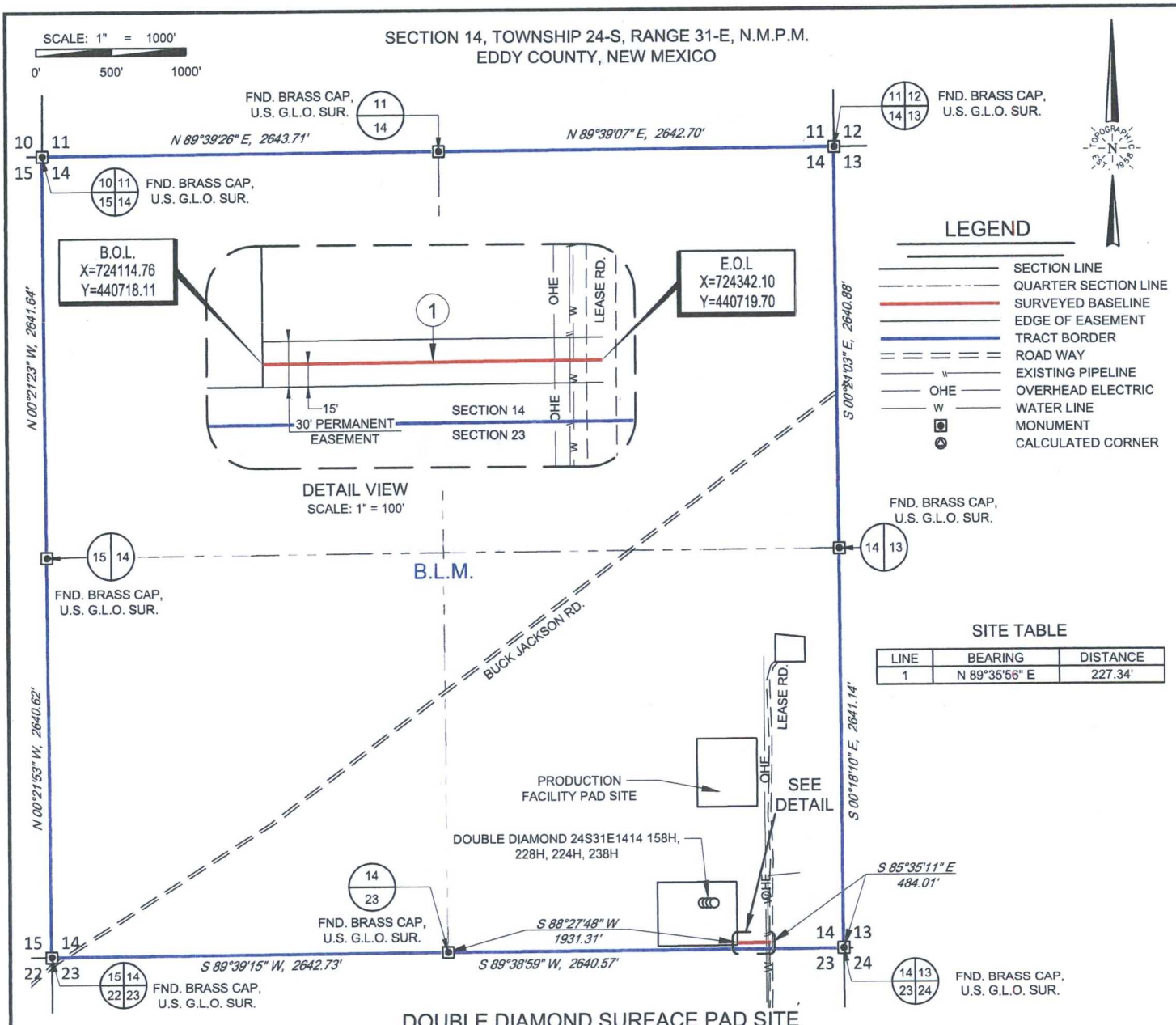
EDDY COUNTY, NEW MEXICO



LEGEND

- SECTION LINE
- QUARTER SECTION LINE
- SURVEYED BASELINE
- EDGE OF EASEMENT
- TRACT BORDER
- ROAD WAY
- EXISTING PIPELINE
- OHE — OVERHEAD ELECTRIC
- W — WATER LINE
- MONUMENT
- CALCULATED CORNER

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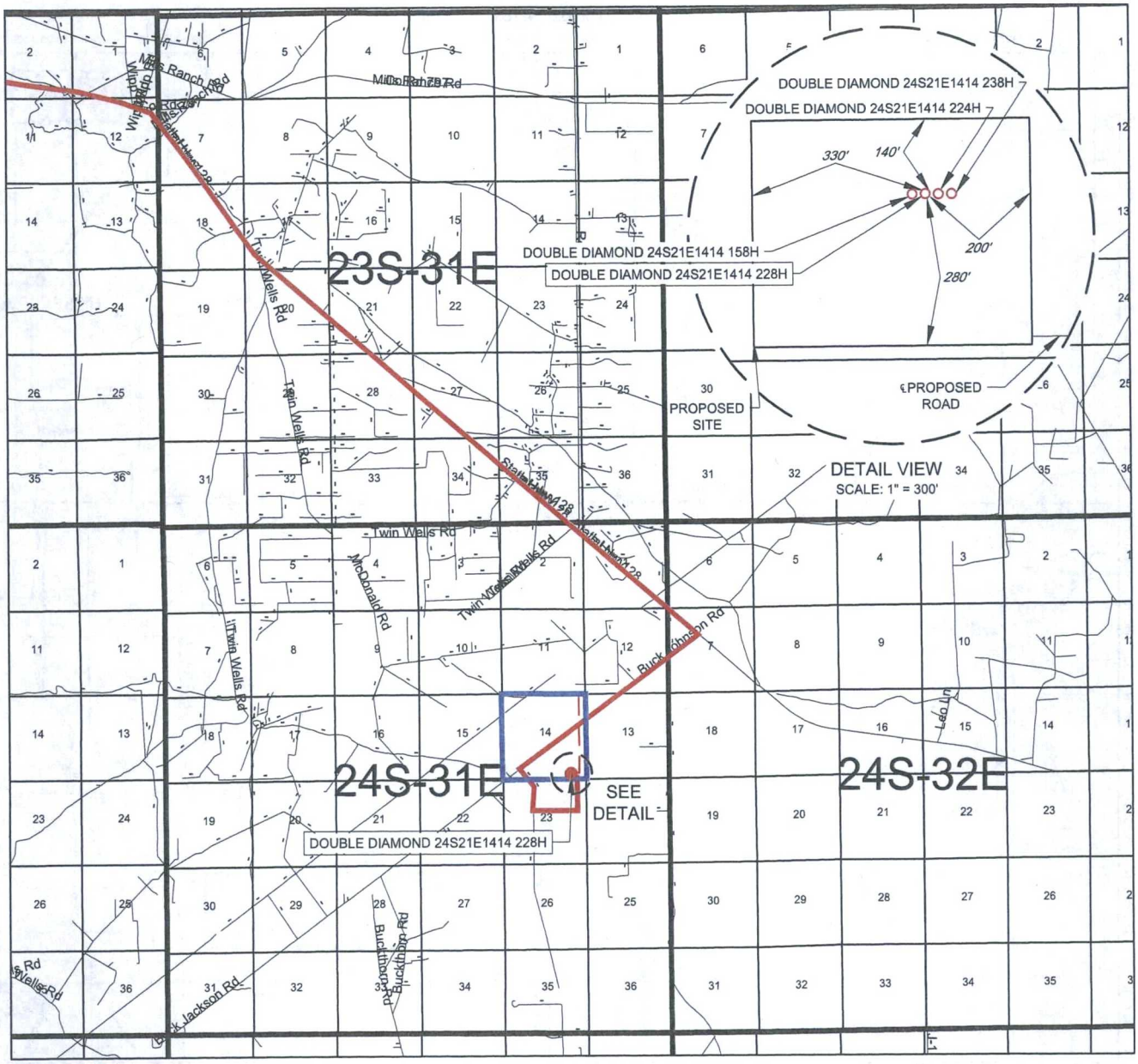

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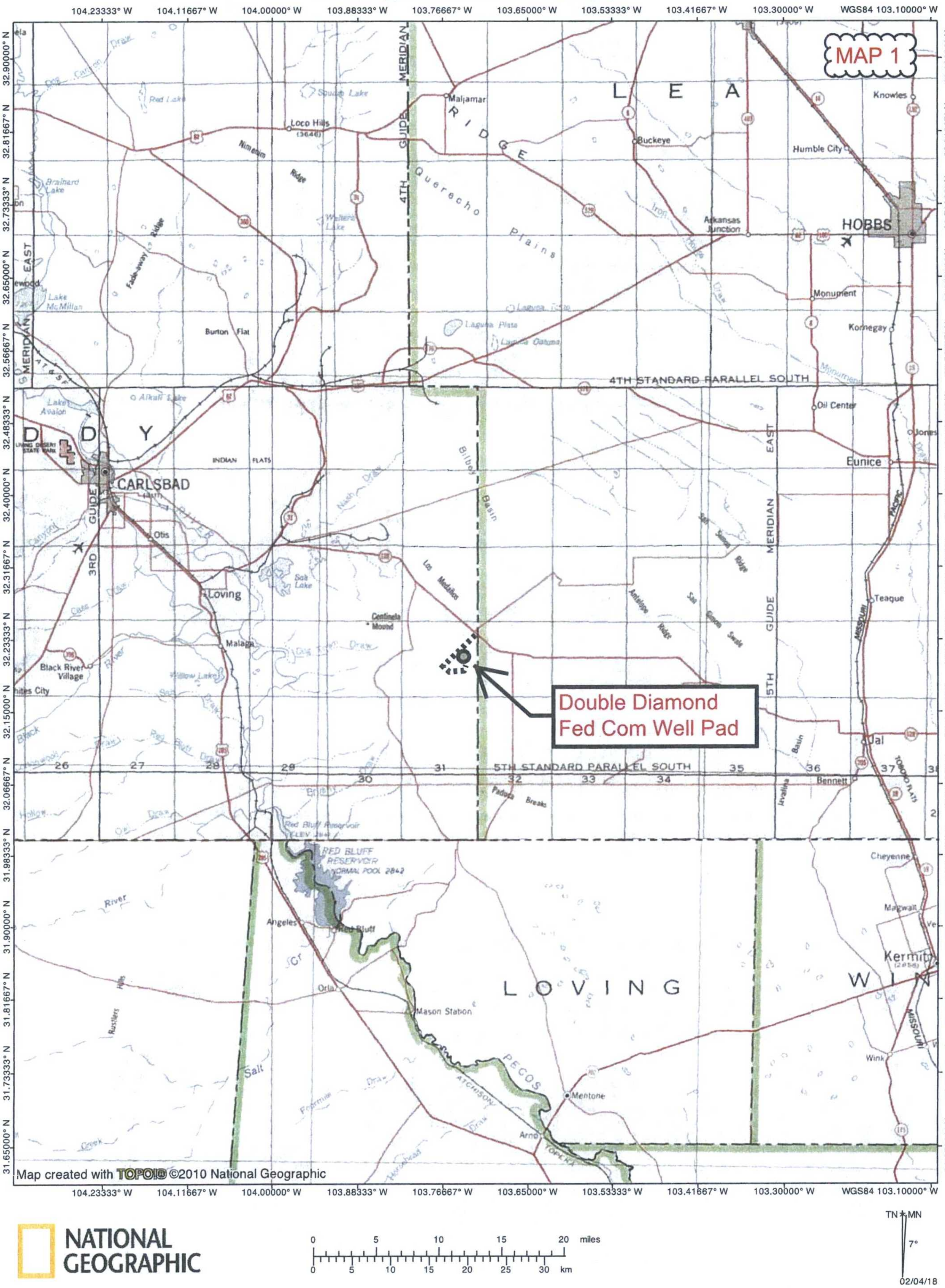
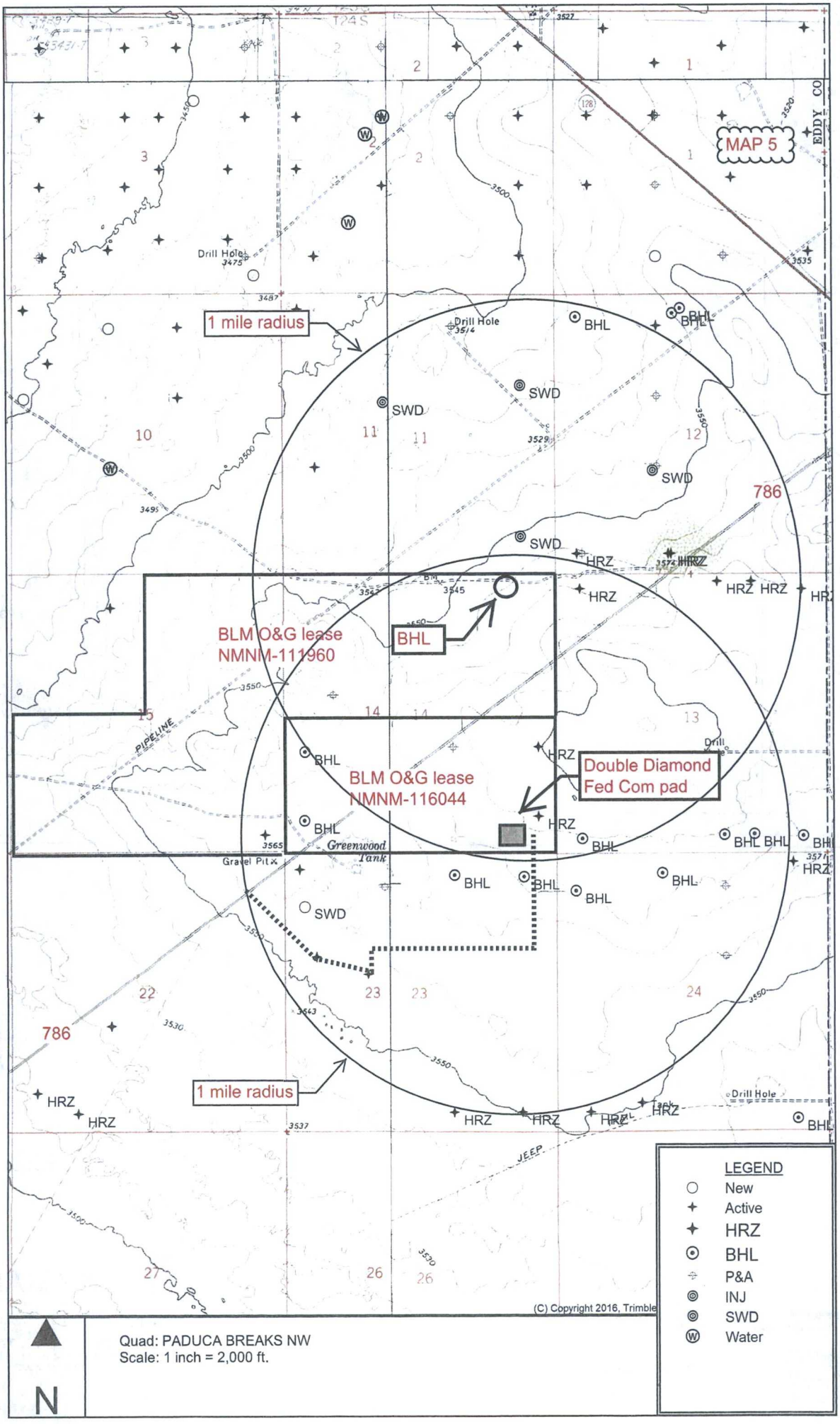
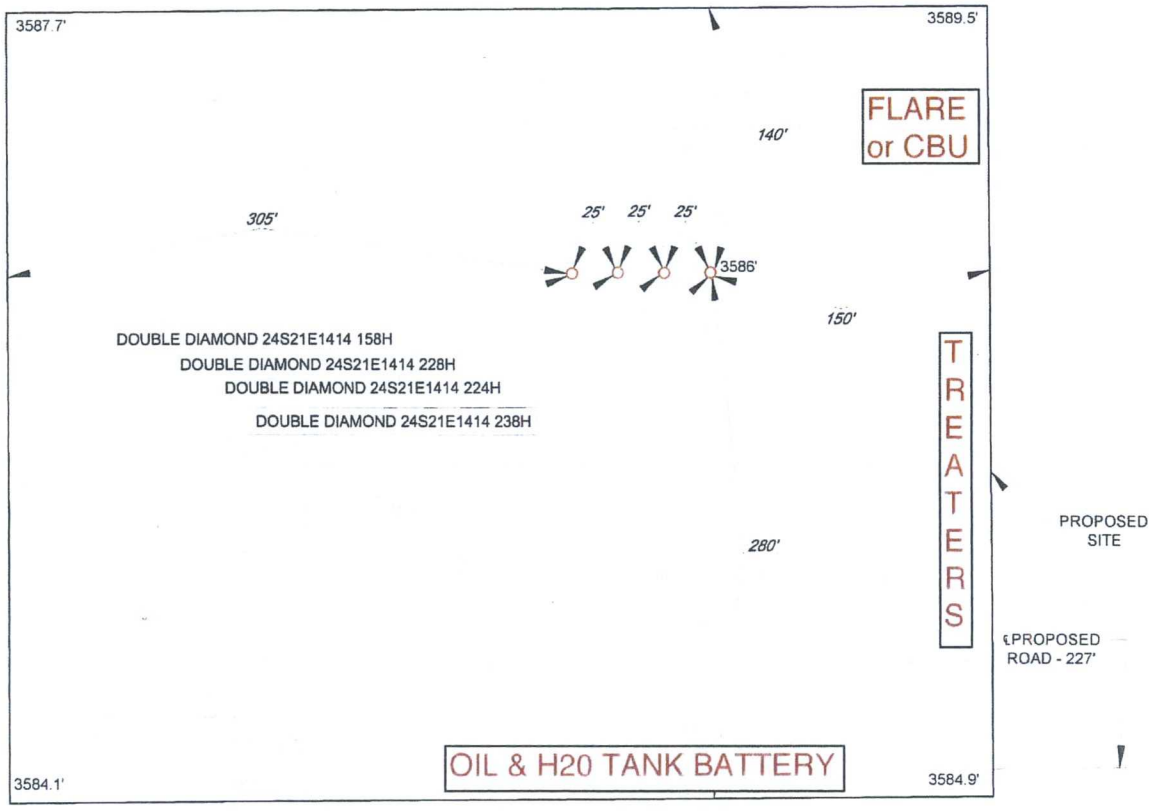


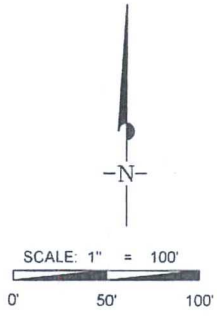

MAP 5
EDDY CO
1 mile radius
BLM O&G lease
NMNM-111960
BHL
BLM O&G lease
NMNM-116044
Double Diamond
Fed Com pad
1 mile radius
786
786
SWD
HRZ
BHL
Drill Hole
Greenwood Tank
Gravel Pit
PIPELINE
JEEP
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
(C) Copyright 2016, Trimble
Quad: PADUCA BREAKS NW
Scale: 1 inch = 2,000 ft.
N

MAP 6

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'





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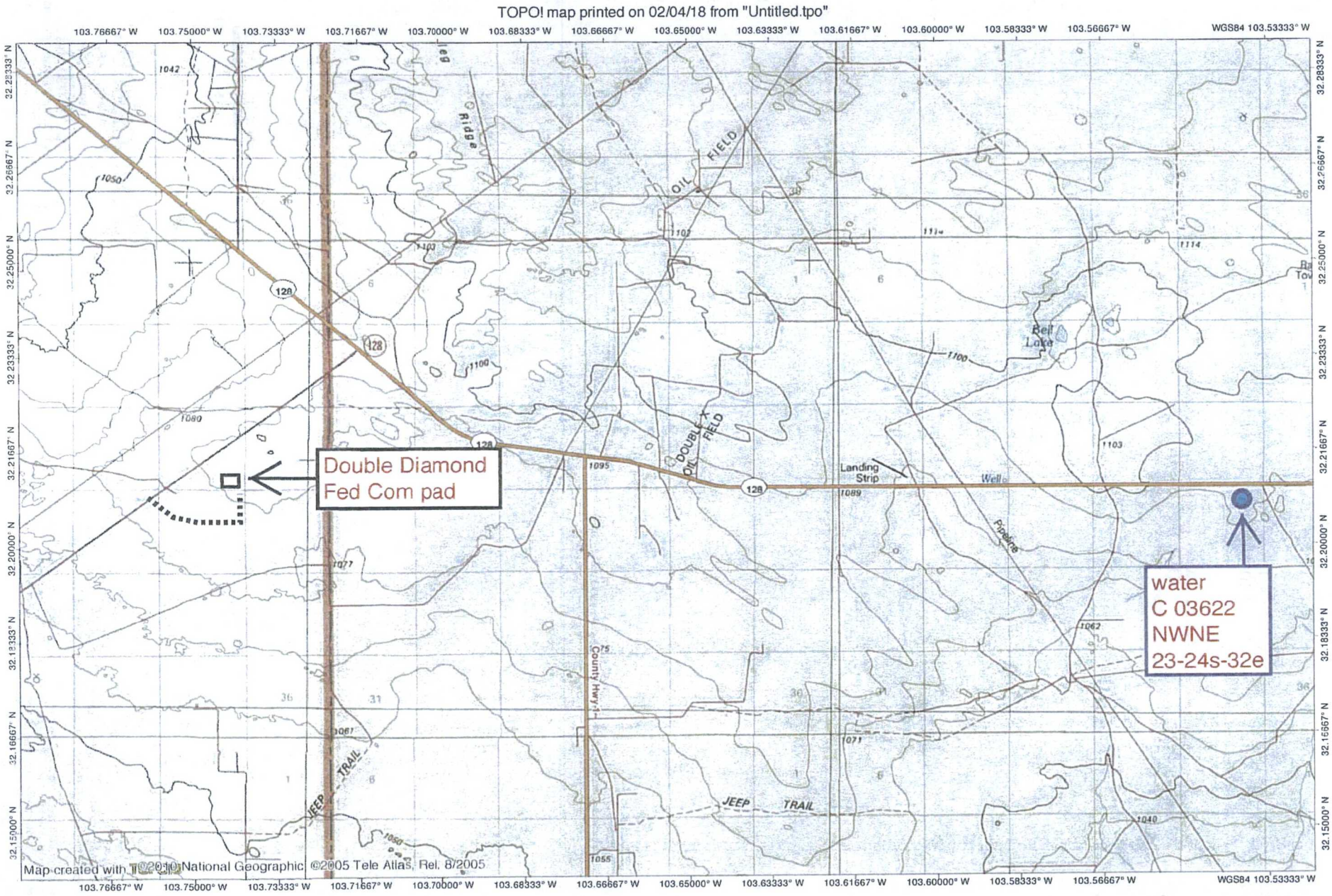
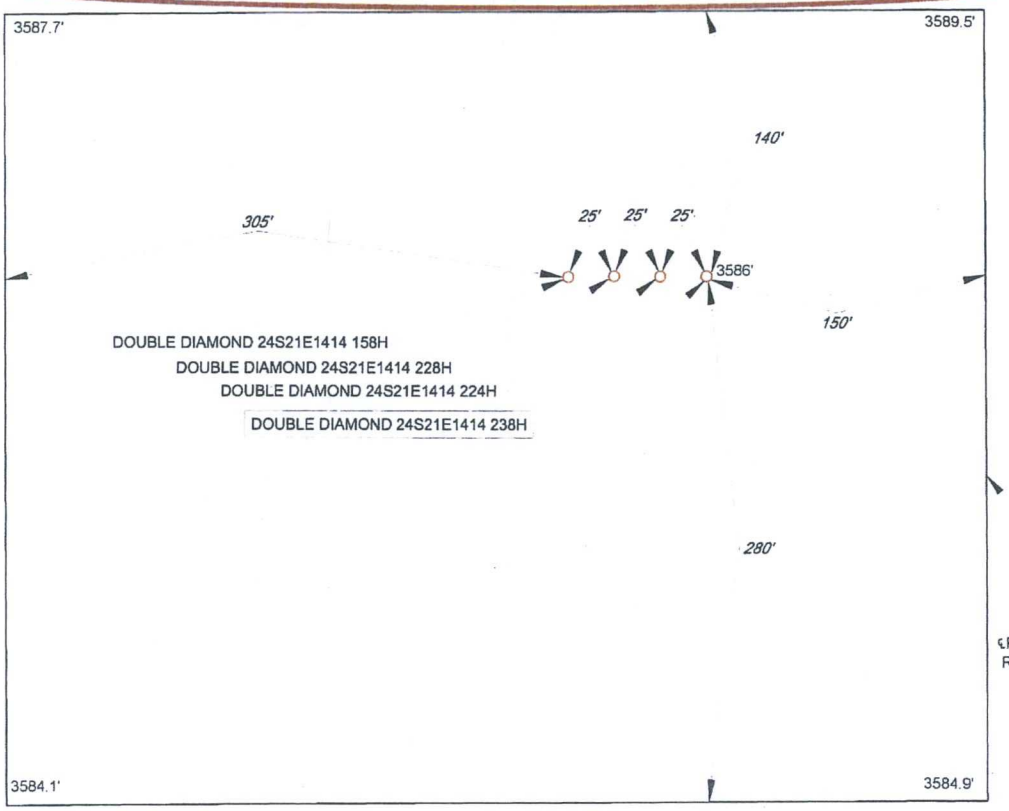

TOPO! map printed on 02/04/18 from "Untitled.tpo"
Double Diamond
Fed Com pad
water
C 03622
NWNE
23-24s-32e
Map created with TOPO! ©2010 National Geographic ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC
MAP 7
02/04/18

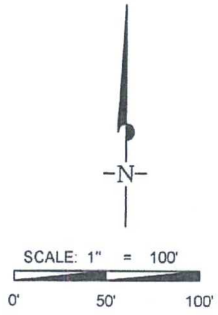
MAP 8

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'

30' w TOPSOIL PILE





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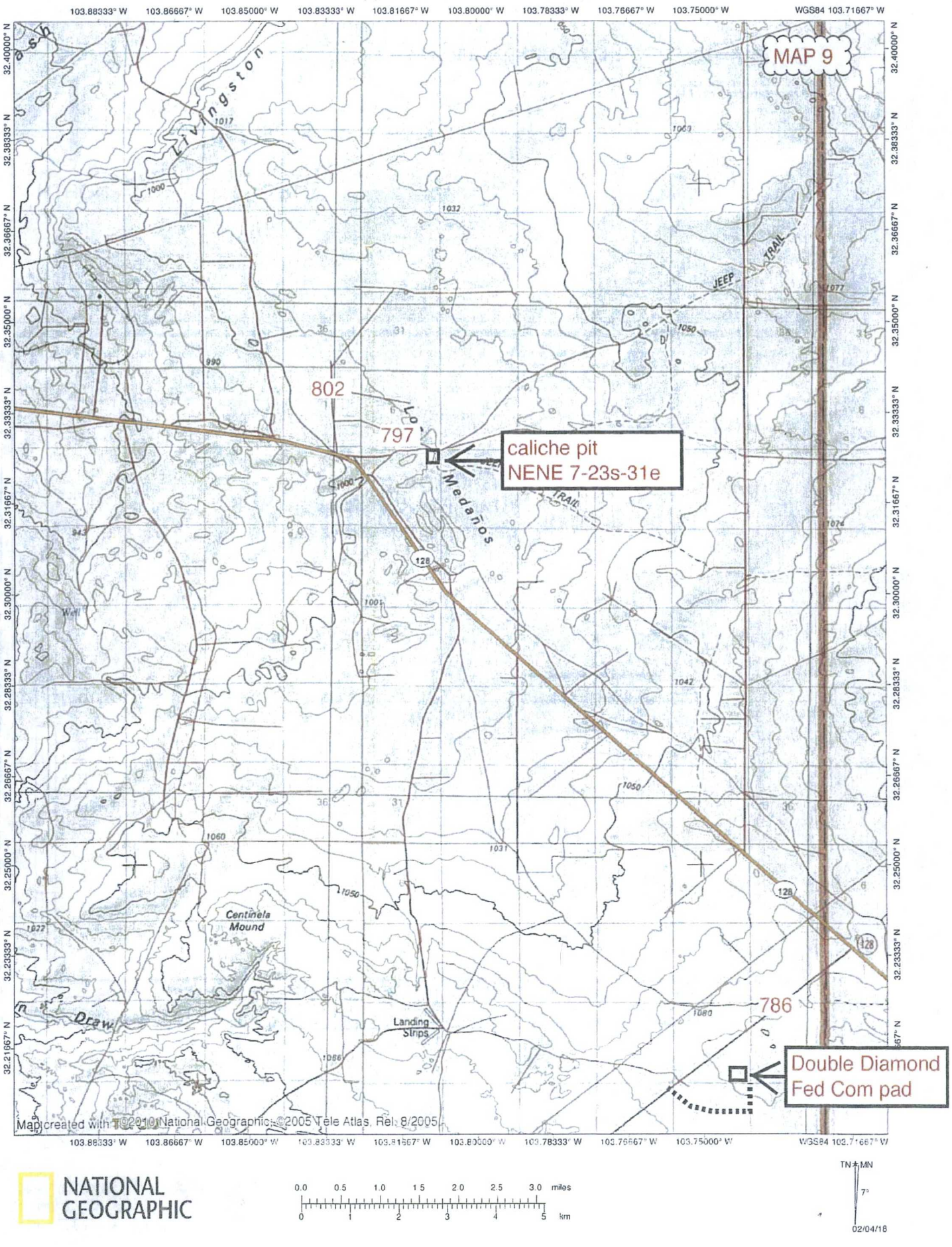
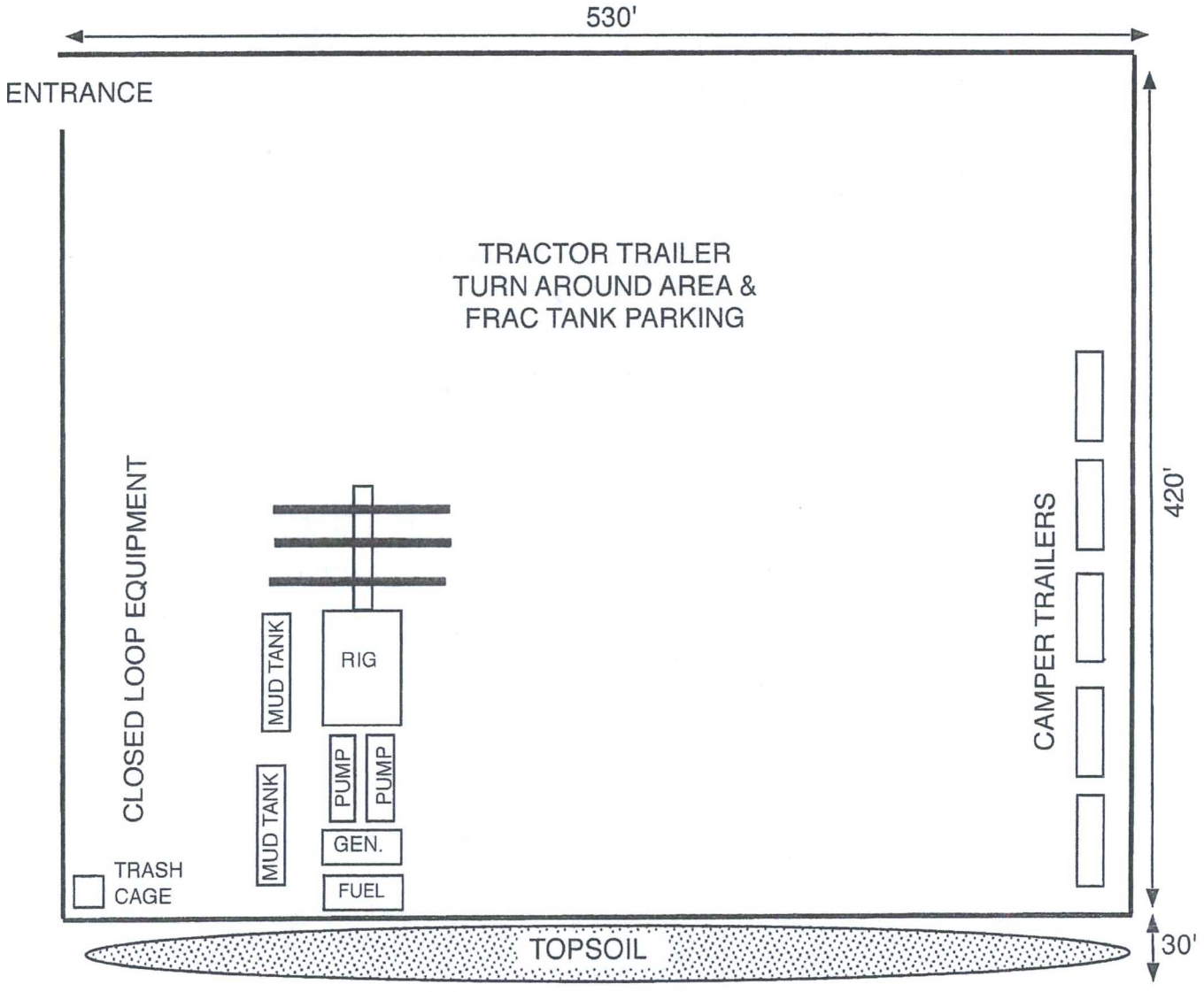

TOPO! map printed on 02/04/18 from "Untitled.tpo"
MAP 9
802
797
caliche pit
NENE 7-23s-31e
786
Double Diamond
Fed Com pad
Centinela
Mound
Landing
Strips
Draw
Medanos
JEEP
TRAIL
Livingston
Map created with TOPO! ©2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005
NATIONAL
GEOGRAPHIC
0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km
TN
MN
7°
02/04/18

Double Diamond Fed Com 224H
rig diagram

1" = 80'

NORTH



PERMITS WEST INC.
PROVIDING PERMITS for LAND USERS

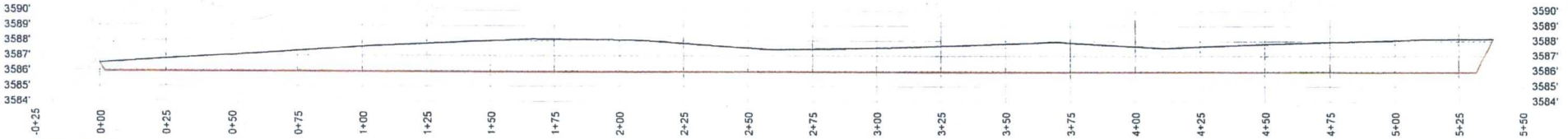
TOP OF PAD ELEVATION: 3585.9292
CUT SLOPE: 33.33% 3.000:1 18.43°
FILL SLOPE: 33.33% 3.000:1 18.43°
BALANCE TOLERANCE (C.Y.): 0.00
CUT SWELL FACTOR: 1.00
FILL SHRINK FACTOR: 1.00

PAD EARTHWORK VOLUMES
CUT 128,917.1 C.F., 4,774.71 C.Y
FILL: 128,917.1 C.F., 4,774.71 C.Y.
AREA: 231518.3 SQ.FT. 5.315 ACRES

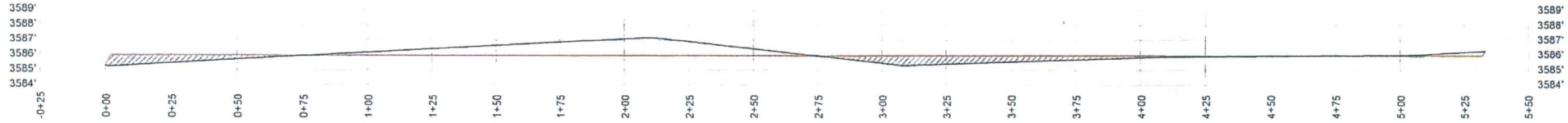
SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

TAP ROCK

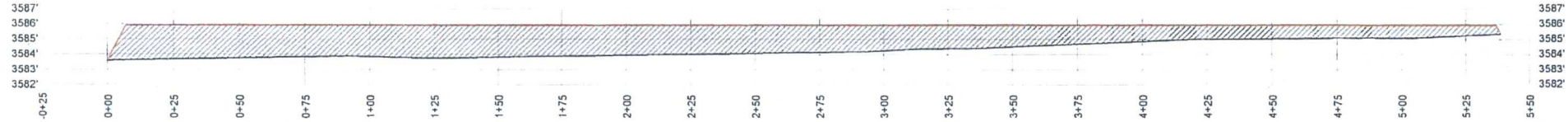
A-A'



B-B'



C-C'



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

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DOUBLE DIAMOND 24S21E1414 PAD SITE	REVISION: INT	REVISION: DATE
DATE: 01/26/18		
FILE: CD_DOUBLE_DIAMOND_UNIT		
DRAWN BY: EAH		
SHEET :		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE. U.S. SURVEY FEET.
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MICHAEL B. BROWN
NEW MEXICO
18329
PROFESSIONAL SURVEYOR

Michael Blake Brown, P.S. No. 18329
JANUARY 26, 2018

MAP 11

S:\SURVEY\TAPROCK\DOUBLE_DIAMOND_UNIT\FINAL_PRODUCTS\CD_DOUBLE_DIAMOND_UNIT.DWG 2/2/2018 4:14:44 PM ccaston

SCALE: 1" = 100'

0' 50' 100'

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

MAP 12

MICHAEL B. BROWN
NEW MEXICO
18329
PROFESSIONAL SURVEYOR

TOPOGRAPHIC
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TAP ROCK

Michael Blake Brown, P.S. No. 18329
JANUARY 26, 2018

DOUBLE DIAMOND 24S21E1414 PAD SITE	REVISION: INT	DATE
DATE: 01/26/18		
FILE: CD_DOUBLE_DIAMOND_UNIT		
DRAWN BY: EAH		
SHEET :		

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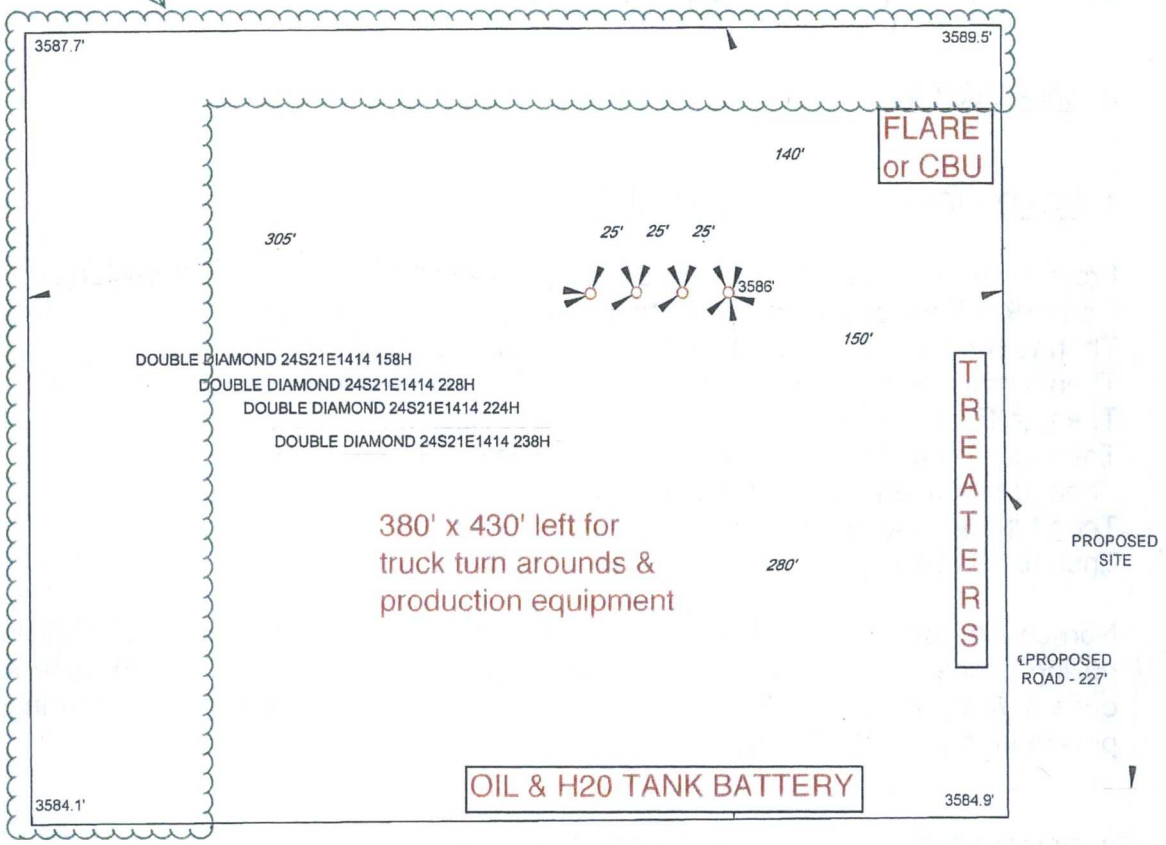
TAP ROCK

MAP 10

interim reclaim
40' on north
100' on west

SECTION 14, TOWNSHIP 24-S, RANGE 31-E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

DETAIL VIEW
SCALE: 1" = 100'



-N-

SCALE: 1" = 100'

0' 50' 100'

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Tap Rock Operating LLC **SURFACE PLAN PAGE 1**
Double Diamond Fed Com 224H
SHL 305' FSL & 885' FEL
BHL 200' FNL & 990' FEL
Sec. 14, T. 24 S., R. 31 E., Eddy County, NM

Surface Use Plan

1. ROAD DIRECTIONS & DESCRIPTIONS (See MAPS 1 – 4)

From the equivalent of Mile Post 23.4 on US 285 between Carlsbad & Loving...
Go E 19.5 miles on paved NM 31 to the equivalent of Mile Post 19.5
Then turn right and go SW 3.1 miles on caliche County Road 786
Then turn left and go SW 1/3 mile on a caliche road to a well
Then go East ¼ mile on a caliche road to a second well
Then turn left and go N 100 yards on a caiche road
Then turn right and go E ½ mile on a caliche road
Then turn left and go N 0.4 mile on a caliche road
Then turn left and go W 227' cross-country to the proposed pad

Non-county roads will be maintained as needed to Gold Book standards. This includes pulling ditches, preserving the crown, and cleaning culverts. This will be done at least once a year, and more often as needed. Caliche will be hauled from an existing pit on private land in NENE 7-23s-31e.

2. ROAD TO BE BUILT OR UPGRADED (See MAP 4)

227' of new resource road will be built. The new road will be crowned and ditched, have a 14' wide driving surface, and be surfaced with caliche. Maximum disturbed width = 30'. Maximum grade = 1%. Maximum cut or fill = 1'. No upgrade, culvert, cattle guard, or vehicle turn out is needed.

3. EXISTING WELLS (See MAP 5)

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 MAP 6)

Production facilities will be on the southeast sides of the pad. Gas pipeline and power line plans have not been finalized.

5. WATER SUPPLY (See MAP 7)

Water will be trucked from a private water well (C 03662) on private land in NWNE 23-24s-33e.

6. CONSTRUCTION MATERIALS & METHODS (see MAPS 8 & 9)

NM One Call (811) will be notified before construction starts. Top ≈6" of soil and brush will be stockpiled north of the pad. Pipe racks will be to the south. A closed loop drilling system will be used. Caliche will be hauled from existing pit on private land in NENE 7-23s-31e.

7. WASTE DISPOSAL

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 Rig Diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See MAPS 10 - 12)

Interim reclamation will shrink the well pad ≈26% by removing caliche and reclaiming the north 40' and west 100', leaving 3.76 acres for producing 5 wells and truck turn arounds. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas. Disturbed areas will be seeded in

accordance with BLM requirements. Enough stockpiled topsoil will be retained to cover the remainder of the pad when the wells are plugged. Once the last well is plugged, then the remainder of the pad and new road will be similarly reclaimed. Noxious weeds will be controlled.

Land use:

30' x 227' road = 0.16 acre
+ 420' x 530' pad = 5.11 acres
short term = 5.27 acres

short term = 5.27 acres
– interim reclamation on well pad = 1.35 acres
3.92 acres long term (0.16 ac. road + 3.76 ac. pad)

11. SURFACE OWNER

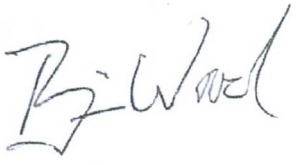
All construction will be on BLM, 620 E. Greene, Carlsbad NM 88220. Phone is 575 234-5972.

12. OTHER INFORMATION

On-site inspection was held with Vance Wolfe (BLM) on December 7, 2017. Lone Mountain filed archaeology report NMCRIS 139066 on October 3, 2017.

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 4th day of February, 2018.



Brian Wood, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120 FAX: (505) 466-9682 Cellular: (505) 699-2276

Field representative will be:

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

Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

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:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

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:

AFMSS

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

Bond Info Data Report

05/01/2018

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: