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EMNRD-OCD ARTESIA

Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM086024

6. If Indian, Allotee or Tribe Name

1a. Type of work: [✔] DRILL [ ] REENTER
1b. Type of Well: [ ] Oil Well [✔] Gas Well [ ] Other
1c. Type of Completion: [ ] Hydraulic Fracturing [✔] Single Zone [ ] Multiple Zone

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

8. Lease Name and Well No.
CYPRESS 34 FEDERAL
232H 319943

2. Name of Operator
TAP ROCK OPERATING LLC

9. API Well No.
30 015 46698

3a. Address
602 Park Point Drive Suite 200 Golden CO 80401

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 NWNE / 546 FNL / 2578 FEL / LAT 32.2670898 / LONG -103.9723441
At proposed prod. zone SESW / 200 FSL / 2430 FWL / LAT 32.2545635 / LONG -103.973121

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 34 / T23S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*
6.5 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)
546 feet

16. No of acres in lease
1440

17. Spacing Unit dedicated to this well
320

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

19. Proposed Depth
10984 feet / 15758 feet

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3044 feet

22. Approximate date work will start*
09/01/2019

23. Estimated duration
90 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Brian Wood / Ph: (505)466-8120	07/03/2019

Title
President

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	02/03/2020

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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

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

APPROVED WITH CONDITIONS

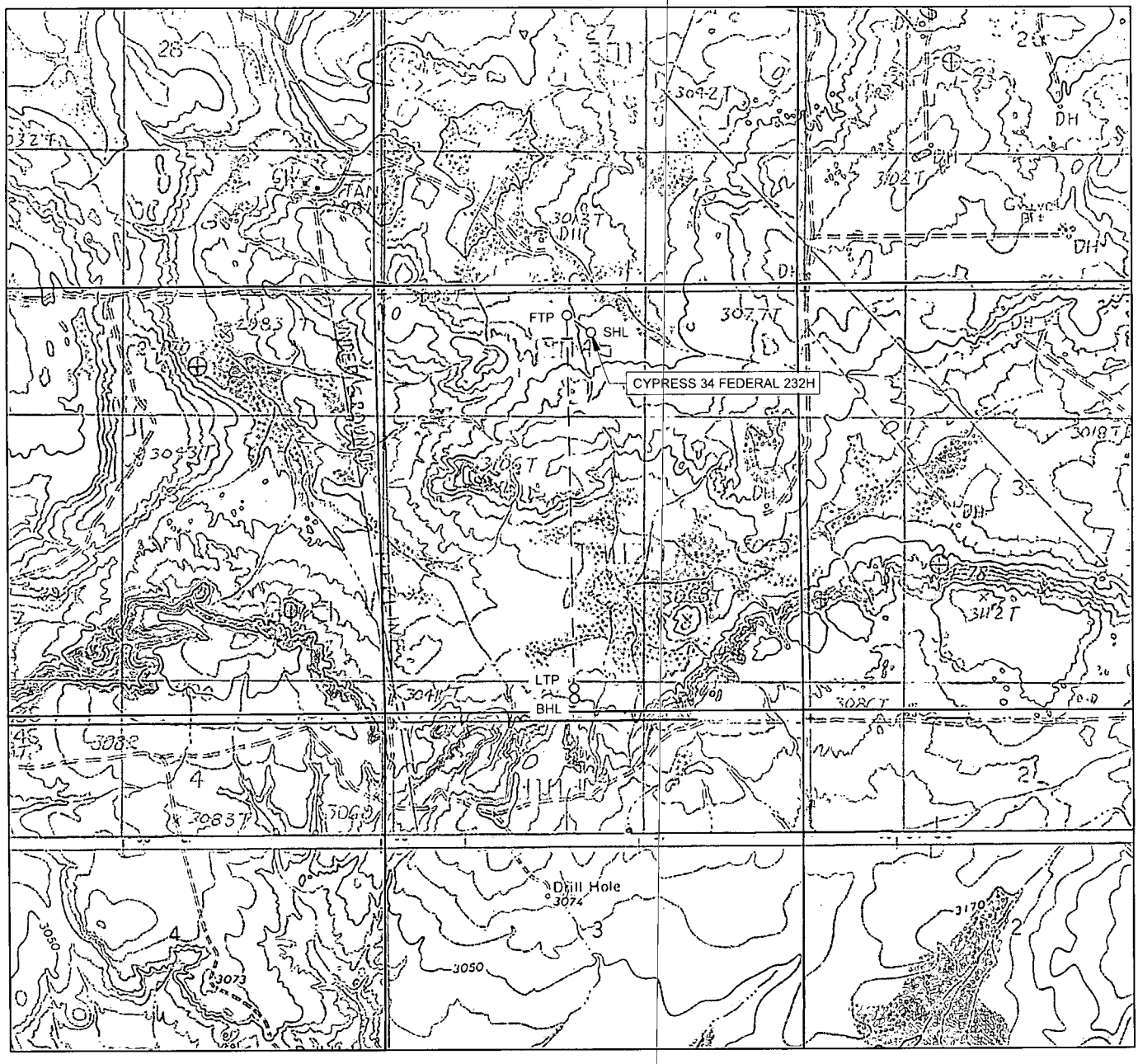
(Continued on page 2)

*(Instructions on page 2)

Approval Date: 02/03/2020

KS 2-10-20

LOCATION & ELEVATION VERIFICATION MAP



TAP ROCK

LEASE NAME & WELL NO.: CYPRESS 34 FEDERAL 232H

SECTION 34 TWP 23-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM ELEVATION 3044'
DESCRIPTION 546' FNL & 2578' FEL

LATITUDE N 32.2670898 LONGITUDE W 103.9723441

-N-

SCALE: 1" = 2000'

0' 1000' 2000'

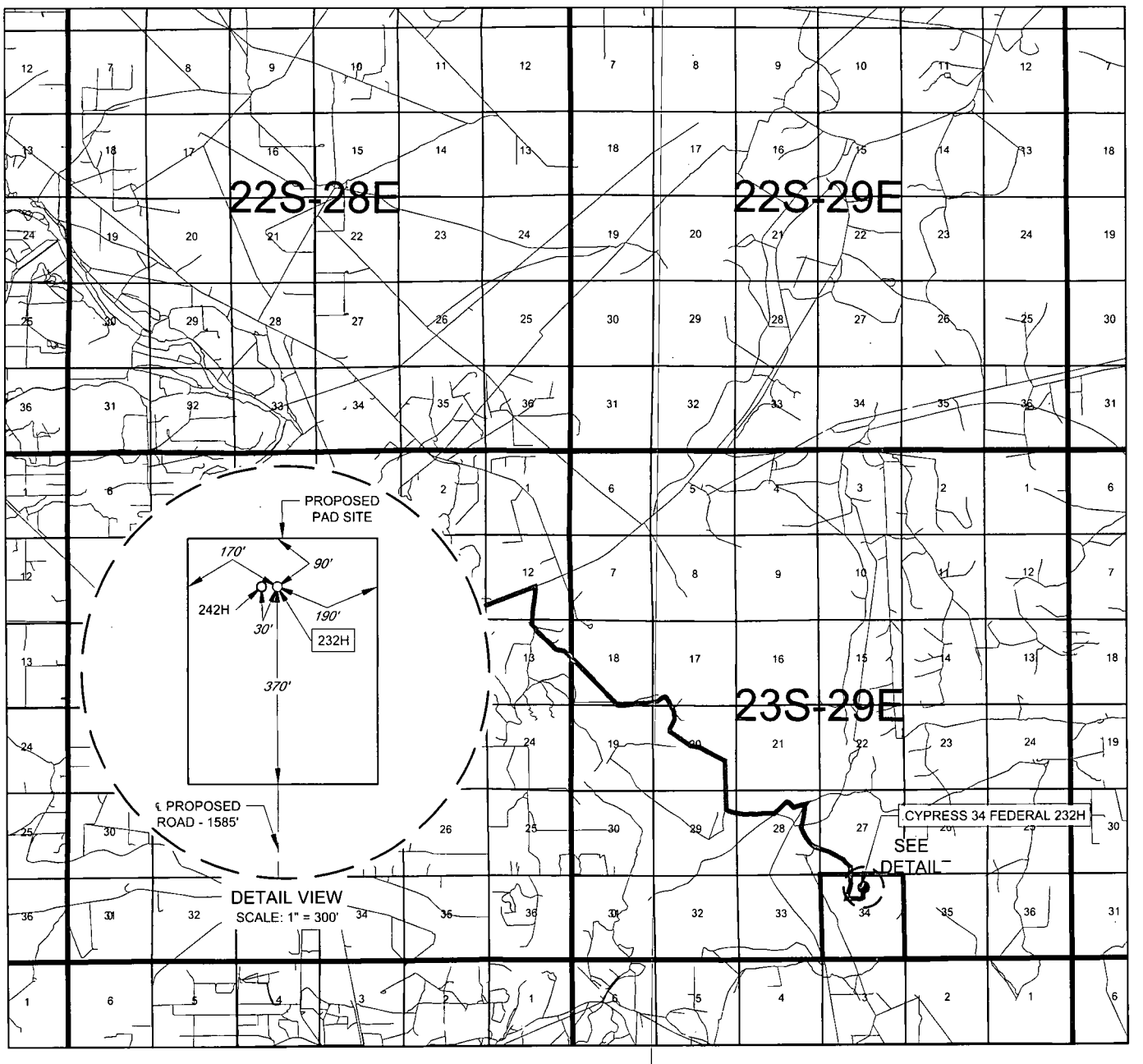
THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF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

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

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 2

VICINITY MAP



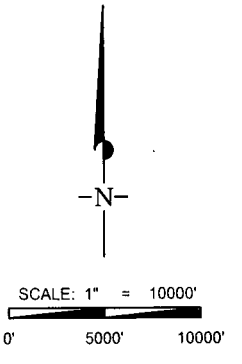
TAP ROCK

LEASE NAME & WELL NO.: CYPRESS 34 FEDERAL 232H

SECTION 34 TWP 23-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 546' FNL & 2578' FEL

DISTANCE & DIRECTION

FROM INT. OF NM-31, & STATE HWY 387, GO EAST ON NM-31 ±1.7 MILES, THENCE SOUTH (RIGHT) ON FISHERMANS LN. ±0.5 MILES, THENCE CONTINUE STRAIGHT ON A LEASE RD. ±4.8 MILES, THENCE SOUTH (RIGHT) ON A LEASE RD. ± 0.6 MILES, THENCE EAST (LEFT) ON A LEASE RD. ±0.3 MILES, THENCE SOUTH (RIGHT) ON A LEASE RD. ±0.6 MILES, THENCE EAST (LEFT) ON A PROPOSED RD. ±1585 FEET TO A POINT ±370 FEET SOUTH OF THE LOCATION.



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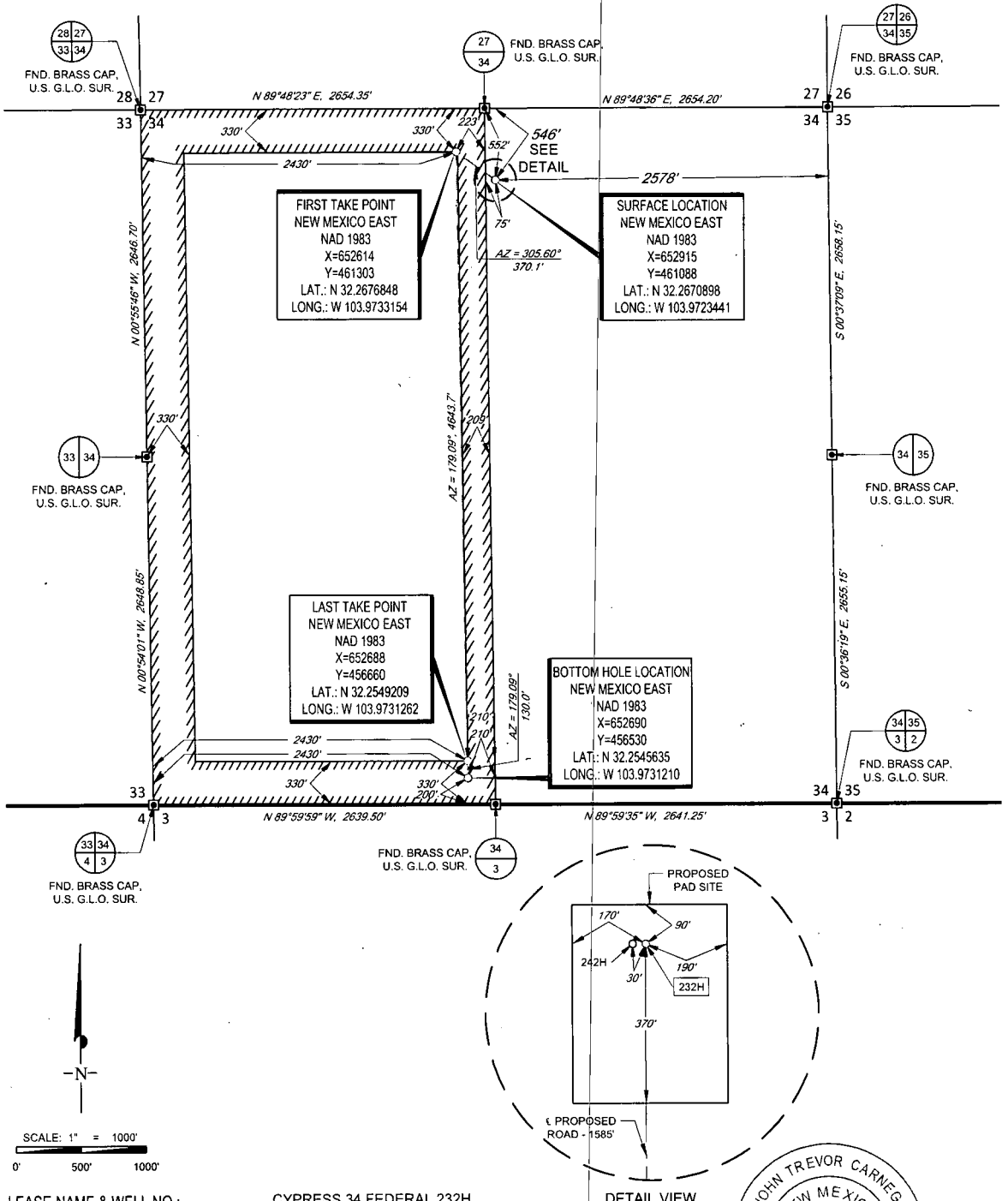
TAP ROCK

EXHIBIT 2A

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



DETAIL VIEW
SCALE: 1" = 300'

LEASE NAME & WELL NO.: CYPRESS 34 FEDERAL 232H

SECTION 34 TWP 23-S RGE 29-E SURVEY N.M.P.M.
COUNTY EDDY STATE NM
DESCRIPTION 546' FNL & 2578' FEL

DISTANCE & DIRECTION
FROM INT. OF NM-31, & STATE HWY 387, GO EAST ON NM-31 ±1.7 MILES, THENCE SOUTH (RIGHT) ON FISHERMANS LN. ±0.5 MILES, THENCE CONTINUE STRAIGHT ON A LEASE RD. ±4.8 MILES, THENCE SOUTH (RIGHT) ON A LEASE RD. ± 0.6 MILES, THENCE EAST (LEFT) ON A LEASE RD. ±0.3 MILES, THENCE SOUTH (RIGHT) ON A LEASE RD. ±0.6 MILES, THENCE EAST (LEFT) ON A PROPOSED RD. ±1585 FEET TO A POINT ±370 FEET SOUTH OF THE LOCATION.

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

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

JOHN TREVOR CARNEGIE
NEW MEXICO
11401
REGISTERED PROFESSIONAL SURVEYOR

John Trevor Carnegie, P.S. No. 11401
MAY 1, 2019

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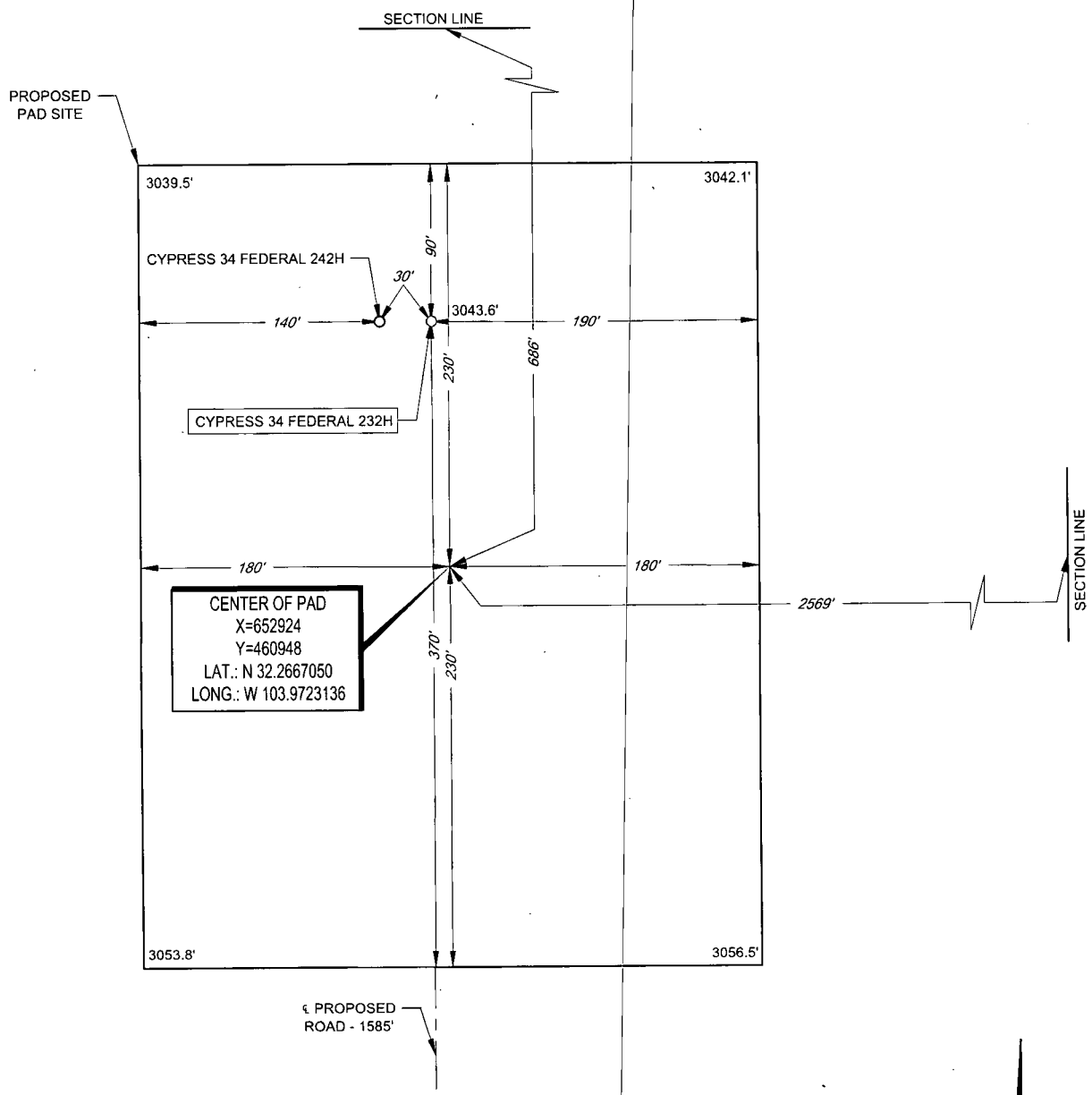
EXHIBIT 2B

TAP ROCK

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

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: CYPRESS 34 FEDERAL 232H

232H LATITUDE N 32.2670898 232H LONGITUDE W 103.9723441

CENTER OF PAD IS 686' FNL & 2569' FEL

-N-

SCALE: 1" = 100'

0' 50' 100'

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

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

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

ORIGINAL DOCUMENT SIZE: 8.5" X 11"

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	TAP ROCK OPERATING LLC
WELL NAME & NO.:	CYPRESS 34 FEDERAL 232H
SURFACE HOLE FOOTAGE:	564'/N & 2578'/E
BOTTOM HOLE FOOTAGE	200'/S & 2430'/W
LOCATION:	Section 34, T.23 S., R.29 E., NMP
COUNTY:	Eddy County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	○ None	◉ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	○ Multibowl	◉ Both
Other	☑ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately 350 feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

24 hours in the Potash Area or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

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

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

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.**

❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

❖ In Secretary Potash Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

3. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

- Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout

preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.
d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

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

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

☒ 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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

    b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, 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 not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. The results of the test shall be reported to the appropriate BLM office.

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
LEASE NO.:	NMNM086024
COUNTY:	Eddy

Wells:

Cypress 34 Federal 207H
Surface Hole Location: 521' FNL & 2579' FEL, Section 34, T. 23 S., R. 29 E.
Bottom Hole Location: 30' FSL & 2310' FWL, Section 34, T. 23 S., R. 29 E.

Cypress 34 Federal 212H
Surface Hole Location: 646' FNL & 2579' FEL, Section 34, T. 23 S., R. 29 E.
Bottom Hole Location: 30' FSL & 1650' FWL, Section 34, T. 23 S., R. 29 E.

Cypress 34 Federal 232H
Surface Hole Location: 546' FNL & 2578' FEL, Section 34, T. 23 S., R. 29 E.
Bottom Hole Location: 200' FSL & 2430' FWL, Section 34, T. 23 S., R. 29 E.

Cypress 34 Federal 242H
Surface Hole Location: 571' FNL & 2578' FEL, Section 34, T. 23 S., R. 29 E.
Bottom Hole Location: 200' FSL & 2010' FWL, Section 34, T. 23 S., R. 29 E.

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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: 02/03/2020

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

OR

If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See information below discussing NAGPRA.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

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

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.

SPECIAL REQUIREMENT(S)

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

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

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

Prior to pipeline installation/construction a leak detection plan will be developed. The method(s) could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present.

The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Cave/Karst:

Construction Mitigation

In order to mitigate the impacts from construction activities on cave and karst resources, the following Conditions of Approval will apply to this APD or project:

General Construction:

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

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Road Construction:

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

Buried Pipeline/Cable Construction:

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

Drilling Mitigation
Federal regulations and standard Conditions of Approval applied to all APDs require that adequate measures are taken to prevent contamination to the environment. Due to the extreme sensitivity of the cave and karst resources in this project area, the following additional Conditions of Approval will be added to this APD.

To prevent cave and karst resource contamination the following will be required:

- Closed loop system using steel tanks - all fluids and cuttings will be hauled off-site and disposed of properly at an authorized site
- Rotary drilling with fresh water where cave or karst features are expected to prevent contamination of freshwater aquifers.
- Directional drilling is only allowed at depths greater than 100 feet below the cave occurrence zone to prevent additional impacts resulting from directional drilling.
- Lost circulation zones will be logged and reported in the drilling report so BLM can assess the situation and work with the operator on corrective actions.
- Additional drilling, casing, and cementing procedures to protect cave zones and fresh water aquifers. See drilling COAs.

Production Mitigation
In order to mitigate the impacts from production activities and due to the nature of karst terrane, the following Conditions of Approval will apply to this APD:

- Tank battery locations and facilities will be bermed and lined with a 20 mil thick permanent liner that has a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.
- Development and implementation of a leak detection system to provide an early alert to operators when a leak has occurred.
- Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

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

Plugging and Abandonment Mitigation
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Potash:
Lessees must comply with the 2012 Secretarial Potash Order. The Order is designed to manage the efficient development of oil, gas, and potash resources. Section 6 of the Order provides general provisions which must be followed to minimize conflict between the industries and ensure the safety of operations.

Soils:
Topsoil will be stockpiled separately to enhance reclamation. oamy soils (LA – Largo loam) will be stockpiled on the southern portion of the eastern facility pad edge. The sandy soils (PA – Pajarito loamy fine sand, SM – Simona-Bippus complex) will be stockpiled on the northern portion of the eastern facility pad edge (see page 17 of this document).

Interim reclamation will be conducted on all disturbed areas not needed for active support of production operations, and if caliche is used as a surfacing material it will be removed at time of reclamation to mitigate impacts to soil resources. When re-spreading the topsoil, Tap Rock will utilize the separate topsoil stockpiles according to soil type and spread them accordingly to mimic the original conditions.

Vegetation:
Interim reclamation will be conducted on all disturbed areas not needed for active support of production operations, and if caliche is used as a surfacing material it will be removed at time of reclamation to enhance re-establishment of vegetation. Reseeding will take place according to topsoil types, as outlined in the Environmental Assessment's (Section 3.7) soil map and mitigation measures for soils. Loamy soils will be reseeded with seed mix 1, and sandy soils will be reseeded with seed mix 2 (see page 17-19 of this document).

VRM IV:

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

V. 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.

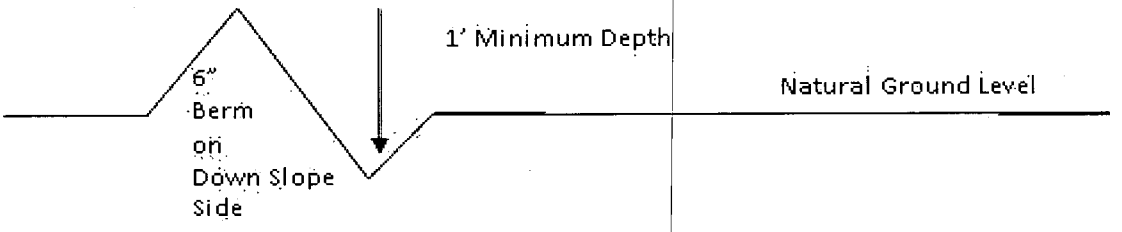
Ditching
Ditching shall be required on both sides of the road.

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:

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

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

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

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

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

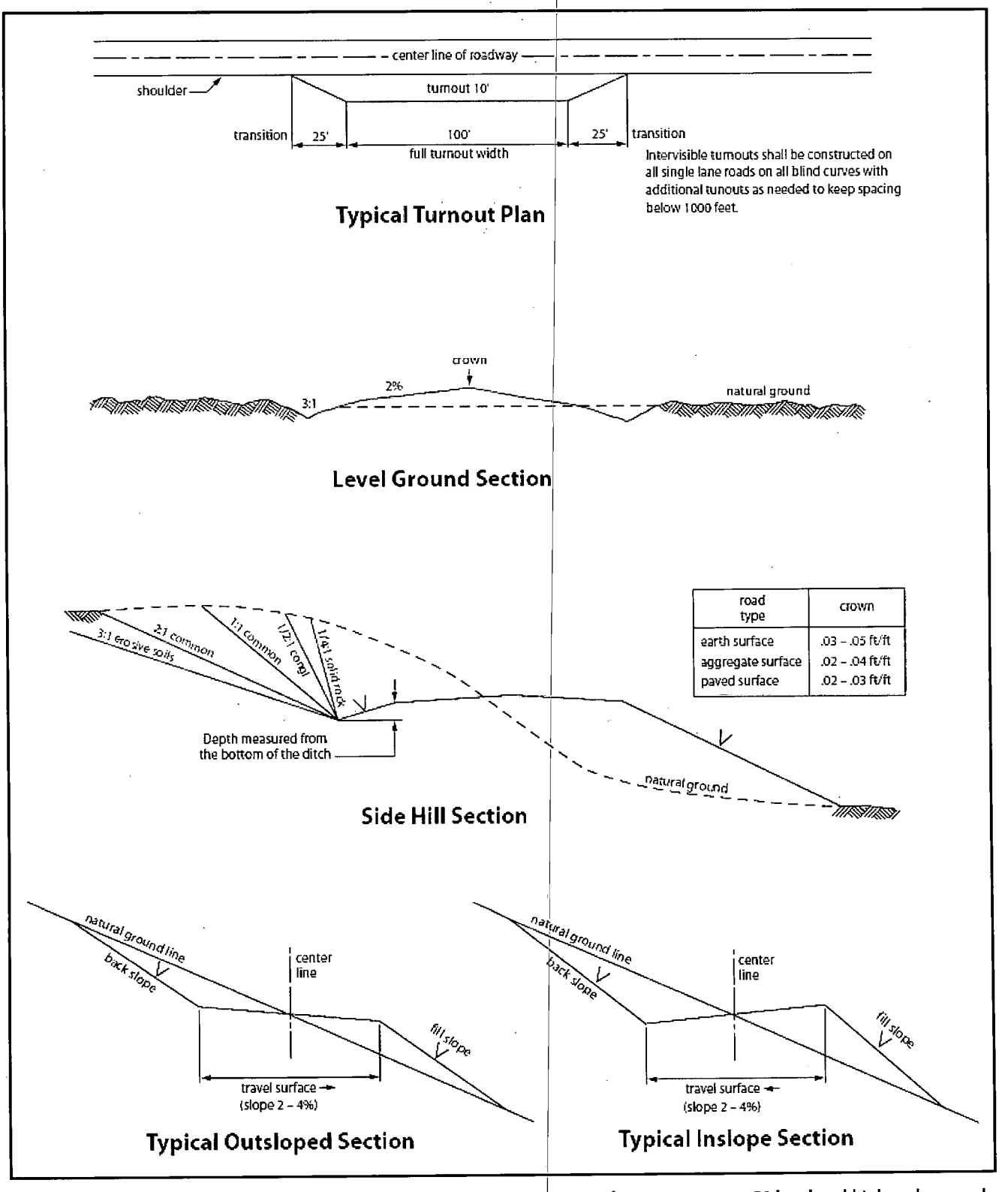


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VI. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

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

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

B. PIPELINES

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage

channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.

- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

BURIED PIPELINE STIPULATIONS

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

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

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on

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

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

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

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

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

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

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

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

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless

otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

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

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

(X) seed mixture 1	( ) seed mixture 3
( ) seed mixture 2	( ) seed mixture 4
( ) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

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

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

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

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

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If the entire project is covered under the Permian Basin Programmatic Agreement (cultural resources only):

The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and the BLM will be notified as soon as possible within 24 hours. Work shall not resume until a Notice to Proceed is issued by the BLM. See Stipulation 17 for more information.

If the proposed project is split between a Class III inventory and a Permian Basin Programmatic Agreement contribution, the portion of the project covered under Class III inventory should default to the first paragraph stipulations.

17. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes."

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

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

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

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

21. Special Stipulations:

Karst:

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered alignments may be rerouted to avoid the karst feature and lessen; the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating values and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

VII. INTERIM RECLAMATION

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

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

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

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

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

VIII. FINAL ABANDONMENT & RECLAMATION

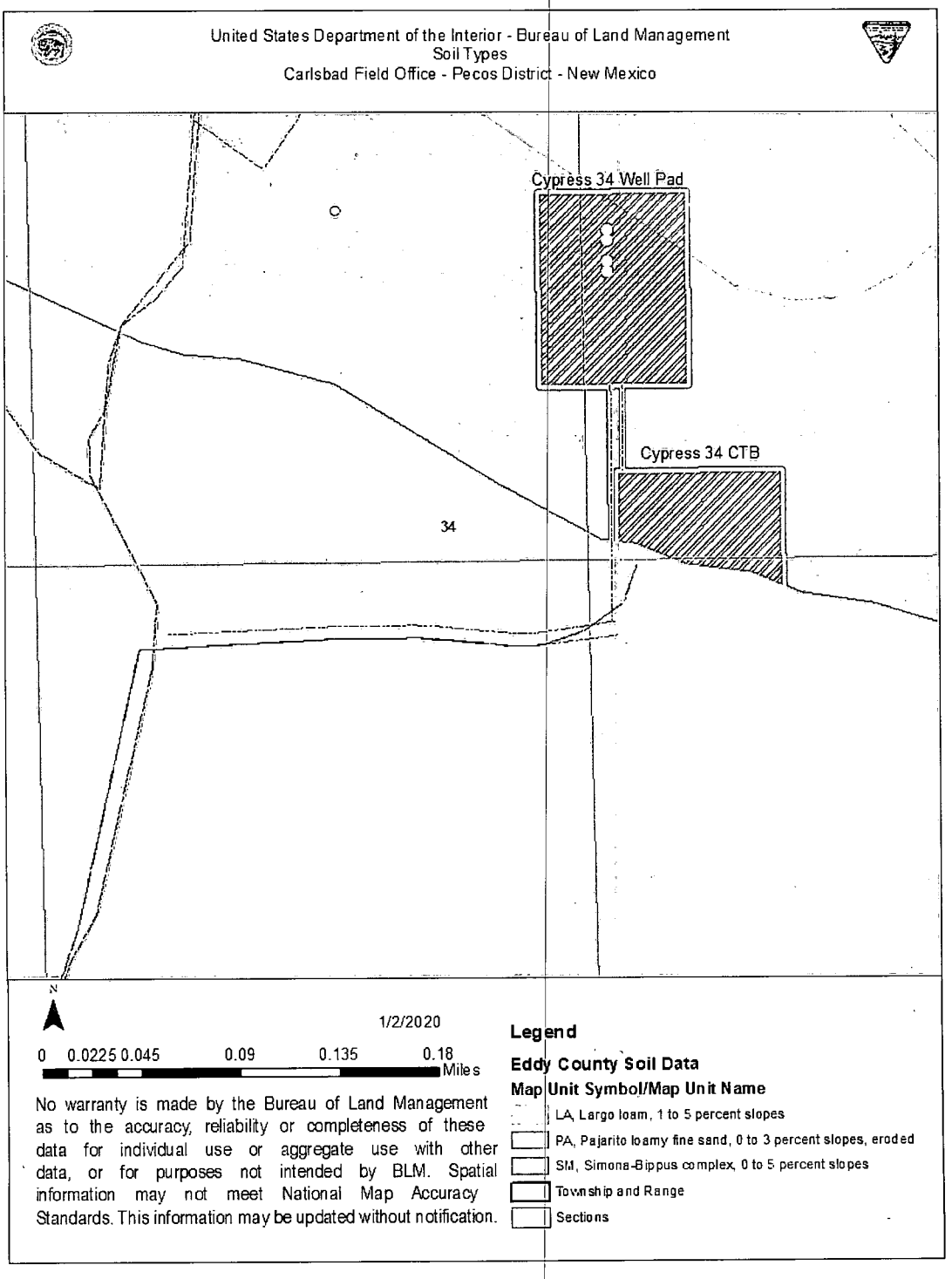
At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

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

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

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

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.



Soil Guide to Seed Mixtures – See EA for Additional Details

Seed Mixture 1 for Loamy Sites

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

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

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

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

*Pounds of pure live seed:

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

Seed Mixture 2, for Sandy Sites

The 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 will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will 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). The 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. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will 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
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

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BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

02/03/2020

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: 07/03/2019

Title: President

Street Address: 37 Verano Looop

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

Phone: (505)466-8120

Email address: afmss@permitswest.com

Field Representative

Representative Name:

Street Address: 602 Park Point Dr., Suite 200

City: Golden **State:** CO **Zip:** 80401

Phone: (720)459-3724

Email address:

AFMSS

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

Application Data Report
02/03/2020

APD ID: 10400043211
Submission Date: 07/03/2019
Operator Name: TAP ROCK OPERATING LLC
Well Name: CYPRESS 34 FEDERAL
Well Number: 232H
Well Type: CONVENTIONAL GAS WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400043211
Tie to previous NOS?
Submission Date: 07/03/2019
BLM Office: CARLSBAD
User: Brian Wood
Title: President
Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED
Lease number: NMNM086024
Lease Acres: 1440
Surface access agreement in place?
Allotted?
Reservation:
Agreement in place? NO
Federal or Indian agreement:
Agreement number:
Agreement name:
Keep application confidential? NO
Permitting Agent? YES
APD Operator: TAP ROCK OPERATING LLC
Operator letter of designation:

Operator Info

Operator Organization Name: TAP ROCK OPERATING LLC
Operator Address: 602 Park Point Drive Suite 200
Zip: 80401
Operator PO Box:
Operator City: Golden
State: CO
Operator Phone: (720)460-3316
Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO
Master Development Plan name:
Well in Master SUPO? NO
Master SUPO name:
Well in Master Drilling Plan? NO
Master Drilling Plan name:
Well Name: CYPRESS 34 FEDERAL
Well Number: 232H
Well API Number:
Field/Pool or Exploratory? Field and Pool
Field Name: PURPLE SAGE
Pool Name: WOLFCAMP
Is the proposed well in an area containing other mineral resources? USEABLE WATER,POTASH

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

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

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:** CYPRESS 34 FEDERAL **Number:** 232H

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: 6.5 Miles **Distance to nearest well:** 25 FT **Distance to lease line:** 546 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Cypress_232H_C102_ETAL_20190627105039.pdf

Well work start Date: 09/01/2019 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 11401 **Reference Datum:**

Wellbore	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	Will this well produce from this lease?
SHL Leg #1	546	FNL	2578	FEL	23S	29E	34	Aliquot NWNE	32.2670898	-103.9723441	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 086024	3044	0	0	
KOP Leg #1	111	FNL	2397	FWL	23S	29E	34	Aliquot NENW	32.2682809	-103.9733312	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 086024	-7358	10437	10402	
PPP Leg #1-1	111	FNL	2397	FWL	23S	29E	34	Aliquot NENW	32.2682809	-103.9733312	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 086024	-7041	10120	10085	

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

Wellbore	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	Will this well produce from this lease?
EXIT Leg #1	200	FSL	2430	FWL	23S	29E	34	Aliquot SESW	32.2545635	-103.973121	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 086024	-7940	15758	10984	
BHL Leg #1	200	FSL	2430	FWL	23S	29E	34	Aliquot SESW	32.2545635	-103.973121	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 086024	-7940	15758	10984	

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Drilling Plan Data Report

02/03/2020

APD ID: 10400043211

Submission Date: 07/03/2019

Highlighted data reflects the most recent changes

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL

Well Number: 232H

Show Final Text

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
488395	QUATERNARY	3044	0	0	OTHER : CALICHE	OTHER, USEABLE WATER : SALT	N
488396	RUSTLER ANHYDRITE	2796	248	248		OTHER : SALT	N
488397	SALADO	2435	609	609	SALT	OTHER : SALT	N
488398	BASE OF SALT	189	2855	2871		OTHER : SALT	N
488399	LAMAR	-31	3075	3093		NATURAL GAS, OIL	N
488401	BELL CANYON	-55	3099	3118		NATURAL GAS, OIL	N
488402	CHERRY CANYON	-953	3997	4025		NATURAL GAS, OIL	N
488403	BRUSHY CANYON	-2103	5147	5182		NATURAL GAS, OIL	N
488405	BONE SPRING	-3791	6835	6870		NATURAL GAS, OIL	N
488407	BONE SPRING 1ST	-4787	7831	7866		NATURAL GAS, OIL	N
488408	BONE SPRING 2ND	-4989	8033	8068		NATURAL GAS, OIL	N
488410	BONE SPRING 3RD	-5923	8967	9002		NATURAL GAS, OIL	N
488411	WOLFCAMP	-7940	10984	15758		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

Pressure Rating (PSI): 5M **Rating Depth:** 15000

Equipment: A 15,000', 5,000 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. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

Requesting Variance? YES

Variance request: Tap Rock requests a variance to run a multi-bowl speed head for setting the Intermediate 1, Intermediate 2, and Production Strings. Tap Rock requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Tap Rock requests a variance to have the option of batch drilling this well with other wells on the same pad. In the event that this well is batch drilled, after drilling surface, 1st intermediate, and 2nd intermediate hole sections and cementing 2 nd intermediate casing, a 10M dry hole cap with bleed off valve will be installed. The rig will then walk to another well on the pad. When the rig returns to this well and BOPs are installed, the operator will perform a full BOP test. Due to the Potash, Tap Rock will cement the 7-5/8" string to surface. Tap Rock requests approval to possibly utilize a spudder rig to drill and set casing for the surface interval on this well. The spudder rig will be possibly utilized in order to reduce cost and save time. The wellhead will be installed and tested as soon as the surface casing is cut off per the existing COAs. A blind flange with the same pressure rating as the wellhead will be installed on the well. Once the spudder rig is removed, Tap Rock will secure the wellhead area by placing a guard rail around the cellar. Pressure will be monitored and a means for intervention will be maintained while the drilling rig is not over the well. Spudder rig operations are expected to take 2-3 days per well. Three wells on the pad will have surface casing set by the spudder rig as a part of this operation. The BLM will be notified 24 hours prior to commencing spudder rig operations. Within 90 days of the departure of the spudder rig, drilling operations will recommence on these wells. This rig will have a BOP stack equal or greater to the pressure rating required in the COAs. The BLM will be notified 24 hours before the larger rig moves on the pre-set wells. Tap Rock will have supervision on the spudder rig to ensure compliance with all BLM and NMOCD regulations.

Testing Procedure: After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 2,500 psi. The BOP will be tested in this manner after nipple-up if any break of the stack occurs.

Choke Diagram Attachment:

Cypress_232H_Choke_032918_20190627113327.pdf

BOP Diagram Attachment:

Well_Control_Plan_10M_BOP_5M_Annular_20191219101442.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	350	0	350			350	J-55	54.5	BUTT	1.13	1.15	DRY	1.51	DRY	1.51

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

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
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3150	0	3131			3150	J-55	40	BUTT	1.13	1.15	DRY	1.51	DRY	1.51
3	PRODUCTION	6.75	5.5	NEW	NON API	N	0	9830	0	9795			9830	P-110	20	OTHER - TXP	1.13	1.15	DRY	1.51	DRY	1.51
4	INTERMEDIATE	8.75	7.625	NEW	NON API	N	0	10330	0	10295	3044		10330	P-110	29.7	OTHER - W-513	1.13	1.15	DRY	1.51	DRY	1.51
5	PRODUCTION	6.75	5.0	NEW	NON API	Y	9830	15750	9795	10242			5920	P-110	18	OTHER - W-521	1.13	1.15	DRY	1.51	DRY	1.51

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_232H_Casing_Design_Assumptions_20190627114255.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_232H_Casing_Design_Assumptions_20190627114718.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

Casing Attachments

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Cypress_232H_5.5in_TXP_Casing_Spec_20190627120617.PDF

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_232H_Casing_Design_Assumptions_20190627120534.pdf

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

Inspection Document:

Spec Document:

Cypress_232H_7.625in_W513_Casing_Spec_20191219102507.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cypress_232H_Casing_Design_Assumptions_20190627114916.pdf

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

Inspection Document:

Spec Document:

Cypress_232H_5in_W521_Casing_Spec_20190627120929.pdf

Tapered String Spec:

Cypress_232H_5in_W521_Casing_Spec_20190627121012.pdf

Casing Design Assumptions and Worksheet(s):

Cypress_232H_Casing_Design_Assumptions_20190627120853.pdf

Section 4 - Cement

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	0	0	0	0	0	0	None	None
SURFACE	Lead		0	350	360	1.35	14.8	486	100	C	5% NCI +LCM
INTERMEDIATE	Lead		0	2363	560	2.18	12.7	1221	65	C	Bentonite + 1% CaCL2 + 8% NaCl + LCM
INTERMEDIATE	Tail		2363	3150	306	1.33	14.8	407	65	C	5% NaCl + LCM
INTERMEDIATE	Lead		0	9330	441	2.87	11.5	1265	35	TXI	Fluid Loss + Dispersant + Retarder + LCM
INTERMEDIATE	Tail		9330	10330	107	1.27	15	136	35	H	Fluid Loss + Dispersant + Retarder + LCM
PRODUCTION	Lead		9830	15750	485	1.71	14.2	830	25	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: Electronic Pason mud monitor system complying with Onshore Order 1 will be used.

Describe the mud monitoring system utilized: 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.

Circulating Medium Table

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

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
3000	10330	OTHER : FW and Cut Brine	9	9							
0	350	OTHER : FW Spud Mud	8.3	8.3							
350	3000	OTHER : Brine Water	10	10							
10330	15750	OIL-BASED MUD	13	13							

Section 6 - Test, Logging, Coring

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

Electric Logging Program: No open-hole logs are planned at this time for the pilot hole.
GR will be collected while drilling through the MWD tools from 9.625" casing shoe to TD.
A 2-person mud logging program will be used from 9.625" casing shoe to TD.
CBL w/ CCL from as far as gravity will let it fall to TOC.

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

CBL,GR

Coring operation description for the well:

No DSTs or cores are planned at this time.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7425 **Anticipated Surface Pressure:** 5008.52

Anticipated Bottom Hole Temperature(F): 170

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:

Cypress_232H_H2S_Plan_20190627124427.pdf

Operator Name: TAP ROCK OPERATING LLC

Well Name: CYPRESS 34 FEDERAL **Well Number:** 232H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cypress_232H_Horizontal_Plan_20190627113810.pdf

Other proposed operations facets description:

Complete drill plan attached

Other proposed operations facets attachment:

Cypress_232H_Drill_Plan_REVISED_121619_20191219103050.pdf
Coflex_Certs_20191219103145.pdf
Cypress_232H_Speedhead_Specs_033018_20191219103203.pdf
Well_Control_Plan_10M_BOP_5M_Annular_20191219103209.pdf

Other Variance attachment:

Hydrogen Sulfide Drilling

Operations Plan

Tap Rock Resources

1 H2S safety instructions to the following:

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

2 H2S Detection and Alarm Systems:

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

3 Windsocks and / Wind Streamers:

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

4 Condition Flags and Signs:

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

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

6 Communication:

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

7 Drilling Stem Testing:

- No DST cores are planned at this time

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

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

11 Emergency Contacts

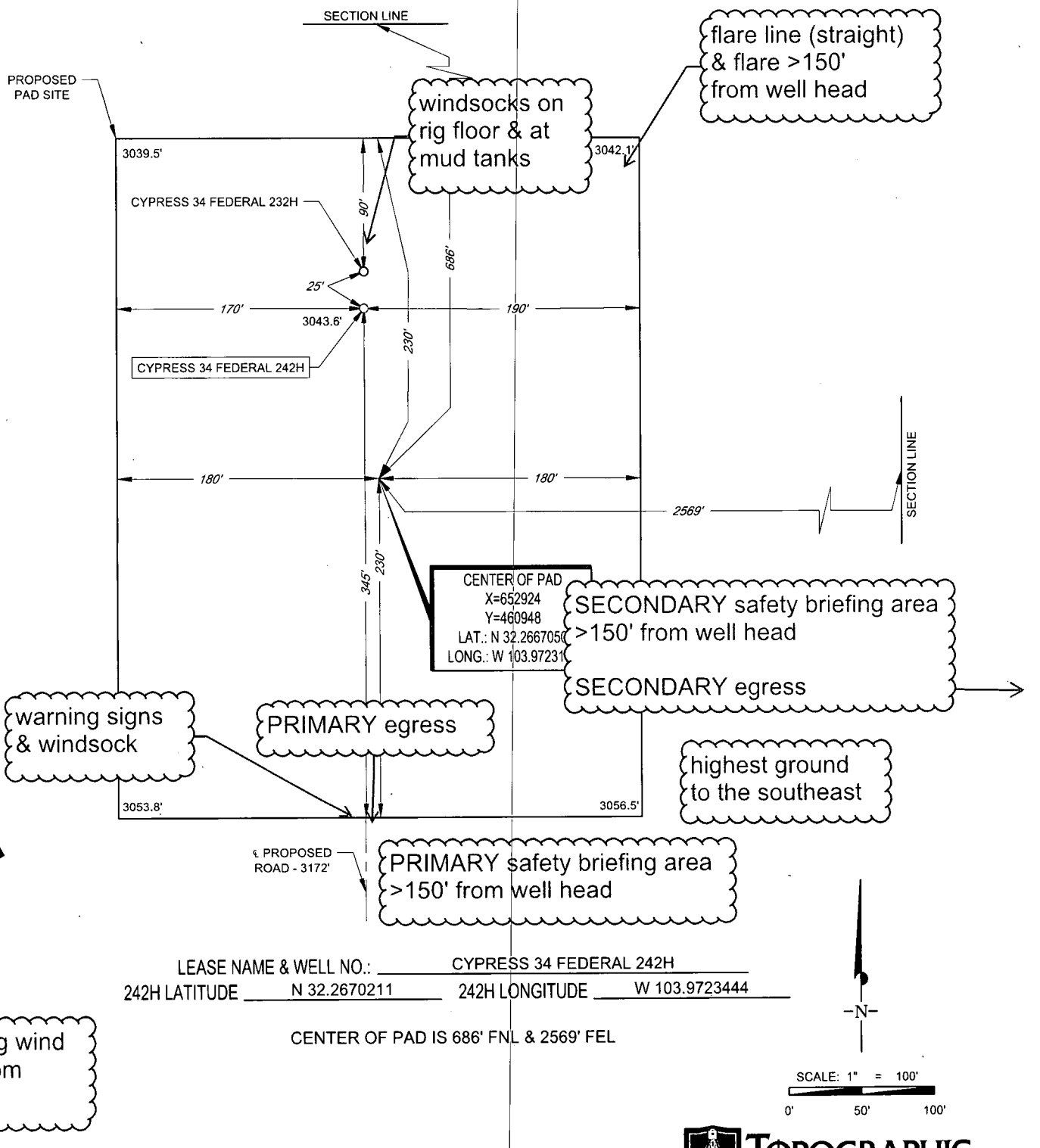
Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911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

EXHIBIT 2B

TAP ROCK

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

DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: CYPRESS 34 FEDERAL 242H

242H LATITUDE N 32.2670211 242H LONGITUDE W 103.9723444

CENTER OF PAD IS 686' FNL & 2569' FEL

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.

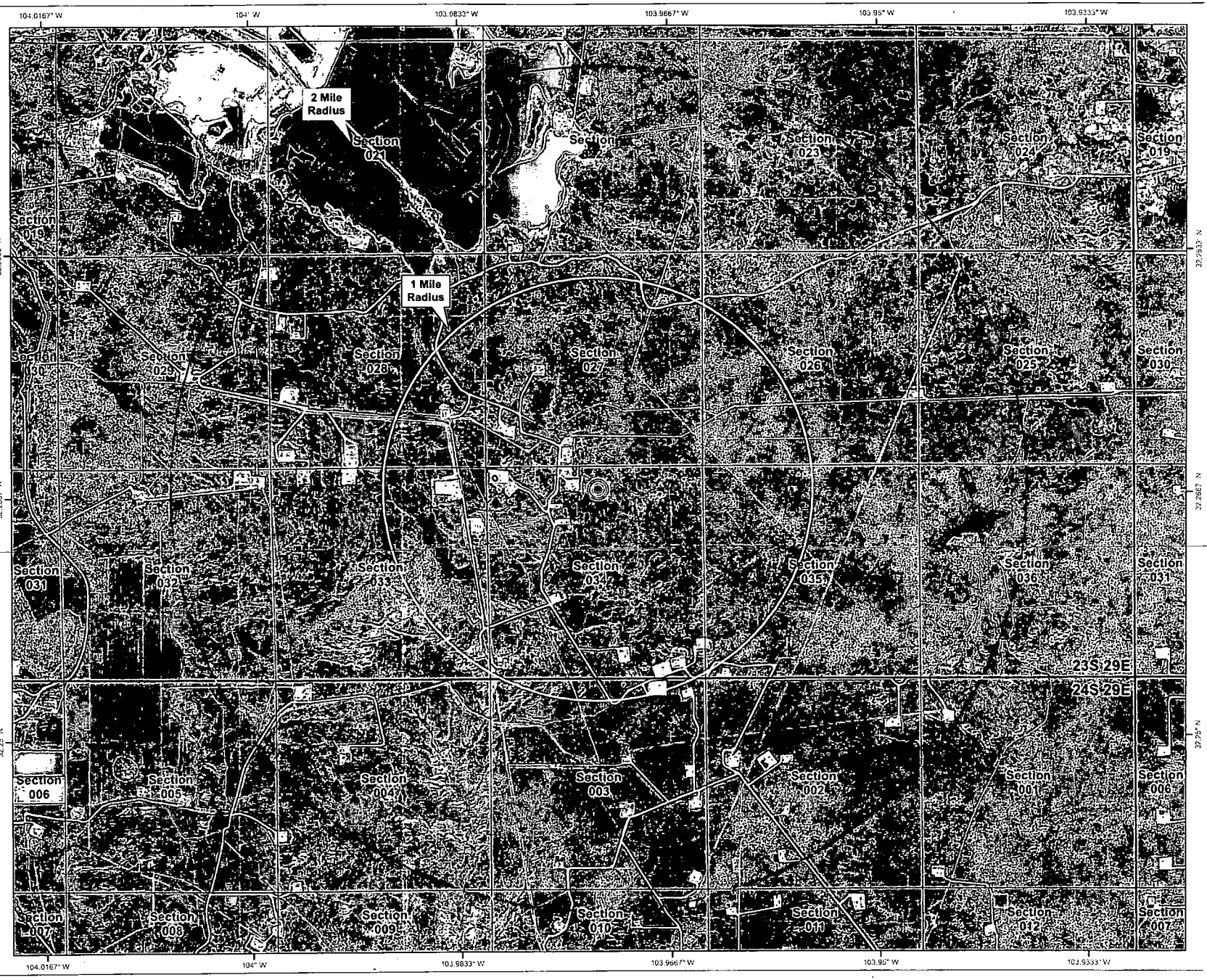
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

ORIGINAL DOCUMENT SIZE: 8.5" X 11"

Tap Rock Operating LLC

Cypress 34 Federal
232H & 242H
H2S Contingency Plan:
2 Mile Radius Map

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



Well Pad Location

1:27,000

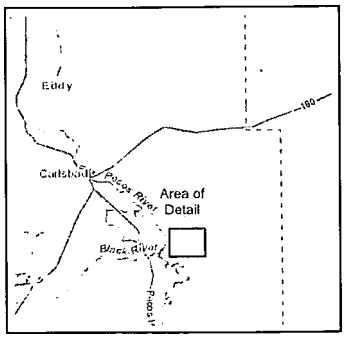
0 0.25 0.5 1

Miles

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST, Inc.
PROVIDING PERMITS for LAND USERS

Prepared by Permits West, Inc., June 26, 2019
for Tap Rock Operating, LLC



Tap Rock Operating, LLC.
roject: Eddy County, NM (NAD83)
Site: Cypress 34 Fed
Well: 232H
Wellbore: OH
Plan: Plan #1 (232H/OH)

WELL DETAILS: 232H

Ground Elevation:: 3044.0
RKB Elevation: RKB @ 3070.0usft (26' RKB)
Rig Name: 26' RKB

Surface Hole Location

Northing	Easting	Latittude	Longitude
461087.97	652914.57	32° 16' 1.523 N	103° 58' 20.439 W

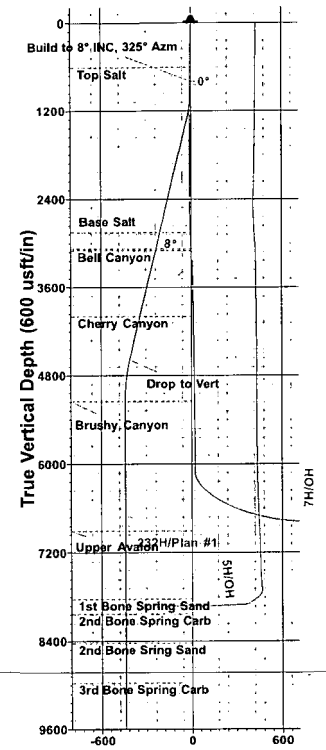
G
T M

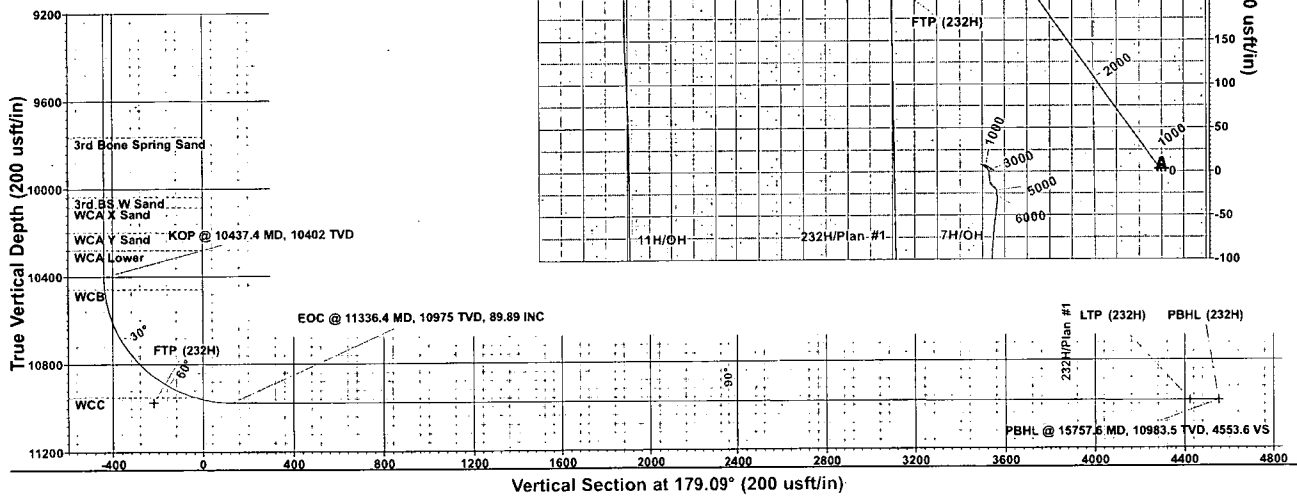
Azimuths to Grid North
True North: -0.19°
Magnetic North: 6.74°

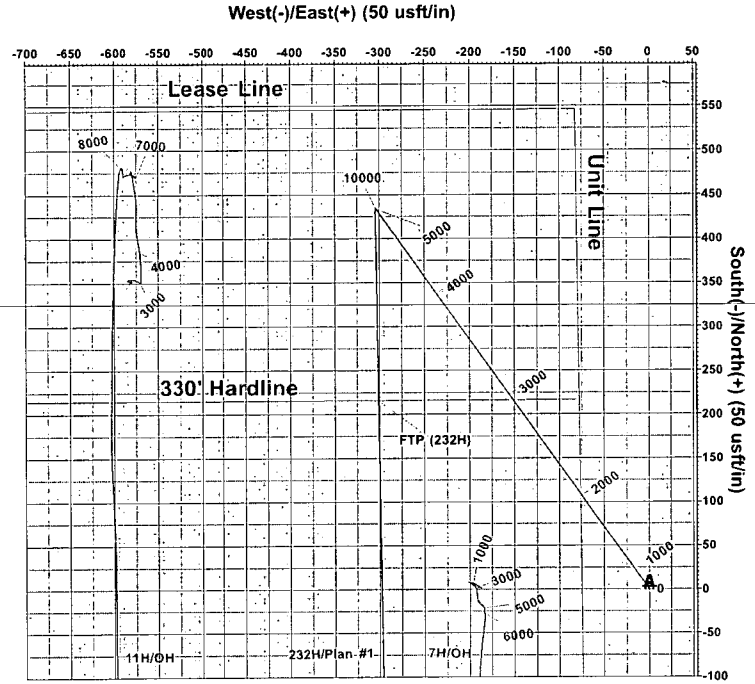
Magnetic Field
Strength: 47725.6snT
Dip Angle: 60.01°
Date: 5/23/2019
Model: IGRF2015

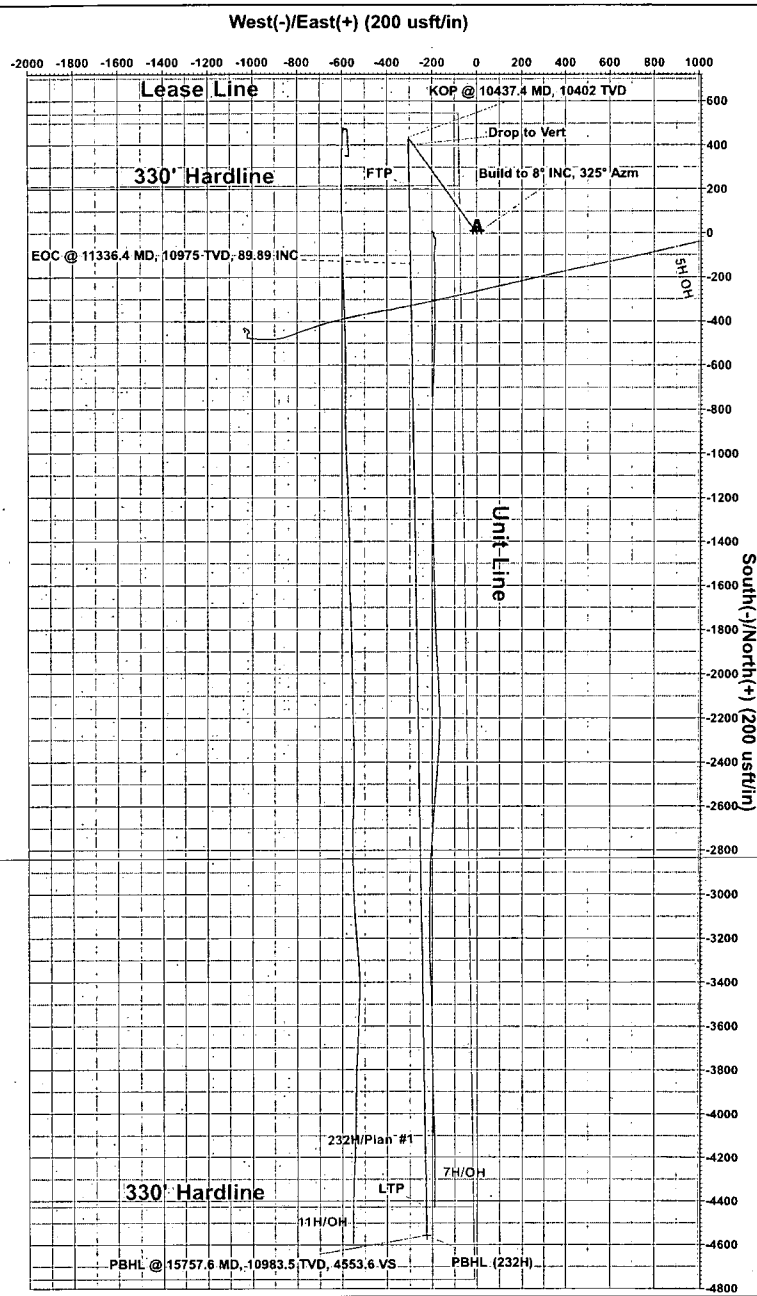
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1333.3	8.00	325.00	1331.6	30.5	-21.3	1.50	325.00	-30.8	
4	4613.3	8.00	325.00	4579.7	404.4	-283.2	0.00	0.00	-408.8	
5	5146.7	0.00	0.00	5111.3	434.8	-304.5	1.50	180.00	-439.6	
6	10437.4	0.00	0.00	10402.0	434.8	-304.5	0.00	0.00	-439.6	
7	11336.4	89.89	179.09	10975.0	-137.0	-295.4	10.00	179.09	132.3	
8	15627.6	89.89	179.09	10983.2	-4427.7	-227.2	0.00	0.00	4423.5	LTP (232H)
9	15757.6	89.89	179.09	10983.5	-4557.7	-225.2	0.00	0.00	4553.6	PBHL (232H)









PROJECT DETAILS: Eddy County, NM (NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

Plan: Plan #1 (232H/OH)
Created By: Matt Higgins Date: 20:02, May 23 2019

Tap Rock Operating, LLC.

Eddy County, NM (NAD83)
Cypress 34 Federal
232H

OH

Plan: Plan #1

Standard Planning Report

23 May, 2019

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

Site	Cypress 34 Federal				
Site Position:		**Northing:**	461,087.97 usft	**Latitude:**	32° 16' 1.523 N
From:	Lat/Long	**Easting:**	652,914.58 usft	**Longitude:**	103° 58' 20.439 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.19 °

Well	232H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	461,087.97 usft	**Latitude:**	32° 16' 1.523 N
	+E/-W	0.0 usft	**Easting:**	652,914.58 usft	**Longitude:**	103° 58' 20.439 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	3,044.0 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	5/23/2019	6.93	60.01	47,726

Design	Plan #1		
Audit Notes:			
Version:	**Phase:**	PLAN	**Tie On Depth:** 0.0

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.0	0.0	0.0	179.09

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,333.3	8.00	325.00	1,331.6	30.5	-21.3	1.50	1.50	0.00	325.00	
4,613.3	8.00	325.00	4,579.7	404.4	-283.2	0.00	0.00	0.00	0.00	
5,146.7	0.00	0.00	5,111.3	434.8	-304.5	1.50	-1.50	0.00	180.00	
10,437.4	0.00	0.00	10,402.0	434.8	-304.5	0.00	0.00	0.00	0.00	
11,336.4	89.89	179.09	10,975.0	-137.0	-295.4	10.00	10.00	0.00	179.09	
15,627.6	89.89	179.09	10,983.2	-4,427.7	-227.2	0.00	0.00	0.00	0.00	LTP (232H)
15,757.6	89.89	179.09	10,983.5	-4,557.7	-225.2	0.00	0.00	0.00	0.00	PBHL (232H)

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
609.0	0.00	0.00	609.0	0.0	0.0	0.0	0.00	0.00	0.00
Top Salt									
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
Build to 8° INC, 325° Azm									
900.0	1.50	325.00	900.0	1.1	-0.8	-1.1	1.50	1.50	0.00
1,000.0	3.00	325.00	999.9	4.3	-3.0	-4.3	1.50	1.50	0.00
1,100.0	4.50	325.00	1,099.7	9.6	-6.8	-9.8	1.50	1.50	0.00
1,200.0	6.00	325.00	1,199.3	17.1	-12.0	-17.3	1.50	1.50	0.00
1,300.0	7.50	325.00	1,298.6	26.8	-18.7	-27.1	1.50	1.50	0.00
1,333.3	8.00	325.00	1,331.6	30.5	-21.3	-30.8	1.50	1.50	0.00
1,400.0	8.00	325.00	1,397.6	38.1	-26.6	-38.5	0.00	0.00	0.00
1,500.0	8.00	325.00	1,496.6	49.5	-34.6	-50.0	0.00	0.00	0.00
1,600.0	8.00	325.00	1,595.7	60.9	-42.6	-61.5	0.00	0.00	0.00
1,700.0	8.00	325.00	1,694.7	72.3	-50.6	-73.0	0.00	0.00	0.00
1,800.0	8.00	325.00	1,793.7	83.7	-58.6	-84.6	0.00	0.00	0.00
1,900.0	8.00	325.00	1,892.8	95.1	-66.6	-96.1	0.00	0.00	0.00
2,000.0	8.00	325.00	1,991.8	106.5	-74.5	-107.6	0.00	0.00	0.00
2,100.0	8.00	325.00	2,090.8	117.9	-82.5	-119.1	0.00	0.00	0.00
2,200.0	8.00	325.00	2,189.8	129.3	-90.5	-130.7	0.00	0.00	0.00
2,300.0	8.00	325.00	2,288.9	140.7	-98.5	-142.2	0.00	0.00	0.00
2,400.0	8.00	325.00	2,387.9	152.1	-106.5	-153.7	0.00	0.00	0.00
2,500.0	8.00	325.00	2,486.9	163.5	-114.5	-165.3	0.00	0.00	0.00
2,600.0	8.00	325.00	2,585.9	174.9	-122.4	-176.8	0.00	0.00	0.00
2,700.0	8.00	325.00	2,685.0	186.3	-130.4	-188.3	0.00	0.00	0.00
2,800.0	8.00	325.00	2,784.0	197.7	-138.4	-199.8	0.00	0.00	0.00
2,871.7	8.00	325.00	2,855.0	205.8	-144.1	-208.1	0.00	0.00	0.00
Base Salt									
2,900.0	8.00	325.00	2,883.0	209.1	-146.4	-211.4	0.00	0.00	0.00
3,000.0	8.00	325.00	2,982.0	220.5	-154.4	-222.9	0.00	0.00	0.00
3,093.9	8.00	325.00	3,075.0	231.2	-161.9	-233.7	0.00	0.00	0.00
Lamar									
3,100.0	8.00	325.00	3,081.1	231.9	-162.3	-234.4	0.00	0.00	0.00
3,118.1	8.00	325.00	3,099.0	233.9	-163.8	-236.5	0.00	0.00	0.00
Bell Canyon									
3,200.0	8.00	325.00	3,180.1	243.3	-170.3	-245.9	0.00	0.00	0.00
3,300.0	8.00	325.00	3,279.1	254.7	-178.3	-257.5	0.00	0.00	0.00
3,400.0	8.00	325.00	3,378.2	266.1	-186.3	-269.0	0.00	0.00	0.00
3,500.0	8.00	325.00	3,477.2	277.5	-194.3	-280.5	0.00	0.00	0.00
3,600.0	8.00	325.00	3,576.2	288.9	-202.3	-292.0	0.00	0.00	0.00
3,700.0	8.00	325.00	3,675.2	300.3	-210.2	-303.6	0.00	0.00	0.00
3,800.0	8.00	325.00	3,774.3	311.7	-218.2	-315.1	0.00	0.00	0.00
3,900.0	8.00	325.00	3,873.3	323.1	-226.2	-326.6	0.00	0.00	0.00
4,000.0	8.00	325.00	3,972.3	334.5	-234.2	-338.1	0.00	0.00	0.00
4,024.9	8.00	325.00	3,997.0	337.3	-236.2	-341.0	0.00	0.00	0.00
Cherry Canyon									
4,100.0	8.00	325.00	4,071.3	345.9	-242.2	-349.7	0.00	0.00	0.00
4,200.0	8.00	325.00	4,170.4	357.3	-250.2	-361.2	0.00	0.00	0.00
4,300.0	8.00	325.00	4,269.4	368.7	-258.1	-372.7	0.00	0.00	0.00
4,400.0	8.00	325.00	4,368.4	380.1	-266.1	-384.2	0.00	0.00	0.00
4,500.0	8.00	325.00	4,467.5	391.5	-274.1	-395.8	0.00	0.00	0.00
4,600.0	8.00	325.00	4,566.5	402.9	-282.1	-407.3	0.00	0.00	0.00
4,613.3	8.00	325.00	4,579.6	404.4	-283.1	-408.8	0.00	0.00	0.00
Drop to Vert									
4,700.0	6.70	325.00	4,665.6	413.5	-289.5	-418.0	1.50	-1.50	0.00
4,800.0	5.20	325.00	4,765.1	422.0	-295.5	-426.6	1.50	-1.50	0.00
4,900.0	3.70	325.00	4,864.8	428.3	-299.9	-433.0	1.50	-1.50	0.00
5,000.0	2.20	325.00	4,964.7	432.5	-302.9	-437.3	1.50	-1.50	0.00
5,100.0	0.70	325.00	5,064.6	434.6	-304.3	-439.4	1.50	-1.50	0.00

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,146.7	0.00	0.00	5,111.3	434.8	-304.5	-439.6	1.50	-1.50	0.00
5,182.4	0.00	0.00	5,147.0	434.8	-304.5	-439.6	0.00	0.00	0.00
Brushy Canyon									
5,200.0	0.00	0.00	5,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,300.0	0.00	0.00	5,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,400.0	0.00	0.00	5,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,464.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,564.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,664.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,764.6	434.8	-304.5	-439.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,864.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,964.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,064.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,464.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,564.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,664.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,764.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,864.6	434.8	-304.5	-439.6	0.00	0.00	0.00
6,942.4	0.00	0.00	6,907.0	434.8	-304.5	-439.6	0.00	0.00	0.00
Upper Avalon									
7,000.0	0.00	0.00	6,964.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,100.0	0.00	0.00	7,064.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,464.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,564.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,664.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,764.6	434.8	-304.5	-439.6	0.00	0.00	0.00
7,866.4	0.00	0.00	7,831.0	434.8	-304.5	-439.6	0.00	0.00	0.00
1st Bone Spring Sand									
7,900.0	0.00	0.00	7,864.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,964.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,068.4	0.00	0.00	8,033.0	434.8	-304.5	-439.6	0.00	0.00	0.00
2nd Bone Spring Carb									
8,100.0	0.00	0.00	8,064.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,200.0	0.00	0.00	8,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,300.0	0.00	0.00	8,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,400.0	0.00	0.00	8,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,465.4	0.00	0.00	8,430.0	434.8	-304.5	-439.6	0.00	0.00	0.00
2nd Bone Spring Sand									
8,500.0	0.00	0.00	8,464.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,600.0	0.00	0.00	8,564.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,700.0	0.00	0.00	8,664.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,800.0	0.00	0.00	8,764.6	434.8	-304.5	-439.6	0.00	0.00	0.00
8,900.0	0.00	0.00	8,864.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,000.0	0.00	0.00	8,964.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,002.4	0.00	0.00	8,967.0	434.8	-304.5	-439.6	0.00	0.00	0.00
3rd Bone Spring Carb									
9,100.0	0.00	0.00	9,064.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,200.0	0.00	0.00	9,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,300.0	0.00	0.00	9,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,400.0	0.00	0.00	9,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,500.0	0.00	0.00	9,464.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,600.0	0.00	0.00	9,564.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,700.0	0.00	0.00	9,664.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,799.4	0.00	0.00	9,764.0	434.8	-304.5	-439.6	0.00	0.00	0.00
3rd Bone Spring Sand									
9,800.0	0.00	0.00	9,764.6	434.8	-304.5	-439.6	0.00	0.00	0.00
9,900.0	0.00	0.00	9,864.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,000.0	0.00	0.00	9,964.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,070.4	0.00	0.00	10,035.0	434.8	-304.5	-439.6	0.00	0.00	0.00

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3rd BS W Sand									
10,100.0	0.00	0.00	10,064.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,120.4	0.00	0.00	10,085.0	434.8	-304.5	-439.6	0.00	0.00	0.00
WCA X Sand									
10,200.0	0.00	0.00	10,164.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,234.4	0.00	0.00	10,199.0	434.8	-304.5	-439.6	0.00	0.00	0.00
WCA Y Sand									
10,300.0	0.00	0.00	10,264.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,315.4	0.00	0.00	10,280.0	434.8	-304.5	-439.6	0.00	0.00	0.00
WCA Lower									
10,400.0	0.00	0.00	10,364.6	434.8	-304.5	-439.6	0.00	0.00	0.00
10,437.4	0.00	0.00	10,402.0	434.8	-304.5	-439.6	0.00	0.00	0.00
KOP @ 10437.4 MD, 10402 TVD									
10,450.0	1.26	179.09	10,414.6	434.7	-304.5	-439.5	10.01	10.01	0.00
10,493.5	5.61	179.09	10,458.0	432.1	-304.4	-436.9	10.00	10.00	0.00
WCB									
10,500.0	6.26	179.09	10,464.5	431.4	-304.4	-436.2	10.00	10.00	0.00
10,550.0	11.26	179.09	10,513.9	423.8	-304.3	-428.6	10.00	10.00	0.00
10,600.0	16.26	179.09	10,562.4	411.9	-304.1	-416.7	10.00	10.00	0.00
10,650.0	21.26	179.09	10,609.8	395.8	-303.9	-400.6	10.00	10.00	0.00
10,700.0	26.26	179.09	10,655.5	375.7	-303.5	-380.5	10.00	10.00	0.00
10,750.0	31.26	179.09	10,699.3	351.7	-303.2	-356.4	10.00	10.00	0.00
10,800.0	36.26	179.09	10,740.9	323.9	-302.7	-328.7	10.00	10.00	0.00
10,850.0	41.26	179.09	10,779.9	292.6	-302.2	-297.4	10.00	10.00	0.00
10,900.0	46.26	179.09	10,816.0	258.0	-301.7	-262.8	10.00	10.00	0.00
10,950.0	51.26	179.09	10,848.9	220.5	-301.1	-225.2	10.00	10.00	0.00
11,000.0	56.26	179.09	10,878.5	180.1	-300.4	-184.9	10.00	10.00	0.00
11,050.0	61.26	179.09	10,904.4	137.4	-299.7	-142.2	10.00	10.00	0.00
11,100.0	66.26	179.09	10,926.5	92.6	-299.0	-97.3	10.00	10.00	0.00
11,150.0	71.26	179.09	10,944.6	46.0	-298.3	-50.7	10.00	10.00	0.00
11,167.6	73.01	179.09	10,950.0	29.3	-298.0	-34.0	10.00	10.00	0.00
WCC									
11,200.0	76.26	179.09	10,958.6	-2.0	-297.5	-2.8	10.00	10.00	0.00
11,250.0	81.26	179.09	10,968.3	-51.0	-296.8	46.3	10.00	10.00	0.00
11,300.0	86.26	179.09	10,973.8	-100.7	-296.0	96.0	10.00	10.00	0.00
11,336.4	89.89	179.09	10,975.0	-137.0	-295.4	132.3	9.99	9.99	0.00
EOC @ 11336.4 MD, 10975 TVD, 89.89 INC									
11,400.0	89.89	179.09	10,975.1	-200.6	-294.4	195.9	0.00	0.00	0.00
11,500.0	89.89	179.09	10,975.3	-300.6	-292.8	295.9	0.00	0.00	0.00
11,600.0	89.89	179.09	10,975.5	-400.6	-291.2	395.9	0.00	0.00	0.00
11,700.0	89.89	179.09	10,975.7	-500.6	-289.6	495.9	0.00	0.00	0.00
11,800.0	89.89	179.09	10,975.9	-600.6	-288.0	595.9	0.00	0.00	0.00
11,900.0	89.89	179.09	10,976.1	-700.6	-286.4	695.9	0.00	0.00	0.00
12,000.0	89.89	179.09	10,976.3	-800.6	-284.9	795.9	0.00	0.00	0.00
12,100.0	89.89	179.09	10,976.5	-900.5	-283.3	895.9	0.00	0.00	0.00
12,200.0	89.89	179.09	10,976.7	-1,000.5	-281.7	995.9	0.00	0.00	0.00
12,300.0	89.89	179.09	10,976.8	-1,100.5	-280.1	1,095.9	0.00	0.00	0.00
12,400.0	89.89	179.09	10,977.0	-1,200.5	-278.5	1,195.9	0.00	0.00	0.00
12,500.0	89.89	179.09	10,977.2	-1,300.5	-276.9	1,295.9	0.00	0.00	0.00
12,600.0	89.89	179.09	10,977.4	-1,400.5	-275.3	1,395.9	0.00	0.00	0.00
12,700.0	89.89	179.09	10,977.6	-1,500.5	-273.7	1,495.9	0.00	0.00	0.00
12,800.0	89.89	179.09	10,977.8	-1,600.5	-272.1	1,595.9	0.00	0.00	0.00
12,900.0	89.89	179.09	10,978.0	-1,700.4	-270.6	1,695.9	0.00	0.00	0.00
13,000.0	89.89	179.09	10,978.2	-1,800.4	-269.0	1,795.9	0.00	0.00	0.00
13,100.0	89.89	179.09	10,978.4	-1,900.4	-267.4	1,895.9	0.00	0.00	0.00
13,200.0	89.89	179.09	10,978.6	-2,000.4	-265.8	1,995.9	0.00	0.00	0.00
13,300.0	89.89	179.09	10,978.8	-2,100.4	-264.2	2,095.9	0.00	0.00	0.00
13,400.0	89.89	179.09	10,979.0	-2,200.4	-262.6	2,195.9	0.00	0.00	0.00
13,500.0	89.89	179.09	10,979.2	-2,300.4	-261.0	2,295.9	0.00	0.00	0.00
13,600.0	89.89	179.09	10,979.3	-2,400.4	-259.4	2,395.9	0.00	0.00	0.00
13,700.0	89.89	179.09	10,979.5	-2,500.3	-257.9	2,495.9	0.00	0.00	0.00
13,800.0	89.89	179.09	10,979.7	-2,600.3	-256.3	2,595.9	0.00	0.00	0.00
13,900.0	89.89	179.09	10,979.9	-2,700.3	-254.7	2,695.9	0.00	0.00	0.00
14,000.0	89.89	179.09	10,980.1	-2,800.3	-253.1	2,795.9	0.00	0.00	0.00
14,100.0	89.89	179.09	10,980.3	-2,900.3	-251.5	2,895.9	0.00	0.00	0.00
14,200.0	89.89	179.09	10,980.5	-3,000.3	-249.9	2,995.9	0.00	0.00	0.00

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,300.0	89.89	179.09	10,980.7	-3,100.3	-248.3	3,095.9	0.00	0.00	0.00
14,400.0	89.89	179.09	10,980.9	-3,200.3	-246.7	3,195.9	0.00	0.00	0.00
14,500.0	89.89	179.09	10,981.1	-3,300.2	-245.1	3,295.9	0.00	0.00	0.00
14,600.0	89.89	179.09	10,981.3	-3,400.2	-243.6	3,395.9	0.00	0.00	0.00
14,700.0	89.89	179.09	10,981.5	-3,500.2	-242.0	3,495.9	0.00	0.00	0.00
14,800.0	89.89	179.09	10,981.6	-3,600.2	-240.4	3,595.9	0.00	0.00	0.00
14,900.0	89.89	179.09	10,981.8	-3,700.2	-238.8	3,695.9	0.00	0.00	0.00
15,000.0	89.89	179.09	10,982.0	-3,800.2	-237.2	3,795.9	0.00	0.00	0.00
15,100.0	89.89	179.09	10,982.2	-3,900.2	-235.6	3,895.9	0.00	0.00	0.00
15,200.0	89.89	179.09	10,982.4	-4,000.1	-234.0	3,995.9	0.00	0.00	0.00
15,300.0	89.89	179.09	10,982.6	-4,100.1	-232.4	4,095.9	0.00	0.00	0.00
15,400.0	89.89	179.09	10,982.8	-4,200.1	-230.9	4,195.9	0.00	0.00	0.00
15,500.0	89.89	179.09	10,983.0	-4,300.1	-229.3	4,295.9	0.00	0.00	0.00
15,600.0	89.89	179.09	10,983.2	-4,400.1	-227.7	4,395.9	0.00	0.00	0.00
15,627.6	89.89	179.09	10,983.2	-4,427.7	-227.2	4,423.5	0.00	0.00	0.00
15,700.0	89.89	179.09	10,983.4	-4,500.1	-226.1	4,495.9	0.00	0.00	0.00
15,757.6	89.89	179.09	10,983.5	-4,557.7	-225.2	4,553.5	0.00	0.00	0.00

PBHL @ 15757.6 MD, 10983.5 TVD, 4553.6 VS

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (232H)	0.00	0.00	10,975.0	215.4	-300.9	461,303.42	652,613.63	32° 16' 3.665 N	103° 58' 23.935 W
- plan misses target center by 100.3usft at 11019.9usft MD (10889.2 TVD, 163.4 N, -300.2 E)									
- Point									
LTP (232H)	0.00	0.00	10,983.0	-4,427.7	-226.9	456,660.28	652,687.69	32° 15' 17.715 N	103° 58' 23.254 W
- plan misses target center by 0.4usft at 15627.6usft MD (10983.2 TVD, -4427.7 N, -227.2 E)									
- Point									
PBHL (232H)	0.00	0.00	10,983.2	-4,557.7	-224.8	456,530.27	652,689.74	32° 15' 16.429 N	103° 58' 23.236 W
- plan misses target center by 0.4usft at 15757.6usft MD (10983.5 TVD, -4557.7 N, -225.2 E)									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
800.0	800.0	0.0	0.0	Build to 8° INC, 325° Azm
4,613.3	4,579.6	404.4	-283.1	Drop to Vert
10,437.4	10,402.0	434.8	-304.5	KOP @ 10437.4 MD, 10402 TVD
11,336.4	10,975.0	-137.0	-295.4	EOC @ 11336.4 MD, 10975 TVD, 89.89 INC
15,757.6	10,983.5	-4,557.7	-225.2	PBHL @ 15757.6 MD, 10983.5 TVD, 4553.6 VS

Tap Rock Operating, LLC.

Eddy County, NM (NAD83)
Cypress 34 Fed
232H

OH
Plan #1

Anticollision Report

23 May, 2019

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 10.0usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum separation factor of 10.00	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 5/23/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	15,757.6	Plan #1 (OH)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Cypress 34 Fed						
11H - OH - OH	7,033.6	6,961.0	272.9	223.1	5.482	CC
11H - OH - OH	7,080.0	7,005.8	273.0	222.9	5.450	ES
11H - OH - OH	8,540.0	8,465.5	293.6	233.4	4.875	SF
5H - OH - OH	7,941.7	8,572.8	747.1	650.0	7.698	CC, ES
5H - OH - OH	7,960.0	8,573.3	747.3	650.2	7.695	SF
7H - OH - OH	1,944.0	1,904.6	160.4	136.2	6.609	CC
7H - OH - OH	2,050.0	2,009.6	161.1	135.5	6.293	ES
7H - OH - OH	2,540.0	2,494.7	180.2	148.8	5.732	SF

Offset Design Cypress 34 Fed - 11H - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 411-MWD — **Offset Well Error:** 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,370.0	4,338.7	4,294.8	4,291.8	17.0	15.2	-47.29	419.9	-575.0	314.3	282.8	31.50	9.976	
4,380.0	4,348.6	4,304.9	4,301.8	17.0	15.3	-47.28	421.0	-574.9	313.4	281.9	31.57	9.927	
4,390.0	4,358.5	4,314.9	4,311.8	17.1	15.3	-47.28	422.0	-574.9	312.6	281.0	31.65	9.878	
4,400.0	4,368.4	4,325.0	4,321.8	17.1	15.3	-47.27	423.1	-574.9	311.8	280.1	31.72	9.829	
4,410.0	4,378.3	4,335.0	4,331.8	17.1	15.4	-47.27	424.2	-574.9	311.0	279.2	31.80	9.780	
4,420.0	4,388.2	4,345.1	4,341.8	17.2	15.4	-47.26	425.2	-574.8	310.1	278.3	31.87	9.731	
4,430.0	4,398.1	4,355.0	4,351.7	17.2	15.4	-47.26	426.3	-574.8	309.3	277.3	31.94	9.682	
4,440.0	4,408.0	4,365.0	4,361.6	17.3	15.5	-47.26	427.3	-574.8	308.5	276.4	32.02	9.634	
4,450.0	4,417.9	4,375.0	4,371.5	17.3	15.5	-47.26	428.3	-574.7	307.6	275.5	32.09	9.586	
4,460.0	4,427.8	4,385.0	4,381.5	17.3	15.5	-47.26	429.4	-574.7	306.8	274.6	32.16	9.538	
4,470.0	4,437.7	4,394.9	4,391.4	17.4	15.6	-47.25	430.4	-574.7	305.9	273.7	32.24	9.490	
4,480.0	4,447.6	4,404.9	4,401.3	17.4	15.6	-47.25	431.4	-574.7	305.1	272.8	32.31	9.443	
4,490.0	4,457.5	4,414.9	4,411.2	17.5	15.6	-47.25	432.4	-574.6	304.3	271.9	32.39	9.395	
4,500.0	4,467.5	4,424.9	4,421.1	17.5	15.7	-47.26	433.5	-574.6	303.4	271.0	32.46	9.348	
4,510.0	4,477.4	4,434.8	4,431.1	17.6	15.7	-47.26	434.5	-574.6	302.6	270.1	32.53	9.301	
4,520.0	4,487.3	4,444.6	4,440.8	17.6	15.7	-47.26	435.5	-574.5	301.8	269.2	32.61	9.255	
4,530.0	4,497.2	4,454.1	4,450.3	17.6	15.8	-47.26	436.4	-574.5	300.9	268.3	32.68	9.209	
4,540.0	4,507.1	4,463.6	4,459.7	17.7	15.8	-47.27	437.4	-574.5	300.1	267.4	32.75	9.164	
4,550.0	4,517.0	4,473.2	4,469.2	17.7	15.8	-47.27	438.4	-574.5	299.3	266.5	32.82	9.119	
4,560.0	4,526.9	4,482.7	4,478.6	17.8	15.9	-47.27	439.3	-574.6	298.6	265.7	32.90	9.076	
4,570.0	4,536.8	4,492.2	4,488.1	17.8	15.9	-47.28	440.3	-574.6	297.8	264.8	32.97	9.033	
4,580.0	4,546.7	4,501.7	4,497.6	17.8	15.9	-47.28	441.3	-574.7	297.0	264.0	33.04	8.990	
4,590.0	4,556.6	4,511.2	4,507.0	17.9	16.0	-47.29	442.2	-574.7	296.3	263.2	33.11	8.948	
4,600.0	4,566.5	4,520.7	4,516.5	17.9	16.0	-47.30	443.2	-574.8	295.6	262.4	33.19	8.907	
4,610.0	4,576.4	4,530.2	4,526.0	18.0	16.0	-47.30	444.1	-574.9	294.9	261.6	33.26	8.867	
4,620.0	4,586.3	4,539.9	4,535.6	18.0	16.1	-47.30	445.1	-575.1	294.2	260.9	33.33	8.826	
4,630.0	4,596.2	4,549.9	4,545.5	18.1	16.1	-47.30	446.1	-575.2	293.6	260.1	33.41	8.786	
4,640.0	4,606.1	4,559.9	4,555.5	18.1	16.1	-47.30	447.1	-575.3	292.9	259.4	33.49	8.747	
4,650.0	4,616.0	4,569.8	4,565.4	18.1	16.2	-47.29	448.1	-575.4	292.3	258.7	33.56	8.708	
4,660.0	4,625.9	4,579.8	4,575.3	18.2	16.2	-47.28	449.1	-575.6	291.7	258.0	33.64	8.670	
4,670.0	4,635.9	4,589.8	4,585.2	18.2	16.2	-47.27	450.0	-575.7	291.1	257.4	33.72	8.633	
4,680.0	4,645.8	4,599.8	4,595.2	18.3	16.3	-47.26	451.0	-575.8	290.5	256.7	33.79	8.597	
4,690.0	4,655.7	4,609.7	4,605.1	18.3	16.3	-47.25	451.9	-576.0	290.0	256.1	33.87	8.561	
4,700.0	4,665.6	4,619.7	4,615.0	18.3	16.3	-47.23	452.9	-576.1	289.4	255.5	33.94	8.526	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,710.0	4,675.6	4,629.7	4,624.9	18.4	16.4	-47.21	453.8	-576.3	288.9	254.9	34.02	8.492	
4,720.0	4,685.5	4,639.7	4,634.9	18.4	16.4	-47.19	454.8	-576.4	288.4	254.3	34.09	8.459	
4,730.0	4,695.4	4,649.6	4,644.8	18.5	16.4	-47.17	455.7	-576.5	287.9	253.7	34.17	8.427	
4,740.0	4,705.4	4,659.6	4,654.7	18.5	16.5	-47.14	456.6	-576.7	287.4	253.2	34.24	8.395	
4,750.0	4,715.3	4,669.6	4,664.6	18.5	16.5	-47.11	457.5	-576.8	287.0	252.7	34.31	8.364	
4,760.0	4,725.3	4,679.5	4,674.6	18.6	16.6	-47.08	458.4	-577.0	286.6	252.2	34.39	8.334	
4,770.0	4,735.2	4,689.5	4,684.5	18.6	16.6	-47.04	459.4	-577.1	286.2	251.7	34.46	8.304	
4,780.0	4,745.2	4,699.5	4,694.4	18.7	16.6	-47.00	460.3	-577.3	285.8	251.2	34.53	8.275	
4,790.0	4,755.1	4,709.4	4,704.3	18.7	16.7	-46.96	461.2	-577.4	285.4	250.8	34.61	8.247	
4,800.0	4,765.1	4,719.4	4,714.3	18.7	16.7	-46.91	462.1	-577.6	285.1	250.4	34.68	8.220	
4,810.0	4,775.1	4,729.5	4,724.3	18.8	16.7	-46.87	463.0	-577.7	284.7	250.0	34.75	8.193	
4,820.0	4,785.0	4,739.8	4,734.6	18.8	16.8	-46.82	463.9	-577.9	284.4	249.6	34.83	8.167	
4,830.0	4,795.0	4,750.1	4,744.8	18.8	16.8	-46.77	464.8	-578.0	284.1	249.2	34.90	8.141	
4,840.0	4,804.9	4,760.4	4,755.1	18.9	16.8	-46.72	465.7	-578.1	283.8	248.8	34.97	8.115	
4,850.0	4,814.9	4,770.7	4,765.3	18.9	16.9	-46.68	466.5	-578.3	283.5	248.4	35.04	8.090	
4,860.0	4,824.9	4,780.9	4,775.6	19.0	16.9	-46.63	467.3	-578.4	283.2	248.1	35.11	8.065	
4,870.0	4,834.9	4,791.2	4,785.8	19.0	16.9	-46.59	468.0	-578.5	282.9	247.7	35.19	8.040	
4,880.0	4,844.8	4,801.5	4,796.1	19.0	17.0	-46.55	468.8	-578.6	282.6	247.4	35.26	8.016	
4,890.0	4,854.8	4,811.8	4,806.4	19.1	17.0	-46.51	469.5	-578.7	282.4	247.0	35.33	7.992	
4,900.0	4,864.8	4,822.0	4,816.6	19.1	17.1	-46.47	470.2	-578.8	282.1	246.7	35.40	7.968	
4,910.0	4,874.8	4,832.1	4,826.6	19.1	17.1	-46.44	470.8	-578.9	281.8	246.4	35.47	7.945	
4,920.0	4,884.7	4,842.2	4,836.7	19.2	17.1	-46.40	471.4	-579.0	281.6	246.1	35.54	7.923	
4,930.0	4,894.7	4,852.3	4,846.7	19.2	17.2	-46.37	472.0	-579.1	281.4	245.8	35.61	7.902	
4,940.0	4,904.7	4,862.4	4,856.8	19.2	17.2	-46.34	472.6	-579.2	281.2	245.5	35.68	7.881	
4,950.0	4,914.7	4,872.4	4,866.9	19.3	17.2	-46.31	473.1	-579.3	281.0	245.3	35.75	7.860	
4,960.0	4,924.7	4,882.5	4,876.9	19.3	17.3	-46.28	473.6	-579.4	280.8	245.0	35.82	7.840	
4,970.0	4,934.7	4,892.6	4,887.0	19.4	17.3	-46.26	474.1	-579.5	280.7	244.8	35.89	7.820	
4,980.0	4,944.7	4,902.7	4,897.1	19.4	17.3	-46.24	474.6	-579.6	280.5	244.6	35.96	7.801	
4,990.0	4,954.7	4,912.8	4,907.2	19.4	17.4	-46.21	475.0	-579.7	280.4	244.4	36.03	7.783	
5,000.0	4,964.7	4,923.2	4,917.6	19.5	17.4	-46.20	475.4	-579.8	280.3	244.2	36.10	7.764	
5,010.0	4,974.6	4,933.6	4,928.0	19.5	17.4	-46.18	475.8	-579.9	280.2	244.0	36.17	7.746	
5,020.0	4,984.6	4,944.0	4,938.4	19.5	17.5	-46.17	476.1	-580.0	280.1	243.8	36.24	7.729	
5,030.0	4,994.6	4,954.4	4,948.8	19.6	17.5	-46.16	476.4	-580.1	280.0	243.6	36.31	7.711	
5,040.0	5,004.6	4,964.9	4,959.2	19.6	17.5	-46.16	476.6	-580.1	279.8	243.5	36.37	7.693	
5,050.0	5,014.6	4,975.3	4,969.6	19.6	17.6	-46.16	476.8	-580.2	279.7	243.3	36.44	7.676	
5,060.0	5,024.6	4,985.7	4,980.0	19.7	17.6	-46.17	477.0	-580.2	279.6	243.1	36.51	7.659	
5,070.0	5,034.6	4,996.1	4,990.5	19.7	17.6	-46.18	477.1	-580.3	279.6	243.0	36.58	7.642	
5,080.0	5,044.6	5,006.5	5,000.9	19.7	17.7	-46.19	477.1	-580.3	279.5	242.8	36.65	7.625	
5,090.0	5,054.6	5,016.6	5,010.9	19.8	17.7	-46.21	477.2	-580.3	279.4	242.7	36.72	7.609	
5,100.0	5,064.6	5,026.6	5,021.0	19.8	17.8	-46.22	477.2	-580.3	279.3	242.5	36.78	7.593	
5,110.0	5,074.6	5,036.7	5,031.0	19.8	17.8	-46.23	477.3	-580.4	279.3	242.4	36.85	7.578	
5,120.0	5,084.6	5,046.7	5,041.1	19.9	17.8	-46.23	477.3	-580.4	279.2	242.3	36.92	7.564	
5,130.0	5,094.6	5,056.8	5,051.2	19.9	17.9	-46.24	477.3	-580.4	279.2	242.2	36.98	7.550	
5,136.2	5,100.8	5,063.0	5,057.3	19.9	17.9	-46.24	477.4	-580.4	279.2	242.2	37.02	7.542	
5,140.0	5,104.6	5,066.9	5,061.2	19.9	17.9	-46.24	477.4	-580.4	279.2	242.2	37.05	7.537	
5,150.0	5,114.6	5,076.9	5,071.3	20.0	17.9	-81.23	477.4	-580.4	279.2	242.1	37.09	7.529	
5,160.0	5,124.6	5,087.0	5,081.3	20.0	18.0	-81.23	477.4	-580.4	279.2	242.1	37.15	7.515	
5,170.0	5,134.6	5,097.0	5,091.4	20.0	18.0	-81.23	477.4	-580.5	279.2	242.0	37.22	7.502	
5,180.0	5,144.6	5,107.0	5,101.4	20.1	18.0	-81.23	477.4	-580.5	279.3	242.0	37.29	7.489	
5,190.0	5,154.6	5,117.0	5,111.4	20.1	18.1	-81.23	477.4	-580.5	279.3	241.9	37.36	7.476	
5,200.0	5,164.6	5,127.0	5,121.4	20.1	18.1	-81.23	477.4	-580.5	279.3	241.9	37.42	7.463	
5,210.0	5,174.6	5,137.0	5,131.4	20.2	18.1	-81.23	477.4	-580.5	279.3	241.8	37.49	7.450	
5,220.0	5,184.6	5,147.0	5,141.4	20.2	18.2	-81.23	477.4	-580.5	279.3	241.8	37.55	7.437	
5,230.0	5,194.6	5,157.0	5,151.4	20.2	18.2	-81.23	477.4	-580.5	279.3	241.7	37.62	7.425	
5,240.0	5,204.6	5,167.0	5,161.3	20.3	18.2	-81.23	477.4	-580.5	279.3	241.6	37.69	7.412	
5,250.0	5,214.6	5,177.0	5,171.3	20.3	18.3	-81.23	477.4	-580.6	279.3	241.6	37.75	7.399	
5,260.0	5,224.6	5,187.0	5,181.3	20.3	18.3	-81.23	477.4	-580.6	279.4	241.5	37.82	7.386	
5,270.0	5,234.6	5,197.0	5,191.3	20.3	18.3	-81.23	477.4	-580.6	279.4	241.5	37.89	7.374	
5,280.0	5,244.6	5,207.0	5,201.3	20.4	18.4	-81.23	477.4	-580.6	279.4	241.4	37.95	7.361	
5,290.0	5,254.6	5,217.0	5,211.3	20.4	18.4	-81.23	477.4	-580.6	279.4	241.4	38.02	7.349	
5,300.0	5,264.6	5,227.0	5,221.3	20.4	18.4	-81.24	477.4	-580.6	279.4	241.3	38.09	7.336	
5,310.0	5,274.6	5,237.0	5,231.3	20.5	18.5	-81.24	477.4	-580.6	279.4	241.3	38.15	7.324	
5,320.0	5,284.6	5,247.0	5,241.3	20.5	18.5	-81.24	477.4	-580.7	279.4	241.2	38.22	7.312	
5,330.0	5,294.6	5,257.0	5,251.3	20.5	18.5	-81.24	477.4	-580.7	279.5	241.2	38.28	7.299	
5,340.0	5,304.6	5,267.0	5,261.3	20.6	18.6	-81.25	477.4	-580.7	279.5	241.1	38.35	7.287	
5,350.0	5,314.6	5,277.0	5,271.3	20.6	18.6	-81.25	477.3	-580.7	279.5	241.1	38.42	7.275	

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,360.0	5,324.6	5,287.0	5,281.3	20.6	18.6	-81.26	477.3	-580.7	279.5	241.0	38.48	7.263	
5,370.0	5,334.6	5,297.1	5,291.5	20.7	18.6	-81.26	477.3	-580.7	279.5	241.0	38.55	7.251	
5,380.0	5,344.6	5,307.4	5,301.7	20.7	18.7	-81.27	477.3	-580.7	279.5	240.9	38.62	7.238	
5,390.0	5,354.6	5,317.6	5,311.9	20.7	18.7	-81.27	477.3	-580.7	279.5	240.8	38.68	7.225	
5,400.0	5,364.6	5,327.8	5,322.2	20.8	18.7	-81.28	477.2	-580.7	279.5	240.7	38.75	7.213	
5,410.0	5,374.6	5,338.0	5,332.4	20.8	18.8	-81.28	477.2	-580.7	279.5	240.7	38.82	7.200	
5,420.0	5,384.6	5,348.3	5,342.6	20.8	18.8	-81.29	477.2	-580.7	279.4	240.6	38.89	7.186	
5,430.0	5,394.6	5,358.5	5,352.8	20.9	18.8	-81.29	477.1	-580.7	279.4	240.5	38.95	7.173	
5,440.0	5,404.6	5,368.6	5,362.9	20.9	18.9	-81.30	477.1	-580.6	279.4	240.4	39.02	7.160	
5,450.0	5,414.6	5,378.6	5,372.9	20.9	18.9	-81.30	477.1	-580.6	279.3	240.2	39.09	7.147	
5,460.0	5,424.6	5,388.6	5,382.9	21.0	18.9	-81.31	477.0	-580.5	279.3	240.1	39.15	7.133	
5,470.0	5,434.6	5,398.5	5,392.9	21.0	19.0	-81.32	477.0	-580.5	279.2	240.0	39.22	7.120	
5,480.0	5,444.6	5,408.5	5,402.9	21.0	19.0	-81.32	477.0	-580.5	279.2	239.9	39.28	7.107	
5,490.0	5,454.6	5,418.5	5,412.8	21.1	19.0	-81.33	476.9	-580.4	279.2	239.8	39.35	7.094	
5,500.0	5,464.6	5,428.5	5,422.8	21.1	19.1	-81.33	476.9	-580.4	279.1	239.7	39.42	7.081	
5,510.0	5,474.6	5,438.4	5,432.8	21.1	19.1	-81.34	476.9	-580.4	279.1	239.6	39.48	7.068	
5,520.0	5,484.6	5,448.4	5,442.8	21.2	19.1	-81.34	476.8	-580.3	279.0	239.5	39.55	7.055	
5,530.0	5,494.6	5,458.4	5,452.8	21.2	19.2	-81.35	476.8	-580.3	279.0	239.4	39.62	7.042	
5,540.0	5,504.6	5,468.4	5,462.7	21.2	19.2	-81.35	476.8	-580.3	279.0	239.3	39.68	7.030	
5,550.0	5,514.6	5,478.4	5,472.7	21.3	19.2	-81.35	476.8	-580.2	278.9	239.2	39.75	7.017	
5,560.0	5,524.6	5,488.3	5,482.6	21.3	19.3	-81.36	476.7	-580.2	278.9	239.1	39.82	7.004	
5,570.0	5,534.6	5,498.2	5,492.6	21.3	19.3	-81.36	476.7	-580.2	278.9	239.0	39.88	6.992	
5,580.0	5,544.6	5,508.2	5,502.5	21.4	19.3	-81.37	476.7	-580.1	278.8	238.9	39.95	6.980	
5,590.0	5,554.6	5,518.1	5,512.4	21.4	19.4	-81.37	476.7	-580.1	278.8	238.8	40.02	6.967	
5,600.0	5,564.6	5,528.0	5,522.4	21.4	19.4	-81.37	476.6	-580.1	278.8	238.7	40.08	6.955	
5,610.0	5,574.6	5,537.9	5,532.3	21.5	19.4	-81.38	476.6	-580.1	278.8	238.6	40.15	6.943	
5,620.0	5,584.6	5,547.9	5,542.2	21.5	19.5	-81.38	476.6	-580.1	278.7	238.5	40.22	6.931	
5,630.0	5,594.6	5,557.8	5,552.2	21.5	19.5	-81.38	476.6	-580.1	278.7	238.4	40.28	6.919	
5,640.0	5,604.6	5,567.7	5,562.1	21.6	19.5	-81.38	476.6	-580.0	278.7	238.4	40.35	6.908	
5,650.0	5,614.6	5,577.7	5,572.0	21.6	19.6	-81.39	476.6	-580.0	278.7	238.3	40.42	6.896	
5,660.0	5,624.6	5,587.7	5,582.0	21.6	19.6	-81.39	476.6	-580.0	278.7	238.2	40.48	6.884	
5,670.0	5,634.6	5,597.7	5,592.0	21.7	19.6	-81.39	476.6	-580.0	278.7	238.1	40.55	6.872	
5,680.0	5,644.6	5,607.6	5,602.0	21.7	19.7	-81.39	476.6	-580.0	278.7	238.0	40.62	6.861	
5,690.0	5,654.6	5,617.6	5,612.0	21.7	19.7	-81.39	476.6	-580.0	278.7	238.0	40.68	6.849	
5,700.0	5,664.6	5,627.6	5,622.0	21.7	19.7	-81.39	476.6	-580.0	278.6	237.9	40.75	6.838	
5,710.0	5,674.6	5,637.6	5,631.9	21.8	19.8	-81.39	476.6	-580.0	278.6	237.8	40.82	6.826	
5,720.0	5,684.6	5,647.6	5,641.9	21.8	19.8	-81.39	476.6	-580.0	278.6	237.7	40.89	6.815	
5,730.0	5,694.6	5,657.5	5,651.9	21.8	19.8	-81.39	476.6	-580.0	278.6	237.7	40.95	6.804	
5,740.0	5,704.6	5,667.5	5,661.9	21.9	19.9	-81.38	476.6	-579.9	278.6	237.6	41.02	6.792	
5,750.0	5,714.6	5,677.5	5,671.9	21.9	19.9	-81.38	476.6	-579.9	278.6	237.5	41.09	6.781	
5,760.0	5,724.6	5,687.5	5,681.9	21.9	19.9	-81.38	476.6	-579.9	278.6	237.5	41.15	6.770	
5,770.0	5,734.6	5,697.5	5,691.9	22.0	20.0	-81.38	476.6	-579.9	278.6	237.4	41.22	6.759	
5,780.0	5,744.6	5,707.5	5,701.9	22.0	20.0	-81.38	476.6	-579.9	278.6	237.3	41.29	6.747	
5,790.0	5,754.6	5,717.5	5,711.9	22.0	20.0	-81.38	476.6	-579.9	278.6	237.2	41.36	6.736	
5,800.0	5,764.6	5,727.5	5,721.9	22.1	20.1	-81.38	476.6	-579.9	278.6	237.2	41.42	6.725	
5,810.0	5,774.6	5,737.5	5,731.9	22.1	20.1	-81.38	476.6	-579.9	278.6	237.1	41.49	6.714	
5,820.0	5,784.6	5,747.6	5,741.9	22.1	20.1	-81.38	476.6	-579.9	278.6	237.0	41.56	6.703	
5,830.0	5,794.6	5,757.6	5,751.9	22.2	20.2	-81.38	476.6	-579.9	278.6	236.9	41.63	6.692	
5,840.0	5,804.6	5,767.5	5,761.8	22.2	20.2	-81.38	476.6	-579.9	278.6	236.9	41.69	6.681	
5,850.0	5,814.6	5,777.4	5,771.7	22.2	20.2	-81.38	476.6	-579.9	278.6	236.8	41.76	6.670	
5,852.9	5,817.6	5,780.3	5,774.7	22.3	20.2	-81.39	476.6	-579.9	278.6	236.8	41.78	6.667	
5,860.0	5,824.6	5,787.3	5,781.6	22.3	20.3	-81.39	476.5	-579.9	278.6	236.7	41.83	6.660	
5,870.0	5,834.6	5,797.2	5,791.5	22.3	20.3	-81.39	476.5	-579.9	278.6	236.7	41.89	6.649	
5,880.0	5,844.6	5,807.1	5,801.4	22.3	20.3	-81.40	476.5	-579.9	278.6	236.6	41.96	6.639	
5,890.0	5,854.6	5,817.0	5,811.3	22.4	20.4	-81.41	476.5	-579.9	278.6	236.6	42.03	6.629	
5,900.0	5,864.6	5,826.9	5,821.2	22.4	20.4	-81.41	476.4	-579.9	278.6	236.5	42.09	6.619	
5,910.0	5,874.6	5,836.8	5,831.1	22.4	20.4	-81.42	476.4	-580.0	278.6	236.5	42.16	6.609	
5,920.0	5,884.6	5,846.7	5,841.1	22.5	20.5	-81.43	476.4	-580.0	278.6	236.4	42.23	6.599	
5,930.0	5,894.6	5,856.6	5,851.0	22.5	20.5	-81.44	476.3	-580.0	278.7	236.4	42.29	6.589	
5,940.0	5,904.6	5,866.6	5,860.9	22.5	20.5	-81.45	476.3	-580.1	278.7	236.3	42.36	6.579	
5,950.0	5,914.6	5,876.6	5,870.9	22.6	20.6	-81.46	476.2	-580.1	278.7	236.3	42.43	6.569	
5,960.0	5,924.6	5,886.6	5,880.9	22.6	20.6	-81.47	476.2	-580.1	278.7	236.2	42.49	6.560	
5,970.0	5,934.6	5,896.6	5,890.9	22.6	20.6	-81.48	476.2	-580.2	278.8	236.2	42.56	6.550	
5,980.0	5,944.6	5,906.6	5,900.9	22.7	20.7	-81.48	476.1	-580.2	278.8	236.2	42.63	6.540	
5,990.0	5,954.6	5,916.6	5,910.9	22.7	20.7	-81.49	476.1	-580.2	278.8	236.1	42.70	6.531	
6,000.0	5,964.6	5,926.6	5,920.9	22.7	20.7	-81.49	476.1	-580.3	278.9	236.1	42.76	6.521	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,010.0	5,974.6	5,936.6	5,930.9	22.8	20.8	-81.50	476.1	-580.3	278.9	236.1	42.83	6.511	
6,020.0	5,984.6	5,946.6	5,940.9	22.8	20.8	-81.50	476.1	-580.3	278.9	236.0	42.90	6.502	
6,030.0	5,994.6	5,956.6	5,950.9	22.8	20.8	-81.50	476.1	-580.3	278.9	236.0	42.96	6.492	
6,040.0	6,004.6	5,966.6	5,961.0	22.9	20.9	-81.50	476.1	-580.4	279.0	235.9	43.03	6.483	
6,050.0	6,014.6	5,976.7	5,971.0	22.9	20.9	-81.51	476.0	-580.4	279.0	235.9	43.10	6.473	
6,060.0	6,024.6	5,986.7	5,981.0	22.9	20.9	-81.51	476.0	-580.4	279.0	235.9	43.17	6.464	
6,070.0	6,034.6	5,996.7	5,991.1	23.0	21.0	-81.51	476.0	-580.5	279.0	235.8	43.23	6.454	
6,080.0	6,044.6	6,006.8	6,001.1	23.0	21.0	-81.52	476.0	-580.5	279.1	235.8	43.30	6.445	
6,090.0	6,054.6	6,016.8	6,011.2	23.0	21.0	-81.52	476.0	-580.5	279.1	235.7	43.37	6.435	
6,100.0	6,064.6	6,026.8	6,021.2	23.1	21.1	-81.52	476.0	-580.5	279.1	235.7	43.44	6.426	
6,110.0	6,074.6	6,036.9	6,031.2	23.1	21.1	-81.53	475.9	-580.6	279.1	235.6	43.50	6.416	
6,120.0	6,084.6	6,046.9	6,041.3	23.1	21.1	-81.54	475.9	-580.6	279.1	235.6	43.57	6.407	
6,130.0	6,094.6	6,057.0	6,051.3	23.2	21.2	-81.54	475.9	-580.6	279.2	235.5	43.64	6.397	
6,140.0	6,104.6	6,067.1	6,061.4	23.2	21.2	-81.55	475.9	-580.6	279.2	235.5	43.71	6.387	
6,150.0	6,114.6	6,077.2	6,071.5	23.2	21.2	-81.56	475.8	-580.6	279.2	235.4	43.77	6.378	
6,160.0	6,124.6	6,087.2	6,081.6	23.3	21.3	-81.57	475.8	-580.6	279.2	235.3	43.84	6.368	
6,170.0	6,134.6	6,097.3	6,091.7	23.3	21.3	-81.58	475.7	-580.6	279.2	235.3	43.91	6.358	
6,180.0	6,144.6	6,107.4	6,101.8	23.3	21.3	-81.60	475.6	-580.7	279.2	235.2	43.98	6.348	
6,190.0	6,154.6	6,117.5	6,111.8	23.4	21.4	-81.61	475.6	-580.7	279.2	235.1	44.04	6.339	
6,200.0	6,164.6	6,127.6	6,121.9	23.4	21.4	-81.63	475.5	-580.7	279.2	235.1	44.11	6.329	
6,210.0	6,174.6	6,137.6	6,132.0	23.4	21.4	-81.64	475.4	-580.7	279.2	235.0	44.18	6.319	
6,220.0	6,184.6	6,147.6	6,142.0	23.5	21.5	-81.66	475.3	-580.7	279.2	234.9	44.25	6.309	
6,230.0	6,194.6	6,157.6	6,152.0	23.5	21.5	-81.68	475.2	-580.7	279.1	234.8	44.31	6.299	
6,240.0	6,204.6	6,167.6	6,162.0	23.5	21.5	-81.70	475.1	-580.7	279.1	234.8	44.38	6.289	
6,250.0	6,214.6	6,177.6	6,171.9	23.6	21.6	-81.71	475.1	-580.7	279.1	234.7	44.45	6.280	
6,260.0	6,224.6	6,187.6	6,181.9	23.6	21.6	-81.73	475.0	-580.7	279.1	234.6	44.52	6.270	
6,270.0	6,234.6	6,197.6	6,191.9	23.6	21.6	-81.74	474.9	-580.7	279.1	234.5	44.58	6.260	
6,280.0	6,244.6	6,207.5	6,201.9	23.7	21.7	-81.76	474.9	-580.7	279.1	234.5	44.65	6.251	
6,290.0	6,254.6	6,217.5	6,211.9	23.7	21.7	-81.77	474.8	-580.7	279.1	234.4	44.72	6.241	
6,300.0	6,264.6	6,227.5	6,221.9	23.7	21.7	-81.78	474.7	-580.7	279.1	234.3	44.79	6.232	
6,310.0	6,274.6	6,237.6	6,232.0	23.8	21.8	-81.79	474.7	-580.7	279.1	234.2	44.85	6.222	
6,320.0	6,284.6	6,247.9	6,242.3	23.8	21.8	-81.80	474.6	-580.7	279.1	234.2	44.92	6.212	
6,330.0	6,294.6	6,258.2	6,252.5	23.8	21.8	-81.82	474.6	-580.7	279.1	234.1	44.99	6.202	
6,340.0	6,304.6	6,268.5	6,262.8	23.9	21.9	-81.83	474.5	-580.7	279.0	234.0	45.06	6.192	
6,350.0	6,314.6	6,278.7	6,273.1	23.9	21.9	-81.84	474.4	-580.6	279.0	233.8	45.13	6.182	
6,360.0	6,324.6	6,289.0	6,283.3	23.9	21.9	-81.86	474.3	-580.6	278.9	233.7	45.20	6.171	
6,370.0	6,334.6	6,299.3	6,293.6	24.0	22.0	-81.88	474.2	-580.5	278.9	233.6	45.27	6.160	
6,380.0	6,344.6	6,309.5	6,303.9	24.0	22.0	-81.89	474.1	-580.5	278.8	233.4	45.33	6.149	
6,390.0	6,354.6	6,319.8	6,314.2	24.0	22.0	-81.91	474.1	-580.4	278.7	233.3	45.40	6.138	
6,400.0	6,364.6	6,330.0	6,324.3	24.1	22.1	-81.93	474.0	-580.3	278.6	233.1	45.47	6.127	
6,410.0	6,374.6	6,339.9	6,334.2	24.1	22.1	-81.95	473.9	-580.2	278.5	233.0	45.54	6.116	
6,420.0	6,384.6	6,349.8	6,344.1	24.1	22.1	-81.96	473.8	-580.2	278.4	232.8	45.61	6.105	
6,430.0	6,394.6	6,359.7	6,354.0	24.2	22.2	-81.98	473.7	-580.1	278.3	232.7	45.67	6.094	
6,440.0	6,404.6	6,369.6	6,363.9	24.2	22.2	-81.99	473.6	-580.0	278.3	232.5	45.74	6.083	
6,450.0	6,414.6	6,379.5	6,373.8	24.2	22.2	-82.01	473.5	-580.0	278.2	232.4	45.81	6.073	
6,460.0	6,424.6	6,389.4	6,383.7	24.3	22.3	-82.02	473.4	-579.9	278.1	232.2	45.88	6.062	
6,470.0	6,434.6	6,399.3	6,393.6	24.3	22.3	-82.03	473.4	-579.8	278.0	232.1	45.94	6.052	
6,480.0	6,444.6	6,409.2	6,403.5	24.3	22.3	-82.04	473.3	-579.8	278.0	232.0	46.01	6.041	
6,490.0	6,454.6	6,419.1	6,413.4	24.4	22.4	-82.06	473.2	-579.7	277.9	231.8	46.08	6.031	
6,500.0	6,464.6	6,429.1	6,423.4	24.4	22.4	-82.07	473.2	-579.7	277.9	231.7	46.15	6.021	
6,510.0	6,474.6	6,439.1	6,433.4	24.4	22.4	-82.08	473.1	-579.6	277.8	231.6	46.22	6.011	
6,520.0	6,484.6	6,449.1	6,443.4	24.5	22.5	-82.09	473.1	-579.6	277.7	231.5	46.28	6.001	
6,530.0	6,494.6	6,459.1	6,453.5	24.5	22.5	-82.10	473.0	-579.5	277.7	231.3	46.35	5.991	
6,540.0	6,504.6	6,469.1	6,463.5	24.5	22.5	-82.11	473.0	-579.4	277.6	231.2	46.42	5.980	
6,550.0	6,514.6	6,479.2	6,473.5	24.6	22.6	-82.12	472.9	-579.4	277.5	231.1	46.49	5.970	
6,560.0	6,524.6	6,489.2	6,483.5	24.6	22.6	-82.13	472.8	-579.3	277.5	230.9	46.56	5.960	
6,570.0	6,534.6	6,499.2	6,493.5	24.6	22.6	-82.14	472.8	-579.3	277.4	230.8	46.62	5.950	
6,580.0	6,544.6	6,509.2	6,503.6	24.7	22.7	-82.15	472.7	-579.2	277.3	230.7	46.69	5.940	
6,590.0	6,554.6	6,519.3	6,513.6	24.7	22.7	-82.16	472.7	-579.2	277.3	230.5	46.76	5.930	
6,600.0	6,564.6	6,529.4	6,523.7	24.7	22.7	-82.17	472.6	-579.1	277.2	230.4	46.83	5.920	
6,610.0	6,574.6	6,539.5	6,533.9	24.8	22.8	-82.18	472.6	-579.0	277.1	230.2	46.90	5.909	
6,620.0	6,584.6	6,549.7	6,544.0	24.8	22.8	-82.19	472.5	-578.9	277.1	230.1	46.97	5.899	
6,630.0	6,594.6	6,559.8	6,554.1	24.8	22.8	-82.19	472.5	-578.9	277.0	229.9	47.03	5.889	
6,640.0	6,604.6	6,569.9	6,564.3	24.9	22.9	-82.20	472.4	-578.8	276.9	229.8	47.10	5.878	
6,650.0	6,614.6	6,580.1	6,574.4	24.9	22.9	-82.21	472.3	-578.7	276.8	229.6	47.17	5.868	
6,660.0	6,624.6	6,590.2	6,584.5	24.9	22.9	-82.22	472.3	-578.6	276.7	229.4	47.24	5.857	

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,670.0	6,634.6	6,600.4	6,594.7	25.0	23.0	-82.23	472.2	-578.5	276.6	229.3	47.31	5.846	
6,680.0	6,644.6	6,610.5	6,604.8	25.0	23.0	-82.23	472.2	-578.4	276.5	229.1	47.38	5.836	
6,690.0	6,654.6	6,620.5	6,614.8	25.0	23.0	-82.24	472.1	-578.3	276.4	228.9	47.44	5.825	
6,700.0	6,664.6	6,630.5	6,624.9	25.1	23.1	-82.25	472.1	-578.2	276.2	228.7	47.51	5.814	
6,710.0	6,674.6	6,640.6	6,634.9	25.1	23.1	-82.26	472.0	-578.1	276.1	228.5	47.58	5.803	
6,720.0	6,684.6	6,650.6	6,644.9	25.1	23.1	-82.27	471.9	-578.0	276.0	228.4	47.65	5.793	
6,730.0	6,694.6	6,660.6	6,654.9	25.2	23.2	-82.29	471.9	-577.9	275.9	228.2	47.72	5.782	
6,740.0	6,704.6	6,670.6	6,665.0	25.2	23.2	-82.30	471.8	-577.8	275.8	228.0	47.79	5.771	
6,750.0	6,714.6	6,680.7	6,675.0	25.2	23.2	-82.32	471.7	-577.6	275.7	227.8	47.85	5.760	
6,760.0	6,724.6	6,690.7	6,685.0	25.3	23.3	-82.33	471.6	-577.5	275.5	227.6	47.92	5.750	
6,770.0	6,734.6	6,700.7	6,695.0	25.3	23.3	-82.35	471.5	-577.4	275.4	227.4	47.99	5.739	
6,780.0	6,744.6	6,710.8	6,705.1	25.3	23.3	-82.37	471.4	-577.3	275.3	227.2	48.06	5.728	
6,790.0	6,754.6	6,720.8	6,715.1	25.4	23.4	-82.39	471.3	-577.2	275.2	227.0	48.13	5.718	
6,800.0	6,764.6	6,730.9	6,725.2	25.4	23.4	-82.41	471.2	-577.1	275.1	226.9	48.20	5.707	
6,810.0	6,774.6	6,740.9	6,735.2	25.4	23.4	-82.43	471.1	-577.0	274.9	226.7	48.27	5.696	
6,820.0	6,784.6	6,751.0	6,745.3	25.5	23.5	-82.44	471.0	-576.9	274.8	226.5	48.33	5.685	
6,830.0	6,794.6	6,761.0	6,755.3	25.5	23.5	-82.46	470.9	-576.7	274.7	226.3	48.40	5.675	
6,840.0	6,804.6	6,771.1	6,765.4	25.5	23.6	-82.47	470.8	-576.6	274.5	226.1	48.47	5.664	
6,850.0	6,814.6	6,781.1	6,775.5	25.6	23.6	-82.49	470.7	-576.5	274.4	225.9	48.54	5.653	
6,860.0	6,824.6	6,791.2	6,785.5	25.6	23.6	-82.50	470.6	-576.4	274.3	225.7	48.61	5.642	
6,870.0	6,834.6	6,801.2	6,795.5	25.6	23.7	-82.51	470.6	-576.2	274.1	225.4	48.68	5.631	
6,880.0	6,844.6	6,811.0	6,805.3	25.7	23.7	-82.52	470.5	-576.1	274.0	225.2	48.75	5.621	
6,890.0	6,854.6	6,820.8	6,815.1	25.7	23.7	-82.53	470.4	-576.0	273.9	225.0	48.81	5.610	
6,900.0	6,864.6	6,830.6	6,824.9	25.7	23.8	-82.54	470.4	-575.9	273.7	224.9	48.88	5.600	
6,910.0	6,874.6	6,840.4	6,834.7	25.8	23.8	-82.54	470.3	-575.8	273.6	224.7	48.95	5.590	
6,920.0	6,884.6	6,850.2	6,844.5	25.8	23.8	-82.55	470.3	-575.7	273.5	224.5	49.02	5.580	
6,930.0	6,894.6	6,860.0	6,854.3	25.8	23.9	-82.56	470.3	-575.6	273.4	224.3	49.08	5.571	
6,940.0	6,904.6	6,869.8	6,864.1	25.9	23.9	-82.56	470.2	-575.5	273.3	224.2	49.15	5.561	
6,950.0	6,914.6	6,879.6	6,873.9	25.9	23.9	-82.57	470.2	-575.4	273.3	224.0	49.22	5.552	
6,960.0	6,924.6	6,889.4	6,883.7	25.9	24.0	-82.57	470.2	-575.3	273.2	223.9	49.29	5.543	
6,970.0	6,934.6	6,899.1	6,893.4	26.0	24.0	-82.57	470.1	-575.3	273.1	223.8	49.35	5.534	
6,980.0	6,944.6	6,908.9	6,903.2	26.0	24.0	-82.57	470.1	-575.2	273.0	223.6	49.42	5.525	
6,990.0	6,954.6	6,918.6	6,912.9	26.0	24.1	-82.57	470.1	-575.2	273.0	223.5	49.49	5.516	
7,000.0	6,964.6	6,928.3	6,922.6	26.1	24.1	-82.57	470.1	-575.1	273.0	223.4	49.56	5.508	
7,010.0	6,974.6	6,938.1	6,932.4	26.1	24.1	-82.57	470.1	-575.1	272.9	223.3	49.63	5.500	
7,020.0	6,984.6	6,947.8	6,942.1	26.1	24.2	-82.57	470.1	-575.1	272.9	223.2	49.69	5.492	
7,030.0	6,994.6	6,957.5	6,951.8	26.2	24.2	-82.56	470.2	-575.1	272.9	223.1	49.76	5.484	
7,033.6	6,998.2	6,961.0	6,955.3	26.2	24.2	-82.56	470.2	-575.1	272.9	223.1	49.78	5.482	CC
7,040.0	7,004.6	6,967.2	6,961.5	26.2	24.2	-82.55	470.2	-575.1	272.9	223.1	49.83	5.477	
7,050.0	7,014.6	6,977.0	6,971.3	26.3	24.3	-82.54	470.3	-575.1	272.9	223.0	49.90	5.470	
7,060.0	7,024.6	6,987.0	6,981.3	26.3	24.3	-82.53	470.3	-575.1	272.9	223.0	49.96	5.463	
7,070.0	7,034.6	6,996.2	6,990.5	26.3	24.3	-82.52	470.4	-575.1	273.0	222.9	50.03	5.456	
7,080.0	7,044.6	7,005.8	7,000.1	26.4	24.4	-82.51	470.4	-575.2	273.0	222.9	50.10	5.450	ES
7,090.0	7,054.6	7,015.3	7,009.6	26.4	24.4	-82.49	470.5	-575.2	273.1	222.9	50.16	5.444	
7,100.0	7,064.6	7,024.9	7,019.2	26.4	24.4	-82.48	470.6	-575.3	273.2	222.9	50.23	5.439	
7,110.0	7,074.6	7,034.4	7,028.7	26.5	24.4	-82.46	470.7	-575.4	273.3	223.0	50.30	5.433	
7,120.0	7,084.6	7,044.0	7,038.3	26.5	24.5	-82.44	470.8	-575.5	273.4	223.0	50.36	5.428	
7,130.0	7,094.6	7,053.5	7,047.8	26.5	24.5	-82.42	470.9	-575.6	273.5	223.1	50.43	5.424	
7,140.0	7,104.6	7,063.0	7,057.3	26.6	24.5	-82.39	471.1	-575.7	273.7	223.2	50.50	5.420	
7,150.0	7,114.6	7,072.6	7,066.9	26.6	24.6	-82.37	471.2	-575.9	273.9	223.3	50.56	5.416	
7,160.0	7,124.6	7,082.0	7,076.3	26.6	24.6	-82.34	471.3	-576.0	274.0	223.4	50.63	5.413	
7,170.0	7,134.6	7,091.7	7,086.0	26.7	24.6	-82.32	471.5	-576.2	274.2	223.5	50.70	5.409	
7,180.0	7,144.6	7,101.2	7,095.5	26.7	24.7	-82.29	471.6	-576.4	274.5	223.7	50.76	5.407	
7,190.0	7,154.6	7,110.8	7,105.1	26.7	24.7	-82.27	471.8	-576.6	274.7	223.9	50.83	5.404	
7,200.0	7,164.6	7,120.3	7,114.6	26.8	24.7	-82.24	471.9	-576.8	274.9	224.0	50.90	5.402	
7,210.0	7,174.6	7,129.9	7,124.2	26.8	24.8	-82.21	472.1	-577.0	275.2	224.2	50.96	5.400	
7,220.0	7,184.6	7,139.4	7,133.7	26.8	24.8	-82.19	472.3	-577.3	275.5	224.5	51.03	5.399	
7,230.0	7,194.6	7,149.0	7,143.3	26.9	24.8	-82.17	472.4	-577.6	275.8	224.7	51.10	5.397	
7,240.0	7,204.6	7,158.6	7,152.8	26.9	24.9	-82.14	472.6	-577.8	276.1	224.9	51.16	5.396	
7,250.0	7,214.6	7,168.1	7,162.4	26.9	24.9	-82.12	472.7	-578.1	276.4	225.2	51.23	5.396	
7,260.0	7,224.6	7,177.8	7,172.0	27.0	24.9	-82.10	472.9	-578.5	276.8	225.5	51.30	5.396	
7,270.0	7,234.6	7,188.1	7,182.3	27.0	25.0	-82.07	473.0	-578.8	277.1	225.8	51.37	5.395	
7,280.0	7,244.6	7,198.3	7,192.6	27.0	25.0	-82.06	473.2	-579.1	277.5	226.0	51.44	5.394	
7,290.0	7,254.6	7,208.6	7,202.8	27.1	25.0	-82.04	473.3	-579.4	277.8	226.3	51.51	5.393	
7,300.0	7,264.6	7,218.9	7,213.1	27.1	25.1	-82.03	473.4	-579.8	278.1	226.5	51.57	5.392	
7,310.0	7,274.6	7,229.2	7,223.4	27.1	25.1	-82.03	473.4	-580.1	278.4	226.8	51.64	5.391	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Offset Site Error: 0.0 usft

Survey Program: 411-MWD

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,320.0	7,284.6	7,239.4	7,233.7	27.2	25.2	-82.02	473.5	-580.4	278.7	227.0	51.71	5.389	
7,330.0	7,294.6	7,249.7	7,243.9	27.2	25.2	-82.03	473.5	-580.7	279.0	227.2	51.78	5.388	
7,340.0	7,304.6	7,260.0	7,254.2	27.2	25.2	-82.03	473.5	-580.9	279.3	227.4	51.85	5.386	
7,350.0	7,314.6	7,270.3	7,264.5	27.3	25.3	-82.04	473.5	-581.2	279.5	227.6	51.92	5.383	
7,360.0	7,324.6	7,280.1	7,274.3	27.3	25.3	-82.05	473.5	-581.5	279.8	227.8	51.99	5.381	
7,370.0	7,334.6	7,290.0	7,284.2	27.3	25.3	-82.06	473.5	-581.7	280.0	228.0	52.06	5.380	
7,380.0	7,344.6	7,299.8	7,294.0	27.4	25.4	-82.08	473.5	-582.0	280.3	228.2	52.13	5.378	
7,390.0	7,354.6	7,309.6	7,303.8	27.4	25.4	-82.09	473.4	-582.3	280.6	228.4	52.19	5.376	
7,400.0	7,364.6	7,319.4	7,313.6	27.4	25.4	-82.11	473.4	-582.6	280.9	228.6	52.26	5.375	
7,410.0	7,374.6	7,329.3	7,323.4	27.5	25.5	-82.12	473.3	-582.9	281.2	228.8	52.33	5.373	
7,420.0	7,384.6	7,339.1	7,333.3	27.5	25.5	-82.14	473.3	-583.2	281.5	229.1	52.40	5.372	
7,430.0	7,394.6	7,348.9	7,343.1	27.5	25.5	-82.16	473.3	-583.5	281.8	229.3	52.47	5.371	
7,440.0	7,404.6	7,358.7	7,352.9	27.6	25.6	-82.18	473.2	-583.8	282.1	229.6	52.53	5.370	
7,450.0	7,414.6	7,368.6	7,362.8	27.6	25.6	-82.20	473.1	-584.1	282.4	229.8	52.60	5.369	
7,460.0	7,424.6	7,378.7	7,372.9	27.6	25.6	-82.22	473.1	-584.5	282.7	230.0	52.67	5.368	
7,470.0	7,434.6	7,388.8	7,382.9	27.7	25.7	-82.24	473.0	-584.8	283.0	230.3	52.74	5.366	
7,480.0	7,444.6	7,398.8	7,393.0	27.7	25.7	-82.27	472.9	-585.1	283.3	230.5	52.81	5.365	
7,490.0	7,454.6	7,408.9	7,403.0	27.7	25.7	-82.29	472.9	-585.4	283.6	230.8	52.88	5.364	
7,500.0	7,464.6	7,419.0	7,413.1	27.8	25.8	-82.32	472.8	-585.8	284.0	231.0	52.95	5.363	
7,510.0	7,474.6	7,429.0	7,423.2	27.8	25.8	-82.35	472.7	-586.1	284.3	231.2	53.02	5.362	
7,520.0	7,484.6	7,439.1	7,433.2	27.8	25.8	-82.37	472.6	-586.4	284.6	231.5	53.09	5.360	
7,530.0	7,494.6	7,449.2	7,443.3	27.9	25.9	-82.40	472.5	-586.7	284.9	231.7	53.16	5.359	
7,540.0	7,504.6	7,459.3	7,453.4	27.9	25.9	-82.43	472.4	-587.0	285.1	231.9	53.22	5.357	
7,550.0	7,514.6	7,469.9	7,464.0	27.9	25.9	-82.47	472.2	-587.3	285.4	232.1	53.30	5.356	
7,560.0	7,524.6	7,480.4	7,474.5	28.0	26.0	-82.50	472.1	-587.6	285.7	232.3	53.37	5.353	
7,570.0	7,534.6	7,491.0	7,485.1	28.0	26.0	-82.53	472.0	-587.9	285.9	232.5	53.44	5.351	
7,580.0	7,544.6	7,501.6	7,495.7	28.0	26.0	-82.56	471.9	-588.2	286.2	232.6	53.51	5.348	
7,590.0	7,554.6	7,512.2	7,506.3	28.1	26.1	-82.59	471.8	-588.4	286.4	232.8	53.58	5.344	
7,600.0	7,564.6	7,522.8	7,516.8	28.1	26.1	-82.62	471.6	-588.6	286.5	232.9	53.65	5.341	
7,610.0	7,574.6	7,533.3	7,527.4	28.2	26.1	-82.64	471.5	-588.8	286.7	233.0	53.72	5.337	
7,620.0	7,584.6	7,543.9	7,538.0	28.2	26.2	-82.67	471.4	-588.9	286.8	233.0	53.79	5.332	
7,630.0	7,594.6	7,554.5	7,548.6	28.2	26.2	-82.70	471.3	-589.1	286.9	233.1	53.86	5.327	
7,640.0	7,604.6	7,564.9	7,559.0	28.3	26.3	-82.72	471.2	-589.2	287.1	233.1	53.93	5.322	
7,650.0	7,614.6	7,575.4	7,569.4	28.3	26.3	-82.75	471.1	-589.3	287.1	233.1	54.00	5.317	
7,660.0	7,624.6	7,585.8	7,579.9	28.3	26.3	-82.77	471.0	-589.4	287.2	233.1	54.07	5.311	
7,670.0	7,634.6	7,596.2	7,590.3	28.4	26.4	-82.79	470.9	-589.5	287.3	233.1	54.14	5.306	
7,680.0	7,644.6	7,606.7	7,600.8	28.4	26.4	-82.80	470.8	-589.5	287.3	233.1	54.21	5.299	
7,690.0	7,654.6	7,617.1	7,611.2	28.4	26.4	-82.81	470.8	-589.5	287.3	233.0	54.28	5.293	
7,700.0	7,664.6	7,627.6	7,621.6	28.5	26.5	-82.82	470.7	-589.6	287.3	233.0	54.35	5.286	
7,710.0	7,674.6	7,638.0	7,632.1	28.5	26.5	-82.83	470.7	-589.6	287.3	232.9	54.42	5.280	
7,720.0	7,684.6	7,648.4	7,642.4	28.5	26.5	-82.84	470.7	-589.5	287.3	232.8	54.49	5.272	
7,730.0	7,694.6	7,658.1	7,652.2	28.6	26.6	-82.84	470.6	-589.5	287.3	232.7	54.56	5.265	
7,740.0	7,704.6	7,667.9	7,661.9	28.6	26.6	-82.83	470.7	-589.5	287.3	232.7	54.63	5.259	
7,749.5	7,714.1	7,677.1	7,671.2	28.6	26.6	-82.83	470.7	-589.5	287.3	232.6	54.70	5.252	
7,750.0	7,714.6	7,677.6	7,671.7	28.6	26.6	-82.82	470.7	-589.5	287.3	232.6	54.70	5.252	
7,760.0	7,724.6	7,687.4	7,681.5	28.7	26.7	-82.81	470.8	-589.5	287.3	232.5	54.77	5.246	
7,770.0	7,734.6	7,697.1	7,691.2	28.7	26.7	-82.79	470.9	-589.5	287.3	232.5	54.83	5.239	
7,780.0	7,744.6	7,706.9	7,701.0	28.7	26.7	-82.76	471.0	-589.5	287.3	232.4	54.90	5.233	
7,790.0	7,754.6	7,716.7	7,710.7	28.8	26.8	-82.73	471.2	-589.5	287.3	232.4	54.97	5.227	
7,800.0	7,764.6	7,726.4	7,720.5	28.8	26.8	-82.69	471.4	-589.5	287.4	232.4	55.04	5.222	
7,810.0	7,774.6	7,736.2	7,730.2	28.8	26.8	-82.65	471.6	-589.5	287.4	232.3	55.10	5.216	
7,820.0	7,784.6	7,746.0	7,740.1	28.9	26.9	-82.60	471.8	-589.6	287.5	232.3	55.17	5.211	
7,830.0	7,794.6	7,756.0	7,750.0	28.9	26.9	-82.55	472.1	-589.6	287.5	232.3	55.24	5.205	
7,840.0	7,804.6	7,766.0	7,760.0	28.9	26.9	-82.50	472.4	-589.6	287.6	232.3	55.31	5.200	
7,850.0	7,814.6	7,775.9	7,770.0	29.0	27.0	-82.45	472.6	-589.6	287.7	232.3	55.38	5.195	
7,860.0	7,824.6	7,785.9	7,779.9	29.0	27.0	-82.40	472.9	-589.7	287.7	232.3	55.45	5.189	
7,870.0	7,834.6	7,795.9	7,789.9	29.0	27.0	-82.34	473.2	-589.7	287.8	232.3	55.51	5.184	
7,880.0	7,844.6	7,805.8	7,799.9	29.1	27.1	-82.29	473.5	-589.7	287.9	232.3	55.58	5.179	
7,890.0	7,854.6	7,815.8	7,809.8	29.1	27.1	-82.23	473.7	-589.7	287.9	232.3	55.65	5.174	
7,900.0	7,864.6	7,825.8	7,819.8	29.1	27.1	-82.18	474.0	-589.8	288.0	232.3	55.72	5.168	
7,910.0	7,874.6	7,835.7	7,829.8	29.2	27.2	-82.12	474.3	-589.8	288.1	232.3	55.79	5.163	
7,920.0	7,884.6	7,845.6	7,839.6	29.2	27.2	-82.06	474.6	-589.8	288.1	232.3	55.86	5.158	
7,930.0	7,894.6	7,855.5	7,849.5	29.2	27.3	-82.01	474.9	-589.9	288.2	232.3	55.92	5.153	
7,940.0	7,904.6	7,865.4	7,859.4	29.3	27.3	-81.95	475.2	-589.9	288.3	232.3	55.99	5.149	
7,950.0	7,914.6	7,875.2	7,869.2	29.3	27.3	-81.89	475.5	-589.9	288.4	232.3	56.06	5.144	
7,960.0	7,924.6	7,885.1	7,879.1	29.3	27.4	-81.83	475.8	-590.0	288.4	232.3	56.13	5.139	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,970.0	7,934.6	7,895.0	7,889.0	29.4	27.4	-81.77	476.1	-590.0	288.5	232.3	56.20	5.135	
7,980.0	7,944.6	7,904.8	7,898.8	29.4	27.4	-81.71	476.5	-590.1	288.6	232.4	56.26	5.130	
7,990.0	7,954.6	7,914.7	7,908.7	29.4	27.5	-81.65	476.8	-590.1	288.7	232.4	56.33	5.126	
8,000.0	7,964.6	7,924.6	7,918.6	29.5	27.5	-81.58	477.1	-590.2	288.8	232.4	56.40	5.121	
8,010.0	7,974.6	7,934.6	7,928.6	29.5	27.5	-81.52	477.4	-590.3	289.0	232.5	56.47	5.117	
8,020.0	7,984.6	7,944.8	7,938.8	29.6	27.6	-81.46	477.8	-590.3	289.1	232.5	56.54	5.113	
8,030.0	7,994.6	7,955.0	7,949.0	29.6	27.6	-81.40	478.1	-590.4	289.2	232.6	56.61	5.108	
8,040.0	8,004.6	7,965.2	7,959.1	29.6	27.6	-81.34	478.4	-590.4	289.3	232.6	56.68	5.104	
8,050.0	8,014.6	7,975.4	7,969.3	29.7	27.7	-81.29	478.6	-590.5	289.3	232.6	56.74	5.099	
8,060.0	8,024.6	7,985.6	7,979.5	29.7	27.7	-81.24	478.9	-590.5	289.4	232.6	56.81	5.094	
8,070.0	8,034.6	7,995.7	7,989.7	29.7	27.7	-81.20	479.1	-590.5	289.5	232.6	56.88	5.089	
8,080.0	8,044.6	8,005.9	7,999.9	29.8	27.8	-81.15	479.4	-590.6	289.6	232.6	56.95	5.084	
8,090.0	8,054.6	8,016.1	8,010.1	29.8	27.8	-81.11	479.6	-590.6	289.6	232.6	57.02	5.079	
8,100.0	8,064.6	8,026.3	8,020.2	29.8	27.8	-81.08	479.8	-590.6	289.7	232.6	57.09	5.074	
8,110.0	8,074.6	8,036.1	8,030.1	29.9	27.9	-81.05	479.9	-590.7	289.7	232.6	57.16	5.069	
8,120.0	8,084.6	8,046.0	8,039.9	29.9	27.9	-81.02	480.1	-590.7	289.8	232.6	57.23	5.064	
8,130.0	8,094.6	8,055.8	8,049.8	29.9	27.9	-80.99	480.2	-590.7	289.8	232.6	57.30	5.059	
8,140.0	8,104.6	8,065.7	8,059.6	30.0	28.0	-80.96	480.4	-590.8	289.9	232.6	57.37	5.054	
8,150.0	8,114.6	8,075.6	8,069.5	30.0	28.0	-80.94	480.5	-590.8	290.0	232.6	57.43	5.049	
8,160.0	8,124.6	8,085.4	8,079.4	30.0	28.1	-80.92	480.6	-590.9	290.1	232.6	57.50	5.044	
8,170.0	8,134.6	8,095.3	8,089.2	30.1	28.1	-80.90	480.7	-591.0	290.2	232.6	57.57	5.040	
8,180.0	8,144.6	8,105.1	8,099.1	30.1	28.1	-80.88	480.8	-591.0	290.2	232.6	57.64	5.035	
8,190.0	8,154.6	8,115.0	8,108.9	30.1	28.2	-80.87	480.9	-591.1	290.3	232.6	57.71	5.031	
8,200.0	8,164.6	8,124.8	8,118.8	30.2	28.2	-80.86	481.0	-591.2	290.4	232.7	57.78	5.027	
8,210.0	8,174.6	8,134.7	8,128.6	30.2	28.2	-80.85	481.0	-591.3	290.5	232.7	57.85	5.023	
8,220.0	8,184.6	8,144.5	8,138.4	30.2	28.3	-80.84	481.1	-591.4	290.6	232.7	57.91	5.019	
8,230.0	8,194.6	8,154.3	8,148.3	30.3	28.3	-80.83	481.2	-591.5	290.8	232.8	57.98	5.015	
8,240.0	8,204.6	8,164.2	8,158.1	30.3	28.3	-80.82	481.2	-591.6	290.9	232.8	58.05	5.011	
8,250.0	8,214.6	8,174.0	8,167.9	30.3	28.4	-80.81	481.3	-591.7	291.0	232.9	58.12	5.007	
8,260.0	8,224.6	8,183.8	8,177.7	30.4	28.4	-80.81	481.3	-591.9	291.1	233.0	58.19	5.004	
8,270.0	8,234.6	8,193.6	8,187.6	30.4	28.4	-80.80	481.4	-592.0	291.3	233.0	58.26	5.000	
8,280.0	8,244.6	8,203.8	8,197.8	30.4	28.5	-80.80	481.4	-592.1	291.4	233.1	58.33	4.996	
8,290.0	8,254.6	8,214.1	8,208.0	30.5	28.5	-80.82	481.3	-592.3	291.6	233.2	58.40	4.993	
8,300.0	8,264.6	8,224.3	8,218.3	30.5	28.5	-80.86	481.1	-592.4	291.7	233.2	58.47	4.989	
8,310.0	8,274.6	8,234.6	8,228.5	30.5	28.6	-80.93	480.8	-592.6	291.8	233.3	58.54	4.985	
8,320.0	8,284.6	8,244.8	8,238.7	30.6	28.6	-81.03	480.4	-592.8	291.9	233.3	58.61	4.981	
8,330.0	8,294.6	8,255.0	8,248.9	30.6	28.6	-81.15	479.8	-593.0	292.0	233.3	58.68	4.976	
8,340.0	8,304.6	8,265.2	8,259.0	30.6	28.7	-81.30	479.0	-593.2	292.1	233.3	58.75	4.972	
8,350.0	8,314.6	8,275.4	8,269.2	30.7	28.7	-81.47	478.2	-593.4	292.2	233.4	58.82	4.967	
8,360.0	8,324.6	8,285.5	8,279.3	30.7	28.7	-81.67	477.2	-593.7	292.3	233.4	58.89	4.963	
8,370.0	8,334.6	8,295.6	8,289.3	30.8	28.8	-81.90	476.0	-593.9	292.4	233.4	58.97	4.958	
8,380.0	8,344.6	8,306.1	8,299.7	30.8	28.8	-82.16	474.7	-594.2	292.4	233.4	59.04	4.953	
8,390.0	8,354.6	8,316.9	8,310.4	30.8	28.8	-82.47	473.2	-594.4	292.5	233.4	59.11	4.948	
8,400.0	8,364.6	8,327.6	8,321.0	30.9	28.9	-82.82	471.4	-594.7	292.5	233.3	59.19	4.942	
8,410.0	8,374.6	8,338.2	8,331.4	30.9	28.9	-83.21	469.4	-595.0	292.5	233.3	59.26	4.936	
8,420.0	8,384.6	8,348.8	8,341.7	30.9	28.9	-83.64	467.3	-595.2	292.5	233.2	59.34	4.930	
8,430.0	8,394.6	8,359.2	8,351.9	31.0	29.0	-84.10	464.9	-595.5	292.5	233.1	59.41	4.924	
8,440.0	8,404.6	8,369.6	8,361.9	31.0	29.0	-84.60	462.4	-595.7	292.5	233.0	59.49	4.917	
8,450.0	8,414.6	8,379.8	8,371.8	31.0	29.0	-85.13	459.7	-596.0	292.5	233.0	59.57	4.911	
8,453.5	8,418.1	8,383.4	8,375.2	31.0	29.0	-85.33	458.7	-596.0	292.5	232.9	59.59	4.909	
8,460.0	8,424.6	8,390.0	8,381.5	31.1	29.1	-85.69	456.8	-596.2	292.5	232.9	59.64	4.905	
8,470.0	8,434.6	8,399.9	8,391.0	31.1	29.1	-86.28	453.8	-596.4	292.5	232.8	59.72	4.899	
8,480.0	8,444.6	8,409.6	8,400.2	31.1	29.1	-86.89	450.7	-596.6	292.6	232.8	59.79	4.893	
8,490.0	8,454.6	8,419.3	8,409.3	31.2	29.1	-87.53	447.5	-596.8	292.7	232.8	59.87	4.888	
8,500.0	8,464.6	8,428.8	8,418.2	31.2	29.2	-88.18	444.1	-597.1	292.8	232.8	59.94	4.884	
8,510.0	8,474.6	8,438.2	8,426.9	31.2	29.2	-88.86	440.7	-597.3	292.9	232.9	60.02	4.880	
8,520.0	8,484.6	8,447.4	8,435.5	31.3	29.2	-89.55	437.1	-597.5	293.1	233.0	60.09	4.878	
8,530.0	8,494.6	8,456.5	8,443.8	31.3	29.3	-90.27	433.5	-597.7	293.3	233.2	60.16	4.876	
8,540.0	8,504.6	8,465.5	8,452.0	31.3	29.3	-90.99	429.7	-597.9	293.6	233.4	60.24	4.875 SF	
8,550.0	8,514.6	8,474.4	8,460.0	31.4	29.3	-91.73	425.9	-598.1	294.0	233.7	60.31	4.875	
8,560.0	8,524.6	8,483.1	8,467.8	31.4	29.3	-92.49	422.1	-598.3	294.4	234.0	60.38	4.876	
8,570.0	8,534.6	8,491.7	8,475.5	31.4	29.4	-93.25	418.1	-598.5	294.9	234.5	60.45	4.879	
8,580.0	8,544.6	8,500.3	8,483.0	31.5	29.4	-94.03	414.1	-598.7	295.5	235.0	60.53	4.883	
8,590.0	8,554.6	8,508.8	8,490.4	31.5	29.4	-94.82	410.0	-598.9	296.2	235.6	60.60	4.888	
8,600.0	8,564.6	8,517.1	8,497.7	31.5	29.4	-95.61	405.9	-599.0	297.0	236.3	60.67	4.895	
8,610.0	8,574.6	8,525.3	8,504.8	31.6	29.5	-96.40	401.8	-599.2	297.8	237.1	60.74	4.903	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,620.0	8,584.6	8,533.4	8,511.7	31.6	29.5	-97.20	397.6	-599.4	298.8	238.0	60.81	4.913	
8,630.0	8,594.6	8,541.3	8,518.4	31.6	29.5	-97.99	393.4	-599.6	299.8	239.0	60.88	4.925	
8,640.0	8,604.6	8,549.1	8,525.0	31.7	29.5	-98.79	389.2	-599.7	301.0	240.1	60.95	4.939	
8,650.0	8,614.6	8,556.9	8,531.5	31.7	29.5	-99.58	385.0	-599.9	302.3	241.3	61.01	4.954	
8,660.0	8,624.6	8,564.4	8,537.8	31.8	29.6	-100.37	380.8	-600.0	303.7	242.6	61.08	4.972	
8,670.0	8,634.6	8,571.9	8,543.9	31.8	29.6	-101.16	376.5	-600.2	305.2	244.0	61.15	4.991	
8,680.0	8,644.6	8,583.0	8,553.0	31.8	29.6	-102.34	370.1	-600.4	306.8	245.6	61.23	5.011	
8,690.0	8,654.6	8,583.0	8,553.0	31.9	29.6	-102.34	370.1	-600.4	308.6	247.3	61.26	5.037	
8,700.0	8,664.6	8,593.5	8,561.4	31.9	29.6	-103.48	363.8	-600.6	310.4	249.1	61.34	5.061	
8,710.0	8,674.6	8,600.5	8,566.9	31.9	29.7	-104.24	359.6	-600.7	312.4	251.0	61.41	5.088	
8,720.0	8,684.6	8,607.3	8,572.3	32.0	29.7	-105.00	355.4	-600.8	314.6	253.1	61.47	5.118	
8,730.0	8,694.6	8,614.0	8,577.6	32.0	29.7	-105.74	351.3	-601.0	316.8	255.3	61.53	5.149	
8,740.0	8,704.6	8,620.6	8,582.7	32.0	29.7	-106.48	347.1	-601.1	319.3	257.7	61.59	5.183	
8,750.0	8,714.6	8,627.0	8,587.6	32.1	29.7	-107.21	342.9	-601.2	321.8	260.2	61.65	5.220	
8,760.0	8,724.6	8,633.4	8,592.5	32.1	29.8	-107.92	338.8	-601.3	324.5	262.8	61.71	5.258	
8,770.0	8,734.6	8,639.6	8,597.2	32.1	29.8	-108.63	334.7	-601.4	327.3	265.5	61.77	5.299	
8,780.0	8,744.6	8,645.8	8,601.7	32.2	29.8	-109.33	330.7	-601.5	330.3	268.4	61.83	5.342	
8,790.0	8,754.6	8,651.8	8,606.2	32.2	29.8	-110.01	326.6	-601.6	333.4	271.5	61.89	5.387	
8,800.0	8,764.6	8,657.7	8,610.5	32.2	29.8	-110.69	322.6	-601.7	336.6	274.7	61.94	5.434	
8,810.0	8,774.6	8,663.5	8,614.7	32.3	29.8	-111.35	318.6	-601.8	340.0	278.0	62.00	5.483	
8,820.0	8,784.6	8,677.0	8,624.4	32.3	29.9	-112.90	309.2	-602.0	343.6	281.5	62.08	5.534	
8,830.0	8,794.6	8,677.0	8,624.4	32.3	29.9	-112.90	309.2	-602.0	347.1	285.0	62.12	5.588	
8,840.0	8,804.6	8,677.0	8,624.4	32.4	29.9	-112.90	309.2	-602.0	350.9	288.8	62.15	5.646	
8,850.0	8,814.6	8,686.2	8,630.9	32.4	29.9	-113.94	302.7	-602.1	354.8	292.6	62.22	5.703	
8,860.0	8,824.6	8,691.8	8,634.8	32.4	29.9	-114.58	298.7	-602.2	358.8	296.6	62.27	5.762	
8,870.0	8,834.6	8,697.3	8,638.6	32.5	29.9	-115.21	294.7	-602.2	363.0	300.7	62.33	5.824	
8,880.0	8,844.6	8,702.7	8,642.3	32.5	30.0	-115.82	290.7	-602.3	367.3	304.9	62.38	5.888	
8,890.0	8,854.6	8,708.1	8,646.0	32.5	30.0	-116.43	286.8	-602.4	371.7	309.2	62.43	5.953	
8,900.0	8,864.6	8,713.4	8,649.5	32.6	30.0	-117.02	282.9	-602.4	376.2	313.7	62.48	6.021	
8,910.0	8,874.6	8,718.6	8,653.0	32.6	30.0	-117.60	279.0	-602.5	380.8	318.3	62.53	6.090	
8,920.0	8,884.6	8,723.7	8,656.4	32.6	30.0	-118.17	275.2	-602.5	385.6	323.0	62.58	6.161	
8,930.0	8,894.6	8,728.7	8,659.7	32.7	30.0	-118.73	271.4	-602.6	390.4	327.8	62.63	6.234	
8,940.0	8,904.6	8,740.0	8,667.1	32.7	30.1	-119.97	262.9	-602.7	395.5	332.8	62.70	6.307	
8,950.0	8,914.6	8,740.0	8,667.1	32.8	30.1	-119.97	262.9	-602.7	400.5	337.8	62.74	6.384	
8,960.0	8,924.6	8,744.6	8,670.0	32.8	30.1	-120.47	259.3	-602.7	405.7	342.9	62.78	6.461	
8,970.0	8,934.6	8,751.1	8,674.3	32.8	30.1	-121.17	254.4	-602.8	410.9	348.1	62.84	6.540	
8,980.0	8,944.6	8,757.6	8,678.4	32.9	30.1	-121.86	249.4	-602.8	416.3	353.4	62.89	6.619	
8,990.0	8,954.6	8,764.1	8,682.6	32.9	30.1	-122.54	244.4	-602.9	421.7	358.7	62.94	6.699	
9,000.0	8,964.6	8,770.6	8,686.8	32.9	30.2	-123.21	239.4	-602.9	427.1	364.1	62.99	6.780	
9,010.0	8,974.6	8,777.1	8,690.9	33.0	30.2	-123.87	234.5	-602.9	432.7	369.6	63.04	6.863	
9,020.0	8,984.6	8,783.5	8,695.1	33.0	30.2	-124.52	229.5	-603.0	438.2	375.2	63.10	6.946	
9,030.0	8,994.6	8,790.0	8,699.2	33.0	30.2	-125.16	224.6	-603.0	443.9	380.8	63.15	7.030	
9,040.0	9,004.6	8,796.4	8,703.4	33.1	30.3	-125.78	219.7	-603.0	449.6	386.4	63.20	7.115	
9,050.0	9,014.6	8,802.9	8,707.6	33.1	30.3	-126.40	214.7	-603.0	455.4	392.1	63.25	7.200	
9,060.0	9,024.6	8,809.2	8,711.6	33.1	30.3	-126.99	209.9	-603.1	461.2	397.9	63.30	7.287	
9,070.0	9,034.6	8,815.5	8,715.7	33.2	30.3	-127.57	205.1	-603.1	467.1	403.8	63.35	7.374	
9,080.0	9,044.6	8,821.8	8,719.8	33.2	30.3	-128.14	200.2	-603.2	473.0	409.6	63.39	7.462	
9,090.0	9,054.6	8,828.2	8,723.9	33.2	30.4	-128.71	195.4	-603.3	479.0	415.6	63.44	7.551	
9,100.0	9,064.6	8,834.0	8,727.6	33.3	30.4	-129.21	191.0	-603.3	485.1	421.6	63.49	7.640	
9,110.0	9,074.6	8,839.2	8,731.0	33.3	30.4	-129.66	187.0	-603.4	491.2	427.6	63.54	7.730	
9,120.0	9,084.6	8,843.9	8,734.0	33.3	30.4	-130.06	183.4	-603.5	497.3	433.7	63.58	7.822	
9,130.0	9,094.6	8,848.5	8,736.9	33.4	30.4	-130.46	179.8	-603.5	503.5	439.9	63.62	7.914	
9,140.0	9,104.6	8,853.0	8,739.8	33.4	30.4	-130.84	176.3	-603.5	509.8	446.1	63.67	8.007	
9,150.0	9,114.6	8,861.3	8,744.9	33.4	30.5	-131.55	169.8	-603.5	516.2	452.5	63.72	8.101	
9,160.0	9,124.6	8,862.0	8,745.4	33.5	30.5	-131.61	169.3	-603.5	522.6	458.8	63.76	8.196	
9,170.0	9,134.6	8,866.0	8,747.8	33.5	30.5	-131.94	166.1	-603.5	529.0	465.2	63.80	8.292	
9,180.0	9,144.6	8,871.2	8,751.0	33.5	30.5	-132.38	162.0	-603.4	535.5	471.7	63.84	8.389	
9,190.0	9,154.6	8,875.5	8,753.6	33.6	30.5	-132.74	158.6	-603.4	542.1	478.2	63.89	8.486	
9,200.0	9,164.6	8,879.6	8,756.1	33.6	30.5	-133.08	155.3	-603.3	548.8	484.8	63.93	8.584	
9,210.0	9,174.6	8,883.7	8,758.5	33.6	30.6	-133.43	152.0	-603.3	555.4	491.5	63.97	8.683	
9,220.0	9,184.6	8,887.8	8,761.0	33.7	30.6	-133.76	148.8	-603.2	562.2	498.2	64.01	8.783	
9,230.0	9,194.6	8,894.6	8,765.0	33.7	30.6	-134.32	143.3	-603.1	569.0	504.9	64.06	8.883	
9,240.0	9,204.6	8,895.7	8,765.6	33.8	30.6	-134.41	142.4	-603.1	575.8	511.8	64.09	8.984	
9,250.0	9,214.6	8,897.0	8,766.4	33.8	30.6	-134.51	141.3	-603.0	582.8	518.6	64.13	9.087	
9,260.0	9,224.6	8,904.5	8,770.7	33.8	30.6	-135.12	135.2	-602.9	589.7	525.5	64.18	9.188	
9,270.0	9,234.6	8,908.9	8,773.2	33.9	30.7	-135.47	131.6	-602.7	596.7	532.5	64.22	9.291	

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

Offset Design Cypress 34 Fed - 11H - OH - OH

Survey Program: 411-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,280.0	9,244.6	8,913.2	8,775.7	33.9	30.7	-135.82	128.1	-602.6	603.7	539.5	64.26	9.395	
9,290.0	9,254.6	8,917.5	8,778.1	33.9	30.7	-136.16	124.5	-602.4	610.8	546.5	64.30	9.499	
9,300.0	9,264.6	8,921.8	8,780.5	34.0	30.7	-136.50	121.0	-602.3	617.9	553.6	64.34	9.603	
9,310.0	9,274.6	8,928.0	8,784.0	34.0	30.7	-136.99	115.8	-602.0	625.1	560.7	64.39	9.708	
9,320.0	9,284.6	8,928.0	8,784.0	34.0	30.7	-136.99	115.8	-602.0	632.3	567.9	64.42	9.815	
9,330.0	9,294.6	8,928.0	8,784.0	34.1	30.7	-136.99	115.8	-602.0	639.6	575.1	64.46	9.922	

Offset Design Cypress 34 Fed - 5H - OH - OH

Survey Program: 100-CB-GYRO-MS, 7367-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,360.0	7,324.6	8,560.0	7,900.0	27.3	68.5	168.60	-297.6	-156.7	946.7	851.8	94.89	9.977	
7,370.0	7,334.6	8,560.2	7,900.0	27.3	68.5	168.58	-297.6	-156.5	940.6	845.7	94.93	9.909	
7,380.0	7,344.6	8,560.5	7,900.0	27.4	68.5	168.56	-297.5	-156.3	934.6	839.6	94.96	9.841	
7,390.0	7,354.6	8,560.7	7,900.0	27.4	68.5	168.55	-297.5	-156.1	928.6	833.6	95.00	9.775	
7,400.0	7,364.6	8,560.9	7,900.0	27.4	68.5	168.53	-297.4	-155.9	922.7	827.7	95.04	9.709	
7,410.0	7,374.6	8,561.1	7,900.0	27.5	68.5	168.51	-297.4	-155.7	916.9	821.8	95.07	9.644	
7,420.0	7,384.6	8,561.3	7,900.0	27.5	68.5	168.50	-297.3	-155.5	911.1	816.0	95.11	9.579	
7,430.0	7,394.6	8,561.5	7,900.0	27.5	68.5	168.48	-297.3	-155.3	905.4	810.3	95.15	9.516	
7,440.0	7,404.6	8,561.7	7,900.0	27.6	68.5	168.46	-297.3	-155.1	899.8	804.6	95.19	9.453	
7,450.0	7,414.6	8,562.0	7,900.0	27.6	68.5	168.45	-297.2	-154.9	894.3	799.1	95.22	9.391	
7,460.0	7,424.6	8,562.2	7,900.0	27.6	68.5	168.43	-297.2	-154.6	888.8	793.6	95.26	9.331	
7,470.0	7,434.6	8,562.4	7,900.0	27.7	68.5	168.42	-297.1	-154.4	883.4	788.2	95.30	9.271	
7,480.0	7,444.6	8,562.6	7,900.0	27.7	68.5	168.40	-297.1	-154.2	878.2	782.8	95.33	9.211	
7,490.0	7,454.6	8,562.8	7,900.0	27.7	68.5	168.38	-297.0	-154.0	872.9	777.6	95.37	9.153	
7,500.0	7,464.6	8,563.0	7,900.0	27.8	68.5	168.37	-297.0	-153.8	867.8	772.4	95.41	9.096	
7,510.0	7,474.6	8,563.2	7,900.0	27.8	68.5	168.35	-296.9	-153.6	862.8	767.3	95.44	9.039	
7,520.0	7,484.6	8,563.5	7,900.0	27.8	68.5	168.33	-296.9	-153.4	857.8	762.3	95.48	8.984	
7,530.0	7,494.6	8,563.7	7,900.0	27.9	68.5	168.32	-296.8	-153.2	852.9	757.4	95.52	8.930	
7,540.0	7,504.6	8,563.9	7,900.1	27.9	68.5	168.30	-296.8	-153.0	848.2	752.6	95.56	8.876	
7,550.0	7,514.6	8,564.1	7,900.1	27.9	68.5	168.28	-296.7	-152.7	843.5	747.9	95.59	8.824	
7,560.0	7,524.6	8,564.3	7,900.1	28.0	68.5	168.27	-296.7	-152.5	838.9	743.3	95.63	8.772	
7,570.0	7,534.6	8,564.6	7,900.1	28.0	68.5	168.25	-296.6	-152.3	834.4	738.7	95.67	8.722	
7,580.0	7,544.6	8,564.8	7,900.1	28.0	68.5	168.23	-296.6	-152.1	830.0	734.3	95.70	8.672	
7,590.0	7,554.6	8,565.0	7,900.1	28.1	68.5	168.22	-296.6	-151.9	825.7	729.9	95.74	8.624	
7,600.0	7,564.6	8,565.2	7,900.1	28.1	68.5	168.20	-296.5	-151.7	821.5	725.7	95.78	8.577	
7,610.0	7,574.6	8,565.4	7,900.1	28.2	68.5	168.18	-296.5	-151.5	817.4	721.5	95.81	8.531	
7,620.0	7,584.6	8,565.6	7,900.1	28.2	68.5	168.17	-296.4	-151.2	813.4	717.5	95.85	8.486	
7,630.0	7,594.6	8,565.9	7,900.1	28.2	68.5	168.15	-296.4	-151.0	809.5	713.6	95.89	8.442	
7,640.0	7,604.6	8,566.1	7,900.1	28.3	68.5	168.13	-296.3	-150.8	805.7	709.7	95.93	8.399	
7,650.0	7,614.6	8,566.3	7,900.1	28.3	68.5	168.11	-296.3	-150.6	802.0	706.0	95.96	8.357	
7,660.0	7,624.6	8,566.5	7,900.1	28.3	68.5	168.10	-296.2	-150.4	798.4	702.4	96.00	8.317	
7,670.0	7,634.6	8,566.7	7,900.1	28.4	68.5	168.08	-296.2	-150.2	794.9	698.9	96.04	8.277	
7,680.0	7,644.6	8,567.0	7,900.1	28.4	68.5	168.06	-296.1	-150.0	791.6	695.5	96.07	8.239	
7,690.0	7,654.6	8,567.2	7,900.1	28.4	68.5	168.05	-296.1	-149.7	788.3	692.2	96.11	8.202	
7,700.0	7,664.6	8,567.4	7,900.1	28.5	68.5	168.03	-296.0	-149.5	785.2	689.0	96.15	8.166	
7,710.0	7,674.6	8,567.6	7,900.1	28.5	68.5	168.01	-296.0	-149.3	782.2	686.0	96.18	8.132	
7,720.0	7,684.6	8,567.9	7,900.1	28.5	68.5	168.00	-295.9	-149.1	779.3	683.0	96.22	8.099	
7,730.0	7,694.6	8,568.1	7,900.2	28.6	68.5	167.98	-295.9	-148.9	776.5	680.2	96.26	8.067	
7,740.0	7,704.6	8,568.3	7,900.2	28.6	68.5	167.96	-295.8	-148.7	773.8	677.5	96.30	8.036	
7,750.0	7,714.6	8,568.5	7,900.2	28.6	68.5	167.95	-295.8	-148.4	771.3	674.9	96.33	8.006	
7,760.0	7,724.6	8,568.7	7,900.2	28.7	68.5	167.93	-295.7	-148.2	768.8	672.5	96.37	7.978	
7,770.0	7,734.6	8,569.0	7,900.2	28.7	68.5	167.91	-295.7	-148.0	766.5	670.1	96.41	7.951	
7,780.0	7,744.6	8,569.2	7,900.2	28.7	68.5	167.89	-295.7	-147.8	764.4	667.9	96.44	7.926	
7,790.0	7,754.6	8,569.4	7,900.2	28.8	68.5	167.88	-295.6	-147.6	762.3	665.8	96.48	7.901	
7,800.0	7,764.6	8,569.6	7,900.2	28.8	68.6	167.86	-295.6	-147.4	760.4	663.9	96.52	7.878	
7,810.0	7,774.6	8,569.9	7,900.2	28.8	68.6	167.84	-295.5	-147.1	758.6	662.0	96.56	7.857	
7,820.0	7,784.6	8,570.1	7,900.2	28.9	68.6	167.83	-295.5	-146.9	756.9	660.3	96.59	7.836	
7,830.0	7,794.6	8,570.3	7,900.2	28.9	68.6	167.81	-295.4	-146.7	755.4	658.8	96.63	7.817	
7,840.0	7,804.6	8,570.5	7,900.2	28.9	68.6	167.79	-295.4	-146.5	754.0	657.3	96.67	7.800	
7,850.0	7,814.6	8,570.8	7,900.2	29.0	68.6	167.77	-295.3	-146.3	752.7	656.0	96.70	7.783	
7,860.0	7,824.6	8,571.0	7,900.2	29.0	68.6	167.76	-295.3	-146.0	751.5	654.8	96.74	7.769	
7,870.0	7,834.6	8,571.2	7,900.2	29.0	68.6	167.74	-295.2	-145.8	750.5	653.7	96.78	7.755	
7,880.0	7,844.6	8,571.4	7,900.2	29.1	68.6	167.72	-295.2	-145.6	749.6	652.8	96.82	7.743	
7,890.0	7,854.6	8,571.7	7,900.2	29.1	68.6	167.70	-295.1	-145.4	748.9	652.0	96.85	7.732	
7,900.0	7,864.6	8,571.9	7,900.2	29.1	68.6	167.69	-295.1	-145.1	748.3	651.4	96.89	7.723	
7,910.0	7,874.6	8,572.1	7,900.3	29.2	68.6	167.67	-295.0	-144.9	747.8	650.8	96.93	7.715	
7,920.0	7,884.6	8,572.3	7,900.3	29.2	68.6	167.65	-295.0	-144.7	747.4	650.4	96.96	7.708	
7,930.0	7,894.6	8,572.6	7,900.3	29.2	68.6	167.63	-294.9	-144.5	747.2	650.2	97.00	7.703	
7,940.0	7,904.6	8,572.8	7,900.3	29.3	68.6	167.62	-294.9	-144.3	747.1	650.1	97.04	7.699	
7,941.7	7,906.3	8,572.8	7,900.3	29.3	68.6	167.61	-294.9	-144.2	747.1	650.0	97.04	7.698	CC, ES
7,950.0	7,914.6	8,573.0	7,900.3	29.3	68.6	167.60	-294.8	-144.0	747.1	650.1	97.08	7.696	
7,960.0	7,924.6	8,573.3	7,900.3	29.3	68.6	167.58	-294.8	-143.8	747.3	650.2	97.11	7.695	SF
7,970.0	7,934.6	8,573.5	7,900.3	29.4	68.6	167.56	-294.7	-143.6	747.6	650.5	97.15	7.696	
7,980.0	7,944.6	8,573.7	7,900.3	29.4	68.6	167.55	-294.7	-143.4	748.1	650.9	97.19	7.697	
7,990.0	7,954.6	8,573.9	7,900.3	29.4	68.6	167.53	-294.6	-143.1	748.7	651.4	97.22	7.700	
8,000.0	7,964.6	8,574.2	7,900.3	29.5	68.6	167.51	-294.6	-142.9	749.4	652.1	97.26	7.705	

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

Offset Design Cypress 34 Fed - 5H - OH - OH

Survey Program: 100-CB-GYRO-MS, 7367-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,010.0	7,974.6	8,574.4	7,900.3	29.5	68.6	167.49	-294.5	-142.7	750.2	652.9	97.30	7.710	
8,020.0	7,984.6	8,574.6	7,900.3	29.6	68.6	167.48	-294.5	-142.5	751.2	653.8	97.34	7.717	
8,030.0	7,994.6	8,574.9	7,900.3	29.6	68.6	167.46	-294.4	-142.2	752.3	654.9	97.37	7.726	
8,040.0	8,004.6	8,575.1	7,900.3	29.6	68.6	167.44	-294.4	-142.0	753.5	656.1	97.41	7.736	
8,050.0	8,014.6	8,575.3	7,900.3	29.7	68.6	167.42	-294.3	-141.8	754.9	657.5	97.45	7.747	
8,060.0	8,024.6	8,575.6	7,900.3	29.7	68.6	167.41	-294.3	-141.6	756.4	658.9	97.48	7.759	
8,070.0	8,034.6	8,575.8	7,900.3	29.7	68.6	167.39	-294.2	-141.3	758.0	660.5	97.52	7.773	
8,080.0	8,044.6	8,576.0	7,900.3	29.8	68.6	167.37	-294.2	-141.1	759.8	662.2	97.56	7.788	
8,090.0	8,054.6	8,576.3	7,900.4	29.8	68.6	167.35	-294.1	-140.9	761.7	664.1	97.60	7.804	
8,100.0	8,064.6	8,576.5	7,900.4	29.8	68.6	167.33	-294.1	-140.7	763.7	666.0	97.63	7.822	
8,110.0	8,074.6	8,576.7	7,900.4	29.9	68.6	167.32	-294.0	-140.4	765.8	668.1	97.67	7.841	
8,120.0	8,084.6	8,577.0	7,900.4	29.9	68.6	167.30	-294.0	-140.2	768.1	670.4	97.71	7.861	
8,130.0	8,094.6	8,577.2	7,900.4	29.9	68.6	167.28	-293.9	-140.0	770.5	672.7	97.75	7.882	
8,140.0	8,104.6	8,577.4	7,900.4	30.0	68.6	167.26	-293.9	-139.8	773.0	675.2	97.78	7.905	
8,150.0	8,114.6	8,577.7	7,900.4	30.0	68.6	167.24	-293.8	-139.5	775.6	677.8	97.82	7.929	
8,160.0	8,124.6	8,577.9	7,900.4	30.0	68.6	167.23	-293.8	-139.3	778.3	680.5	97.86	7.954	
8,170.0	8,134.6	8,578.1	7,900.4	30.1	68.6	167.21	-293.7	-139.1	781.2	683.3	97.89	7.980	
8,180.0	8,144.6	8,578.4	7,900.4	30.1	68.6	167.19	-293.7	-138.8	784.2	686.2	97.93	8.007	
8,190.0	8,154.6	8,578.6	7,900.4	30.1	68.6	167.17	-293.6	-138.6	787.3	689.3	97.97	8.036	
8,200.0	8,164.6	8,578.8	7,900.4	30.2	68.6	167.15	-293.6	-138.4	790.5	692.5	98.01	8.066	
8,210.0	8,174.6	8,579.1	7,900.4	30.2	68.6	167.14	-293.5	-138.1	793.8	695.8	98.04	8.096	
8,220.0	8,184.6	8,579.3	7,900.4	30.2	68.6	167.12	-293.5	-137.9	797.2	699.1	98.08	8.128	
8,230.0	8,194.6	8,579.5	7,900.4	30.3	68.6	167.10	-293.4	-137.7	800.8	702.7	98.12	8.161	
8,240.0	8,204.6	8,579.8	7,900.4	30.3	68.7	167.08	-293.4	-137.5	804.4	706.3	98.16	8.195	
8,250.0	8,214.6	8,580.0	7,900.4	30.3	68.7	167.06	-293.3	-137.2	808.2	710.0	98.19	8.231	
8,260.0	8,224.6	8,580.2	7,900.5	30.4	68.7	167.05	-293.3	-137.0	812.1	713.8	98.23	8.267	
8,270.0	8,234.6	8,580.5	7,900.5	30.4	68.7	167.03	-293.2	-136.8	816.0	717.8	98.27	8.304	
8,280.0	8,244.6	8,580.7	7,900.5	30.4	68.7	167.01	-293.2	-136.5	820.1	721.8	98.30	8.342	
8,290.0	8,254.6	8,581.0	7,900.5	30.5	68.7	166.99	-293.1	-136.3	824.3	725.9	98.34	8.382	
8,300.0	8,264.6	8,581.2	7,900.5	30.5	68.7	166.97	-293.1	-136.1	828.5	730.2	98.38	8.422	
8,310.0	8,274.6	8,581.4	7,900.5	30.5	68.7	166.96	-293.0	-135.8	832.9	734.5	98.42	8.463	
8,320.0	8,284.6	8,581.7	7,900.5	30.6	68.7	166.94	-293.0	-135.6	837.4	738.9	98.45	8.505	
8,330.0	8,294.6	8,581.9	7,900.5	30.6	68.7	166.92	-292.9	-135.4	841.9	743.5	98.49	8.548	
8,340.0	8,304.6	8,582.2	7,900.5	30.6	68.7	166.90	-292.9	-135.1	846.6	748.1	98.53	8.592	
8,350.0	8,314.6	8,582.4	7,900.5	30.7	68.7	166.88	-292.8	-134.9	851.3	752.8	98.57	8.637	
8,360.0	8,324.6	8,582.6	7,900.5	30.7	68.7	166.86	-292.8	-134.7	856.2	757.6	98.60	8.683	
8,370.0	8,334.6	8,582.9	7,900.5	30.8	68.7	166.84	-292.7	-134.4	861.1	762.5	98.64	8.730	
8,380.0	8,344.6	8,583.1	7,900.5	30.8	68.7	166.83	-292.7	-134.2	866.1	767.5	98.68	8.777	
8,390.0	8,354.6	8,583.4	7,900.5	30.8	68.7	166.81	-292.6	-134.0	871.2	772.5	98.71	8.826	
8,400.0	8,364.6	8,583.6	7,900.5	30.9	68.7	166.79	-292.6	-133.7	876.4	777.7	98.75	8.875	
8,410.0	8,374.6	8,583.8	7,900.5	30.9	68.7	166.77	-292.5	-133.5	881.7	782.9	98.79	8.925	
8,420.0	8,384.6	8,584.1	7,900.6	30.9	68.7	166.75	-292.5	-133.3	887.0	788.2	98.83	8.976	
8,430.0	8,394.6	8,584.3	7,900.6	31.0	68.7	166.73	-292.4	-133.0	892.5	793.6	98.86	9.027	
8,440.0	8,404.6	8,584.6	7,900.6	31.0	68.7	166.72	-292.4	-132.8	898.0	799.1	98.90	9.079	
8,450.0	8,414.6	8,584.8	7,900.6	31.0	68.7	166.70	-292.3	-132.5	903.6	804.6	98.94	9.132	
8,460.0	8,424.6	8,585.0	7,900.6	31.1	68.7	166.68	-292.3	-132.3	909.2	810.2	98.98	9.186	
8,470.0	8,434.6	8,585.3	7,900.6	31.1	68.7	166.66	-292.2	-132.1	914.9	815.9	99.01	9.241	
8,480.0	8,444.6	8,585.5	7,900.6	31.1	68.7	166.64	-292.2	-131.8	920.8	821.7	99.05	9.296	
8,490.0	8,454.6	8,585.8	7,900.6	31.2	68.7	166.62	-292.1	-131.6	926.6	827.5	99.09	9.352	
8,500.0	8,464.6	8,586.0	7,900.6	31.2	68.7	166.60	-292.0	-131.3	932.6	833.5	99.13	9.408	
8,510.0	8,474.6	8,586.3	7,900.6	31.2	68.7	166.58	-292.0	-131.1	938.6	839.4	99.16	9.465	
8,520.0	8,484.6	8,586.5	7,900.6	31.3	68.7	166.57	-291.9	-130.9	944.7	845.5	99.20	9.523	
8,530.0	8,494.6	8,586.8	7,900.6	31.3	68.7	166.55	-291.9	-130.6	950.8	851.6	99.24	9.581	
8,540.0	8,504.6	8,587.0	7,900.6	31.3	68.7	166.53	-291.8	-130.4	957.1	857.8	99.28	9.640	
8,550.0	8,514.6	8,587.2	7,900.6	31.4	68.7	166.51	-291.8	-130.2	963.3	864.0	99.31	9.700	
8,560.0	8,524.6	8,587.5	7,900.6	31.4	68.7	166.49	-291.7	-129.9	969.7	870.3	99.35	9.760	
8,570.0	8,534.6	8,587.7	7,900.6	31.4	68.7	166.47	-291.7	-129.7	976.1	876.7	99.39	9.821	
8,580.0	8,544.6	8,588.0	7,900.6	31.5	68.7	166.45	-291.6	-129.4	982.5	883.1	99.43	9.882	
8,590.0	8,554.6	8,588.2	7,900.7	31.5	68.7	166.43	-291.6	-129.2	989.1	889.6	99.46	9.944	

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,410.0	1,407.5	1,374.1	1,373.9	4.9	12.9	-65.17	8.6	-200.6	175.8	158.1	17.73	9.919	
1,420.0	1,417.4	1,384.1	1,383.9	4.9	13.0	-65.57	8.6	-200.7	175.4	157.5	17.85	9.825	
1,430.0	1,427.3	1,394.2	1,394.0	4.9	13.1	-65.97	8.6	-200.8	174.9	156.9	17.97	9.731	
1,440.0	1,437.2	1,404.2	1,404.0	5.0	13.1	-66.38	8.6	-200.9	174.4	156.3	18.09	9.639	
1,450.0	1,447.1	1,414.3	1,414.1	5.0	13.2	-66.80	8.6	-201.0	173.9	155.7	18.21	9.548	
1,460.0	1,457.0	1,424.4	1,424.3	5.1	13.3	-67.22	8.7	-201.0	173.4	155.1	18.34	9.458	
1,470.0	1,466.9	1,434.5	1,434.3	5.1	13.4	-67.64	8.7	-201.1	172.9	154.5	18.46	9.369	
1,480.0	1,476.8	1,444.5	1,444.4	5.1	13.5	-68.07	8.7	-201.1	172.5	153.9	18.58	9.281	
1,490.0	1,486.7	1,454.6	1,454.4	5.2	13.6	-68.49	8.7	-201.2	172.0	153.3	18.70	9.195	
1,500.0	1,496.6	1,464.6	1,464.4	5.2	13.6	-68.92	8.7	-201.2	171.5	152.7	18.83	9.110	
1,510.0	1,506.5	1,474.6	1,474.4	5.3	13.7	-69.36	8.7	-201.2	171.0	152.1	18.95	9.026	
1,520.0	1,516.5	1,484.6	1,484.4	5.3	13.8	-69.79	8.7	-201.2	170.5	151.5	19.07	8.943	
1,530.0	1,526.4	1,494.5	1,494.3	5.3	13.9	-70.23	8.7	-201.3	170.1	150.9	19.19	8.862	
1,540.0	1,536.3	1,504.3	1,504.2	5.4	14.0	-70.66	8.7	-201.3	169.6	150.3	19.31	8.783	
1,550.0	1,546.2	1,514.2	1,514.0	5.4	14.1	-71.10	8.7	-201.3	169.2	149.7	19.43	8.705	
1,560.0	1,556.1	1,524.1	1,524.0	5.4	14.1	-71.54	8.7	-201.3	168.8	149.2	19.56	8.629	
1,570.0	1,566.0	1,534.0	1,533.9	5.5	14.2	-71.99	8.7	-201.3	168.3	148.7	19.68	8.554	
1,580.0	1,575.9	1,543.9	1,543.8	5.5	14.3	-72.43	8.7	-201.3	167.9	148.1	19.80	8.481	
1,590.0	1,585.8	1,553.8	1,553.6	5.6	14.4	-72.88	8.7	-201.4	167.5	147.6	19.92	8.409	
1,600.0	1,595.7	1,563.7	1,563.6	5.6	14.5	-73.34	8.7	-201.4	167.1	147.1	20.04	8.339	
1,610.0	1,605.6	1,573.7	1,573.5	5.6	14.5	-73.79	8.7	-201.4	166.8	146.6	20.16	8.270	
1,620.0	1,615.5	1,583.6	1,583.4	5.7	14.6	-74.25	8.6	-201.4	166.4	146.1	20.29	8.202	
1,630.0	1,625.4	1,593.5	1,593.3	5.7	14.7	-74.71	8.6	-201.4	166.0	145.6	20.41	8.135	
1,640.0	1,635.3	1,603.4	1,603.2	5.8	14.8	-75.17	8.6	-201.4	165.7	145.1	20.53	8.070	
1,650.0	1,645.2	1,613.3	1,613.1	5.8	14.9	-75.63	8.6	-201.5	165.3	144.7	20.65	8.006	
1,660.0	1,655.1	1,623.2	1,623.0	5.8	15.0	-76.09	8.6	-201.5	165.0	144.2	20.77	7.943	
1,670.0	1,665.0	1,633.1	1,632.9	5.9	15.0	-76.56	8.6	-201.5	164.7	143.8	20.90	7.881	
1,680.0	1,674.9	1,643.0	1,642.8	5.9	15.1	-77.03	8.6	-201.5	164.4	143.4	21.02	7.821	
1,690.0	1,684.8	1,652.9	1,652.7	6.0	15.2	-77.50	8.6	-201.5	164.1	143.0	21.14	7.762	
1,700.0	1,694.7	1,662.8	1,662.6	6.0	15.3	-77.97	8.6	-201.5	163.8	142.6	21.26	7.704	
1,710.0	1,704.6	1,672.7	1,672.5	6.0	15.4	-78.44	8.6	-201.6	163.5	142.2	21.39	7.647	
1,720.0	1,714.5	1,682.6	1,682.4	6.1	15.5	-78.91	8.6	-201.6	163.3	141.8	21.51	7.591	
1,730.0	1,724.4	1,692.5	1,692.3	6.1	15.5	-79.38	8.6	-201.6	163.0	141.4	21.63	7.537	
1,740.0	1,734.3	1,702.3	1,702.1	6.2	15.6	-79.85	8.6	-201.6	162.8	141.1	21.76	7.483	
1,750.0	1,744.2	1,712.1	1,712.0	6.2	15.7	-80.31	8.6	-201.7	162.6	140.7	21.88	7.431	
1,760.0	1,754.1	1,722.0	1,721.8	6.2	15.8	-80.78	8.6	-201.7	162.4	140.4	22.01	7.380	
1,770.0	1,764.0	1,732.0	1,731.9	6.3	15.9	-81.26	8.6	-201.7	162.2	140.1	22.13	7.329	
1,780.0	1,773.9	1,742.0	1,741.8	6.3	16.0	-81.74	8.6	-201.7	162.0	139.8	22.26	7.280	
1,790.0	1,783.8	1,752.0	1,751.8	6.4	16.0	-82.22	8.6	-201.8	161.8	139.5	22.38	7.231	
1,800.0	1,793.7	1,761.9	1,761.7	6.4	16.1	-82.71	8.6	-201.8	161.7	139.2	22.50	7.184	
1,810.0	1,803.6	1,771.8	1,771.6	6.4	16.2	-83.19	8.6	-201.8	161.5	138.9	22.63	7.137	
1,820.0	1,813.5	1,781.7	1,781.5	6.5	16.3	-83.68	8.6	-201.8	161.4	138.6	22.75	7.092	
1,830.0	1,823.4	1,791.6	1,791.5	6.5	16.4	-84.17	8.6	-201.8	161.2	138.3	22.88	7.048	
1,840.0	1,833.3	1,801.6	1,801.4	6.6	16.5	-84.66	8.6	-201.8	161.1	138.1	23.00	7.005	
1,850.0	1,843.2	1,811.5	1,811.3	6.6	16.5	-85.15	8.6	-201.8	161.0	137.9	23.12	6.963	
1,860.0	1,853.1	1,821.4	1,821.3	6.6	16.6	-85.64	8.6	-201.8	160.9	137.6	23.24	6.922	
1,870.0	1,863.0	1,831.4	1,831.2	6.7	16.7	-86.13	8.6	-201.8	160.8	137.4	23.36	6.881	
1,880.0	1,872.9	1,841.4	1,841.2	6.7	16.8	-86.63	8.6	-201.8	160.7	137.2	23.49	6.842	
1,890.0	1,882.9	1,851.2	1,851.0	6.8	16.9	-87.12	8.6	-201.8	160.6	137.0	23.60	6.804	
1,900.0	1,892.8	1,861.0	1,860.9	6.8	16.9	-87.61	8.6	-201.8	160.5	136.8	23.73	6.767	
1,910.0	1,902.7	1,870.9	1,870.8	6.8	17.0	-88.10	8.6	-201.8	160.5	136.6	23.85	6.730	
1,920.0	1,912.6	1,880.8	1,880.7	6.9	17.1	-88.59	8.6	-201.8	160.5	136.5	23.98	6.693	
1,930.0	1,922.5	1,890.7	1,890.6	6.9	17.2	-89.08	8.6	-201.9	160.4	136.3	24.10	6.657	
1,940.0	1,932.4	1,900.7	1,900.5	7.0	17.3	-89.57	8.6	-201.9	160.4	136.2	24.23	6.622	
1,944.0	1,936.3	1,904.6	1,904.4	7.0	17.3	-89.76	8.6	-201.9	160.4	136.2	24.27	6.609	CC
1,950.0	1,942.3	1,910.5	1,910.4	7.0	17.4	-90.06	8.6	-201.9	160.4	136.1	24.35	6.588	
1,960.0	1,952.2	1,920.4	1,920.2	7.0	17.4	-90.54	8.6	-201.9	160.4	136.0	24.48	6.555	
1,970.0	1,962.1	1,930.3	1,930.1	7.1	17.5	-91.03	8.6	-201.9	160.5	135.9	24.60	6.523	
1,980.0	1,972.0	1,940.2	1,940.0	7.1	17.6	-91.52	8.6	-201.9	160.5	135.8	24.73	6.492	
1,990.0	1,981.9	1,950.1	1,949.9	7.2	17.7	-92.01	8.6	-201.9	160.6	135.7	24.85	6.461	
2,000.0	1,991.8	1,960.0	1,959.8	7.2	17.8	-92.49	8.6	-201.9	160.6	135.7	24.98	6.432	
2,010.0	2,001.7	1,970.0	1,969.8	7.2	17.9	-92.98	8.6	-201.9	160.7	135.6	25.10	6.402	
2,020.0	2,011.6	1,979.9	1,979.7	7.3	18.0	-93.47	8.6	-202.0	160.8	135.6	25.23	6.374	
2,030.0	2,021.5	1,989.8	1,989.6	7.3	18.0	-93.96	8.6	-202.0	160.9	135.5	25.35	6.346	
2,040.0	2,031.4	1,999.7	1,999.5	7.4	18.1	-94.45	8.6	-202.0	161.0	135.5	25.48	6.319	
2,050.0	2,041.3	2,009.6	2,009.4	7.4	18.2	-94.94	8.6	-202.0	161.1	135.5	25.60	6.293	ES

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

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,060.0	2,051.2	2,019.5	2,019.3	7.4	18.3	-95.43	8.6	-202.0	161.2	135.5	25.73	6.268	
2,070.0	2,061.1	2,029.4	2,029.2	7.5	18.4	-95.91	8.6	-202.0	161.4	135.5	25.85	6.243	
2,080.0	2,071.0	2,039.3	2,039.1	7.5	18.5	-96.40	8.6	-202.0	161.5	135.6	25.97	6.219	
2,090.0	2,080.9	2,049.2	2,049.0	7.6	18.5	-96.88	8.6	-202.0	161.7	135.6	26.10	6.196	
2,100.0	2,090.8	2,059.1	2,058.9	7.6	18.6	-97.36	8.6	-202.0	161.9	135.7	26.22	6.173	
2,110.0	2,100.7	2,069.0	2,068.9	7.6	18.7	-97.85	8.6	-202.0	162.1	135.7	26.35	6.151	
2,120.0	2,110.6	2,079.0	2,078.8	7.7	18.8	-98.33	8.6	-202.0	162.3	135.8	26.48	6.129	
2,130.0	2,120.5	2,088.9	2,088.8	7.7	18.9	-98.81	8.6	-202.0	162.5	135.9	26.60	6.109	
2,140.0	2,130.4	2,098.9	2,098.7	7.8	19.0	-99.29	8.6	-202.0	162.7	136.0	26.72	6.088	
2,150.0	2,140.3	2,108.7	2,108.6	7.8	19.1	-99.76	8.6	-202.0	162.9	136.1	26.85	6.069	
2,160.0	2,150.2	2,118.6	2,118.4	7.8	19.1	-100.23	8.6	-202.0	163.2	136.2	26.97	6.050	
2,170.0	2,160.1	2,128.5	2,128.3	7.9	19.2	-100.71	8.6	-202.0	163.4	136.3	27.10	6.032	
2,180.0	2,170.0	2,138.4	2,138.2	7.9	19.3	-101.18	8.7	-202.0	163.7	136.5	27.22	6.014	
2,190.0	2,179.9	2,148.4	2,148.2	8.0	19.4	-101.65	8.7	-202.0	164.0	136.6	27.34	5.997	
2,200.0	2,189.8	2,158.4	2,158.2	8.0	19.5	-102.13	8.7	-202.0	164.3	136.8	27.46	5.981	
2,210.0	2,199.7	2,168.3	2,168.1	8.0	19.6	-102.60	8.7	-202.0	164.5	137.0	27.58	5.966	
2,220.0	2,209.6	2,178.2	2,178.0	8.1	19.6	-103.07	8.7	-202.0	164.9	137.2	27.70	5.951	
2,230.0	2,219.5	2,188.0	2,187.9	8.1	19.7	-103.54	8.7	-202.0	165.2	137.3	27.82	5.938	
2,240.0	2,229.4	2,197.9	2,197.7	8.2	19.8	-104.01	8.7	-202.0	165.5	137.6	27.93	5.925	
2,250.0	2,239.3	2,207.8	2,207.6	8.2	19.9	-104.47	8.7	-202.0	165.8	137.8	28.05	5.912	
2,260.0	2,249.3	2,217.7	2,217.5	8.3	19.9	-104.94	8.6	-201.9	166.2	138.0	28.17	5.900	
2,270.0	2,259.2	2,227.6	2,227.4	8.3	20.0	-105.40	8.6	-201.9	166.6	138.3	28.29	5.888	
2,280.0	2,269.1	2,237.4	2,237.2	8.3	20.1	-105.86	8.6	-201.9	166.9	138.5	28.40	5.878	
2,290.0	2,279.0	2,247.3	2,247.1	8.4	20.2	-106.32	8.6	-201.9	167.3	138.8	28.52	5.867	
2,300.0	2,288.9	2,257.2	2,257.0	8.4	20.3	-106.78	8.6	-201.9	167.7	139.1	28.64	5.857	
2,310.0	2,298.8	2,267.2	2,267.0	8.5	20.3	-107.24	8.6	-201.9	168.1	139.4	28.75	5.847	
2,320.0	2,308.7	2,277.2	2,277.0	8.5	20.4	-107.70	8.6	-201.8	168.6	139.7	28.87	5.838	
2,330.0	2,318.6	2,287.1	2,287.0	8.5	20.5	-108.17	8.5	-201.8	169.0	140.0	28.99	5.829	
2,340.0	2,328.5	2,297.1	2,296.9	8.6	20.6	-108.63	8.5	-201.8	169.4	140.3	29.11	5.820	
2,350.0	2,338.4	2,307.1	2,306.9	8.6	20.7	-109.10	8.5	-201.7	169.8	140.6	29.23	5.812	
2,360.0	2,348.3	2,317.0	2,316.8	8.7	20.7	-109.56	8.5	-201.6	170.3	140.9	29.34	5.803	
2,370.0	2,358.2	2,327.0	2,326.8	8.7	20.8	-110.02	8.4	-201.6	170.7	141.3	29.46	5.796	
2,380.0	2,368.1	2,336.9	2,336.8	8.7	20.9	-110.49	8.4	-201.5	171.2	141.6	29.58	5.788	
2,390.0	2,378.0	2,346.8	2,346.6	8.8	21.0	-110.94	8.4	-201.4	171.7	142.0	29.70	5.781	
2,400.0	2,387.9	2,356.7	2,356.5	8.8	21.1	-111.40	8.4	-201.3	172.2	142.3	29.81	5.775	
2,410.0	2,397.8	2,366.5	2,366.4	8.9	21.1	-111.85	8.4	-201.2	172.6	142.7	29.93	5.769	
2,420.0	2,407.7	2,376.4	2,376.2	8.9	21.2	-112.30	8.3	-201.1	173.2	143.1	30.05	5.763	
2,430.0	2,417.6	2,386.3	2,386.1	8.9	21.3	-112.76	8.3	-201.0	173.7	143.5	30.16	5.758	
2,440.0	2,427.5	2,396.2	2,396.0	9.0	21.4	-113.22	8.2	-200.9	174.2	143.9	30.28	5.753	
2,450.0	2,437.4	2,406.0	2,405.8	9.0	21.5	-113.68	8.2	-200.8	174.8	144.4	30.40	5.749	
2,460.0	2,447.3	2,415.9	2,415.7	9.1	21.5	-114.13	8.1	-200.7	175.3	144.8	30.51	5.746	
2,470.0	2,457.2	2,425.7	2,425.5	9.1	21.6	-114.58	8.0	-200.5	175.9	145.3	30.63	5.742	
2,480.0	2,467.1	2,435.5	2,435.3	9.1	21.7	-115.03	8.0	-200.4	176.5	145.7	30.74	5.740	
2,490.0	2,477.0	2,445.4	2,445.2	9.2	21.8	-115.48	7.9	-200.3	177.1	146.2	30.86	5.738	
2,500.0	2,486.9	2,455.3	2,455.1	9.2	21.9	-115.93	7.8	-200.2	177.7	146.7	30.98	5.736	
2,510.0	2,496.8	2,465.1	2,464.9	9.3	21.9	-116.37	7.8	-200.1	178.3	147.2	31.09	5.734	
2,520.0	2,506.7	2,474.9	2,474.8	9.3	22.0	-116.81	7.7	-199.9	178.9	147.7	31.21	5.733	
2,530.0	2,516.6	2,484.8	2,484.6	9.4	22.1	-117.25	7.6	-199.8	179.6	148.3	31.33	5.733	
2,540.0	2,526.5	2,494.7	2,494.5	9.4	22.2	-117.69	7.5	-199.7	180.2	148.8	31.44	5.732 SF	
2,550.0	2,536.4	2,504.6	2,504.4	9.4	22.3	-118.12	7.4	-199.5	180.9	149.4	31.56	5.732	
2,560.0	2,546.3	2,514.4	2,514.2	9.5	22.3	-118.55	7.4	-199.4	181.6	149.9	31.67	5.733	
2,570.0	2,556.2	2,524.3	2,524.1	9.5	22.4	-118.98	7.3	-199.3	182.3	150.5	31.79	5.734	
2,580.0	2,566.1	2,534.1	2,533.9	9.6	22.5	-119.41	7.2	-199.1	183.0	151.1	31.91	5.735	
2,590.0	2,576.0	2,543.9	2,543.7	9.6	22.6	-119.83	7.1	-199.0	183.7	151.7	32.02	5.737	
2,600.0	2,585.9	2,553.8	2,553.6	9.6	22.7	-120.26	7.0	-198.8	184.4	152.3	32.14	5.739	
2,610.0	2,595.8	2,563.8	2,563.6	9.7	22.7	-120.69	6.9	-198.7	185.2	152.9	32.26	5.741	
2,620.0	2,605.7	2,573.7	2,573.5	9.7	22.8	-121.11	6.8	-198.5	185.9	153.5	32.37	5.743	
2,630.0	2,615.6	2,583.6	2,583.4	9.8	22.9	-121.52	6.7	-198.4	186.7	154.2	32.49	5.746	
2,640.0	2,625.6	2,593.4	2,593.2	9.8	23.0	-121.94	6.6	-198.2	187.4	154.8	32.61	5.749	
2,650.0	2,635.5	2,603.3	2,603.1	9.8	23.1	-122.35	6.5	-198.1	188.2	155.5	32.72	5.752	
2,660.0	2,645.4	2,613.1	2,612.9	9.9	23.1	-122.75	6.4	-197.9	189.0	156.2	32.84	5.756	
2,670.0	2,655.3	2,622.9	2,622.7	9.9	23.2	-123.15	6.3	-197.8	189.8	156.9	32.95	5.760	
2,680.0	2,665.2	2,632.7	2,632.5	10.0	23.3	-123.56	6.2	-197.6	190.6	157.5	33.07	5.764	
2,690.0	2,675.1	2,642.5	2,642.3	10.0	23.4	-123.95	6.1	-197.5	191.4	158.3	33.18	5.769	
2,700.0	2,685.0	2,652.2	2,652.0	10.1	23.5	-124.35	6.0	-197.3	192.3	159.0	33.30	5.774	
2,710.0	2,694.9	2,662.1	2,661.9	10.1	23.5	-124.74	5.8	-197.1	193.1	159.7	33.42	5.780	

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

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,720.0	2,704.8	2,671.9	2,671.7	10.1	23.6	-125.14	5.7	-196.9	194.0	160.5	33.53	5.786	
2,730.0	2,714.7	2,681.7	2,681.5	10.2	23.7	-125.53	5.6	-196.8	194.9	161.2	33.65	5.792	
2,740.0	2,724.6	2,691.5	2,691.3	10.2	23.8	-125.92	5.4	-196.6	195.8	162.0	33.76	5.799	
2,750.0	2,734.5	2,701.3	2,701.1	10.3	23.9	-126.30	5.3	-196.4	196.7	162.8	33.88	5.806	
2,760.0	2,744.4	2,711.1	2,710.9	10.3	23.9	-126.68	5.2	-196.3	197.6	163.6	33.99	5.813	
2,770.0	2,754.3	2,720.8	2,720.6	10.3	24.0	-127.06	5.0	-196.1	198.5	164.4	34.11	5.820	
2,780.0	2,764.2	2,730.6	2,730.3	10.4	24.1	-127.43	4.9	-195.9	199.5	165.3	34.23	5.829	
2,790.0	2,774.1	2,740.4	2,740.1	10.4	24.2	-127.80	4.7	-195.7	200.4	166.1	34.34	5.837	
2,800.0	2,784.0	2,750.1	2,749.9	10.5	24.3	-128.17	4.5	-195.5	201.4	167.0	34.46	5.846	
2,810.0	2,793.9	2,759.9	2,759.6	10.5	24.3	-128.54	4.4	-195.4	202.4	167.8	34.57	5.855	
2,820.0	2,803.8	2,769.6	2,769.4	10.5	24.4	-128.91	4.2	-195.2	203.4	168.7	34.69	5.864	
2,830.0	2,813.7	2,779.5	2,779.2	10.6	24.5	-129.27	4.0	-195.0	204.4	169.6	34.80	5.873	
2,840.0	2,823.6	2,789.3	2,789.1	10.6	24.6	-129.63	3.8	-194.8	205.4	170.5	34.92	5.883	
2,850.0	2,833.5	2,799.2	2,798.9	10.7	24.7	-129.99	3.6	-194.6	206.5	171.4	35.04	5.893	
2,860.0	2,843.4	2,808.9	2,808.6	10.7	24.8	-130.34	3.4	-194.4	207.5	172.4	35.15	5.903	
2,870.0	2,853.3	2,818.6	2,818.3	10.8	24.8	-130.68	3.2	-194.3	208.6	173.3	35.27	5.914	
2,880.0	2,863.2	2,828.4	2,828.1	10.8	24.9	-131.02	3.0	-194.1	209.6	174.3	35.38	5.925	
2,890.0	2,873.1	2,838.2	2,837.9	10.8	25.0	-131.35	2.9	-194.0	210.7	175.2	35.50	5.936	
2,900.0	2,883.0	2,848.1	2,847.8	10.9	25.1	-131.68	2.7	-193.8	211.8	176.2	35.62	5.947	
2,910.0	2,892.9	2,857.9	2,857.6	10.9	25.2	-132.00	2.5	-193.7	212.9	177.2	35.73	5.958	
2,920.0	2,902.8	2,867.9	2,867.6	11.0	25.2	-132.32	2.3	-193.6	214.0	178.2	35.85	5.970	
2,930.0	2,912.7	2,877.8	2,877.5	11.0	25.3	-132.63	2.1	-193.5	215.1	179.1	35.97	5.981	
2,940.0	2,922.6	2,887.7	2,887.4	11.0	25.4	-132.94	1.9	-193.4	216.2	180.1	36.08	5.992	
2,950.0	2,932.5	2,897.7	2,897.4	11.1	25.5	-133.24	1.7	-193.3	217.3	181.1	36.20	6.003	
2,960.0	2,942.4	2,907.6	2,907.4	11.1	25.6	-133.54	1.6	-193.2	218.4	182.1	36.32	6.014	
2,970.0	2,952.3	2,917.6	2,917.3	11.2	25.7	-133.83	1.4	-193.1	219.6	183.1	36.44	6.025	
2,980.0	2,962.2	2,927.6	2,927.3	11.2	25.8	-134.12	1.2	-193.1	220.7	184.1	36.56	6.036	
2,990.0	2,972.1	2,937.7	2,937.4	11.2	25.8	-134.41	1.1	-193.0	221.8	185.1	36.68	6.047	
3,000.0	2,982.0	2,947.7	2,947.4	11.3	25.9	-134.69	0.9	-192.9	222.9	186.1	36.80	6.058	
3,010.0	2,992.0	2,957.7	2,957.4	11.3	26.0	-134.96	0.8	-192.9	224.0	187.1	36.92	6.068	
3,020.0	3,001.9	2,967.7	2,967.4	11.4	26.1	-135.23	0.7	-192.8	225.1	188.1	37.03	6.079	
3,030.0	3,011.8	2,977.6	2,977.3	11.4	26.2	-135.49	0.6	-192.8	226.2	189.1	37.15	6.089	
3,040.0	3,021.7	2,987.7	2,987.4	11.5	26.3	-135.75	0.4	-192.8	227.3	190.1	37.27	6.099	
3,050.0	3,031.6	2,997.9	2,997.6	11.5	26.3	-136.01	0.3	-192.7	228.4	191.0	37.39	6.109	
3,060.0	3,041.5	3,007.9	3,007.6	11.5	26.4	-136.26	0.2	-192.7	229.5	192.0	37.51	6.119	
3,070.0	3,051.4	3,017.9	3,017.6	11.6	26.5	-136.51	0.1	-192.7	230.6	193.0	37.63	6.129	
3,080.0	3,061.3	3,027.7	3,027.4	11.6	26.6	-136.75	0.1	-192.7	231.7	194.0	37.75	6.139	
3,090.0	3,071.2	3,037.6	3,037.3	11.7	26.7	-136.99	0.0	-192.7	232.9	195.0	37.87	6.149	
3,100.0	3,081.1	3,047.5	3,047.2	11.7	26.8	-137.23	-0.1	-192.7	234.0	196.0	37.99	6.159	
3,110.0	3,091.0	3,057.4	3,057.1	11.7	26.9	-137.46	-0.2	-192.7	235.1	197.0	38.11	6.169	
3,120.0	3,100.9	3,067.3	3,067.0	11.8	26.9	-137.70	-0.3	-192.6	236.2	198.0	38.23	6.179	
3,130.0	3,110.8	3,077.2	3,076.9	11.8	27.0	-137.92	-0.4	-192.6	237.3	199.0	38.35	6.189	
3,140.0	3,120.7	3,087.0	3,086.7	11.9	27.1	-138.15	-0.5	-192.6	238.5	200.0	38.46	6.199	
3,150.0	3,130.6	3,096.9	3,096.6	11.9	27.2	-138.38	-0.6	-192.6	239.6	201.0	38.58	6.210	
3,160.0	3,140.5	3,106.8	3,106.5	11.9	27.3	-138.60	-0.7	-192.6	240.7	202.0	38.70	6.220	
3,170.0	3,150.4	3,116.7	3,116.4	12.0	27.4	-138.82	-0.8	-192.6	241.9	203.0	38.82	6.230	
3,180.0	3,160.3	3,126.6	3,126.3	12.0	27.4	-139.04	-0.8	-192.6	243.0	204.1	38.94	6.241	
3,190.0	3,170.2	3,136.4	3,136.1	12.1	27.5	-139.25	-0.9	-192.6	244.2	205.1	39.06	6.251	
3,200.0	3,180.1	3,146.3	3,146.0	12.1	27.6	-139.46	-1.0	-192.6	245.3	206.1	39.18	6.261	
3,210.0	3,190.0	3,156.3	3,156.0	12.2	27.7	-139.68	-1.1	-192.6	246.5	207.2	39.30	6.272	
3,220.0	3,199.9	3,166.2	3,165.9	12.2	27.8	-139.89	-1.2	-192.6	247.6	208.2	39.42	6.282	
3,230.0	3,209.8	3,176.2	3,175.9	12.2	27.9	-140.10	-1.3	-192.6	248.8	209.2	39.54	6.292	
3,240.0	3,219.7	3,186.2	3,185.9	12.3	28.0	-140.30	-1.4	-192.6	249.9	210.3	39.66	6.302	
3,250.0	3,229.6	3,190.0	3,189.7	12.3	28.0	-140.38	-1.4	-192.6	251.2	211.4	39.73	6.322	
3,260.0	3,239.5	3,190.0	3,189.7	12.4	28.0	-140.38	-1.4	-192.6	252.8	213.0	39.77	6.356	
3,270.0	3,249.4	3,190.0	3,189.7	12.4	28.0	-140.38	-1.4	-192.6	254.7	214.9	39.81	6.399	
3,280.0	3,259.3	3,190.0	3,189.7	12.4	28.0	-140.38	-1.4	-192.6	257.1	217.2	39.85	6.452	
3,290.0	3,269.2	3,190.0	3,189.7	12.5	28.0	-140.38	-1.4	-192.6	259.8	219.9	39.89	6.514	
3,300.0	3,279.1	3,190.0	3,189.7	12.5	28.0	-140.38	-1.4	-192.6	262.9	222.9	39.92	6.584	
3,310.0	3,289.0	3,190.0	3,189.7	12.6	28.0	-140.38	-1.4	-192.6	266.3	226.3	39.96	6.663	
3,320.0	3,298.9	3,268.6	3,265.7	12.6	28.6	-142.22	-12.2	-191.6	269.4	228.9	40.58	6.640	
3,330.0	3,308.8	3,278.3	3,275.3	12.7	28.7	-142.39	-12.3	-191.6	270.6	229.9	40.70	6.650	
3,340.0	3,318.7	3,288.0	3,285.0	12.7	28.8	-142.57	-12.4	-191.6	271.8	231.0	40.81	6.659	
3,350.0	3,328.6	3,297.8	3,294.8	12.7	28.9	-142.75	-12.4	-191.6	273.0	232.0	40.93	6.669	
3,360.0	3,338.5	3,307.7	3,304.7	12.8	29.0	-142.93	-12.5	-191.5	274.1	233.1	41.05	6.678	
3,370.0	3,348.4	3,317.5	3,314.6	12.8	29.1	-143.11	-12.6	-191.5	275.3	234.2	41.17	6.688	

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,380.0	3,358.4	3,327.5	3,324.5	12.9	29.1	-143.29	-12.7	-191.5	276.5	235.2	41.29	6.697	
3,390.0	3,368.3	3,337.5	3,334.5	12.9	29.2	-143.46	-12.7	-191.5	277.7	236.3	41.41	6.707	
3,400.0	3,378.2	3,347.5	3,344.5	12.9	29.3	-143.64	-12.8	-191.5	278.9	237.4	41.53	6.716	
3,410.0	3,388.1	3,357.5	3,354.6	13.0	29.4	-143.81	-12.9	-191.4	280.1	238.5	41.65	6.725	
3,420.0	3,398.0	3,367.7	3,364.7	13.0	29.5	-143.99	-12.9	-191.4	281.3	239.5	41.77	6.734	
3,430.0	3,407.9	3,377.9	3,374.9	13.1	29.6	-144.17	-13.0	-191.4	282.5	240.6	41.89	6.742	
3,440.0	3,417.8	3,388.6	3,385.6	13.1	29.7	-144.35	-13.0	-191.3	283.6	241.6	42.02	6.750	
3,450.0	3,427.7	3,400.0	3,397.0	13.1	29.8	-144.55	-13.0	-191.3	284.7	242.6	42.15	6.755	
3,460.0	3,437.6	3,408.8	3,405.8	13.2	29.8	-144.70	-13.0	-191.3	285.9	243.6	42.26	6.764	
3,470.0	3,447.5	3,417.5	3,414.5	13.2	29.9	-144.85	-13.0	-191.2	287.0	244.6	42.37	6.774	
3,480.0	3,457.4	3,427.0	3,424.1	13.3	30.0	-145.01	-13.0	-191.2	288.2	245.7	42.49	6.783	
3,490.0	3,467.3	3,436.5	3,433.6	13.3	30.1	-145.18	-13.1	-191.1	289.4	246.8	42.60	6.793	
3,500.0	3,477.2	3,446.0	3,443.0	13.4	30.2	-145.34	-13.1	-191.0	290.6	247.9	42.72	6.803	
3,510.0	3,487.1	3,455.9	3,452.9	13.4	30.2	-145.51	-13.2	-191.0	291.9	249.0	42.84	6.813	
3,520.0	3,497.0	3,465.9	3,462.9	13.4	30.3	-145.67	-13.3	-190.9	293.1	250.1	42.96	6.823	
3,530.0	3,506.9	3,475.9	3,473.0	13.5	30.4	-145.84	-13.4	-190.9	294.3	251.2	43.08	6.832	
3,540.0	3,516.8	3,486.0	3,483.0	13.5	30.5	-145.99	-13.4	-190.8	295.5	252.3	43.20	6.842	
3,550.0	3,526.7	3,495.9	3,493.0	13.6	30.6	-146.15	-13.5	-190.8	296.8	253.4	43.32	6.851	
3,560.0	3,536.6	3,505.9	3,502.9	13.6	30.7	-146.30	-13.6	-190.8	298.0	254.6	43.44	6.860	
3,570.0	3,546.5	3,515.7	3,512.8	13.6	30.8	-146.45	-13.6	-190.8	299.2	255.7	43.56	6.869	
3,580.0	3,556.4	3,525.6	3,522.6	13.7	30.8	-146.60	-13.7	-190.8	300.4	256.8	43.68	6.879	
3,590.0	3,566.3	3,535.4	3,532.4	13.7	30.9	-146.75	-13.8	-190.7	301.7	257.9	43.80	6.888	
3,600.0	3,576.2	3,545.3	3,542.4	13.8	31.0	-146.90	-13.8	-190.7	302.9	259.0	43.92	6.897	
3,610.0	3,586.1	3,555.1	3,552.1	13.8	31.1	-147.05	-13.9	-190.7	304.2	260.1	44.04	6.907	
3,620.0	3,596.0	3,564.8	3,561.8	13.9	31.2	-147.19	-14.0	-190.6	305.4	261.2	44.15	6.917	
3,630.0	3,605.9	3,574.7	3,571.8	13.9	31.3	-147.34	-14.0	-190.6	306.7	262.4	44.27	6.926	
3,640.0	3,615.8	3,584.6	3,581.7	13.9	31.3	-147.49	-14.1	-190.6	307.9	263.5	44.39	6.936	
3,650.0	3,625.7	3,594.5	3,591.5	14.0	31.4	-147.63	-14.2	-190.5	309.2	264.6	44.51	6.945	
3,660.0	3,635.6	3,604.4	3,601.4	14.0	31.5	-147.77	-14.3	-190.5	310.4	265.8	44.63	6.955	
3,670.0	3,645.5	3,614.4	3,611.4	14.1	31.6	-147.91	-14.3	-190.5	311.7	266.9	44.75	6.964	
3,680.0	3,655.4	3,624.5	3,621.6	14.1	31.7	-148.06	-14.4	-190.4	312.9	268.0	44.88	6.973	
3,690.0	3,665.3	3,634.6	3,631.6	14.1	31.8	-148.20	-14.5	-190.4	314.2	269.2	45.00	6.982	
3,700.0	3,675.2	3,644.7	3,641.7	14.2	31.9	-148.34	-14.5	-190.4	315.4	270.3	45.12	6.991	
3,710.0	3,685.1	3,654.8	3,651.9	14.2	32.0	-148.48	-14.6	-190.4	316.7	271.4	45.24	6.999	
3,720.0	3,695.0	3,665.0	3,662.0	14.3	32.0	-148.62	-14.6	-190.3	317.9	272.5	45.36	7.008	
3,730.0	3,704.9	3,675.0	3,672.1	14.3	32.1	-148.76	-14.7	-190.3	319.1	273.6	45.48	7.016	
3,740.0	3,714.8	3,684.9	3,682.0	14.4	32.2	-148.90	-14.7	-190.2	320.3	274.7	45.60	7.025	
3,750.0	3,724.7	3,694.8	3,691.8	14.4	32.3	-149.04	-14.7	-190.1	321.6	275.9	45.72	7.033	
3,760.0	3,734.7	3,704.6	3,701.6	14.4	32.4	-149.17	-14.7	-190.1	322.8	277.0	45.84	7.042	
3,770.0	3,744.6	3,714.3	3,711.3	14.5	32.5	-149.31	-14.8	-190.0	324.0	278.1	45.96	7.051	
3,780.0	3,754.5	3,723.9	3,720.9	14.5	32.5	-149.44	-14.8	-190.0	325.3	279.2	46.08	7.060	
3,790.0	3,764.4	3,733.6	3,730.7	14.6	32.6	-149.57	-14.9	-189.9	326.6	280.4	46.19	7.069	
3,800.0	3,774.3	3,743.5	3,740.5	14.6	32.7	-149.70	-14.9	-189.8	327.8	281.5	46.31	7.078	
3,810.0	3,784.2	3,753.4	3,750.4	14.6	32.8	-149.83	-15.0	-189.8	329.1	282.7	46.43	7.087	
3,820.0	3,794.1	3,763.3	3,760.4	14.7	32.9	-149.96	-15.0	-189.8	330.3	283.8	46.55	7.096	
3,830.0	3,804.0	3,773.1	3,770.2	14.7	33.0	-150.08	-15.1	-189.7	331.6	284.9	46.67	7.105	
3,840.0	3,813.9	3,783.0	3,780.0	14.8	33.0	-150.20	-15.1	-189.7	332.9	286.1	46.79	7.114	
3,850.0	3,823.8	3,792.9	3,789.9	14.8	33.1	-150.33	-15.2	-189.7	334.2	287.2	46.91	7.123	
3,860.0	3,833.7	3,802.7	3,799.7	14.8	33.2	-150.44	-15.3	-189.6	335.4	288.4	47.03	7.132	
3,870.0	3,843.6	3,812.4	3,809.5	14.9	33.3	-150.56	-15.3	-189.6	336.7	289.6	47.15	7.141	
3,880.0	3,853.5	3,822.2	3,819.3	14.9	33.4	-150.68	-15.4	-189.6	338.0	290.7	47.27	7.150	
3,890.0	3,863.4	3,832.1	3,829.1	15.0	33.5	-150.79	-15.5	-189.6	339.3	291.9	47.39	7.159	
3,900.0	3,873.3	3,842.1	3,839.2	15.0	33.6	-150.91	-15.5	-189.6	340.6	293.1	47.52	7.168	
3,910.0	3,883.2	3,852.2	3,849.3	15.1	33.6	-151.03	-15.6	-189.5	341.9	294.2	47.64	7.176	
3,920.0	3,893.1	3,862.3	3,859.4	15.1	33.7	-151.15	-15.7	-189.5	343.1	295.4	47.76	7.185	
3,930.0	3,903.0	3,872.3	3,869.3	15.1	33.8	-151.27	-15.7	-189.4	344.4	296.5	47.88	7.193	
3,940.0	3,912.9	3,882.2	3,879.2	15.2	33.9	-151.39	-15.7	-189.4	345.7	297.7	48.00	7.202	
3,950.0	3,922.8	3,892.1	3,889.1	15.2	34.0	-151.51	-15.8	-189.3	347.0	298.9	48.12	7.211	
3,960.0	3,932.7	3,902.1	3,899.1	15.3	34.1	-151.63	-15.8	-189.2	348.3	300.0	48.24	7.219	
3,970.0	3,942.6	3,912.0	3,909.0	15.3	34.2	-151.75	-15.9	-189.2	349.5	301.2	48.36	7.228	
3,980.0	3,952.5	3,922.0	3,919.0	15.3	34.2	-151.87	-15.9	-189.1	350.8	302.3	48.48	7.236	
3,990.0	3,962.4	3,931.7	3,928.7	15.4	34.3	-151.98	-16.0	-189.1	352.1	303.5	48.60	7.245	
4,000.0	3,972.3	3,941.3	3,938.3	15.4	34.4	-152.09	-16.0	-189.0	353.4	304.7	48.72	7.254	
4,010.0	3,982.2	3,950.9	3,947.9	15.5	34.5	-152.20	-16.1	-189.0	354.7	305.8	48.84	7.263	
4,020.0	3,992.1	3,960.7	3,957.7	15.5	34.6	-152.31	-16.1	-188.9	356.0	307.0	48.96	7.272	
4,030.0	4,002.0	3,970.6	3,967.6	15.6	34.7	-152.42	-16.2	-188.9	357.3	308.2	49.08	7.280	

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,040.0	4,011.9	3,980.5	3,977.5	15.6	34.8	-152.52	-16.3	-188.9	358.6	309.4	49.20	7.289	
4,050.0	4,021.8	3,990.5	3,987.5	15.6	34.8	-152.63	-16.3	-188.8	359.9	310.6	49.32	7.298	
4,060.0	4,031.7	4,000.7	3,997.8	15.7	34.9	-152.73	-16.4	-188.8	361.2	311.8	49.44	7.306	
4,070.0	4,041.6	4,011.1	4,008.1	15.7	35.0	-152.84	-16.5	-188.8	362.5	312.9	49.57	7.313	
4,080.0	4,051.5	4,021.2	4,018.3	15.8	35.1	-152.94	-16.5	-188.8	363.8	314.1	49.69	7.321	
4,090.0	4,061.4	4,031.3	4,028.3	15.8	35.2	-153.05	-16.5	-188.8	365.1	315.3	49.81	7.329	
4,100.0	4,071.3	4,041.4	4,038.4	15.8	35.3	-153.15	-16.6	-188.7	366.4	316.4	49.94	7.337	
4,110.0	4,081.2	4,051.3	4,048.3	15.9	35.4	-153.26	-16.6	-188.6	367.6	317.6	50.06	7.344	
4,120.0	4,091.1	4,061.1	4,058.2	15.9	35.4	-153.37	-16.6	-188.6	368.9	318.7	50.18	7.352	
4,130.0	4,101.1	4,070.8	4,067.8	16.0	35.5	-153.48	-16.6	-188.5	370.2	319.9	50.29	7.361	
4,140.0	4,111.0	4,080.5	4,077.6	16.0	35.6	-153.58	-16.7	-188.4	371.5	321.1	50.41	7.369	
4,150.0	4,120.9	4,090.3	4,087.3	16.1	35.7	-153.69	-16.7	-188.3	372.8	322.2	50.53	7.377	
4,160.0	4,130.8	4,100.0	4,097.0	16.1	35.8	-153.79	-16.7	-188.3	374.1	323.4	50.65	7.386	
4,170.0	4,140.7	4,109.8	4,106.8	16.1	35.9	-153.89	-16.8	-188.2	375.4	324.6	50.77	7.394	
4,180.0	4,150.6	4,119.7	4,116.7	16.2	36.0	-153.98	-16.8	-188.2	376.7	325.8	50.89	7.402	
4,190.0	4,160.5	4,129.9	4,126.9	16.2	36.0	-154.08	-16.9	-188.2	378.0	327.0	51.01	7.410	
4,200.0	4,170.4	4,139.9	4,137.0	16.3	36.1	-154.18	-16.9	-188.1	379.3	328.2	51.14	7.417	
4,210.0	4,180.3	4,149.9	4,147.0	16.3	36.2	-154.27	-17.0	-188.1	380.6	329.3	51.26	7.425	
4,220.0	4,190.2	4,159.7	4,156.8	16.3	36.3	-154.37	-17.0	-188.1	381.9	330.5	51.38	7.433	
4,230.0	4,200.1	4,169.6	4,166.6	16.4	36.4	-154.46	-17.0	-188.0	383.2	331.7	51.50	7.441	
4,240.0	4,210.0	4,179.5	4,176.5	16.4	36.5	-154.56	-17.1	-188.0	384.5	332.9	51.62	7.448	
4,250.0	4,219.9	4,189.2	4,186.2	16.5	36.6	-154.66	-17.1	-187.9	385.8	334.1	51.74	7.457	
4,260.0	4,229.8	4,198.8	4,195.8	16.5	36.6	-154.76	-17.1	-187.8	387.1	335.2	51.86	7.465	
4,270.0	4,239.7	4,208.3	4,205.3	16.6	36.7	-154.85	-17.2	-187.7	388.4	336.5	51.97	7.474	
4,280.0	4,249.6	4,217.7	4,214.8	16.6	36.8	-154.95	-17.2	-187.6	389.8	337.7	52.09	7.482	
4,290.0	4,259.5	4,227.3	4,224.3	16.6	36.9	-155.04	-17.3	-187.5	391.1	338.9	52.21	7.491	
4,300.0	4,269.4	4,237.1	4,234.1	16.7	37.0	-155.13	-17.4	-187.4	392.5	340.1	52.33	7.500	
4,310.0	4,279.3	4,247.4	4,244.4	16.7	37.1	-155.23	-17.4	-187.4	393.8	341.4	52.45	7.508	
4,320.0	4,289.2	4,258.0	4,255.0	16.8	37.2	-155.32	-17.5	-187.4	395.1	342.6	52.58	7.515	
4,330.0	4,299.1	4,268.6	4,265.6	16.8	37.2	-155.41	-17.6	-187.4	396.5	343.8	52.71	7.522	
4,340.0	4,309.0	4,278.7	4,275.7	16.8	37.3	-155.49	-17.6	-187.4	397.8	344.9	52.83	7.529	
4,350.0	4,318.9	4,288.7	4,285.8	16.9	37.4	-155.58	-17.6	-187.4	399.1	346.1	52.95	7.536	
4,360.0	4,328.8	4,298.8	4,295.8	16.9	37.5	-155.67	-17.7	-187.3	400.4	347.3	53.08	7.543	
4,370.0	4,338.7	4,308.6	4,305.6	17.0	37.6	-155.76	-17.7	-187.3	401.7	348.5	53.20	7.551	
4,380.0	4,348.6	4,318.4	4,315.4	17.0	37.7	-155.85	-17.7	-187.2	403.0	349.7	53.31	7.558	
4,390.0	4,358.5	4,328.0	4,325.1	17.1	37.8	-155.93	-17.7	-187.1	404.3	350.9	53.43	7.566	
4,400.0	4,368.4	4,337.6	4,334.6	17.1	37.8	-156.02	-17.8	-187.0	405.6	352.1	53.55	7.574	
4,410.0	4,378.3	4,347.2	4,344.2	17.1	37.9	-156.11	-17.8	-186.9	406.9	353.3	53.67	7.582	
4,420.0	4,388.2	4,356.7	4,353.8	17.2	38.0	-156.19	-17.8	-186.9	408.3	354.5	53.79	7.590	
4,430.0	4,398.1	4,366.5	4,363.5	17.2	38.1	-156.28	-17.9	-186.8	409.6	355.7	53.91	7.598	
4,440.0	4,408.0	4,376.4	4,373.4	17.3	38.2	-156.36	-17.9	-186.8	411.0	356.9	54.03	7.606	
4,450.0	4,417.9	4,386.3	4,383.4	17.3	38.3	-156.45	-18.0	-186.7	412.3	358.2	54.15	7.614	
4,460.0	4,427.8	4,396.3	4,393.4	17.3	38.3	-156.53	-18.1	-186.6	413.6	359.4	54.27	7.622	
4,470.0	4,437.7	4,406.4	4,403.4	17.4	38.4	-156.62	-18.1	-186.6	415.0	360.6	54.39	7.629	
4,480.0	4,447.6	4,416.5	4,413.5	17.4	38.5	-156.70	-18.2	-186.5	416.3	361.8	54.52	7.637	
4,490.0	4,457.5	4,426.4	4,423.5	17.5	38.6	-156.78	-18.2	-186.4	417.7	363.0	54.64	7.644	
4,500.0	4,467.5	4,436.3	4,433.3	17.5	38.7	-156.87	-18.2	-186.4	419.0	364.2	54.76	7.652	
4,510.0	4,477.4	4,446.1	4,443.2	17.6	38.8	-156.95	-18.3	-186.3	420.3	365.5	54.88	7.659	
4,520.0	4,487.3	4,455.9	4,453.0	17.6	38.9	-157.03	-18.3	-186.3	421.7	366.7	55.00	7.667	
4,530.0	4,497.2	4,465.6	4,462.7	17.6	39.0	-157.11	-18.4	-186.2	423.0	367.9	55.12	7.675	
4,540.0	4,507.1	4,475.1	4,472.2	17.7	39.0	-157.18	-18.4	-186.1	424.4	369.1	55.24	7.683	
4,550.0	4,517.0	4,484.6	4,481.6	17.7	39.1	-157.26	-18.5	-186.1	425.7	370.4	55.36	7.691	
4,560.0	4,526.9	4,494.1	4,491.1	17.8	39.2	-157.33	-18.6	-186.0	427.1	371.6	55.47	7.699	
4,570.0	4,536.8	4,503.8	4,500.8	17.8	39.3	-157.41	-18.7	-186.0	428.5	372.9	55.59	7.708	
4,580.0	4,546.7	4,513.5	4,510.6	17.8	39.4	-157.48	-18.7	-185.9	429.9	374.2	55.71	7.716	
4,590.0	4,556.6	4,523.5	4,520.5	17.9	39.5	-157.55	-18.8	-185.9	431.3	375.4	55.84	7.724	
4,600.0	4,566.5	4,534.0	4,531.0	17.9	39.5	-157.63	-18.9	-185.8	432.6	376.7	55.96	7.731	
4,610.0	4,576.4	4,544.6	4,541.6	18.0	39.6	-157.71	-19.0	-185.8	434.0	377.9	56.09	7.738	
4,620.0	4,586.3	4,555.1	4,552.1	18.0	39.7	-157.80	-19.0	-185.7	435.4	379.1	56.23	7.743	
4,630.0	4,596.2	4,565.2	4,562.2	18.1	39.8	-157.88	-19.1	-185.6	436.7	380.3	56.36	7.748	
4,640.0	4,606.1	4,575.2	4,572.2	18.1	39.9	-157.96	-19.1	-185.6	438.0	381.5	56.50	7.752	
4,650.0	4,616.0	4,585.0	4,582.0	18.1	40.0	-158.04	-19.2	-185.5	439.2	382.6	56.63	7.756	
4,660.0	4,625.9	4,594.7	4,591.7	18.2	40.1	-158.11	-19.2	-185.5	440.5	383.7	56.76	7.760	
4,670.0	4,635.9	4,604.3	4,601.3	18.2	40.2	-158.18	-19.2	-185.4	441.7	384.8	56.89	7.764	
4,680.0	4,645.8	4,613.8	4,610.9	18.3	40.2	-158.25	-19.3	-185.4	442.9	385.9	57.02	7.767	
4,690.0	4,655.7	4,623.7	4,620.7	18.3	40.3	-158.31	-19.4	-185.4	444.1	386.9	57.16	7.770	

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,700.0	4,665.6	4,633.5	4,630.5	18.3	40.4	-158.37	-19.4	-185.4	445.3	388.0	57.29	7.772	
4,710.0	4,675.6	4,643.4	4,640.4	18.4	40.5	-158.44	-19.5	-185.3	446.4	389.0	57.42	7.774	
4,720.0	4,685.5	4,653.2	4,650.2	18.4	40.6	-158.50	-19.6	-185.3	447.5	390.0	57.55	7.776	
4,730.0	4,695.4	4,663.0	4,660.0	18.5	40.7	-158.55	-19.7	-185.3	448.6	391.0	57.68	7.778	
4,740.0	4,705.4	4,673.0	4,670.0	18.5	40.8	-158.62	-19.7	-185.2	449.7	391.9	57.82	7.779	
4,750.0	4,715.3	4,683.0	4,680.1	18.5	40.8	-158.67	-19.8	-185.2	450.8	392.8	57.95	7.779	
4,760.0	4,725.3	4,693.0	4,690.1	18.6	40.9	-158.73	-19.9	-185.1	451.8	393.7	58.08	7.779	
4,770.0	4,735.2	4,703.0	4,700.0	18.6	41.0	-158.79	-19.9	-185.1	452.8	394.6	58.21	7.779	
4,780.0	4,745.2	4,713.0	4,710.0	18.7	41.1	-158.85	-20.0	-185.0	453.8	395.5	58.34	7.778	
4,790.0	4,755.1	4,723.0	4,720.0	18.7	41.2	-158.90	-20.0	-184.9	454.8	396.3	58.47	7.777	
4,800.0	4,765.1	4,733.0	4,730.0	18.7	41.3	-158.95	-20.1	-184.9	455.7	397.1	58.60	7.776	
4,810.0	4,775.1	4,743.2	4,740.2	18.8	41.4	-159.00	-20.2	-184.8	456.6	397.9	58.74	7.773	
4,820.0	4,785.0	4,753.6	4,750.6	18.8	41.5	-159.05	-20.2	-184.8	457.5	398.6	58.87	7.771	
4,830.0	4,795.0	4,764.2	4,761.2	18.8	41.6	-159.10	-20.3	-184.8	458.3	399.3	59.01	7.767	
4,840.0	4,804.9	4,774.4	4,771.4	18.9	41.6	-159.14	-20.3	-184.7	459.1	400.0	59.14	7.763	
4,850.0	4,814.9	4,784.4	4,781.4	18.9	41.7	-159.19	-20.3	-184.6	459.9	400.6	59.26	7.760	
4,860.0	4,824.9	4,794.0	4,791.0	19.0	41.8	-159.23	-20.3	-184.6	460.6	401.2	59.39	7.756	
4,870.0	4,834.9	4,803.5	4,800.5	19.0	41.9	-159.27	-20.4	-184.5	461.4	401.9	59.51	7.752	
4,880.0	4,844.8	4,812.9	4,809.9	19.0	42.0	-159.31	-20.4	-184.5	462.1	402.5	59.64	7.749	
4,890.0	4,854.8	4,821.9	4,819.0	19.1	42.1	-159.35	-20.5	-184.4	462.8	403.1	59.76	7.745	
4,900.0	4,864.8	4,831.7	4,828.7	19.1	42.1	-159.38	-20.6	-184.4	463.5	403.6	59.88	7.741	
4,910.0	4,874.8	4,842.1	4,839.1	19.1	42.2	-159.41	-20.7	-184.4	464.2	404.2	60.01	7.735	
4,920.0	4,884.7	4,854.0	4,851.0	19.2	42.3	-159.44	-20.7	-184.4	464.8	404.7	60.16	7.727	
4,930.0	4,894.7	4,865.3	4,862.3	19.2	42.4	-159.47	-20.8	-184.4	465.4	405.1	60.29	7.719	
4,940.0	4,904.7	4,875.0	4,872.0	19.2	42.5	-159.50	-20.8	-184.4	465.9	405.5	60.42	7.712	
4,950.0	4,914.7	4,883.7	4,880.7	19.3	42.6	-159.52	-20.8	-184.4	466.5	405.9	60.53	7.706	
4,960.0	4,924.7	4,892.4	4,889.4	19.3	42.7	-159.55	-20.8	-184.3	467.0	406.3	60.64	7.701	
4,970.0	4,934.7	4,901.1	4,898.1	19.4	42.7	-159.57	-20.9	-184.3	467.5	406.8	60.76	7.695	
4,980.0	4,944.7	4,910.6	4,907.6	19.4	42.8	-159.60	-21.0	-184.2	468.1	407.2	60.88	7.688	
4,990.0	4,954.7	4,921.0	4,918.0	19.4	42.9	-159.62	-21.1	-184.1	468.6	407.6	61.01	7.681	
5,000.0	4,964.7	4,932.2	4,929.2	19.5	43.0	-159.64	-21.2	-184.1	469.0	407.9	61.14	7.671	
5,010.0	4,974.6	4,943.7	4,940.7	19.5	43.1	-159.66	-21.3	-184.1	469.4	408.2	61.28	7.661	
5,020.0	4,984.6	4,954.9	4,951.9	19.5	43.2	-159.68	-21.3	-184.1	469.8	408.4	61.41	7.650	
5,030.0	4,994.6	4,965.0	4,962.0	19.6	43.3	-159.69	-21.3	-184.2	470.1	408.6	61.54	7.640	
5,040.0	5,004.6	4,974.2	4,971.2	19.6	43.4	-159.70	-21.4	-184.2	470.4	408.8	61.65	7.630	
5,050.0	5,014.6	4,983.1	4,980.1	19.6	43.5	-159.72	-21.4	-184.1	470.7	408.9	61.76	7.621	
5,060.0	5,024.6	4,992.0	4,989.0	19.7	43.5	-159.73	-21.5	-184.1	471.0	409.1	61.88	7.612	
5,070.0	5,034.6	5,001.5	4,998.5	19.7	43.6	-159.75	-21.5	-184.0	471.3	409.3	61.99	7.602	
5,080.0	5,044.6	5,011.4	5,008.4	19.7	43.7	-159.76	-21.6	-184.0	471.6	409.4	62.11	7.592	
5,090.0	5,054.6	5,021.6	5,018.6	19.8	43.8	-159.76	-21.7	-184.0	471.8	409.6	62.24	7.581	
5,100.0	5,064.6	5,031.8	5,028.8	19.8	43.9	-159.76	-21.8	-184.0	472.0	409.7	62.36	7.569	
5,110.0	5,074.6	5,042.4	5,039.4	19.8	44.0	-159.76	-21.9	-184.0	472.2	409.7	62.48	7.557	
5,120.0	5,084.6	5,053.2	5,050.2	19.9	44.1	-159.77	-22.0	-184.0	472.3	409.7	62.61	7.544	
5,130.0	5,094.6	5,063.8	5,060.8	19.9	44.2	-159.77	-22.0	-184.0	472.4	409.7	62.73	7.531	
5,140.0	5,104.6	5,073.8	5,070.8	19.9	44.3	-159.77	-22.1	-184.0	472.5	409.7	62.85	7.518	
5,150.0	5,114.6	5,083.5	5,080.5	20.0	44.3	165.22	-22.1	-183.9	472.6	409.6	62.99	7.502	
5,160.0	5,124.6	5,093.0	5,090.0	20.0	44.4	165.22	-22.1	-183.9	472.6	409.5	63.10	7.489	
5,170.0	5,134.6	5,102.2	5,099.2	20.0	44.5	165.22	-22.2	-183.9	472.7	409.5	63.22	7.477	
5,180.0	5,144.6	5,111.4	5,108.4	20.1	44.6	165.22	-22.3	-183.9	472.8	409.4	63.33	7.465	
5,190.0	5,154.6	5,121.5	5,118.5	20.1	44.7	165.22	-22.4	-183.9	472.9	409.4	63.46	7.452	
5,200.0	5,164.6	5,132.7	5,129.7	20.1	44.8	165.23	-22.5	-183.9	472.9	409.4	63.59	7.437	
5,210.0	5,174.6	5,144.2	5,141.2	20.2	44.9	165.24	-22.5	-184.0	473.0	409.3	63.72	7.422	
5,220.0	5,184.6	5,155.0	5,152.0	20.2	45.0	165.25	-22.6	-184.0	473.0	409.2	63.85	7.408	
5,230.0	5,194.6	5,164.8	5,161.8	20.2	45.1	165.25	-22.6	-184.0	473.0	409.1	63.97	7.394	
5,240.0	5,204.6	5,174.3	5,171.3	20.3	45.1	165.25	-22.6	-184.1	473.1	409.0	64.09	7.381	
5,250.0	5,214.6	5,183.8	5,180.8	20.3	45.2	165.25	-22.7	-184.0	473.1	408.9	64.21	7.368	
5,260.0	5,224.6	5,193.8	5,190.7	20.3	45.3	165.25	-22.7	-184.0	473.1	408.8	64.33	7.355	
5,270.0	5,234.6	5,203.8	5,200.8	20.3	45.4	165.25	-22.8	-184.0	473.2	408.7	64.45	7.341	
5,280.0	5,244.6	5,213.9	5,210.9	20.4	45.5	165.25	-22.8	-184.0	473.2	408.6	64.58	7.328	
5,290.0	5,254.6	5,223.8	5,220.8	20.4	45.6	165.25	-22.8	-184.0	473.3	408.6	64.70	7.315	
5,300.0	5,264.6	5,233.6	5,230.6	20.4	45.7	165.26	-22.9	-184.1	473.3	408.5	64.82	7.302	
5,310.0	5,274.6	5,243.3	5,240.3	20.5	45.8	165.27	-23.0	-184.1	473.4	408.4	64.94	7.289	
5,320.0	5,284.6	5,252.5	5,249.5	20.5	45.8	165.28	-23.0	-184.2	473.4	408.4	65.05	7.277	
5,330.0	5,294.6	5,261.8	5,258.8	20.5	45.9	165.29	-23.1	-184.2	473.5	408.3	65.17	7.266	
5,340.0	5,304.6	5,271.2	5,268.2	20.6	46.0	165.29	-23.2	-184.2	473.6	408.3	65.29	7.254	
5,350.0	5,314.6	5,281.5	5,278.4	20.6	46.1	165.29	-23.3	-184.2	473.7	408.3	65.41	7.242	

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

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,360.0	5,324.6	5,292.4	5,289.3	20.6	46.2	165.29	-23.4	-184.2	473.8	408.2	65.54	7.229	
5,370.0	5,334.6	5,303.4	5,300.4	20.7	46.3	165.29	-23.5	-184.2	473.8	408.2	65.67	7.215	
5,380.0	5,344.6	5,313.9	5,310.9	20.7	46.4	165.30	-23.5	-184.2	473.9	408.1	65.80	7.202	
5,390.0	5,354.6	5,324.1	5,321.1	20.7	46.5	165.30	-23.6	-184.2	473.9	408.0	65.92	7.189	
5,400.0	5,364.6	5,334.1	5,331.1	20.8	46.6	165.31	-23.6	-184.3	474.0	407.9	66.05	7.176	
5,410.0	5,374.6	5,343.7	5,340.7	20.8	46.6	165.31	-23.7	-184.3	474.0	407.8	66.17	7.164	
5,420.0	5,384.6	5,353.1	5,350.1	20.8	46.7	165.32	-23.7	-184.3	474.0	407.8	66.28	7.152	
5,430.0	5,394.6	5,362.4	5,359.4	20.9	46.8	165.32	-23.8	-184.3	474.1	407.7	66.40	7.140	
5,440.0	5,404.6	5,372.0	5,369.0	20.9	46.9	165.32	-23.9	-184.3	474.2	407.7	66.52	7.129	
5,450.0	5,414.6	5,381.8	5,378.8	20.9	47.0	165.32	-23.9	-184.3	474.3	407.6	66.64	7.117	
5,460.0	5,424.6	5,391.8	5,388.7	21.0	47.1	165.32	-24.0	-184.3	474.4	407.6	66.76	7.105	
5,470.0	5,434.6	5,401.8	5,398.8	21.0	47.1	165.32	-24.1	-184.3	474.4	407.6	66.88	7.094	
5,480.0	5,444.6	5,411.8	5,408.8	21.0	47.2	165.33	-24.2	-184.3	474.5	407.5	67.01	7.082	
5,490.0	5,454.6	5,421.8	5,418.8	21.1	47.3	165.33	-24.3	-184.3	474.6	407.5	67.13	7.070	
5,500.0	5,464.6	5,431.8	5,428.7	21.1	47.4	165.34	-24.4	-184.3	474.7	407.4	67.25	7.059	
5,510.0	5,474.6	5,441.6	5,438.6	21.1	47.5	165.34	-24.5	-184.3	474.8	407.4	67.37	7.047	
5,520.0	5,484.6	5,451.3	5,448.3	21.2	47.6	165.34	-24.6	-184.3	474.9	407.4	67.49	7.036	
5,530.0	5,494.6	5,461.3	5,458.3	21.2	47.7	165.34	-24.7	-184.3	475.0	407.4	67.61	7.025	
5,540.0	5,504.6	5,471.5	5,468.5	21.2	47.8	165.35	-24.8	-184.3	475.1	407.3	67.74	7.013	
5,550.0	5,514.6	5,482.6	5,479.6	21.3	47.9	165.35	-24.9	-184.3	475.1	407.3	67.87	7.001	
5,560.0	5,524.6	5,493.7	5,490.6	21.3	48.0	165.36	-24.9	-184.3	475.2	407.2	68.00	6.988	
5,570.0	5,534.6	5,504.1	5,501.1	21.3	48.0	165.36	-25.0	-184.4	475.2	407.1	68.13	6.976	
5,580.0	5,544.6	5,513.7	5,510.7	21.4	48.1	165.37	-25.0	-184.4	475.3	407.0	68.25	6.964	
5,590.0	5,554.6	5,523.4	5,520.4	21.4	48.2	165.37	-25.1	-184.4	475.3	407.0	68.37	6.952	
5,600.0	5,564.6	5,533.2	5,530.2	21.4	48.3	165.36	-25.1	-184.3	475.4	406.9	68.49	6.941	
5,610.0	5,574.6	5,543.2	5,540.2	21.5	48.4	165.36	-25.2	-184.3	475.4	406.8	68.61	6.929	
5,620.0	5,584.6	5,553.2	5,550.2	21.5	48.5	165.36	-25.2	-184.3	475.5	406.8	68.73	6.918	
5,630.0	5,594.6	5,563.2	5,560.2	21.5	48.6	165.36	-25.3	-184.3	475.5	406.7	68.86	6.906	
5,640.0	5,604.6	5,573.3	5,570.3	21.6	48.7	165.37	-25.3	-184.3	475.6	406.6	68.98	6.895	
5,650.0	5,614.6	5,583.1	5,580.1	21.6	48.7	165.38	-25.4	-184.4	475.7	406.6	69.10	6.884	
5,660.0	5,624.6	5,592.7	5,589.7	21.6	48.8	165.38	-25.5	-184.4	475.7	406.5	69.22	6.873	
5,670.0	5,634.6	5,601.9	5,598.9	21.7	48.9	165.39	-25.5	-184.4	475.8	406.5	69.33	6.862	
5,680.0	5,644.6	5,611.5	5,608.5	21.7	49.0	165.39	-25.6	-184.4	475.9	406.4	69.45	6.852	
5,690.0	5,654.6	5,621.5	5,618.5	21.7	49.1	165.39	-25.7	-184.4	476.0	406.4	69.58	6.841	
5,700.0	5,664.6	5,632.9	5,629.9	21.7	49.2	165.38	-25.8	-184.4	476.0	406.3	69.71	6.829	
5,710.0	5,674.6	5,645.0	5,642.0	21.8	49.3	165.38	-25.8	-184.3	476.1	406.2	69.85	6.816	
5,720.0	5,684.6	5,655.9	5,652.9	21.8	49.4	165.38	-25.8	-184.3	476.1	406.1	69.98	6.803	
5,730.0	5,694.6	5,665.0	5,662.0	21.8	49.5	165.38	-25.8	-184.3	476.1	406.0	70.09	6.792	
5,730.3	5,695.0	5,666.1	5,663.1	21.8	49.5	165.38	-25.8	-184.3	476.1	406.0	70.10	6.791	
5,740.0	5,704.6	5,674.6	5,671.6	21.9	49.5	165.38	-25.9	-184.3	476.1	405.9	70.21	6.781	
5,750.0	5,714.6	5,683.5	5,680.5	21.9	49.6	165.39	-25.9	-184.4	476.1	405.8	70.32	6.771	
5,760.0	5,724.6	5,692.5	5,689.5	21.9	49.7	165.39	-26.0	-184.4	476.2	405.8	70.44	6.761	
5,770.0	5,734.6	5,702.4	5,699.3	22.0	49.8	165.40	-26.0	-184.4	476.3	405.7	70.56	6.750	
5,780.0	5,744.6	5,712.9	5,709.9	22.0	49.9	165.40	-26.1	-184.4	476.3	405.7	70.69	6.739	
5,790.0	5,754.6	5,724.4	5,721.4	22.0	50.0	165.40	-26.2	-184.4	476.4	405.6	70.82	6.726	
5,800.0	5,764.6	5,735.5	5,732.5	22.1	50.1	165.39	-26.2	-184.3	476.4	405.5	70.95	6.714	
5,810.0	5,774.6	5,745.5	5,742.5	22.1	50.2	165.39	-26.2	-184.3	476.4	405.3	71.07	6.703	
5,820.0	5,784.6	5,755.0	5,752.0	22.1	50.2	165.39	-26.2	-184.3	476.4	405.2	71.19	6.692	
5,830.0	5,794.6	5,763.6	5,760.5	22.2	50.3	165.39	-26.2	-184.3	476.5	405.2	71.30	6.682	
5,840.0	5,804.6	5,772.6	5,769.5	22.2	50.4	165.39	-26.3	-184.3	476.5	405.1	71.41	6.672	
5,850.0	5,814.6	5,782.3	5,779.3	22.2	50.5	165.39	-26.3	-184.3	476.6	405.0	71.54	6.662	
5,860.0	5,824.6	5,793.3	5,790.3	22.3	50.6	165.39	-26.4	-184.3	476.7	405.0	71.67	6.651	
5,870.0	5,834.6	5,804.7	5,801.7	22.3	50.7	165.40	-26.5	-184.3	476.7	404.9	71.80	6.639	
5,880.0	5,844.6	5,815.9	5,812.9	22.3	50.8	165.40	-26.5	-184.3	476.7	404.8	71.93	6.627	
5,885.8	5,850.5	5,821.7	5,818.7	22.4	50.8	165.40	-26.5	-184.3	476.7	404.7	72.00	6.620	
5,890.0	5,854.6	5,825.8	5,822.8	22.4	50.9	165.40	-26.5	-184.3	476.7	404.6	72.05	6.616	
5,900.0	5,864.6	5,835.3	5,832.3	22.4	51.0	165.40	-26.5	-184.3	476.7	404.5	72.17	6.605	
5,910.0	5,874.6	5,845.0	5,842.0	22.4	51.0	165.40	-26.5	-184.3	476.7	404.4	72.29	6.595	
5,920.0	5,884.6	5,853.4	5,850.4	22.5	51.1	165.39	-26.5	-184.2	476.8	404.4	72.40	6.585	
5,930.0	5,894.6	5,862.4	5,859.4	22.5	51.2	165.39	-26.6	-184.2	476.8	404.3	72.51	6.576	
5,940.0	5,904.6	5,872.1	5,869.1	22.5	51.3	165.39	-26.6	-184.2	476.9	404.3	72.63	6.566	
5,950.0	5,914.6	5,883.5	5,880.5	22.6	51.4	165.39	-26.7	-184.2	477.0	404.2	72.77	6.555	
5,960.0	5,924.6	5,895.1	5,892.0	22.6	51.5	165.39	-26.7	-184.2	477.0	404.1	72.90	6.543	
5,970.0	5,934.6	5,906.0	5,902.9	22.6	51.6	165.39	-26.8	-184.2	477.0	404.0	73.03	6.531	
5,974.4	5,939.0	5,910.2	5,907.2	22.7	51.6	165.39	-26.8	-184.2	477.0	403.9	73.09	6.527	
5,980.0	5,944.6	5,915.7	5,912.6	22.7	51.7	165.39	-26.8	-184.2	477.0	403.9	73.15	6.521	

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

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,990.0	5,954.6	5,925.0	5,922.0	22.7	51.7	165.39	-26.8	-184.2	477.0	403.7	73.27	6.511	
6,000.0	5,964.6	5,934.1	5,931.1	22.7	51.8	165.39	-26.8	-184.1	477.0	403.7	73.38	6.501	
6,010.0	5,974.6	5,943.6	5,940.6	22.8	51.9	165.38	-26.8	-184.1	477.1	403.6	73.50	6.491	
6,020.0	5,984.6	5,953.3	5,950.3	22.8	52.0	165.38	-26.8	-184.0	477.1	403.5	73.62	6.481	
6,030.0	5,994.6	5,963.6	5,960.6	22.8	52.1	165.38	-26.9	-184.0	477.2	403.4	73.74	6.471	
6,040.0	6,004.6	5,974.9	5,971.8	22.9	52.2	165.38	-26.9	-184.0	477.2	403.3	73.88	6.460	
6,050.0	6,014.6	5,985.9	5,982.9	22.9	52.3	165.38	-26.9	-184.0	477.2	403.2	74.01	6.448	
6,060.0	6,024.6	5,996.4	5,993.3	22.9	52.4	165.38	-26.9	-184.0	477.2	403.1	74.13	6.437	
6,064.5	6,029.1	6,000.3	5,997.3	23.0	52.4	165.38	-26.9	-184.0	477.2	403.0	74.18	6.433	
6,070.0	6,034.6	6,005.2	6,002.2	23.0	52.4	165.38	-26.9	-184.0	477.2	403.0	74.24	6.428	
6,080.0	6,044.6	6,013.8	6,010.8	23.0	52.5	165.37	-26.9	-184.0	477.2	402.9	74.35	6.419	
6,090.0	6,054.6	6,022.2	6,019.1	23.0	52.6	165.37	-27.0	-183.9	477.3	402.8	74.46	6.410	
6,100.0	6,064.6	6,031.8	6,028.8	23.1	52.7	165.37	-27.1	-183.9	477.4	402.8	74.58	6.401	
6,110.0	6,074.6	6,042.7	6,039.7	23.1	52.8	165.37	-27.1	-183.9	477.5	402.8	74.71	6.391	
6,120.0	6,084.6	6,055.8	6,052.8	23.1	52.9	165.36	-27.2	-183.8	477.5	402.6	74.86	6.379	
6,130.0	6,094.6	6,067.1	6,064.1	23.2	53.0	165.36	-27.1	-183.8	477.5	402.5	74.99	6.367	
6,140.0	6,104.6	6,076.3	6,073.3	23.2	53.1	165.35	-27.1	-183.7	477.5	402.4	75.11	6.357	
6,142.9	6,107.5	6,078.7	6,075.7	23.2	53.1	165.35	-27.1	-183.7	477.5	402.3	75.14	6.355	
6,150.0	6,114.6	6,085.0	6,082.0	23.2	53.1	165.34	-27.1	-183.7	477.5	402.3	75.22	6.348	
6,160.0	6,124.6	6,091.1	6,088.1	23.3	53.2	165.34	-27.1	-183.6	477.5	402.2	75.30	6.341	
6,170.0	6,134.6	6,098.0	6,095.0	23.3	53.2	165.34	-27.2	-183.6	477.7	402.3	75.40	6.335	
6,180.0	6,144.6	6,098.0	6,095.0	23.3	53.2	165.34	-27.2	-183.6	477.9	402.5	75.43	6.336	
6,190.0	6,154.6	6,107.1	6,104.0	23.4	53.3	165.33	-27.5	-183.5	478.2	402.7	75.51	6.334	
6,200.0	6,164.6	6,111.8	6,108.8	23.4	53.3	165.34	-27.7	-183.5	478.7	403.1	75.57	6.335	
6,210.0	6,174.6	6,122.0	6,118.9	23.4	53.3	165.35	-28.3	-183.4	479.3	403.7	75.65	6.336	
6,220.0	6,184.6	6,122.0	6,118.9	23.5	53.3	165.35	-28.3	-183.4	479.9	404.2	75.68	6.341	
6,230.0	6,194.6	6,122.0	6,118.9	23.5	53.3	165.35	-28.3	-183.4	480.7	405.0	75.72	6.349	
6,240.0	6,204.6	6,122.0	6,118.9	23.5	53.3	165.35	-28.3	-183.4	481.7	406.0	75.75	6.360	
6,250.0	6,214.6	6,133.5	6,130.4	23.6	53.3	165.38	-29.4	-183.4	482.6	406.8	75.79	6.368	
6,260.0	6,224.6	6,137.5	6,134.4	23.6	53.3	165.40	-29.9	-183.4	483.8	407.9	75.82	6.380	
6,270.0	6,234.6	6,141.5	6,138.3	23.6	53.3	165.42	-30.4	-183.4	485.0	409.2	75.86	6.394	
6,280.0	6,244.6	6,153.0	6,149.7	23.7	53.3	165.48	-32.2	-183.5	486.6	410.7	75.89	6.411	
6,290.0	6,254.6	6,153.0	6,149.7	23.7	53.3	165.48	-32.2	-183.5	488.0	412.0	75.93	6.427	
6,300.0	6,264.6	6,153.0	6,149.7	23.7	53.3	165.48	-32.2	-183.5	489.6	413.6	75.96	6.445	
6,310.0	6,274.6	6,153.0	6,149.7	23.8	53.3	165.48	-32.2	-183.5	491.4	415.4	76.00	6.466	
6,320.0	6,284.6	6,162.3	6,158.9	23.8	53.3	165.55	-34.0	-183.7	493.2	417.1	76.03	6.486	
6,330.0	6,294.6	6,166.7	6,163.2	23.8	53.3	165.58	-34.9	-183.7	495.1	419.0	76.07	6.509	
6,340.0	6,304.6	6,171.1	6,167.4	23.9	53.3	165.62	-35.8	-183.8	497.2	421.1	76.11	6.533	
6,350.0	6,314.6	6,175.5	6,171.7	23.9	53.3	165.66	-36.8	-183.9	499.4	423.2	76.14	6.558	
6,360.0	6,324.6	6,185.0	6,180.9	23.9	53.3	165.75	-39.2	-184.1	501.7	425.5	76.18	6.586	
6,370.0	6,334.6	6,185.0	6,180.9	24.0	53.3	165.75	-39.2	-184.1	504.0	427.8	76.21	6.613	
6,380.0	6,344.6	6,185.0	6,180.9	24.0	53.3	165.75	-39.2	-184.1	506.5	430.3	76.25	6.643	
6,390.0	6,354.6	6,193.9	6,189.5	24.0	53.3	165.84	-41.5	-184.3	509.1	432.8	76.29	6.673	
6,400.0	6,364.6	6,198.8	6,194.2	24.1	53.3	165.89	-42.9	-184.4	511.7	435.4	76.32	6.705	
6,410.0	6,374.6	6,203.7	6,198.9	24.1	53.3	165.95	-44.3	-184.6	514.5	438.1	76.36	6.738	
6,420.0	6,384.6	6,216.0	6,210.6	24.1	53.4	166.10	-48.1	-185.0	517.4	441.0	76.40	6.773	
6,430.0	6,394.6	6,216.0	6,210.6	24.2	53.4	166.10	-48.1	-185.0	520.3	443.8	76.43	6.807	
6,440.0	6,404.6	6,216.0	6,210.6	24.2	53.4	166.10	-48.1	-185.0	523.3	446.8	76.47	6.843	
6,450.0	6,414.6	6,216.0	6,210.6	24.2	53.4	166.10	-48.1	-185.0	526.5	450.0	76.50	6.882	
6,460.0	6,424.6	6,227.6	6,221.5	24.3	53.4	166.25	-51.9	-185.4	529.6	453.0	76.54	6.919	
6,470.0	6,434.6	6,232.2	6,225.8	24.3	53.4	166.32	-53.5	-185.6	532.9	456.3	76.58	6.959	
6,480.0	6,444.6	6,236.8	6,230.1	24.3	53.4	166.38	-55.1	-185.8	536.2	459.6	76.61	6.999	
6,490.0	6,454.6	6,247.0	6,239.6	24.4	53.4	166.52	-58.9	-186.2	539.7	463.1	76.65	7.041	
6,500.0	6,464.6	6,247.0	6,239.6	24.4	53.4	166.52	-58.9	-186.2	543.2	466.5	76.69	7.084	
6,510.0	6,474.6	6,247.0	6,239.6	24.4	53.4	166.52	-58.9	-186.2	546.8	470.1	76.72	7.128	
6,520.0	6,484.6	6,256.2	6,248.1	24.5	53.4	166.66	-62.4	-186.5	550.5	473.7	76.76	7.172	
6,530.0	6,494.6	6,261.5	6,253.0	24.5	53.4	166.73	-64.5	-186.7	554.3	477.5	76.79	7.217	
6,540.0	6,504.6	6,266.7	6,257.7	24.5	53.4	166.81	-66.5	-187.0	558.1	481.2	76.83	7.264	
6,550.0	6,514.6	6,278.0	6,268.0	24.6	53.4	166.97	-71.2	-187.4	562.0	485.1	76.87	7.311	
6,560.0	6,524.6	6,278.0	6,268.0	24.6	53.4	166.97	-71.2	-187.4	565.9	489.0	76.91	7.359	
6,570.0	6,534.6	6,278.0	6,268.0	24.6	53.4	166.97	-71.2	-187.4	570.0	493.0	76.94	7.408	
6,580.0	6,544.6	6,287.4	6,276.6	24.7	53.4	167.11	-75.1	-187.8	574.0	497.0	76.98	7.457	
6,590.0	6,554.6	6,292.6	6,281.2	24.7	53.4	167.18	-77.3	-188.0	578.2	501.1	77.02	7.507	
6,600.0	6,564.6	6,297.7	6,285.8	24.7	53.4	167.26	-79.6	-188.1	582.4	505.3	77.05	7.558	
6,610.0	6,574.6	6,302.8	6,290.4	24.8	53.4	167.33	-81.8	-188.3	586.6	509.6	77.09	7.610	
6,620.0	6,584.6	6,310.0	6,296.8	24.8	53.4	167.43	-85.1	-188.6	591.0	513.9	77.13	7.663	

Offset Design Cypress 34 Fed - 7H - OH - OH

Survey Program: 100-CB-GYRO-MS, 6122-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 5.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,630.0	6,594.6	6,310.0	6,296.8	24.8	53.4	167.43	-85.1	-188.6	595.4	518.2	77.16	7.716	
6,640.0	6,604.6	6,317.6	6,303.6	24.9	53.4	167.53	-88.6	-188.8	599.8	522.6	77.20	7.770	
6,650.0	6,614.6	6,322.4	6,307.9	24.9	53.4	167.60	-90.8	-188.9	604.3	527.1	77.24	7.825	
6,660.0	6,624.6	6,327.2	6,312.1	24.9	53.4	167.66	-93.0	-189.0	608.9	531.7	77.27	7.880	
6,670.0	6,634.6	6,331.9	6,316.2	25.0	53.4	167.72	-95.3	-189.0	613.6	536.3	77.31	7.937	
6,680.0	6,644.6	6,342.0	6,325.1	25.0	53.4	167.83	-100.1	-189.1	618.3	541.0	77.35	7.994	
6,690.0	6,654.6	6,342.0	6,325.1	25.0	53.4	167.83	-100.1	-189.1	623.0	545.6	77.38	8.051	
6,700.0	6,664.6	6,342.0	6,325.1	25.1	53.4	167.83	-100.1	-189.1	627.9	550.5	77.42	8.110	
6,710.0	6,674.6	6,351.7	6,333.5	25.1	53.4	167.94	-104.9	-189.2	632.7	555.3	77.45	8.169	
6,720.0	6,684.6	6,356.9	6,338.0	25.1	53.4	168.00	-107.5	-189.1	637.6	560.1	77.49	8.228	
6,730.0	6,694.6	6,362.0	6,342.4	25.2	53.4	168.05	-110.1	-189.1	642.6	565.1	77.53	8.288	
6,740.0	6,704.6	6,373.0	6,351.9	25.2	53.4	168.15	-115.7	-189.0	647.6	570.1	77.57	8.349	
6,750.0	6,714.6	6,373.0	6,351.9	25.2	53.4	168.15	-115.7	-189.0	652.7	575.1	77.60	8.410	
6,760.0	6,724.6	6,373.0	6,351.9	25.3	53.4	168.15	-115.7	-189.0	657.8	580.1	77.64	8.473	
6,770.0	6,734.6	6,383.1	6,360.5	25.3	53.4	168.25	-120.9	-188.8	662.9	585.2	77.67	8.534	
6,780.0	6,744.6	6,388.5	6,365.1	25.3	53.4	168.30	-123.8	-188.7	668.1	590.4	77.71	8.597	
6,790.0	6,754.6	6,393.9	6,369.7	25.4	53.4	168.34	-126.6	-188.7	673.3	595.6	77.75	8.660	
6,800.0	6,764.6	6,405.0	6,379.1	25.4	53.4	168.44	-132.5	-188.5	678.6	600.8	77.79	8.724	
6,810.0	6,774.6	6,405.0	6,379.1	25.4	53.4	168.44	-132.5	-188.5	683.9	606.1	77.82	8.788	
6,820.0	6,784.6	6,405.0	6,379.1	25.5	53.4	168.44	-132.5	-188.5	689.2	611.4	77.86	8.853	
6,830.0	6,794.6	6,413.4	6,386.1	25.5	53.4	168.52	-137.1	-188.3	694.6	616.7	77.89	8.918	
6,840.0	6,804.6	6,417.7	6,389.7	25.5	53.4	168.55	-139.5	-188.2	700.1	622.1	77.93	8.983	
6,850.0	6,814.6	6,422.0	6,393.3	25.6	53.4	168.59	-141.8	-188.1	705.6	627.6	77.97	9.050	
6,860.0	6,824.6	6,426.3	6,396.8	25.6	53.4	168.63	-144.2	-188.0	711.1	633.1	78.00	9.117	
6,870.0	6,834.6	6,436.0	6,404.9	25.6	53.4	168.70	-149.7	-187.7	716.7	638.7	78.04	9.184	
6,880.0	6,844.6	6,436.0	6,404.9	25.7	53.4	168.70	-149.7	-187.7	722.3	644.3	78.07	9.252	
6,890.0	6,854.6	6,436.0	6,404.9	25.7	53.4	168.70	-149.7	-187.7	728.0	649.9	78.11	9.321	
6,900.0	6,864.6	6,436.0	6,404.9	25.7	53.4	168.70	-149.7	-187.7	733.8	655.7	78.14	9.391	
6,910.0	6,874.6	6,445.8	6,412.8	25.8	53.4	168.79	-155.4	-187.5	739.6	661.4	78.18	9.459	
6,920.0	6,884.6	6,449.3	6,415.7	25.8	53.4	168.82	-157.5	-187.4	745.4	667.2	78.22	9.530	
6,930.0	6,894.6	6,452.9	6,418.5	25.8	53.4	168.85	-159.6	-187.3	751.3	673.0	78.25	9.600	
6,940.0	6,904.6	6,456.4	6,421.4	25.9	53.4	168.88	-161.7	-187.2	757.2	678.9	78.29	9.672	
6,950.0	6,914.6	6,467.0	6,429.8	25.9	53.4	168.97	-168.1	-187.0	763.3	685.0	78.33	9.744	
6,960.0	6,924.6	6,467.0	6,429.8	25.9	53.4	168.97	-168.1	-187.0	769.3	690.9	78.36	9.816	
6,970.0	6,934.6	6,467.0	6,429.8	26.0	53.4	168.97	-168.1	-187.0	775.3	696.9	78.40	9.889	
6,980.0	6,944.6	6,467.0	6,429.8	26.0	53.4	168.97	-168.1	-187.0	781.5	703.0	78.43	9.963	

Drilling Operations Plan
Cypress 34 Federal 232H
Tap Rock Operating, LLC
SHL 546' FNL & 2578' FEL, Sec. 34
BHL 200' FSL & 2430' FWL, Sec. 34
Sec. 34 T. 23S., R. 29E Lea County, NM

Elevation above Sea Level: 3044'

DRILLING PROGRAM

1. Estimated Tops

Formation	TVD	MD	Lithologies	Bearing
Rustler Anhydrite	248	248		Salt
Salado	609	609	Salt	Salt
Base Salt	2855	2871		Salt
Lamar	3075	3093	Limestone	None
Bell Canyon	3099	3118	Sandstone	Hydrocarbons
Cherry Canyon	3997	4025	Sandstone	Hydrocarbons
Brushy Canyon	5147	5182	Sandstone	Hydrocarbons
Bone Spring	6835	6870	Limestone	Hydrocarbons
1st Bone Spring	7831	7866	Sandstone	Hydrocarbons
2nd Bone Spring	8033	8068	Sandstone	Hydrocarbons
3rd Bone Spring	8967	9002	Sandstone	Hydrocarbons
Wolfcamp	10035	10070	Shale	Hydrocarbons

2. Notable Zones

Lower Wolfcamp is the target formation.

3. Pressure Control

Pressure Control Equipment (See Schematics):
A 15,000', 5,000 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. See attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. The wellhead will be a multi-bowl speed head.

Drilling Operations Plan
Cypress 34 Federal 232H
Tap Rock Operating, LLC
SHL 546' FNL & 2578' FEL, Sec. 34
BHL 200' FSL & 2430' FWL, Sec. 34
Sec. 34 T. 23S., R. 29E Lea County, NM

BOP Test procedure will be as follows:

After surface casing is set and the BOP is nippled up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 2,500 psi. The BOP will be tested in this manner after nipple-up if any break of the stack occurs.

Variance Requests:
Tap Rock requests a variance to run a multi-bowl speed head for setting the Intermediate 1, Intermediate 2, and Production Strings. Tap Rock requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Tap Rock requests a variance to have the option of batch drilling this well with other wells on the same pad. In the event that this well is batch drilled, after drilling surface, 1st intermediate, and 2nd intermediate hole sections and cementing 2nd intermediate casing, a 10M dry hole cap with bleed off valve will be installed. The rig will then walk to another well on the pad. When the rig returns to this well and BOPs are installed, the operator will perform a full BOP test. Due to the Potash, Tap Rock will cement the 7-5/8" string to surface.

Tap Rock requests approval to possibly utilize a spudder rig to drill and set casing for the surface interval on this well. The spudder rig will be possibly utilized in order to reduce cost and save time. The wellhead will be installed and tested as soon as the surface casing is cut off per the existing COAs. A blind flange with the same pressure rating as the wellhead will be installed on the well. Once the spudder rig is removed, Tap Rock will secure the wellhead area by placing a guard rail around the cellar. Pressure will be monitored and a means for intervention will be maintained while the drilling rig is not over the well. Spudder rig operations are expected to take 2-3 days per well. Three wells on the pad will have surface casing set by the spudder rig as a part of this operation. The BLM will be notified 24 hours prior to commencing spudder rig operations. Within 90 days of the departure of the spudder rig, drilling operations will recommence on these wells. This rig will have a BOP stack equal or greater to the pressure rating required in the COAs. The BLM will be notified 24 hours before the larger rig moves on the pre-set wells. Tap Rock will have supervision on the spudder rig to ensure compliance with all BLM and NMOCD regulations.

Drilling Operations Plan
Cypress 34 Federal 232H
Tap Rock Operating, LLC
SHL 546' FNL & 2578' FEL, Sec. 34
BHL 200' FSL & 2430' FWL, Sec. 34
Sec. 34 T. 23S., R. 29E Lea County, NM

4. Casing & Cement

All Casing will be new.

Name	Hole Size	Casing Size	Standard	Tapered	Top MD	Bottom MD	Top TVD	BTM TVD	Grade	Weight	Thread	Collapse	Burst	Tension
Surface	17 1/2	13 3/8	API	No	0	350	0	350	J-55	54.5	BUTT	1.13	1.15	1.6
1st Intermediate	12 1/4	9 5/8	API	No	0	3150	0	3131	J-55	40	BUTT	1.13	1.15	1.6
2nd Intermediate	8 3/4	7 5/8	NON API	Bo	0	10330	0	10295	P-110	29.7	W-513	1.13	1.15	1.6
Production	6 3/4	5 1/2	NON API	No	0	9830	0	9795	P-110	20	TXP	1.13	1.15	1.6
Production	6 3/4	5	NON API	Yes	9830	15750	9795	10242	P-110	18	W-521	1.13	1.15	1.6

Name	Type	Top MD	Sacks	Yield	Cu. Ft	Weight	Excess	Cement	Additives
Surface	Tail	0	360	1.35	486	14.8	100%	C	5% NCl + LCM
1st Intermediate	Lead	0	560	2.18	1221	12.7	65%	C	Bentonite + 1% CaCL2 + 8% NaCl + LCM
	Tail	2363	306	1.33	407	14.8	65%	C	5% NaCl + LCM
2nd Intermediate	Lead	0	441	2.87	1265	11.5	35%	TXI	Fluid Loss + Dispersant + Retarder + LCM
	Tail	9330	107	1.27	136	15	35%	H	Fluid Loss + Dispersant + Retarder + LCM
Production	Tail	9830	485	1.71	830	14.2	25%	H	Fluid Loss + Dispersant + Retarder + LCM

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.

Name	Top	Bottom	Type	Mud Weight	Visc	Fluid Loss
Surface	0	350	FW Spud Mud	8.30	28	NC
Intermediate	350	3000	Brine Water	10.00	30-32	NC
Intermediate 2	3000	10330	FW/Cut Brine	9.00	30-32	NC
Production	10330	15750	Oil Base Mud	13.00	15-20	<10

6. Cores, Tests, & Logs

- Electric Logging Program: No open-hole logs are planned at this time for the pilot hole.
- GR will be collected while drilling through the MWD tools from 9.625" casing shoe to TD.
- A 2-person mud logging program will be used from 9.625" casing shoe to TD.
- No DSTs or cores are planned at this time.
- CBL w/ CCL from as far as gravity will let it fall to TOC.

7. Down Hole Conditions

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈7,425 psi. Expected bottom hole temperature is ≈170° F.

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

8. Down Hole Conditions

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