# Carlsbad Field Office
# OCD Artesia

Form 3160-3
(March 2012)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMNM113944

6. If Indian, Allotee or Tribe Name:

7. If Unit or CA Agreement, Name and No.: 320659 WCA

1a. Type of work: ☑ DRILL ☐ REENTER

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

8. Lease Name and Well No.: COTTONWOOD 29-32 FED COM W 9H

2. Name of Operator: CHISHOLM ENERGY OPERATING LLC 372137

9. API Well No.: 30-015-44919

3a. Address: 801 Cherry St., Suite 1200 Unit 20 Fort Worth

3b. Phone No. (include area code): (817)469-1104

10. Field and Pool, or Exploratory: PURPLE SAGE / WOLFCAMP, (GAS)

4. Location of Well (Report location clearly and in accordance with any State requirements.*)

At surface: LOT D / 100 FNL / 1205 FWL / LAT 32.0202303 / LONG -104.3196809

At proposed prod. zone: LOT 3 / 330 FSL / 1584 FWL / LAT 32.001139 / LONG -104.3184162

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 29 / T26S / R26E / NMP

14. Distance in miles and direction from nearest town or post office*: 11 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): 100 feet

16. No. of acres in lease: 1581.51

17. Spacing Unit dedicated to this well: 447.94

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 60 feet

19. Proposed Depth: 8225 feet / 15132 feet

20. BLM/BIA Bond No. on file: FED: NMB001468

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 3433 feet

22. Approximate date work will start*: 06/01/2018

23. Estimated duration: 30 days

## 24. Attachments

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

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

25. Signature: (Electronic Submission)

Name (Printed/Typed): Jennifer Elrod / Ph: (817)953-3728

Date: 09/19/2017

Title: Senior Regulatory Technician

Approved by (Signature): (Electronic Submission)

Name (Printed/Typed): Cody Layton / Ph: (575)234-5959

Date: 04/20/2018

Title: Supervisor Multiple Resources

Office: CARLSBAD

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

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

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

Approval Date: 04/20/2018

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 26 2018
RECEIVED

C102 - Request for Clean Print, Received RLP 4-27-18

## INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the lan involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impact
ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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## Additional Operator Remarks

### Location of Well

1. SHL: LOT D / 100 FNL / 1205 FWL / TWSP: 26S / RANGE: 26E / SECTION: 29 / LAT: 32.0202303 / LONG: -104.3196809 ( TVD: 0 feet, MD: 0 feet )
   PPP: LOT C / 330 FNL / 1584 FWL / TWSP: 26S / RANGE: 26E / SECTION: 29 / LAT: 32.0193081 / LONG: -104.3184545 ( TVD: 8225 feet, MD: 8620 feet )
   BHL: LOT 3 / 330 FSL / 1584 FWL / TWSP: 26S / RANGE: 26E / SECTION: 32 / LAT: 32.001139 / LONG: -104.3184162 ( TVD: 8225 feet, MD: 15132 feet )

## BLM Point of Contact

Name: Sipra Dahal
Title: Legal Instruments Examiner
Phone: 5752345983
Email: sdahal@blm.gov



**Approval Date: 04/20/2018**

## Review and Appeal Rights

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

# PECOS DISTRICT
# DRILLING OPERATIONS
# CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **Chisholm Energy Operating, LLC** |
| **LEASE NO.:** | **NMNM-113944** |
| **WELL NAME & NO.:** | **Cottonwood 29-32 Fed Com WCA 9H** |
| **SURFACE HOLE FOOTAGE:** | **0100' FNL & 1205' FWL** |
| **BOTTOM HOLE FOOTAGE** | **0330' FSL & 1584' FWL Sec. 32, T. 26 S., R 26 E.** |
| **LOCATION:** | **Section 29, T. 26 S., R 26 E., NMPM** |
| **COUNTY:** | **County, New Mexico** |

**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.

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

**A. Hydrogen Sulfide**

1. Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM.

2. 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. If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.

3. 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 is located, this does not include the dog house or stairway area.

4. 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.

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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.

**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.**

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

**High Cave/Karst.**
**Possibility of water flows in the Salado and Castile.**
**Possibility of lost circulation in the Castile, Salado, and Delaware.**
**Abnormal pressure may be encountered upon penetrating the 3rd Bone Springs Sandstone and all subsequent formations.**

**A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.**

1. The **13-3/8** inch surface casing shall be set at approximately **420** feet and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    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 is to include the lead cement slurry.**

    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.

**Formation below 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

**Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.**

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.**

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

**Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.**

3. 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.

4. **If hard**band 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.

C. **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 53.

2. **Variance approved** to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the **straightness of** the hose, a BLM engineer will be contacted and will review in the field **or via picture** supplied by inspector to determine if changes are required (**operator shall** expect delays if this occurs).

3. **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 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. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
    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.**

**5M 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. The appropriate BLM office shall be notified a minimum of 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).

    a. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

    b. 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.

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

d. 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.**

e. 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.

f. 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.

## D. 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.

## E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

## F. 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.

**JAM 041018**

# PECOS DISTRICT
# SURFACE USE
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | CHISHOLM ENERGY OPERATING LLC |
| LEASE NO.: | NMNM113944 |
| WELL NAME & NO.: | 005H-CottonWood 29-32 Fed Com |
| SURFACE HOLE FOOTAGE: | 100'/N & 1360'/E |
| BOTTOM HOLE FOOTAGE | 330'/S & 2200/E |
| LOCATION: | Section29, R.26E, T26S,NMPM |
| COUNTY: | Eddy County, New Mexico. |

## TABLE OF CONTENTS

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

☐ **Final Abandonment & Reclamation**

## I. GENERAL PROVISIONS

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

## II. PERMIT EXPIRATION

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

## III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

## IV. NOXIOUS WEEDS

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

acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

### Range

1. Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. The operator shall notify the grazing allotment holder prior to crossing the fence or installing a cattleguard.

2. Surface flowlines shall be buried under all intersecting routes and roads. All buried crossings will be filled, compacted and reclaimed when the pipelines are removed.

3. When crossing a fence, surface flowlines will be laid under the bottom wire.

4. The company or contractors shall have in their immediate possession a copy of the approved APD while building well locations or installing pipelines and powerlines.

**Cave/Karst Surface Mitigation**

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

**Construction:**

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

**No Blasting:**

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

**Pad Berming:**

- 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. (Any access road crossing the berm cannot be lower than the berm height.)
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

**Tank Battery Liners and Berms:**
Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

**Leak Detection System:**
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

**Automatic Shut-off Systems**:
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.

**Cave/Karst Subsurface Mitigation**
The following stipulations will be applied to protect cave/karst and ground water concerns:
**Rotary Drilling with Fresh Water:**
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

**Directional Drilling:**
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

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

**Abandonment Cementing:**
Upon well abandonment in 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.

**Pressure Testing:**
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

## Watershed

1. The proposed routes for both the powerline and surface flowlines will not be bladed.
2. Containment berms will be constructed around both tank battery production facilities designed to hold fluids. The containment berms will be constructed with compacted material capable of holding 1½ time the capacity of the largest tank.
3. Topsoil will be stockpiled on the pads to enhance future reclamation.
4. A closed loop drilling system will be used.
5. To prevent any spills from leaving the pads, a two foot berm shall be built inside the fence on each pad.
6. Straw wattles shall be placed completely around the disturbed areas of all pads and along all fences to reduce erosion in this sensitive karst area.
7. Drainage turnouts shall have straw wattles installed.
8. Drainage turnouts along the access road shall not lead to sinkholes.

## VI. CONSTRUCTION

### A. NOTIFICATION

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

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

### B. TOPSOIL

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

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

### C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

### D. FEDERAL MINERAL MATERIALS PIT

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

### E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## F. EXCLOSURE FENCING (CELLARS & PITS)

**Exclosure Fencing**

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

## G. ON LEASE ACCESS ROADS

**Road Width**

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

**Surfacing**

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

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

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

**Crowning**

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

**Ditching**

Ditching shall be required on both sides of the road.

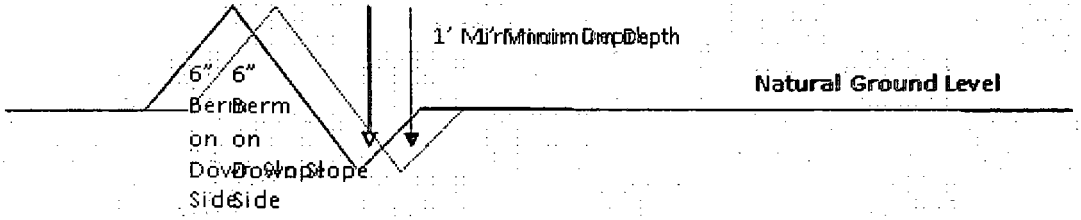
**Turnouts**

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

**Drainage**

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

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




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

## Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards 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 cattleguards 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.

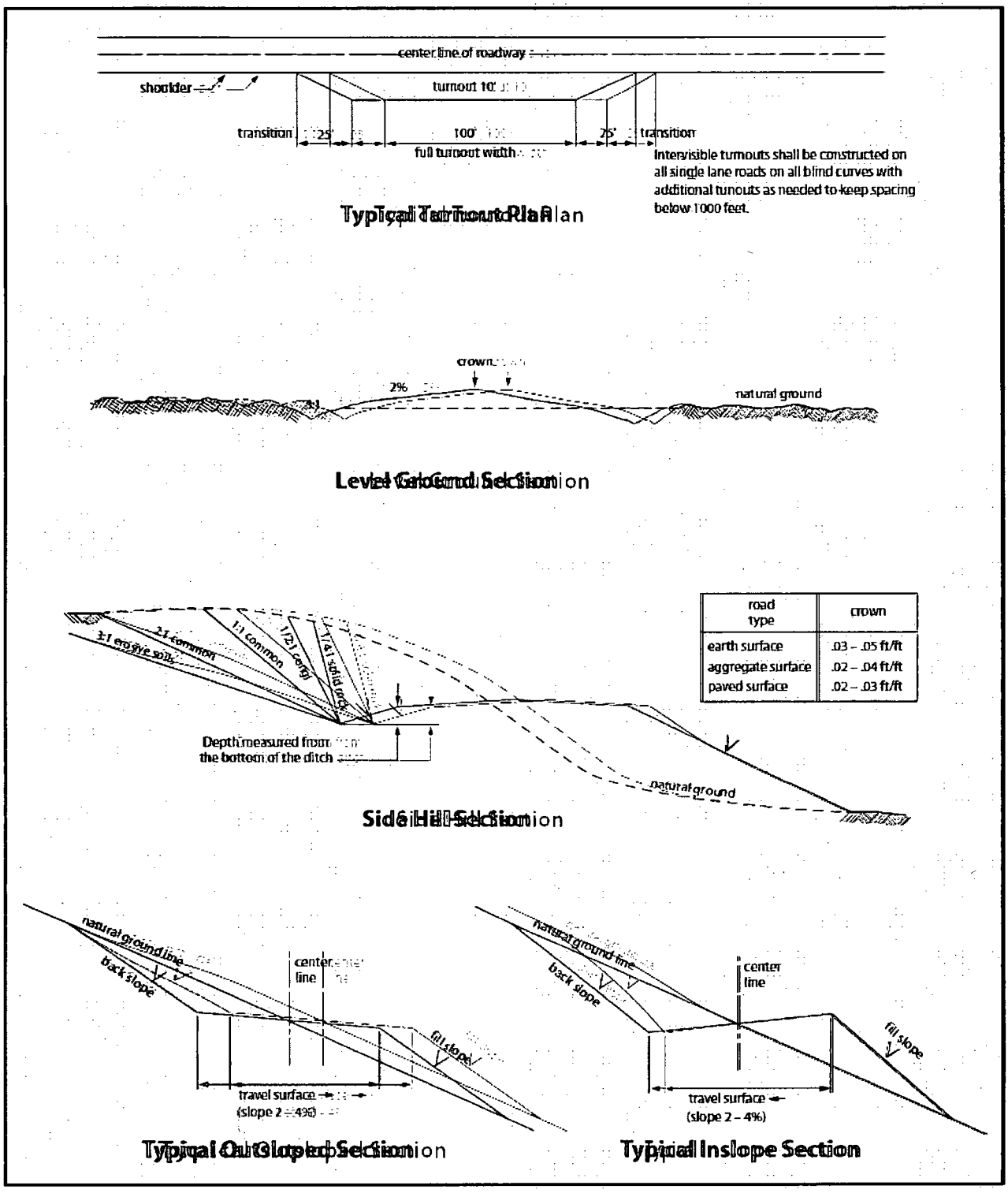



**Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.**

## VII. VII. DRILLING

## A. DRILLING OPERATIONS 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

1. 1. **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.**

2. 2. 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. 3. 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 is located, this does not include the dog house or stairway area.

4. 4. **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.**

## B. CASING

**Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. 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.).**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**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.**

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

**Possibility of water flows in the Salado and Castile.**
**Possibility of lost circulation in the Salado, Castile and Delaware.**

HIGH CAVE/KARST
A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. ON A THREE STRING DESIGN; IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

1. The **13-3/8** inch surface casing shall be set at approximately **420** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    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 is to include the lead cement slurry.**

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

2. The minimum required fill of cement behind the **9-5/8** inch **intermediate casing** is: **(Ensure casing is set in the base of the Castille or the Lamar at approximately 1600')**

☐ 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.**

**Pilot hole plugging approved. A plug is required at the bottom and must be tagged.**
**The second plug must be set across the top of the Wolfcamp formation and must be tagged. Contact BLM at least 4 hours prior to tag.**

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

a. First stage to DV tool:___

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage **cement** job. Operator should have plans as to how they will achieve **circulation** on the next stage.

b. Second stage above DV tool:

☐ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Excess calculates to negative 13% - Additional cement will be required.**

4. 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.

C. **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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **surface** casing shoe shall be psi.

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

**5M 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. The appropriate BLM office shall be notified a **minimum** of 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. 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 (18 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).

c. 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.

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

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

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes 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.

### D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

### E. 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.

**CRW 032816**

## VIII. 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**

**STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES**

**A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review 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. 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. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard 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 in particular, 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. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;

b. Activities of other parties including, but not limited to:
   (1) Land clearing,
   (2) Earth-disturbing and earth-moving work
   (3) Blasting
   (4) Vandalism and sabotage;

c. Acts of God.

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

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

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of 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/she 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 Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

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

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In

hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

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

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

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

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

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

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and

any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

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

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

**BURIED PIPELINE STIPULATIONS**

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

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

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

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

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource

Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

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

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

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

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

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

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

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

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately ___6___ inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

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

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

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

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

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

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

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

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

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

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

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

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

C. **ELECTRIC LINES**

## STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

**A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

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

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

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

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

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

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

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

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

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

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written

authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

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

## IX. 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).

## X. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Seed Mixture 4, for Gypsum 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 |
|---|---|
| Alkali Sacaton (*Sporobolus airoides*) | 1.0 |
| DWS□Four-wing saltbush (*Atriplex canescens*) | 5.0 |

DWS: DeWinged Seed

*Pounds of pure live seed:

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

AFMSS

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

# Operator Certification Data Report

04/23/2018

## Operator Certification

*I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.*

**NAME:** Jennifer Elrod **Signed on:** 09/15/2017

**Title:** Senior Regulatory Technician

**Street Address:** 801 CHERRY STREET, SUITE 1200-UNIT 20

**City:** Fort Worth **State:** TX **Zip:** 76102

**Phone:** (817)953-3728

**Email address:** jelrod@chisholmenergy.com

## Field Representative

**Representative Name:**

**Street Address:**

**City:** **State:** **Zip:**

**Phone:**

**Email address:**

**APD ID:** 10400021455 **Submission Date:** 09/19/2017

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

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

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - General

**APD ID:** 10400021455 **Tie to previous NOS?** 10400015649 **Submission Date:** 09/19/2017

**BLM Office:** CARLSBAD **User:** Jennifer Elrod **Title:** Senior Regulatory Technician

**Federal/Indian APD:** FED **Is the first lease penetrated for production Federal or Indian?** FED

**Lease number:** NMNM113944 **Lease Acres:** 1581.51

**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:** CHISHOLM ENERGY OPERATING LLC

**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** CHISHOLM ENERGY OPERATING LLC

**Operator Address:** 801 Cherry St., Suite 1200 Unit 20 **Zip:** 76102

**Operator PO Box:**

**Operator City:** Fort Worth **State:** TX

**Operator Phone:** (817)469-1104

**Operator Internet Address:**

## Section 2 - Well Information

**Well in Master Development Plan?** NO **Mater Development Plan name:**

**Well in Master SUPO?** EXISTING **Master SUPO name:** Cottonwood SUPO #1

**Well in Master Drilling Plan?** EXISTING **Master Drilling Plan name:** Cottonwood Drilling Plan 2BS

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H **Well API Number:**

**Field/Pool or Exploratory?** Field and Pool **Field Name:** PURPLE SAGE **Pool Name:** WOLFCAMP, (GAS)

**Is the proposed well in an area containing other mineral resources?** USEABLE WATER,NATURAL GAS,OIL

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

**Describe other minerals:**

**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** YES **New surface disturbance?**

**Type of Well Pad:** MULTIPLE WELL **Multiple Well Pad Name:** COTTONWOOD 29-32 FED COM WCA **Number:** 6H & 9H

**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:** 11 Miles **Distance to nearest well:** 60 FT **Distance to lease line:** 100 FT

**Reservoir well spacing assigned acres Measurement:** 447.94 Acres

**Well plat:** COTTONWOOD_29_32_FED_COM_WCA_9H_APD_C102_09062017_20170915085419.pdf

**Well work start Date:** 06/01/2018 **Duration:** 30 DAYS

## Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83 **Vertical Datum:** NAVD88

**Survey number:** 7977

| | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL Leg #1 | 100 | FNL | 1205 | FWL | 26S | 26E | 29 | Lot D | 32.0202303 | -104.3196809 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 113944 | 3433 | 0 | 0 |
| KOP Leg #1 | 100 | FNL | 1205 | FWL | 26S | 26E | 29 | Lot D | 32.0202303 | -104.3196809 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 113944 | -4414 | 7870 | 7847 |
| PPP Leg #1 | 330 | FNL | 1584 | FWL | 26S | 26E | 29 | Lot C | 32.0193081 | -104.3184545 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 113944 | -4792 | 8620 | 8225 |

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXIT Leg #1 | 330 | FSL | 1584 | FWL | 26S | 26E | 32 | Lot 3 | 32.001139 | -104.3184162 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 113944 | -4792 | 15132 | 8225 |
| BHL Leg #1 | 330 | FSL | 1584 | FWL | 26S | 26E | 32 | Lot 3 | 32.001139 | -104.3184162 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 113944 | -4792 | 15132 | 8225 |

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## 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 | 420 | 0 | 420 | -4780 | -5200 | 420 | J-55 | 48 | STC | 3.85 | 9 | BUOY | 18.45 | BUOY | 31 |
| 2 | INTERMEDIATE | 12.25 | 9.625 | NEW | API | N | 0 | 5350 | 0 | 5350 | | | 5350 | J-55 | 40 | LTC | 1.36 | 1.39 | BUOY | 2.88 | BUOY | 3.49 |
| 3 | PRODUCTION | 8.75 | 5.5 | NEW | API | N | 0 | 15132 | 0 | 8225 | -4780 | -11915 | 15132 | P-110 | 20 | BUTT | 2.49 | 2.84 | BUOY | 4.87 | BUOY | 4.68 |

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Casing_Calculator_20170918131655.pdf

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Casing_Calculator_20170918131709.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Casing_Calculator_20170918131719.pdf

## Section 4 - Cement

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURFACE | Lead | | 0 | 420 | 484 | 1.32 | 14.8 | 730 | 150 | Class C Premium Plus | 6.31 gal/sk of Mix Water. No other additives |
| INTERMEDIATE | Lead | | 0 | 4915 | 1515 | 2.19 | 12.7 | 3318 | 100 | Class C | Gel, Cello Flake, Salt |
| INTERMEDIATE | Tail | | 4915 | 5350 | 200 | 1.37 | 14.8 | 274 | 100 | Class C | Calcium Chloride |
| PRODUCTION | Lead | | 0 | 7555 | 619 | 2.92 | 11.3 | 1808 | 10 | 50% Class H + 50% Poz | Gel, Calcium Chloride |

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PRODUCTION | Tail | | 6100 | 15132 | 1582 | 1.2 | 14.5 | 1899 | 10 | 50% Class H + 50% Poz | Gel, Calcium Chloride |

## 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:** Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

**Describe the mud monitoring system utilized:** PVT, Pason/CanRig, Visual Monitoring

## Circulating Medium Table

| Top Depth | Bottom Depth | Mud Type | Min Weight (lbs/gal) | Max Weight (lbs/gal) | Density (lbs/cu ft) | Gel Strength (lbs/100 sqft) | PH | Viscosity (CP) | Salinity (ppm) | Filtration (cc) | Additional Characteristics |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 420 | WATER-BASED MUD | 8.4 | 8.6 | | | | | | | |
| 420 | 5350 | OTHER : 70% Brine / 30% Diesel Emulsion | 8.8 | 9.1 | | | | | | | |
| 5350 | 8225 | OIL-BASED MUD | 9 | 13 | | | | | | | |

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## Section 6 - Test, Logging, Coring

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

N/A

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

CBL,DS,GR,MWD,MICROLO

**Coring operation description for the well:**

N/A

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4112 **Anticipated Surface Pressure:** 2302.5

**Anticipated Bottom Hole Temperature(F):** 160

**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:**

H2S_Plan_20180320070821.pdf

## Section 8 - Other Information

**Proposed horizontal/directional/multi-lateral plan submission:**

Cottonwood_29_32_Fed_COM_WCA_9H_Plan_091417_A0_Plan_Numbers_20170915090850.pdf

Cottonwood_29_32_Fed_COM_WCA_9H_Plan_091417_A0_Plot_20170915090851.pdf

**Other proposed operations facets description:**

REQUESTED VARIANCE FOR MULTI-BOWL WELLHEAD AND FLEX CHOKE HOSE; DIAGRAMS AND SPECS ATTACHED

**Other proposed operations facets attachment:**

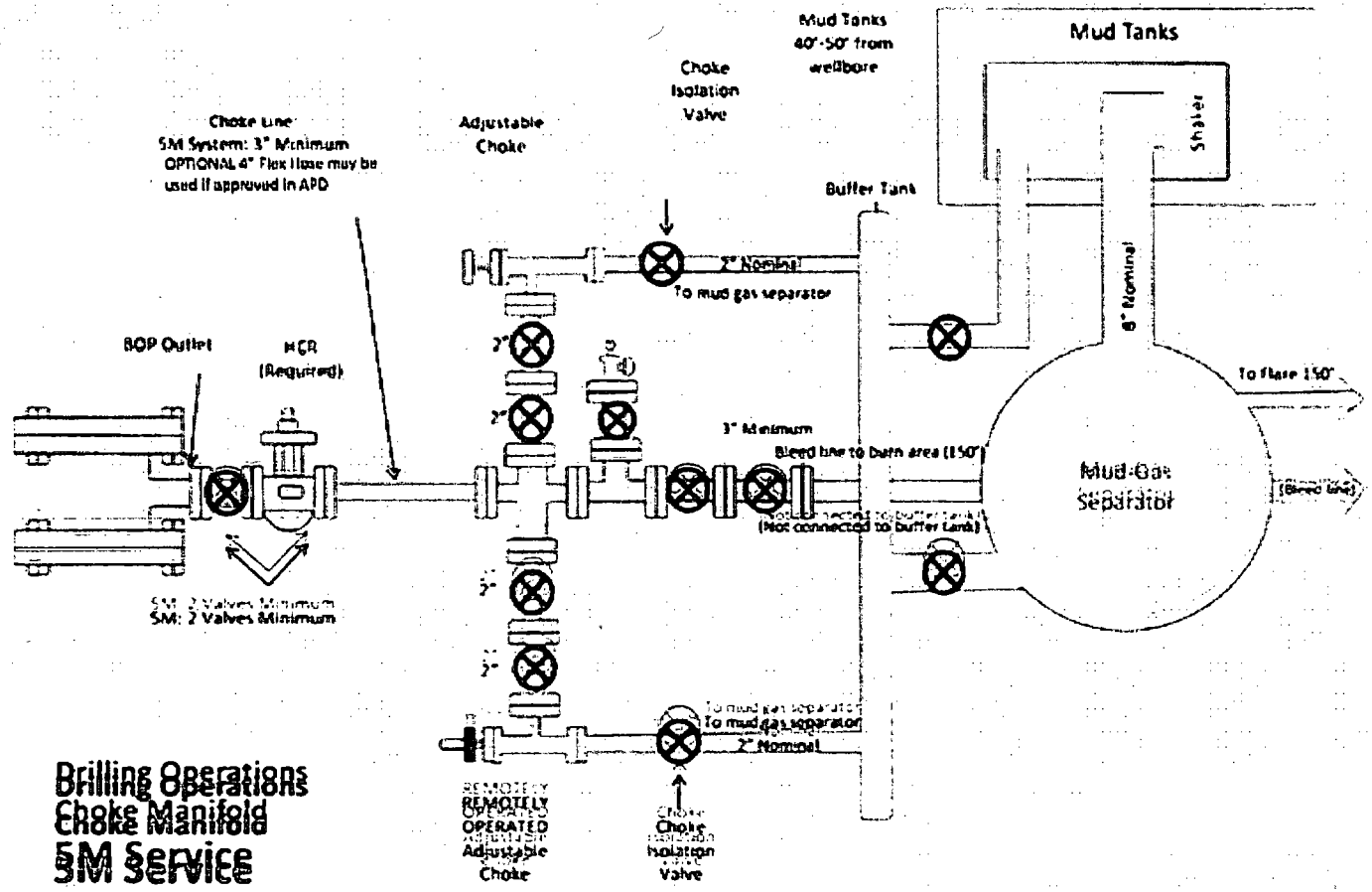
Cactus_Speed_Head_Installation_Procedure_20180320070908.pdf

Cactus_Speed_Head_Pressure_Testing_Statement_20180320070908.pdf

Choke_Hose_M55_1_07102017_145204_66_1225_04_14_2014__20180320070909.pdf

Cactus_Speedhead_Diagram_20180320070909.pdf

**Other Variance attachment:**




Drilling Operations
Choke Manifold
5M Service

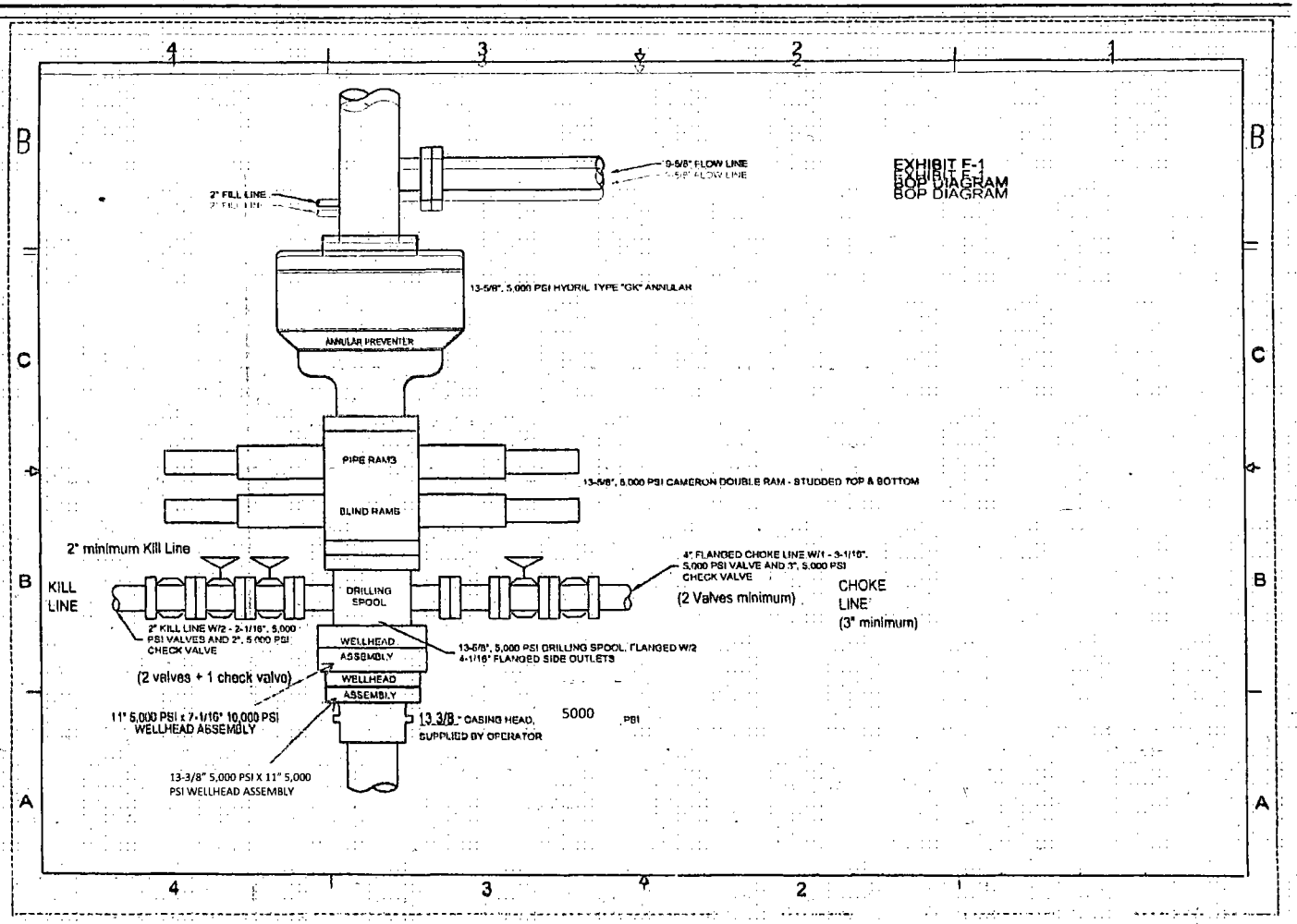


EXHIBIT E-1
BOP DIAGRAM
9-5/8" FLOW LINE
2" FILL LINE
13-5/8", 5,000 PSI HYDRIL TYPE "GK" ANNULAR
ANNULAR PREVENTER
PIPE RAMS
BLIND RAMS
13-5/8", 5,000 PSI CAMERON DOUBLE RAM - STUDDED TOP & BOTTOM
2" minimum Kill Line
KILL LINE
DRILLING SPOOL
4" FLANGED CHOKE LINE W/1 - 3-1/16", 5,000 PSI VALVE AND 1", 5,000 PSI CHECK VALVE
(2 Valves minimum)
CHOKE LINE (3" minimum)
2" KILL LINE W/2 - 2-1/16", 5,000 PSI VALVES AND 2", 5,000 PSI CHECK VALVE
WELLHEAD ASSEMBLY
WELLHEAD ASSEMBLY
13-5/8", 5,000 PSI DRILLING SPOOL, FLANGED W/2 4-1/16" FLANGED SIDE OUTLETS
(2 valves + 1 check valve)
11" 5,000 PSI x 7-1/16" 10,000 PSI WELLHEAD ASSEMBLY
13-3/8" CASING HEAD, SUPPLIED BY OPERATOR
5000 PSI
13-3/8" 5,000 PSI X 11" 5,000 PSI WELLHEAD ASSEMBLY

**Casing Program:** **Cottonwood WCA/WCB (13 3/8" x 9 5/8" x 5 1/2")**

| Open Hole Size (Inches) | Casing Depth; From (ft) | Casing Setting Depth (ft) MD | Casing Setting Depth (ft) TVD | Casing Size (inches) | Casing Weight (lb/ft) | Casing Grade | Thread | Condition | Anticipated Mud Weight (ppg) | Burst (psi) | Burst SF (1.125) | Collapse (psi) | Collapse SF (1.125) | Pipe Body Tension (klbs) | Joint Tension (klbs) | Air Weight (lbs) | Bouyant Weight (lbs) | Pipe Body Tension SF (1.8) | Joint Tension SF (1.8) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | | | | | | | | | | | | | | | | | | |
| 17.5" | 0' | 420' | 420' | 13 3/8" | 48.0 | H-40 | STC | New | 8.8 | 1730 | 9.00 | 740 | 3.85 | 541,000 | 322,000 | 20,160 | 17,449 | 31.00 | 18.45 |
| Intermediate | | | | | | | | | | | | | | | | | | | |
| 12.25" | 0' | 5,350' | 5,350' | 9 5/8" | 40 | J-55 | LTC | New | 10.2 | 3950 | 1.39 | 2570 | 1.36 | 630,000 | 520,000 | 214,000 | 180,644 | 3.49 | 2.88 |
| Production | | | | | | | | | | | | | | | | | | | |
| 8.75" | 0' | 15,222' | 8,160' | 5 1/2" | 20 | P-110 | LTC | New | 10.5 | 12640 | 2.84 | 11100 | 2.49 | 641,000 | 667,000 | 163,200 | 137,014 | 4.68 | 4.87 |

**Casing Design Criteria and Casing Loading Assumptions:**

Surface

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 8.8 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 8.8 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 8.8 ppg |

Intermediate

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.2 ppg |
| Collapse | A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: | 10.2 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.2 ppg |

Production

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.5 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 10.5 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.5 ppg |

**Casing Program:** **Cottonwood WCA/WCB (13 3/8" x 9 5/8" x 5 1/2")**

| Open Hole Size (Inches) | Casing Depth; From (ft) | Casing Setting Depth (ft) MD | Casing Setting Depth (ft) TVD | Casing Size (inches) | Casing Weight (lb/ft) | Casing Grade | Thread | Condition | Anticipated Mud Weight (ppg) | Burst (psi) | Burst SF (1.125) | Collapse (psi) | Collapse SF (1.125) | Pipe Body Tension (klbs) | Joint Tension (klbs) | Air Weight (lbs) | Bouyant Weight (lbs) | Pipe Body Tension SF (1.8) | Joint Tension SF (1.8) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | | | | | | | | | | | | | | | | | | |
| 17.5" | 0' | 420' | 420' | 13 3/8" | 48.0 | H-40 | STC | New | 8.8 | 1730 | 9.00 | 740 | 3.85 | 541,000 | 322,000 | 20,160 | 17,449 | 31.00 | 18.45 |
| Intermediate | | | | | | | | | | | | | | | | | | | |
| 12.25" | 0' | 5,350' | 5,350' | 9 5/8" | 40 | J-55 | LTC | New | 10.2 | 3950 | 1.39 | 2570 | 1.36 | 630,000 | 520,000 | 214,000 | 180,644 | 3.49 | 2.88 |
| Production | | | | | | | | | | | | | | | | | | | |
| 8.75" | 0' | 15,222' | 8,160' | 5 1/2" | 20 | P-110 | LTC | New | 10.5 | 12640 | 2.84 | 11100 | 2.49 | 641,000 | 667,000 | 163,200 | 137,014 | 4.68 | 4.87 |

**Casing Design Criteria and Casing Loading Assumptions:**

Surface

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 8.8 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 8.8 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 8.8 ppg |

Intermediate

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.2 ppg |
| Collapse | A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: | 10.2 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.2 ppg |

Production

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.5 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 10.5 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.5 ppg |

**Casing Program:** **Cottonwood WCA/WCB (13 3/8" x 9 5/8" x 5 1/2")**

| Open Hole Size (Inches) | Casing Depth; From (ft) | Casing Setting Depth (ft) MD | Casing Setting Depth (ft) TVD | Casing Size (inches) | Casing Weight (lb/ft) | Casing Grade | Thread | Condition | Anticipated Mud Weight (ppg) | Burst (psi) | Burst SF (1.125) | Collapse (psi) | Collapse SF (1.125) | Pipe Body Tension (klbs) | Joint Tension (klbs) | Air Weight (lbs) | Bouyant Weight (lbs) | Pipe Body Tension SF (1.8) | Joint Tension SF (1.8) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | | | | | | | | | | | | | | | | | | |
| 17.5" | 0' | 420' | 420' | 13 3/8" | 48.0 | H-40 | STC | New | 8.8 | 1730 | 9.00 | 740 | 3.85 | 541,000 | 322,000 | 20,160 | 17,449 | 31.00 | 18.45 |
| Intermediate | | | | | | | | | | | | | | | | | | | |
| 12.25" | 0' | 5,350' | 5,350' | 9 5/8" | 40 | J-55 | LTC | New | 10.2 | 3950 | 1.39 | 2570 | 1.36 | 630,000 | 520,000 | 214,000 | 180,644 | 3.49 | 2.88 |
| Production | | | | | | | | | | | | | | | | | | | |
| 8.75" | 0' | 15,222' | 8,160' | 5 1/2" | 20 | P-110 | LTC | New | 10.5 | 12640 | 2.84 | 11100 | 2.49 | 641,000 | 667,000 | 163,200 | 137,014 | 4.68 | 4.87 |

**Casing Design Criteria and Casing Loading Assumptions:**

Surface

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 8.8 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 8.8 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 8.8 ppg |

Intermediate

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.2 ppg |
| Collapse | A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: | 10.2 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.2 ppg |

Production

| | | |
|---|---|---|
| Tension | A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: | 10.5 ppg |
| Collapse | A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: | 10.5 ppg |
| Burst | A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: | 10.5 ppg |

Hydrogen Sulfide Drilling Operations Plan
Lea Co., NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:

A. Characteristics of H2S
B. Physical effects and hazards
C. Principal and operation of H2S detectors, warning system and briefing areas.
D. Evacuation procedure, routes and first aid.
E. Proper use of safety equipment & life support systems
F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30-minute pressure demand air packs.

2 H2S Detection and Alarm Systems:

A. H2S sensors/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 play placed as deemed necessary.
B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:

A. Windsock at mudpit area should be high enough to be visible.
B. Windsock on the rig floor and/ or top doghouse should be high enough to be visible.

4 Condition Flags and Signs

A. Warning sign on access road to location.
B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H2S present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

5 Well control equipment:

A. See exhibit BOP and Choke Diagrams

6 Communication:

A. While working under masks chalkboards will be used for communication.
B. Hand signals will be used where chalk board is inappropriate.
C. 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 Drill stem Testing:
No DSTs are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubular goods and other mechanical equipment.

9 If $H_2S$ 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.

**Emergency Procedures**

In the event of a release of gas containing H2S, the first responder(s) must:

« Isolate the area and prevent entry by other persons into the 100 ppm ROE.
« Evacuate any public places encompassed by the 100 ppm ROE.
« Be equipped with H2S monitors and air packs in order to control the release.
« Use the "buddy system" to ensure no injuries occur during the response.
« Take precautions to avoid personal injury during this operation.
« Contact operator and/or local officials to aid in operation.
Chisholm Energy Operating-817-953-6063
« Have received training in the: Detection of H2S, and Measures for protection against the gas, Equipment used for protection and emergency response.

**Ignition of Gas Source**

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (S02). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

**Characteristics of H2S and SO,**

| Common Name | Chemical Formula | Specific Gravity | Threshold Limit | Hazardous Limit | Lethal Concentration |
|---|---|---|---|---|---|
| Hydrogen Sulfide | H2S | 1.189 Air=1 | 10 ppm | 100 ppm/hr | 600 ppm |
| Sulfur Dioxide | SO2 | 2.21 Air=1 | 2 ppm | N/A | 1000 ppm |

**Contacting Authorities**

Chisholm Energy Operating personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to sit e. The following call list of essential and potential responders has been prepared for use during a release.
Nearburg Producing Company's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMERP).

# Chisholm Energy Holdings, LLC

**Eddy County, NM (NAD83)**
**Sec 29-T26S-R26E**
**Cottonwood 29-32 Fed COM WCA 9H**

**Wellbore #1**

**Plan: Plan 091417 A0**

# Standard Planning Report

**14 September, 2017**

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Multi User Db | **Local Co-ordinate Reference:** | Well Cottonwood 29-32 Fed COM WCA 9H |
| **Company:** | Chisholm Energy Holdings, LLC | **TVD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Project:** | Eddy County, NM (NAD83) | **MD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Site:** | Sec 29-T26S-R26E | **North Reference:** | Grid |
| **Well:** | Cottonwood 29-32 Fed COM WCA 9H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan 091417 A0 | | |

| **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** | Sec 29-T26S-R26E | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 370,998.9779 usft | **Latitude:** | 32.019956 |
| **From:** | Map | **Easting:** | 545,508.9000 usft | **Longitude:** | -104.319874 |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.01 ° |

| **Well** | Cottonwood 29-32 Fed COM WCA 9H | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 99.92 ft | **Northing:** | 371,098.9000 usft | **Latitude:** | 32.020230 |
| | **+E/-W** | 59.80 ft | **Easting:** | 545,568.7000 usft | **Longitude:** | -104.319681 |
| **Position Uncertainty** | | 0.00 ft | **Wellhead Elevation:** | 0.00 ft | **Ground Level:** | 3,433.00 ft |

| **Wellbore** | Wellbore #1 | | | | |
|---|---|---|---|---|---|
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | HDGM | 9/14/2017 | 7.47 | 59.63 | 47,882 |

| **Design** | Plan 091417 A0 | | | | |
|---|---|---|---|---|---|
| **Audit Notes:** | | | | | |
| **Version:** | | **Phase:** | PROTOTYPE | **Tie On Depth:** | 0.00 |
| **Vertical Section:** | **Depth From (TVD) (ft)** | **+N/-S (ft)** | **+E/-W (ft)** | **Direction (°)** | |
| | 0.00 | 0.00 | 0.00 | 180.00 | |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,555.09 | 0.00 | 0.00 | 7,555.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,870.09 | 37.80 | 90.00 | 7,847.73 | 0.00 | 100.19 | 12.00 | 12.00 | 0.00 | 90.00 | |
| 8,620.09 | 90.00 | 180.00 | 8,225.00 | -477.47 | 392.84 | 12.00 | 6.96 | 12.00 | 90.00 | |
| 15,132.84 | 90.00 | 180.00 | 8,225.00 | -6,990.21 | 392.90 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL Cottonwood 29 |

| | | | |
|---|---|---|---|
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| **Project:** | Eddy County, NM (NAD83) | **MD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Site:** | Sec 29-T26S-R26E | **North Reference:** | Grid |
| **Well:** | Cottonwood 29-32 Fed COM WCA 9H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan 091417 A0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 0.00 | 0.00 | 3,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 0.00 | 0.00 | 3,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 0.00 | 0.00 | 3,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 0.00 | 0.00 | 3,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 0.00 | 0.00 | 3,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 0.00 | 0.00 | 3,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 0.00 | 0.00 | 3,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 0.00 | 0.00 | 3,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 0.00 | 0.00 | 4,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 0.00 | 0.00 | 4,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 0.00 | 0.00 | 4,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 0.00 | 0.00 | 4,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 0.00 | 0.00 | 4,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 0.00 | 0.00 | 4,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 0.00 | 0.00 | 4,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 0.00 | 0.00 | 4,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 0.00 | 0.00 | 4,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 0.00 | 0.00 | 5,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 0.00 | 0.00 | 5,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.00 | 0.00 | 5,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
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| **Site:** | Sec 29-T26S-R26E | **North Reference:** | Grid |
| **Well:** | Cottonwood 29-32 Fed COM WCA 9H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan 091417 A0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,400.00 | 0.00 | 0.00 | 5,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 0.00 | 0.00 | 5,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 6,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 6,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 6,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 7,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 7,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 7,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 0.00 | 0.00 | 7,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 0.00 | 0.00 | 7,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 0.00 | 0.00 | 7,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,555.09 | 0.00 | 0.00 | 7,555.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Start Build 12.00** | | | | | | | | | |
| 7,575.00 | 2.39 | 90.00 | 7,574.99 | 0.00 | 0.42 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,600.00 | 5.39 | 90.00 | 7,599.93 | 0.00 | 2.11 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,625.00 | 8.39 | 90.00 | 7,624.75 | 0.00 | 5.11 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,650.00 | 11.39 | 90.00 | 7,649.38 | 0.00 | 9.40 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,675.00 | 14.39 | 90.00 | 7,673.74 | 0.00 | 14.98 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,700.00 | 17.39 | 90.00 | 7,697.79 | 0.00 | 21.82 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,725.00 | 20.39 | 90.00 | 7,721.44 | 0.00 | 29.91 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,750.00 | 23.39 | 90.00 | 7,744.63 | 0.00 | 39.23 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,775.00 | 26.39 | 90.00 | 7,767.31 | 0.00 | 49.75 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,800.00 | 29.39 | 90.00 | 7,789.40 | 0.00 | 61.45 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,825.00 | 32.39 | 90.00 | 7,810.85 | 0.00 | 74.28 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,850.00 | 35.39 | 90.00 | 7,831.60 | 0.00 | 88.22 | 0.00 | 12.00 | 12.00 | 0.00 |
| 7,870.09 | 37.80 | 90.00 | 7,847.73 | 0.00 | 100.19 | 0.00 | 12.00 | 12.00 | 0.00 |
| **Start DLS 12.00** | | | | | | | | | |
| 7,875.00 | 37.80 | 90.96 | 7,851.61 | -0.03 | 103.20 | 0.03 | 12.00 | 0.08 | 19.58 |
| 7,900.00 | 37.94 | 95.84 | 7,871.35 | -0.94 | 118.51 | 0.94 | 12.00 | 0.56 | 19.53 |
| 7,925.00 | 38.29 | 100.67 | 7,891.02 | -3.15 | 133.77 | 3.15 | 12.00 | 1.36 | 19.32 |
| 7,950.00 | 38.82 | 105.41 | 7,910.58 | -6.67 | 148.94 | 6.67 | 12.00 | 2.14 | 18.95 |
| 7,975.00 | 39.54 | 110.02 | 7,929.96 | -11.48 | 163.98 | 11.48 | 12.00 | 2.89 | 18.44 |
| 8,000.00 | 40.44 | 114.48 | 7,949.12 | -17.56 | 178.84 | 17.56 | 12.00 | 3.59 | 17.82 |
| 8,025.00 | 41.50 | 118.76 | 7,968.00 | -24.91 | 193.48 | 24.91 | 12.00 | 4.25 | 17.12 |
| 8,050.00 | 42.72 | 122.85 | 7,986.55 | -33.50 | 207.87 | 33.50 | 12.00 | 4.86 | 16.37 |
| 8,075.00 | 44.07 | 126.75 | 8,004.72 | -43.30 | 221.96 | 43.30 | 12.00 | 5.41 | 15.59 |
| 8,100.00 | 45.55 | 130.45 | 8,022.46 | -54.29 | 235.72 | 54.29 | 12.00 | 5.92 | 14.82 |
| 8,125.00 | 47.14 | 133.96 | 8,039.72 | -66.44 | 249.11 | 66.44 | 12.00 | 6.37 | 14.06 |
| 8,150.00 | 48.84 | 137.30 | 8,056.45 | -79.72 | 262.09 | 79.72 | 12.00 | 6.78 | 13.33 |
| 8,175.00 | 50.62 | 140.46 | 8,072.61 | -94.09 | 274.63 | 94.09 | 12.00 | 7.14 | 12.64 |
| 8,200.00 | 52.49 | 143.46 | 8,088.16 | -109.51 | 286.69 | 109.51 | 12.00 | 7.47 | 12.00 |
| 8,225.00 | 54.43 | 146.31 | 8,103.05 | -125.94 | 298.24 | 125.94 | 12.00 | 7.76 | 11.40 |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Multi User Db | **Local Co-ordinate Reference:** | Well Cottonwood 29-32 Fed COM WCA 9H |
| **Company:** | Chisholm Energy Holdings, LLC | **TVD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Project:** | Eddy County, NM (NAD83) | **MD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Site:** | Sec 29-T26S-R26E | **North Reference:** | Grid |
| **Well:** | Cottonwood 29-32 Fed COM WCA 9H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan 091417 A0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 8,250.00 | 56.43 | 149.02 | 8,117.23 | -143.34 | 309.24 | 143.34 | 12.00 | 8.01 | 10.85 |
| 8,275.00 | 58.49 | 151.61 | 8,130.68 | -161.64 | 319.67 | 161.64 | 12.00 | 8.24 | 10.35 |
| 8,300.00 | 60.60 | 154.08 | 8,143.35 | -180.82 | 329.50 | 180.82 | 12.00 | 8.44 | 9.90 |
| 8,325.00 | 62.75 | 156.45 | 8,155.22 | -200.80 | 338.70 | 200.80 | 12.00 | 8.61 | 9.49 |
| 8,350.00 | 64.94 | 158.74 | 8,166.23 | -221.55 | 347.25 | 221.55 | 12.00 | 8.77 | 9.13 |
| 8,375.00 | 67.17 | 160.94 | 8,176.38 | -243.00 | 355.12 | 243.00 | 12.00 | 8.90 | 8.81 |
| 8,400.00 | 69.42 | 163.07 | 8,185.63 | -265.09 | 362.29 | 265.09 | 12.00 | 9.02 | 8.52 |
| 8,425.00 | 71.70 | 165.14 | 8,193.95 | -287.76 | 368.75 | 287.76 | 12.00 | 9.12 | 8.27 |
| 8,450.00 | 74.00 | 167.15 | 8,201.32 | -310.95 | 374.46 | 310.95 | 12.00 | 9.21 | 8.06 |
| 8,475.00 | 76.32 | 169.12 | 8,207.72 | -334.60 | 379.43 | 334.60 | 12.00 | 9.28 | 7.87 |
| 8,500.00 | 78.66 | 171.05 | 8,213.13 | -358.64 | 383.63 | 358.64 | 12.00 | 9.34 | 7.72 |
| 8,525.00 | 81.01 | 172.95 | 8,217.55 | -383.00 | 387.05 | 383.00 | 12.00 | 9.39 | 7.59 |
| 8,550.00 | 83.36 | 174.82 | 8,220.95 | -407.63 | 389.69 | 407.63 | 12.00 | 9.43 | 7.49 |
| 8,575.00 | 85.73 | 176.68 | 8,223.32 | -432.44 | 391.53 | 432.44 | 12.00 | 9.46 | 7.42 |
| 8,600.00 | 88.10 | 178.52 | 8,224.67 | -457.38 | 392.58 | 457.38 | 12.00 | 9.47 | 7.38 |
| 8,620.09 | 90.00 | 180.00 | 8,225.00 | -477.47 | 392.84 | 477.47 | 12.00 | 9.48 | 7.36 |
| **Landing Point** | | | | | | | | | |
| 8,700.00 | 90.00 | 180.00 | 8,225.00 | -557.37 | 392.84 | 557.37 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.00 | 180.00 | 8,225.00 | -657.37 | 392.84 | 657.37 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.00 | 180.00 | 8,225.00 | -757.37 | 392.84 | 757.37 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.00 | 180.00 | 8,225.00 | -857.37 | 392.84 | 857.37 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.00 | 180.00 | 8,225.00 | -957.37 | 392.84 | 957.37 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.00 | 180.00 | 8,225.00 | -1,057.37 | 392.84 | 1,057.37 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.00 | 180.00 | 8,225.00 | -1,157.37 | 392.84 | 1,157.37 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 90.00 | 180.00 | 8,225.00 | -1,257.37 | 392.84 | 1,257.37 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.00 | 180.00 | 8,225.00 | -1,357.37 | 392.84 | 1,357.37 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.00 | 180.00 | 8,225.00 | -1,457.37 | 392.84 | 1,457.37 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.00 | 180.00 | 8,225.00 | -1,557.37 | 392.84 | 1,557.37 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.00 | 180.00 | 8,225.00 | -1,657.37 | 392.84 | 1,657.37 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.00 | 180.00 | 8,225.00 | -1,757.37 | 392.84 | 1,757.37 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.00 | 180.00 | 8,225.00 | -1,857.37 | 392.84 | 1,857.37 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.00 | 180.00 | 8,225.00 | -1,957.37 | 392.84 | 1,957.37 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.00 | 180.00 | 8,225.00 | -2,057.37 | 392.84 | 2,057.37 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.00 | 180.00 | 8,225.00 | -2,157.37 | 392.84 | 2,157.37 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.00 | 180.00 | 8,225.00 | -2,257.37 | 392.84 | 2,257.37 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.00 | 180.00 | 8,225.00 | -2,357.37 | 392.84 | 2,357.37 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 90.00 | 180.00 | 8,225.00 | -2,457.37 | 392.84 | 2,457.37 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.00 | 180.00 | 8,225.00 | -2,557.37 | 392.84 | 2,557.37 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.00 | 180.00 | 8,225.00 | -2,657.37 | 392.84 | 2,657.37 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.00 | 180.00 | 8,225.00 | -2,757.37 | 392.84 | 2,757.37 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.00 | 180.00 | 8,225.00 | -2,857.37 | 392.84 | 2,857.37 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.00 | 180.00 | 8,225.00 | -2,957.37 | 392.84 | 2,957.37 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.00 | 180.00 | 8,225.00 | -3,057.37 | 392.84 | 3,057.37 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.00 | 180.00 | 8,225.00 | -3,157.37 | 392.84 | 3,157.37 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.00 | 180.00 | 8,225.00 | -3,257.37 | 392.84 | 3,257.37 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.00 | 180.00 | 8,225.00 | -3,357.37 | 392.84 | 3,357.37 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 90.00 | 180.00 | 8,225.00 | -3,457.37 | 392.84 | 3,457.37 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 90.00 | 180.00 | 8,225.00 | -3,557.37 | 392.84 | 3,557.37 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 90.00 | 180.00 | 8,225.00 | -3,657.37 | 392.84 | 3,657.37 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 90.00 | 180.00 | 8,225.00 | -3,757.37 | 392.84 | 3,757.37 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 90.00 | 180.00 | 8,225.00 | -3,857.37 | 392.84 | 3,857.37 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 90.00 | 180.00 | 8,225.00 | -3,957.37 | 392.84 | 3,957.37 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 90.00 | 180.00 | 8,225.00 | -4,057.37 | 392.84 | 4,057.37 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.00 | 180.00 | 8,225.00 | -4,157.37 | 392.84 | 4,157.37 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Multi User Db | **Local Co-ordinate Reference:** | Well Cottonwood 29-32 Fed COM WCA 9H |
| **Company:** | Chisholm Energy Holdings, LLC | **TVD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Project:** | Eddy County, NM (NAD83) | **MD Reference:** | KB=22 @ 3455.00ft (Nabors M55) |
| **Site:** | Sec 29-T26S-R26E | **North Reference:** | Grid |
| **Well:** | Cottonwood 29-32 Fed COM WCA 9H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan 091417 A0 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 12,400.00 | 90.00 | 180.00 | 8,225.00 | -4,257.37 | 392.84 | 4,257.37 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 90.00 | 180.00 | 8,225.00 | -4,357.37 | 392.84 | 4,357.37 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 90.00 | 180.00 | 8,225.00 | -4,457.37 | 392.84 | 4,457.37 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 90.00 | 180.00 | 8,225.00 | -4,557.37 | 392.84 | 4,557.37 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 90.00 | 180.00 | 8,225.00 | -4,657.37 | 392.84 | 4,657.37 | 0.00 | 0.00 | 0.00 |
| 12,900.00 | 90.00 | 180.00 | 8,225.00 | -4,757.37 | 392.84 | 4,757.37 | 0.00 | 0.00 | 0.00 |
| 13,000.00 | 90.00 | 180.00 | 8,225.00 | -4,857.37 | 392.84 | 4,857.37 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 90.00 | 180.00 | 8,225.00 | -4,957.37 | 392.84 | 4,957.37 | 0.00 | 0.00 | 0.00 |
| 13,200.00 | 90.00 | 180.00 | 8,225.00 | -5,057.37 | 392.84 | 5,057.37 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 90.00 | 180.00 | 8,225.00 | -5,157.37 | 392.84 | 5,157.37 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 90.00 | 180.00 | 8,225.00 | -5,257.37 | 392.84 | 5,257.37 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 90.00 | 180.00 | 8,225.00 | -5,357.37 | 392.84 | 5,357.37 | 0.00 | 0.00 | 0.00 |
| 13,600.00 | 90.00 | 180.00 | 8,225.00 | -5,457.37 | 392.84 | 5,457.37 | 0.00 | 0.00 | 0.00 |
| 13,700.00 | 90.00 | 180.00 | 8,225.00 | -5,557.37 | 392.84 | 5,557.37 | 0.00 | 0.00 | 0.00 |
| 13,800.00 | 90.00 | 180.00 | 8,225.00 | -5,657.37 | 392.84 | 5,657.37 | 0.00 | 0.00 | 0.00 |
| 13,900.00 | 90.00 | 180.00 | 8,225.00 | -5,757.37 | 392.84 | 5,757.37 | 0.00 | 0.00 | 0.00 |
| 14,000.00 | 90.00 | 180.00 | 8,225.00 | -5,857.37 | 392.84 | 5,857.37 | 0.00 | 0.00 | 0.00 |
| 14,100.00 | 90.00 | 180.00 | 8,225.00 | -5,957.37 | 392.84 | 5,957.37 | 0.00 | 0.00 | 0.00 |
| 14,200.00 | 90.00 | 180.00 | 8,225.00 | -6,057.37 | 392.84 | 6,057.37 | 0.00 | 0.00 | 0.00 |
| 14,300.00 | 90.00 | 180.00 | 8,225.00 | -6,157.37 | 392.84 | 6,157.37 | 0.00 | 0.00 | 0.00 |
| 14,400.00 | 90.00 | 180.00 | 8,225.00 | -6,257.37 | 392.84 | 6,257.37 | 0.00 | 0.00 | 0.00 |
| 14,500.00 | 90.00 | 180.00 | 8,225.00 | -6,357.37 | 392.84 | 6,357.37 | 0.00 | 0.00 | 0.00 |
| 14,600.00 | 90.00 | 180.00 | 8,225.00 | -6,457.37 | 392.84 | 6,457.37 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 90.00 | 180.00 | 8,225.00 | -6,557.37 | 392.84 | 6,557.37 | 0.00 | 0.00 | 0.00 |
| 14,800.00 | 90.00 | 180.00 | 8,225.00 | -6,657.37 | 392.84 | 6,657.37 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 90.00 | 180.00 | 8,225.00 | -6,757.37 | 392.84 | 6,757.37 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 90.00 | 180.00 | 8,225.00 | -6,857.37 | 392.84 | 6,857.37 | 0.00 | 0.00 | 0.00 |
| 15,100.00 | 90.00 | 180.00 | 8,225.00 | -6,957.37 | 392.84 | 6,957.37 | 0.00 | 0.00 | 0.00 |
| 15,132.84 | 90.00 | 180.00 | 8,225.00 | -6,990.21 | 392.90 | 6,990.21 | 0.00 | 0.00 | 0.00 |

**TD at 15132.84 - PBHL Cottonwood 29-32 Fed COM WCA 9H**

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| PBHL Cottonwood 29-32 - plan hits target center - Point | 0.00 | 0.00 | 8,225.00 | -6,990.21 | 392.90 | 364,108.7000 | 545,961.6000 | 32.001014 | -104.318416 |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 7,555.09 | 7,555.09 | 0.00 | 0.00 | Start Build 12.00 |
| 7,870.09 | 7,847.73 | 0.00 | 100.19 | Start DLS 12.00 |
| 8,620.09 | 8,225.00 | -477.47 | 392.84 | Landing Point |
| 15,132.84 | 8,225.00 | -6,990.21 | 392.90 | TD at 15132.84 |

CHISHOLM ENERGY

Chisholm Energy Holdings, LLC
Project: Eddy County, NM (NAD83)
Site: Sec 29-T26S-R26E
Well: Cottonwood 29-32 Fed COM WCA 9H
Wellbore: Wellbore #1
Plan: Plan 091417 A0 (Cottonwood 29-32 Fed COM WCA 9H)
Nabors M55

INTEGRITY Directional Services

**WELL DETAILS: Cottonwood 29-32 Fed COM WCA 9H**

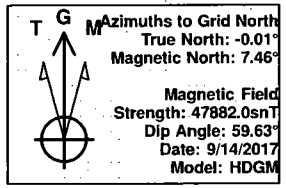
Ground Elevation:: 3433.00
RKB Elevation: KB=22 @ 3455.00ft (Nabors M55)
Rig Name: Nabors M55

| Northing | Easting | Latitude | Longitude |
|---|---|---|---|
| 371098.9000 | 545568.7000 | 32.020230 | -104.319681 |

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

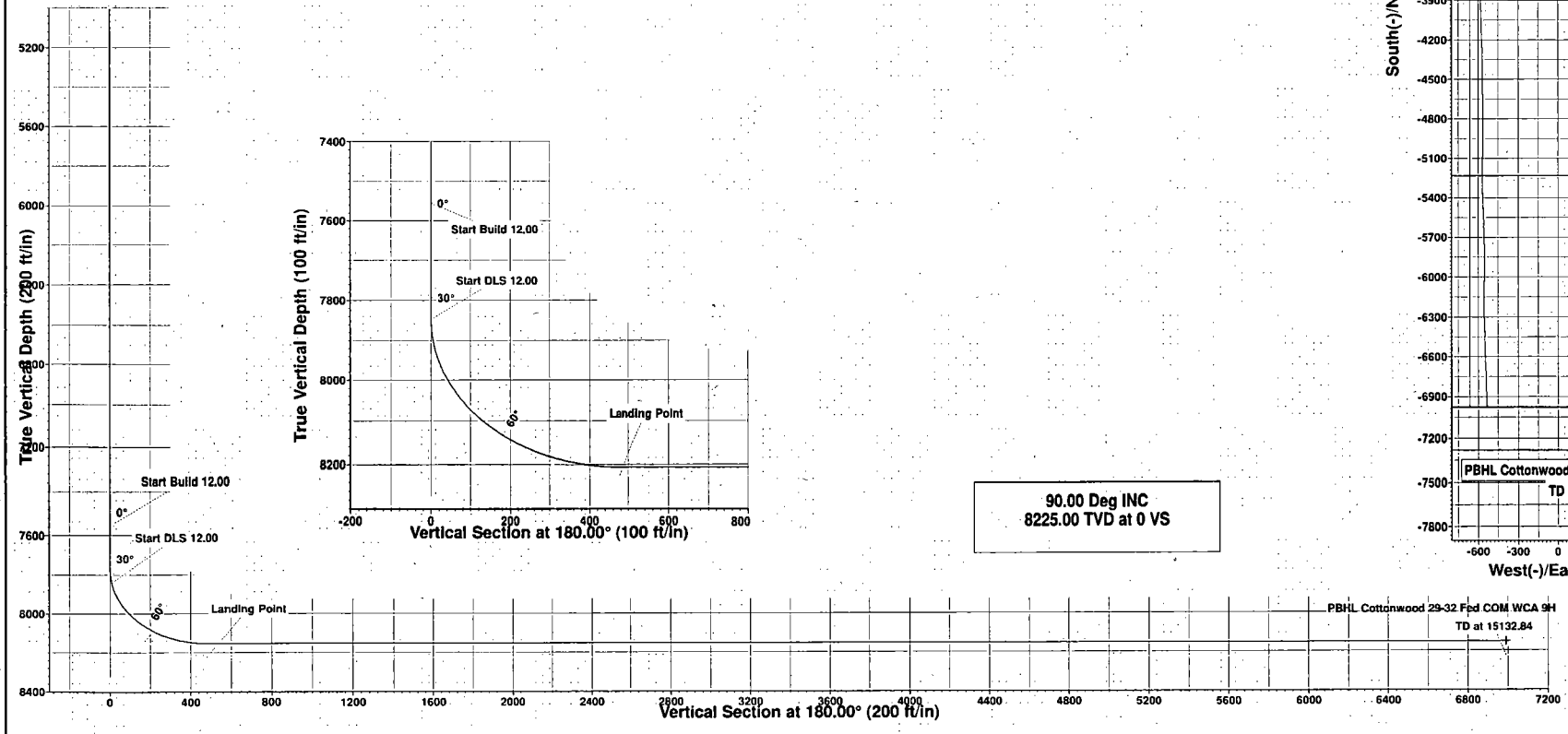
**Planned Section Details**

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 7555.09 | 0.00 | 0.00 | 7555.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Start Build 12.00 |
| 3 | 7870.09 | 37.80 | 90.00 | 7847.73 | 0.00 | 100.19 | 12.00 | 90.00 | 0.00 | Start DLS 12.00 |
| 4 | 8620.09 | 90.00 | 180.00 | 8225.00 | -477.47 | 392.84 | 12.00 | 90.00 | 477.47 | Landing Point |
| 5 | 15132.84 | 90.00 | 180.00 | 8225.00 | -6990.21 | 392.90 | 0.00 | 0.00 | 6990.21 | TD at 15132.84 |




Azimuths to Grid North
True North: -0.01°
Magnetic North: 7.46°

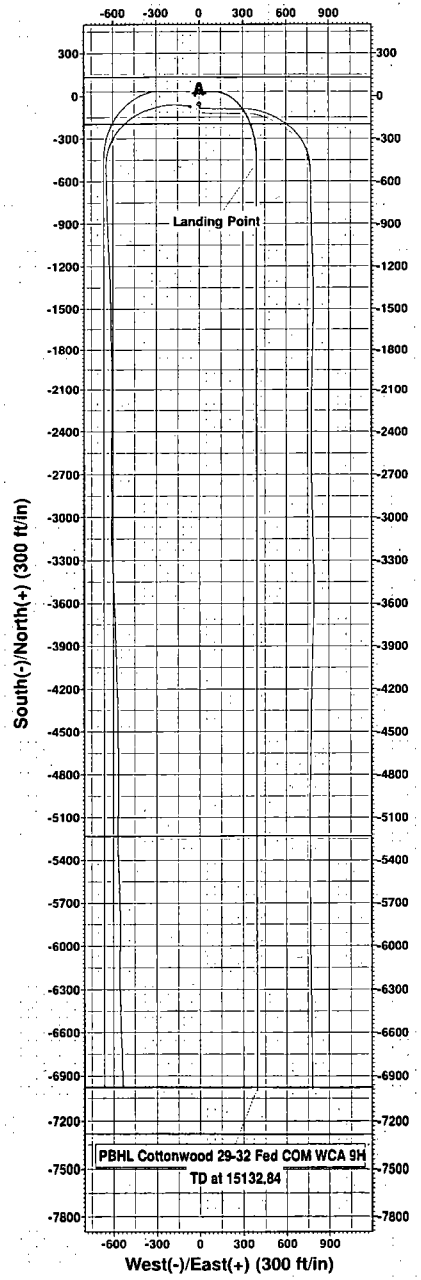
Magnetic Field
Strength: 47882.0snT
Dip Angle: 59.63°
Date: 9/14/2017
Model: HDGM







90.00 Deg INC
8225.00 TVD at 0 VS



Cactus Wellhead

**Installation Procedure Prepared For:**

# Chisholm Energy

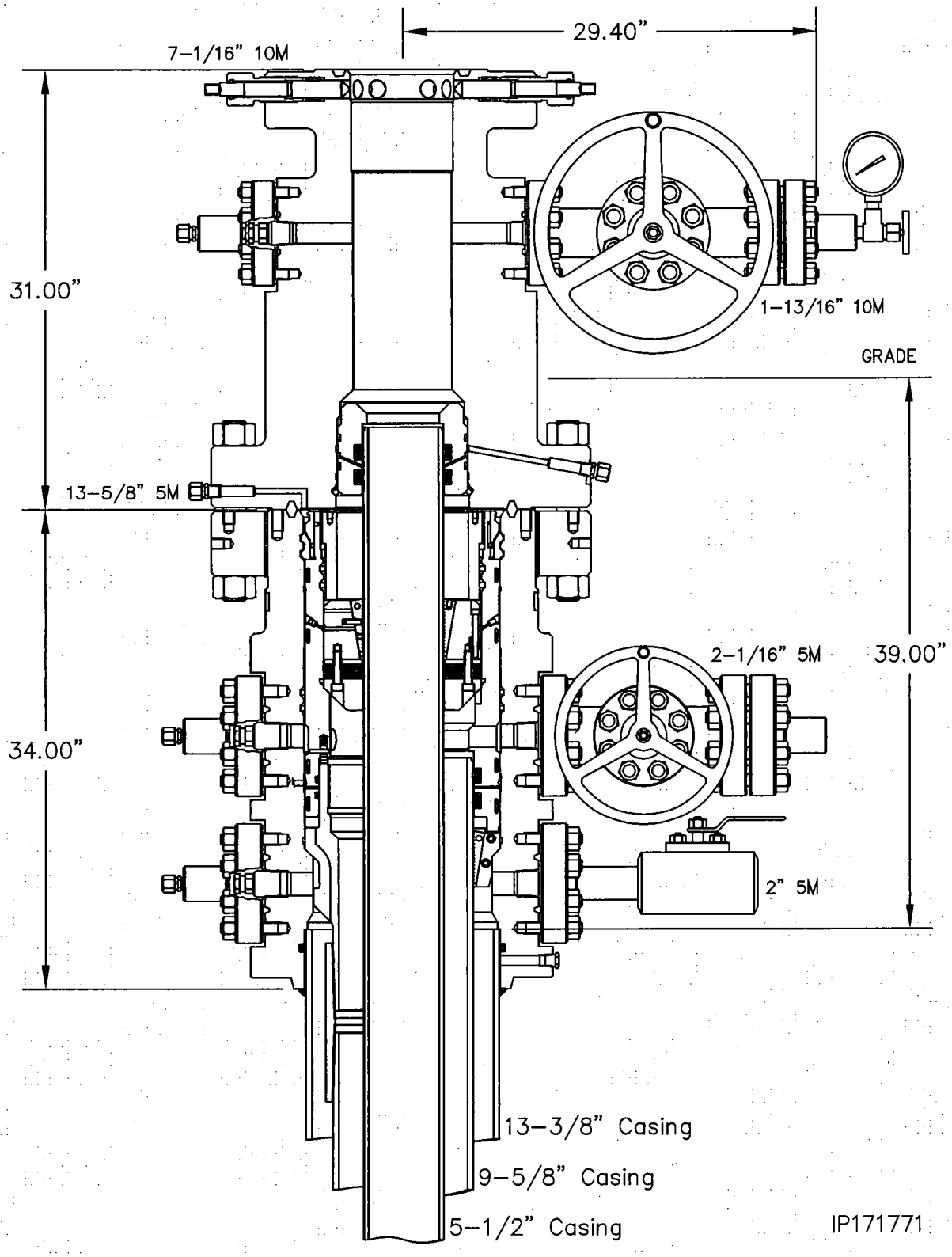
## 13-3/8" x 9-5/8" x 5-1/2" 5/10M MBU-3T Wellhead System With CTH-HPS-F MOD Tubing Head

**Publication # IP0571**

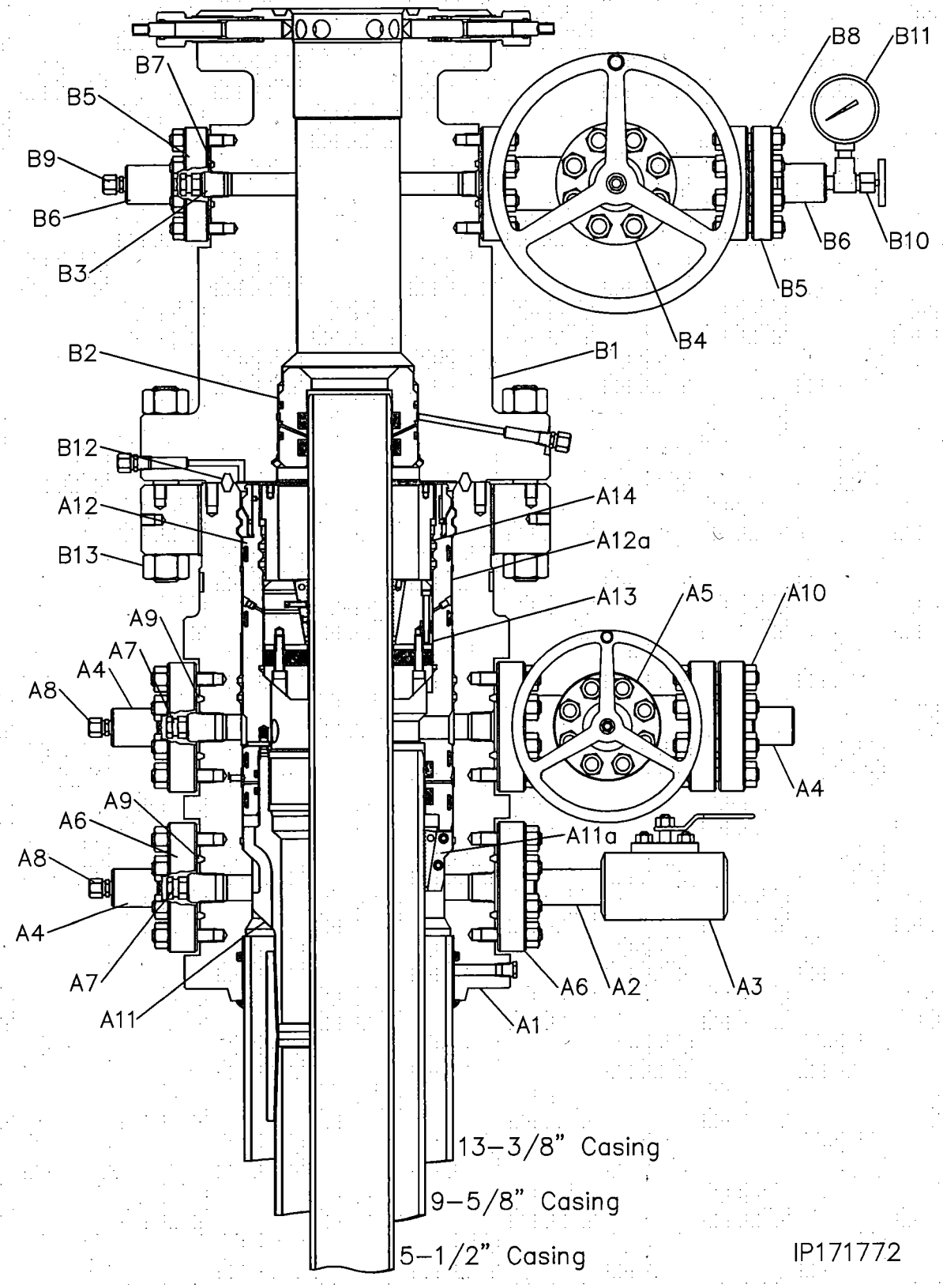
**May, 2017**

# Table of Contents

# System Drawing



# Bill of Materials



## MBU-3T HOUSING ASSEMBLY

| Item | Qty | Description |
|---|---|---|
| A1 | 1 | Housing, CW, MBU-3T, 13.5/8" 5M x 13-3/8" SOW, with two 2-1/16" 5M studded upper and lower outlets with o-ring, 6A-PU-AA-1-2<br>Part # 117620 |
| A2 | 1 | Nipple, 2" line pipe x 6" long<br>Part # NP6A |
| A3 | 1 | Ball Valve, TV, 2" RP, 5M x 2" LP, WCB body SS trim, Delrin seats, HNBR seals, nace with locking handle<br>Part # 115184 |
| A4 | 3 | Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K<br>Part # BP2T |
| A5 | 1 | Gate valve, CW1, 2-1/16" 3/5M, flanged end, handwheel operated, AA/DD-NL trim, (6A-LU-AA/DD-NL-1-2)<br>Part # 610003 |
| A6 | 4 | Companion Flange, 2-1/16" 5M x 2" line pipe, 4130 CMS-102, CMS-002<br>Part # 200002 |
| A7 | 2 | VR Plug, 1-1/2" Sharp Vee x 1-1/4" hex<br>Part # VR2 |
| A8 | 2 | Fitting, grease, vented cap, 1/2" NPT alloy non-nace<br>Part # FTG1 |
| A9 | 5 | Ring Gasket, R-24, 2-1/16" 3/5M<br>Part # R24 |
| A10 | 8 | Studs, all thread with two nuts, black, 7/8" x 6-1/2" long, B7/2H<br>Part # 780067 |

## MBU-3T HOUSING ASSEMBLY

| Item | Qty | Description |
|---|---|---|
| A11 | 1 | Casing Hanger, CW, MBU--3T-LWR-TP, fluted, 13-5/8" x 9-5/8" (40#) LC bottom x 10.250" 4 Stub Acme 2G RH box top, with 11-1/2" OD neck, 6A-U-AA-1-2<br>Part # 120251 |
| A12 | 1 | Packoff, CW, MBU-3T, Mandrel, 13-5/8" nested x 11" with 11.250" 4 Stub Acme 2G LH box top, 1/8" NPT test ports, 6A-U-AA-1-1<br>Part # 117152 |
| A13 | 1 | Casing Hanger, C2, 11" x 5-1/2"<br>Part # 108067 |
| A14 | 1 | Hold Down Ring, for C2 hanger, 11" x 7 through 4-1/2", arranged for packoff MBU-3T, 13-5/8" with 11.250" 4 Stub Acme 2G LH pin x 9.06" ID x 6.25" long, with 2.12" thread length, 4140 110K<br>Part # 117418 |

## TUBING HEAD ASSEMBLY

| Item | Qty | Description |
|---|---|---|
| B1 | 1 | Tubing Head, CW, CTH-HPS-F, 9" (MOD), 13-5/8" 5M x 7-1/16" 10M, with two 1-13/16" 10M studded outlets, round bar, 17-4PH lockscrews, 6A-PU-EE-0,5-2-1<br>Part # |
| B2 | 1 | Secondary Seal, CW, HPS-F, 9 MOD x 5-1/2", 6A-PU-DD-NL-1-2<br>Part # 110503 |
| B3 | 1 | VR Plug, 1-1/4" Sharp Vee x 1-1/4" hex<br>Part # VR1 |
| B4 | 1 | Gate valve, AOZE, 1-13/16" 10M, flanged end, handwheel operated, EE-0,5 trim, (6A-LU-EE-0,5-3-1)<br>Part # 103188 |
| B5 | 2 | Companion Flange, 1-13/16" 10M x 2" LP, 5000 psi max WP, 6A-KU-EE-NL-1<br>Part # 200010 |
| B6 | 2 | Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K<br>Part # BP2T |
| B7 | 3 | Ring Gasket, BX151, 1-13/16" 10M<br>Part # BX-151 |
| B8 | 8 | Studs, all thread with two nuts, black, 3/4" x 5-1/2" long, B7/2H<br>Part # 780080 |
| B9 | 1 | Fitting, grease, vented cap, 1/2" NPT alloy non-nace<br>Part # FTG1 |
| B10 | 1 | Needle Valve, MFA, 1/2" NPT 10M service<br>Part # NVA |
| B11 | 1 | Pressure Gauge, 5M, 4-1/2" face, liquid filled, 1/2" NPT<br>PG5M |
| B12 | 1 | Ring Gasket, BX-160, 13-5/8" 15M<br>Part # BX-160 |
| B13 | 16 | Studs, all thread with two nuts, black, 1-5/8" x 12-3/4" long, B7/2H<br>Part # 780087 |

## RECOMMENDED SERVICE TOOLS

| Item | Qty | Description |
|---|---|---|
| ST1 | 1 | Test Plug/Retrieving Tool, CW, 13-5/8" x 4-1/2" IF (NC-50), 1-1/4" LP bypass and spring loaded lift dogs<br>Part # 104467 |
| ST2 | 1 | Wear Bushing, CW, MBU-3T-LWR, 13-5/8" x 12.31" ID x 27.0" long with 3/8" o-ring<br>Part # 116974 |
| ST3 | 1 | Casing Hanger Running Tool, CW, MBU-3T-LR-TP, 13-5/8" x 9-5/8" LC box top x 10.250" 4 Stub Acme 2G RH pin bottom, max load capacity 1000K, max torque 18000 ft-lbs. spec for rotating casing<br>Part # 105845 |
| ST4 | 1 | Torque Collar, CW, for use with running tool, TP, 10.250 4 stub Acme 2G RH pin bottom and arranged for 11.50" OD x 5.00" long box hanger neck, maximum torque 18,000 ft-lbs<br>Part # 118906 |
| ST5 | 1 | Wash Tool, CW, Casing Hanger, MBU-LR/MBS2, fluted, 13-5/8" x 4-1/2" IF (NC-50) box top threads, with brushes<br>Part # 106277 |
| ST6 | 1 | Packoff Running Tool, CW, MBU-3T UPR, 13-5/8" nested, with 11.250" 4 Stub Acme 2G LH pin bottom x 4-1/2" IF (NC-50) box top with seal sleeve<br>Part # 117310 |
| ST7 | 1 | Test Plug, CW, MBU-2LR Inner, 11" x 4-1/2" IF, 1-1/4" LP bypass<br>Part # 108848 |
| ST8 | 1 | Wear Bushing, MBU-3T-UPR, nested, 13-5/8" x 11" x 9.00" I.D. x 20.0" long, arranged for 13-5/8" tool<br>Part # 117158 |

## RENTAL EQUIPMENT

| Item | Qty | Description |
|---|---|---|
| R1 | 1 | Threaded Hub, CW, MBU-3T, 13-5/8" 5M With 19.000" 2 Stub Acme-2G Left Hand Box Thread<br>Part # 117268 |
| R2 | 1 | Drilling Adapter, CW, MBU-3T, 13-5/8" 5M Quick Connect Bottom x 13-5/8" 5M Studded Top, Temp Rating PU<br>Part # 117278 |
| R3 | 1 | TA Cap, CW, MBU-3T-HPS, 13-5/8" 5M quick connect, with one 2" LPO & 1/2" NPT port, with 1/2" NPT needle valve and 2" LP nipple and valve, 6A-U-AA-1-1<br>Part # 117317 |
| | 1 | Secondary Seal Bushing, CW, HPS, 9" x 5-1/2<br>Part # 109026 |
| R4 | 4 | Lift Eyes, 3/4", side pull hoist ring<br>Part # 115542 |

## EMERGENCY EQUIPMENT

| Item | Qty | Description |
|---|---|---|
| A11a | 1 | Casing Hanger, CW, MBU-3T, 13-5/8" x 9-5/8" 6A-PU-DD-3-1<br>Part # 116998 |
| A12a | 1 | Packoff, CW, MBU-3T, Emergency, 13-5/8" nested x 11" with 11.250" 4 Stub Acme 2G LH box top, 1/8" NPT test ports, 6A-U-AA-1-1<br>Part # 117184 |

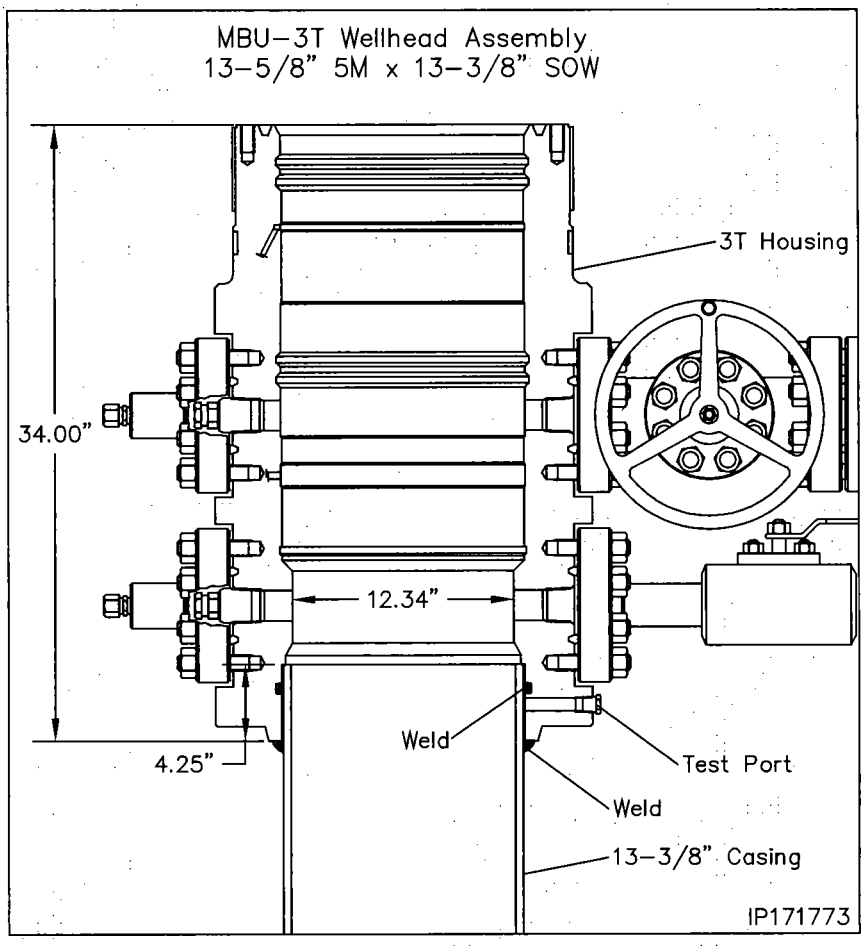
# Stage 1 — Install the MBU-3T Housing

1. Run the conductor and 13-3/8" surface casing to the required depth and cement as required.
2. Cut the conductor pipe off level with the cellar floor.
3. Final cut the 13-3/8" surface casing at 39.00" below ground level (grade). Ensure the cut is level and square with the horizon.
4. Place an 3/16" x 3/8" bevel on the OD of the stub.

**Note:** The slip on and weld preparation is 4.25" in depth.

5. Examine the ***13-5/8" 5M x 13-3/8" SOW x 19.00" 2 Stub Acme LH (Left Hand Thread) MBU-3T Wellhead Housing (Item A1).*** Verify the following:
   - internal bore is clean and in good condition
   - external Acme thread is clean and in good condition
   - thread flange is in place and rotates freely

   valves are intact and in good condition
   - weld socket is clean and free of grease and debris and o-ring is in place and in good condition
6. Align and level the Wellhead Assembly over the casing stub, orienting the outlets so they will be compatible with the drilling equipment.
7. Remove the pipe plug from the port on the bottom of the Head.
8. Slowly and carefully lower the assembly over the casing stub, weld and test the MBU-3T wellhead to the surface casing.
9. Replace the pipe plug in the port on the bottom of the wellhead.




**Note:** The weld should be a fillet-type weld with legs no less than the wall thickness of the casing. Legs of 1/2" to 5/8" are adequate for most jobs.

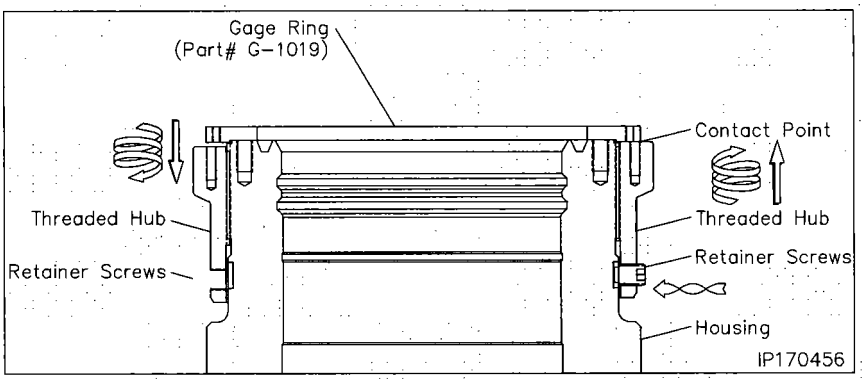
Refer to the back of this publication for the **Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal** and for field testing of the weld connection.

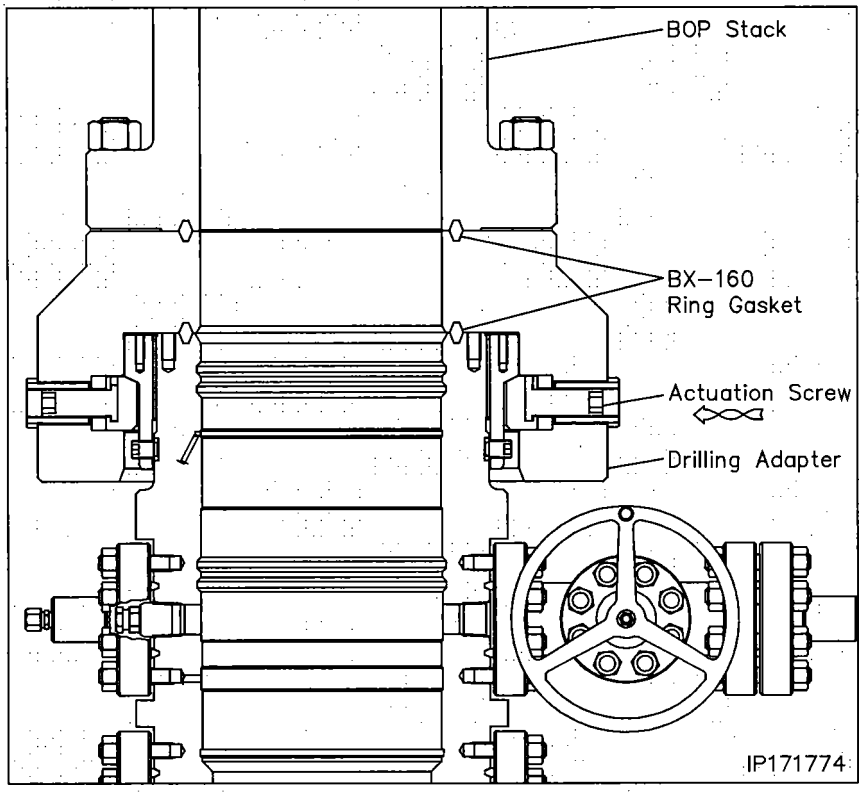
# Stage 2 — Nipple Up The BOP Stack

1. Examine the ***13-5/8" 5M x 19.00" 4 Stub Acme Threaded Hub (Item R1)***. Verify the following:
   - Acme thread are clean and in good condition
   - remove the (4) retainer set screws an place them in a safe place
2. Thoroughly clean and lightly lubricate the mating threads of the housing and the Thread Hub with Copper Coat or Never Seize.
3. Pick up the Hub and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the ring is approximately a 1/4" below the top of the housing.
4. Position the hub gage ring on top of the housing with the counter bore down as indicated. Ensure the gage ring is level and straight.
5. Rotate the Hub clockwise (UP) until it contacts the gage ring.

**WARNING:** Do not off seat the gage ring.

6. Locate the retainer screw holes in the threaded hub.
7. Rotate the Hub up or down to align the holes in the hub with the notches in the housing.
8. Install the set screws and tighten securely. Remove gage ring.
9. Make up the ***13-5/8" 5M Quick Connect x 13-5/8" 5M Studded Adapter (Item R2)*** to the bottom of the BOP stack using a new ***BX-160 Ring Gasket.***
10. Thoroughly clean the MBU-3T hub, ring groove and the mating clamp segments and ring groove of the Adapter attached to the BOP stack.
11. Install a new ***BX-160 Ring Gasket*** into the ring groove of the housing.
12. Pick up the BOP stack and carefully lower it over the top of the housing and land it on the ring gasket.




13. Ensure the BOP is level and then carefully run in all of the drive screws of the upper adapter to contact point.
14. Ensure the assembly remains level, run in one actuation and torque to 100 ft lbs.
15. Locate the screw 180° from the first and torque it to 100 ft lbs.
16. Locate the screws 90° to the right and left and torque them to 100 ft lbs.
17. Position the second 4 point sequence 90° from the first and torque each screw to 200 ft lbs.
18. Run in all remaining screws to contact and then torque each screw to 400 ft lbs.
19. Make one additional round until a stable torque of 400 ft lbs on all (16) screws is achieved.

# Stage 3 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the ***13-5/8" Nominal x 4-1/2" IF (NC-50) CW Test Plug/ Retrieving Tool (Item ST1)***. Verify the following:
   - 1-1/4" VR plug and weep hole plug are in place and tightened securely
   - elastomer seal is in place and in good condition
   - retractable lift lugs are in place, clean, and free to move
   - drill pipe threads are clean and in good condition

2. Position the test plug with the elastomer seal down and the lift lugs up and make up the tool to a joint of drill pipe.

**WARNING:** Ensure that the lift lugs are up and the elastomer seal is down

3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

4. Open the housing lower side outlet valve.

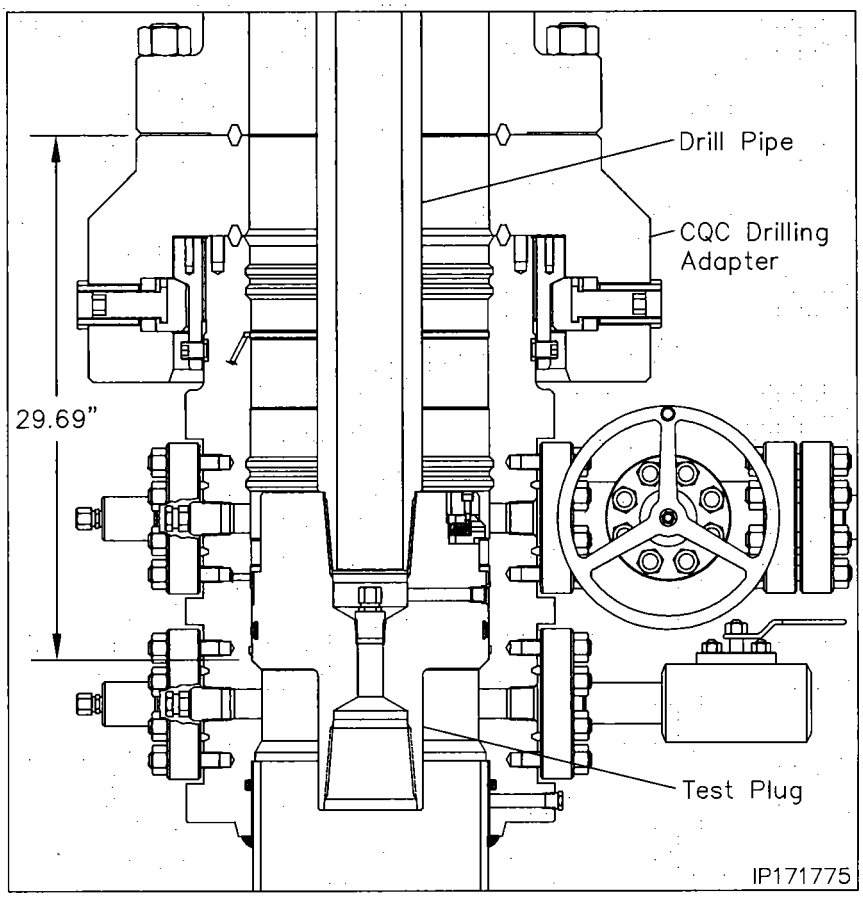
5. Lightly lubricate the test plug seal with oil or light grease.

6. Carefully lower the test plug through the BOP and land it on the load shoulder in the housing, 29.69" below the top of the drilling adapter.

7. Close the BOP rams on the pipe and test the BOP to 5000 psi or as required by site supervisor.

**Note:** Any leakage past the test plug will be clearly visible at the open side outlet valve.

8. After a satisfactory test is achieved, release the pressure and open the rams.




9. Remove as much fluid as possible from the BOP stack and the retrieve the test plug with a straight vertical lift.

**Note:** When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting it from the drill pipe.

10. Repeat this procedure as required during the drilling of the hole section.

# Stage 4 — Run the Lower Wear Bushing

**Note: Always** use a Wear Bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The Wear Bushing **must be retrieved** prior to running the casing.

1. Examine the ***13-5/8" Nominal MBU-3T-LWR Wear Bushing (Item ST2).*** Verify the following
   - internal bore is clean and in good condition
   - upper trash o-ring is in place and in good condition
   - shear o-ring cord is in place and in good condition
   - paint anti-rotation lugs white and allow paint to dry

## Run the Wear Bushing Before Drilling

2. Orient the ***13-5/8" Nominal x 4-1/2" IF (NC-50) CW Test Plug/Retrieving Tool (Item ST1)*** with drill pipe connection up.

3. Attach the Retrieving Tool to a joint of drill pipe.

**WARNING:** Ensure that the lift lugs are down and the elastomer seal is up

4. Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the Wear Bushing until the lugs snap into place.

**Note:** If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

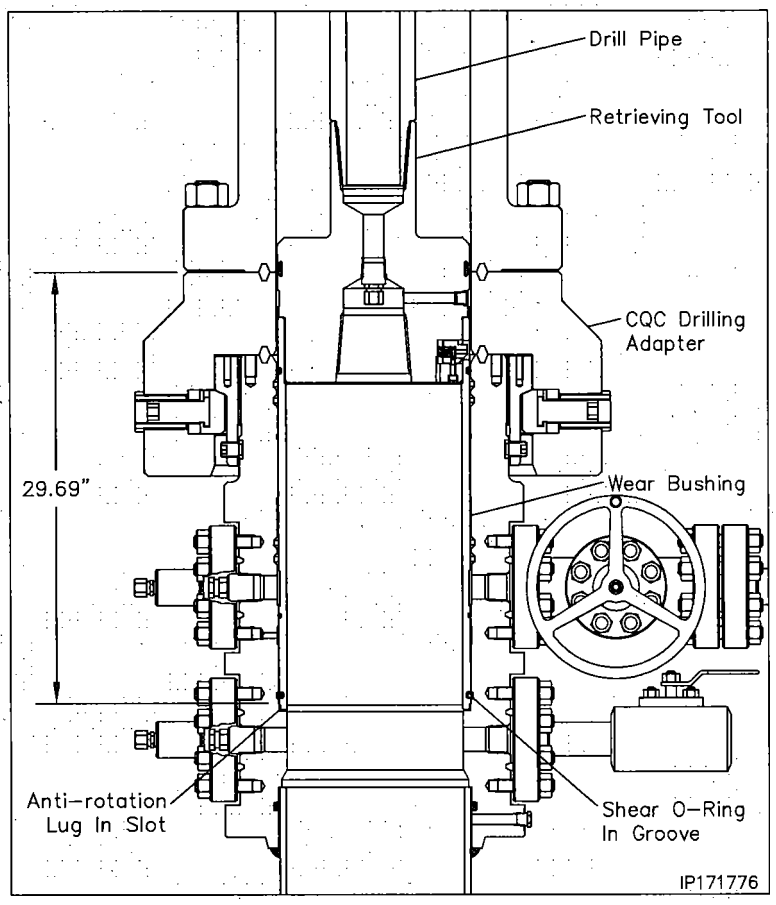
5. **Apply a heavy coat of grease, not dope, to the OD of the bushing.**

6. Ensure the BOP stack is drained and free of any debris from previous test.

7. Slowly lower the Tool/Bushing Assembly through the BOP stack and land it on the load shoulder in the housing, 29.69" below the top of the drilling adapter.

8. Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".

**Note:** The Shear O-Ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.




9. Remove the tool from the Wear Bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight up.

10. Drill as required.

**Note:** It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

## Retrieve the Wear Bushing After Drilling

11. Make up the Retrieving Tool to the drill pipe.

12. Drain BOP stack and wash out if necessary.

13. Slowly lower the tool into the Wear Bushing.

14. Rotate the Retrieving Tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.

15. Using the top drive, slowly pick up on the landing joint in 1000 lbs increments until the busing starts to rise. This action should take a minimum of 3000 lbs pull. Do Not Exceed 60,000 lbs.

16. Retrieve the Wear Bushing, and remove it and the Retrieving Tool from the drill string.

# Stage 5 — Hang Off the 9-5/8" Casing

1. Examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Casing Hanger Running Tool (Item ST3).*** Verify the following:
   - internal bore and threads are clean and in good condition
   - o-ring seal is clean and in good condition
   - torque dogs are in place, in upper most position and retainer set screws are tightened securely

2. Make up a landing joint to the top of the Running Tool and torque connection to thread manufacturer's maximum make up torque.

3. Lay down the landing joint on the pipe rack.

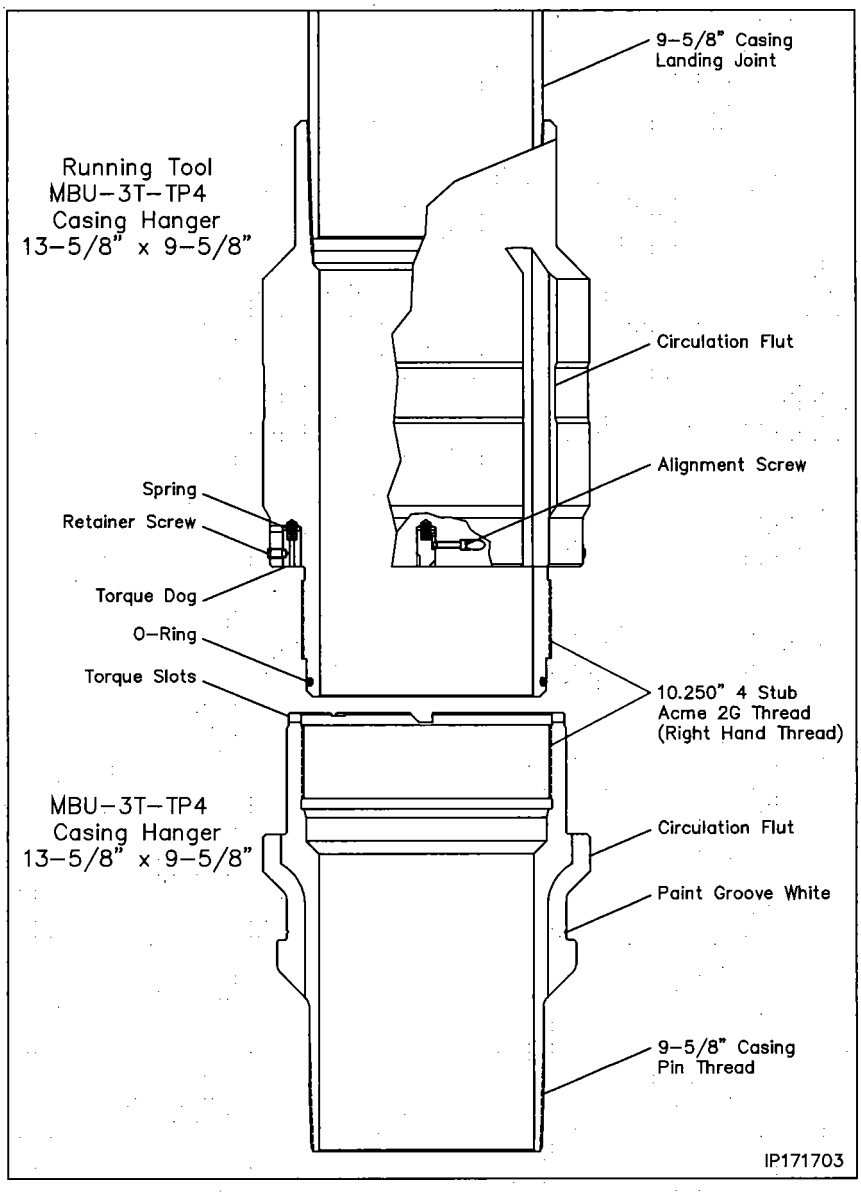
4. On the pipe rack, examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Mandrel Casing Hanger (Item A11).*** Verify the following:
   - internal bore and threads are clean and in good condition
   - neck seal area is clean and undamaged
   - torque slots are clean and in good condition
   - pin threads are clean and in good condition. **Install thread protector**
   - paint indicator groove white as indicated and allow paint to dry

5. Liberally lubricate the mating threads, seal areas and o-ring of the hanger and running tool with a oil or light grease.

6. ***Using chain tongs only,*** thread the Running Tool into the hanger, with right hand rotation, until it shoulders out on the Hanger body.

**WARNING: Do Not** apply torque to the Hanger/Tool connection.

**Note:** If steps 1 through 6 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.



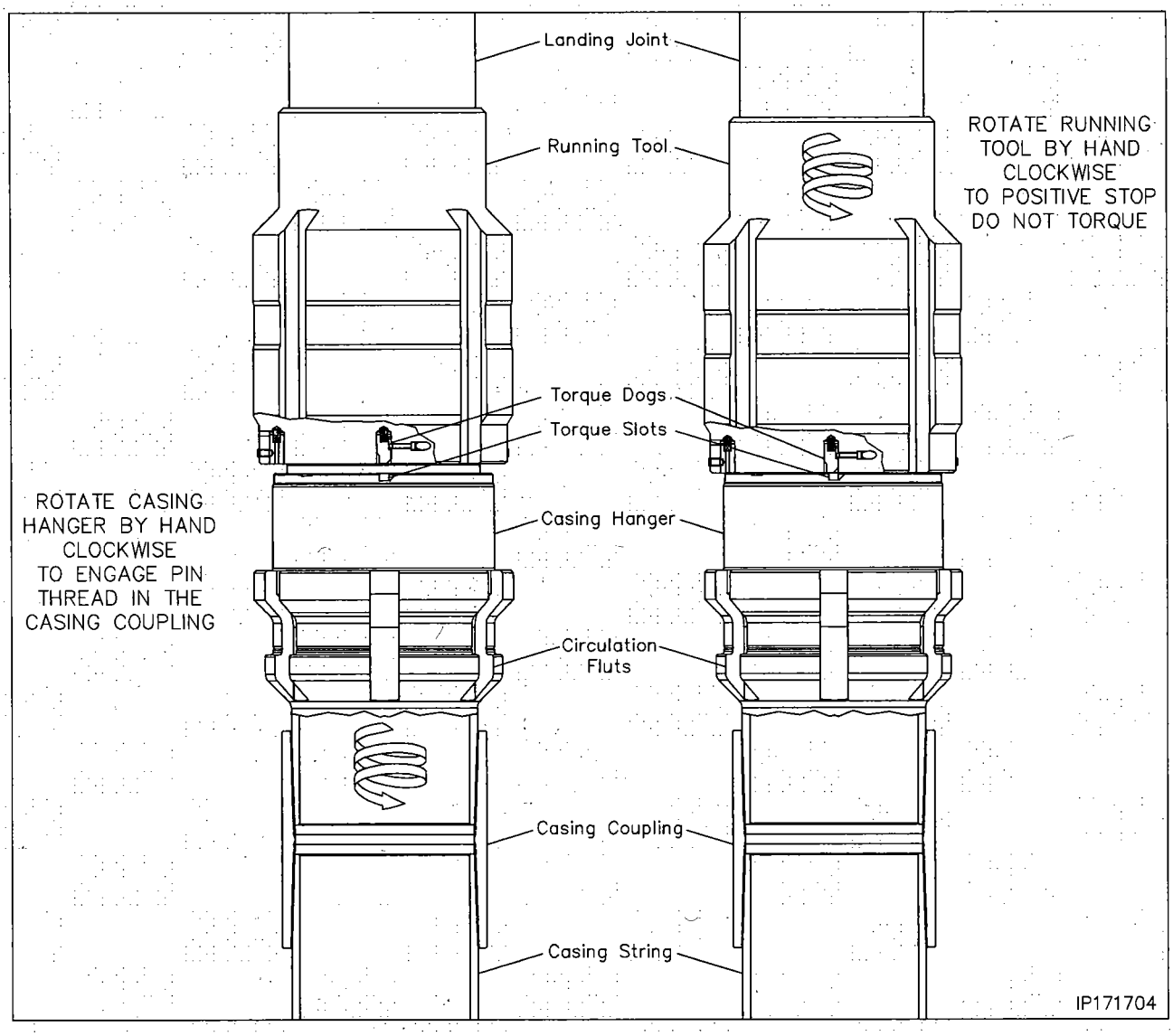

7. Calculate the total landing dimension by adding the previously determined RKB dimension and 29.69", the depth of the wellhead.

8. Starting at the top of the 45° angle load shoulder of the casing hanger measure up the landing joint and place a paint mark on the joint. Mark **HANGER LANDED.**

9. Place a second mark 30" below the first and mark **STOP ROTATING.**

10. Run the 9-5/8" casing as required and space out appropriately for the mandrel casing hanger.

# Stage 5 — Hang Off the 9-5/8" Casing




**Note:** If the 9-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed, Refer to **Stage 5A** for the emergency slip casing hanger procedure.

11. Pick up the casing hanger/running tool joint assembly.

12. Remove the casing hanger thread protector and carefully thread the hanger into the last joint of casing ran. Rotate the hanger clockwise, by hand, to a positive stop.

13. Rotate the running tool clockwise by hand to a positive stop.

# Stage 5 — Hang Off the 9-5/8" Casing

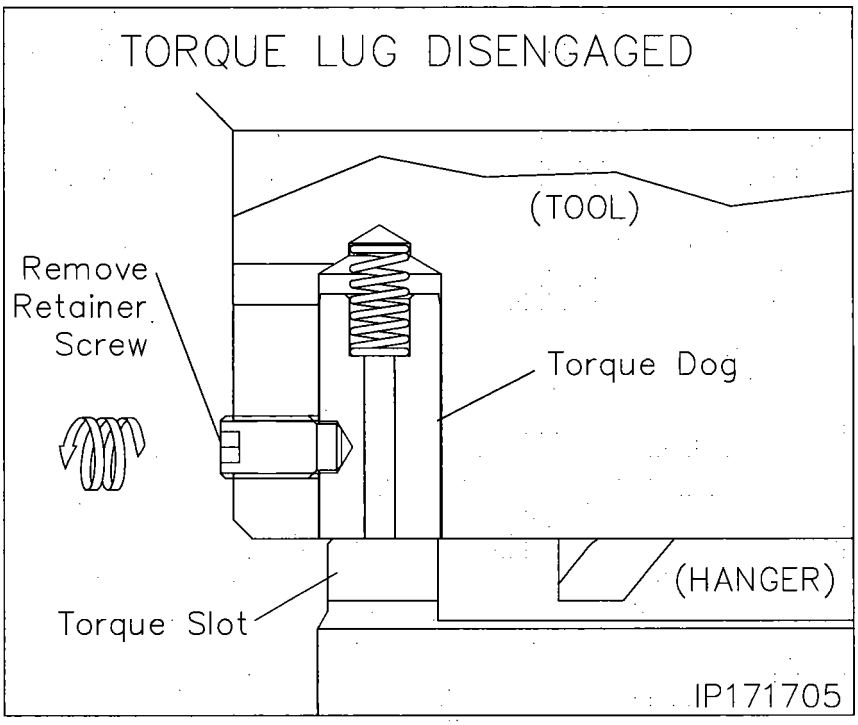
14. Locate the (4) 3/8" socket head set screws in the side of the hanger running tool and remove the screws.

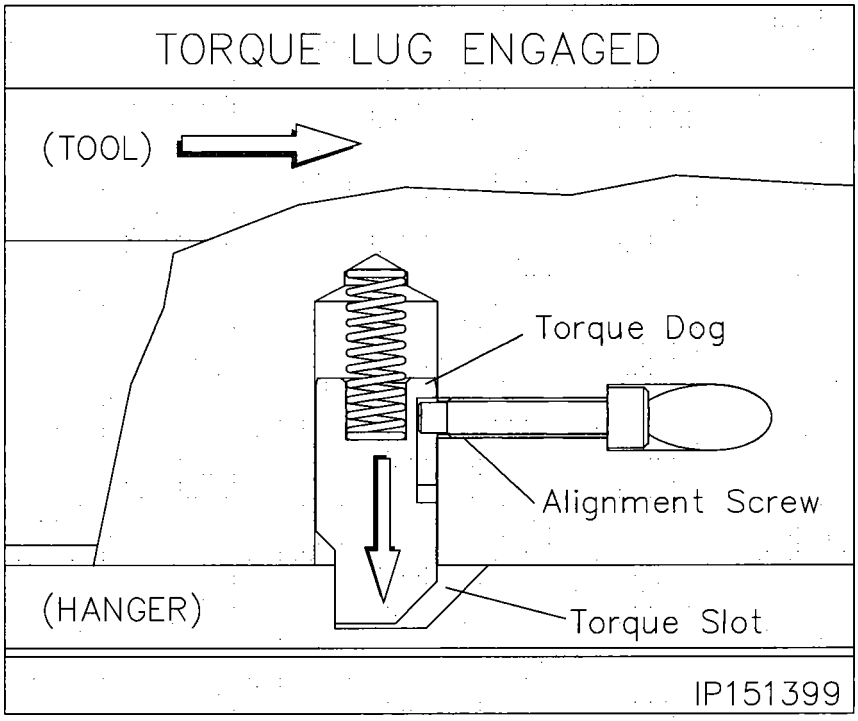
**WARNING:** Place the screws in a safe place to reinstall in the tool when the job is completed.

**Note:** This will release the running tool torque dogs allowing them to move downward.

15. Using only chain tongs, rotate the running tool to the left to allow the torque dogs to engage the torque slots in the top of the hanger.

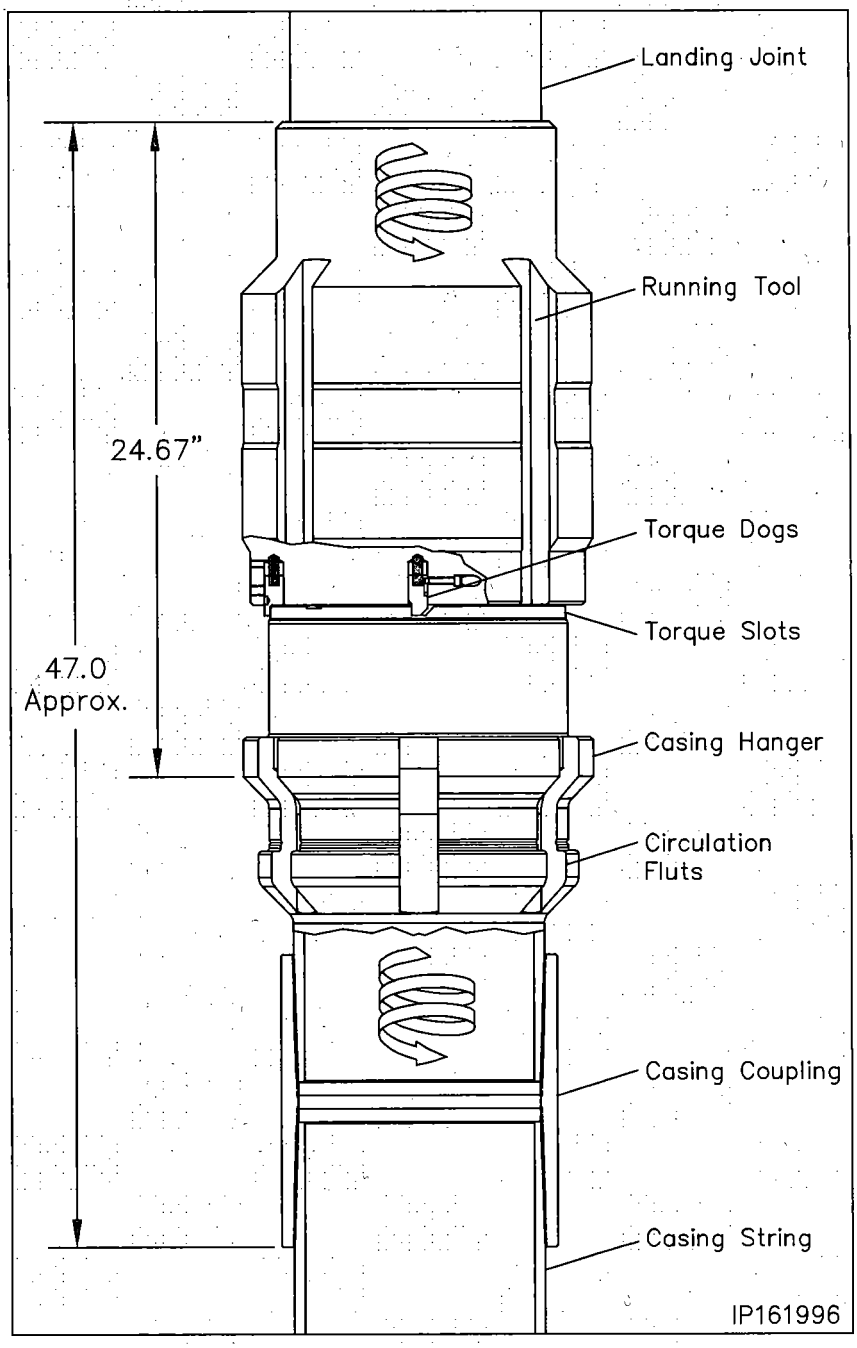
**WARNING:** Do not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement



# Stage 5 — Hang Off the 9-5/8" Casing

16. Engage the CRT tool on the landing joint and torque the casing hanger in the casing string to thread manufacturer's maximum make up torque.



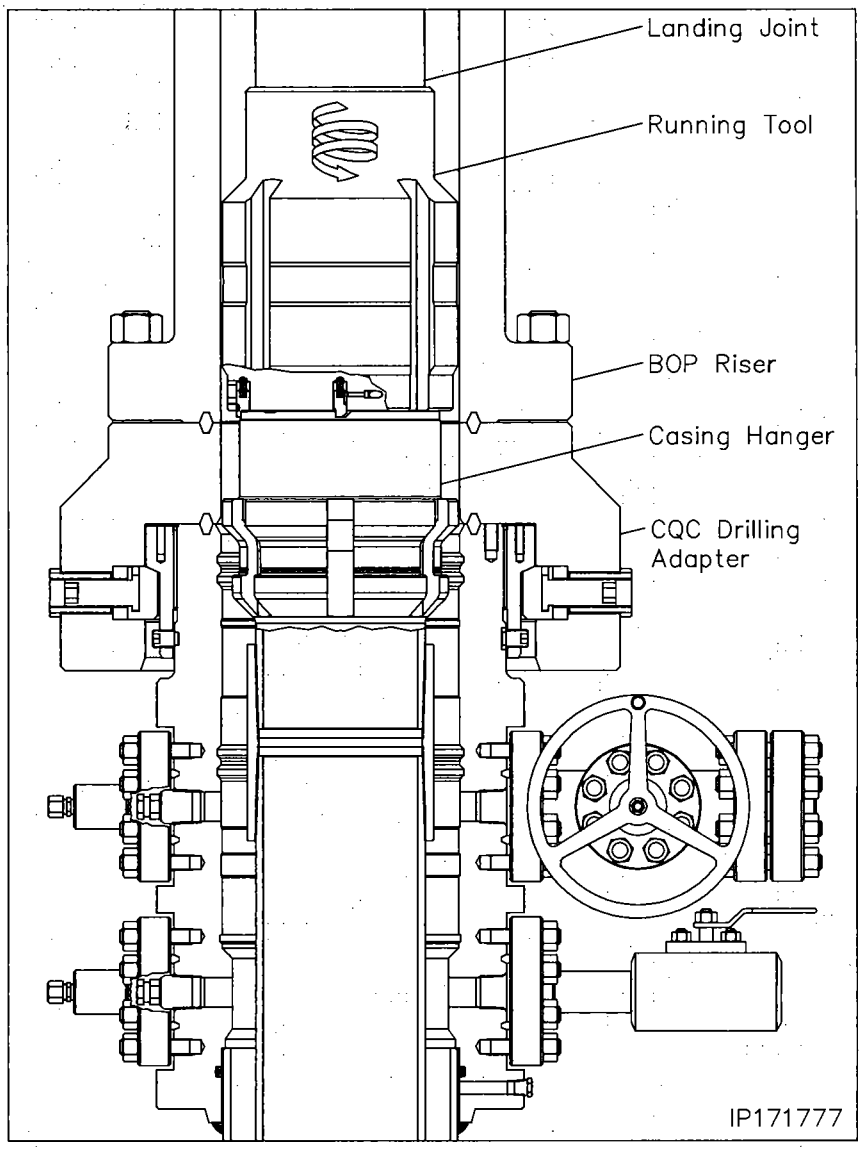
# Stage 5 — Hang Off the 9-5/8" Casing

17. Pick up the casing string and remove the floor slips and rotary bushings.

18. Carefully lower the hanger completely through the BOP annular and then engage the top drive to allow the casing to be rotated clockwise.

19. While rotating the casing clockwise, carefully lower the casing string until the **STOP ROTATING** mark on the landing joint is level with the rig floor.

**Note:** The torque dogs have a maximum rated capacity of 18,000 ft lbs.



# Stage 5 — Hang Off the 9-5/8" Casing

WARNING: Torque wrap can build in the casing string as it is rotated. Ensure the string comes to a neutral position, by allowing it to back off slowly counter clockwise, before the casing hanger is fully landed.

20. Cease rotation and continue carefully lowering the hanger through the wellhead and land it on the load shoulder in the MBU-3T housing, 29.69" below the top of the drilling adapter.

21. Slack off all weight on the casing and verify that the **HANGER LANDED** paint mark has aligned with the rig floor.

22. Open the MBU-3T housing lower outlet valve and drain the BOP stack.

23. Sight through the valve bore to confirm the hanger is properly landed. The white painted indicator groove will be clearly visible in the center of the open outlet valve.

24. Close the open valve and place a vertical paint mark on the landing joint to verify if the casing string rotates during the cementing process.

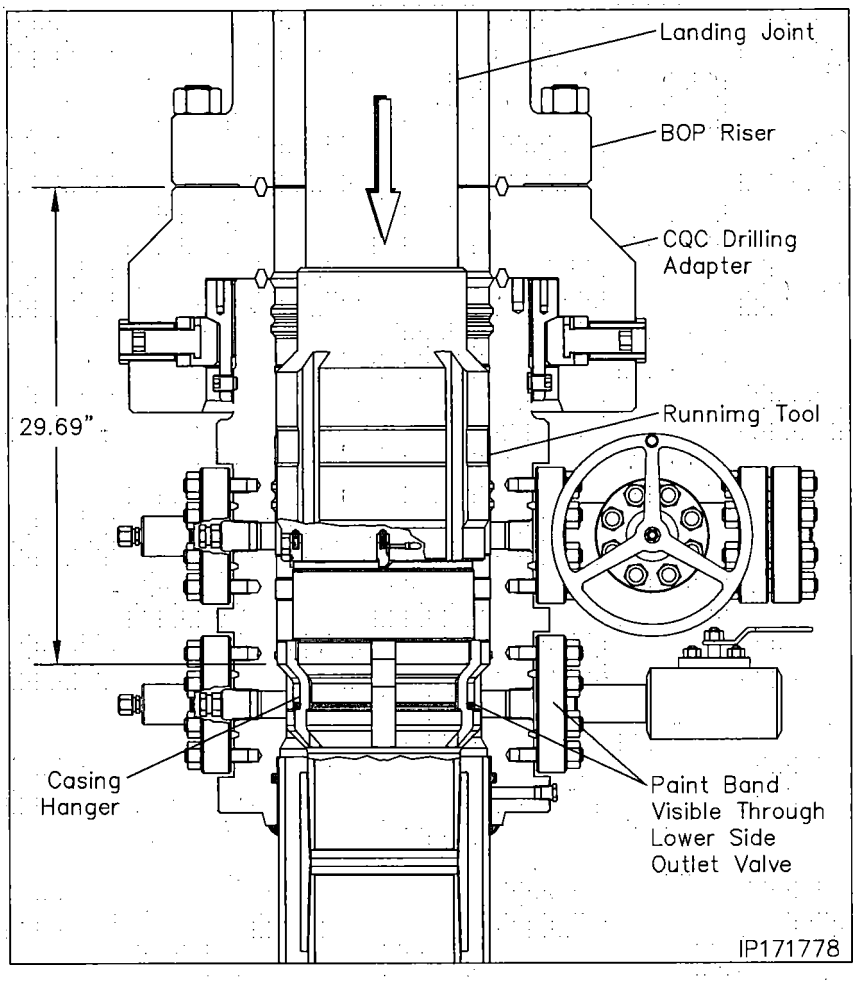
25. Cement the casing as required.

**Note:** Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

26. With cement in place, bleed off all pressure and remove the cementing head.

27. ***Using Chain Tongs Only located 180° apart***, retrieve the Running Tool and landing joint by rotating the landing joint counter clockwise (left) approximately 13 turns or until the tool comes free of the hanger.

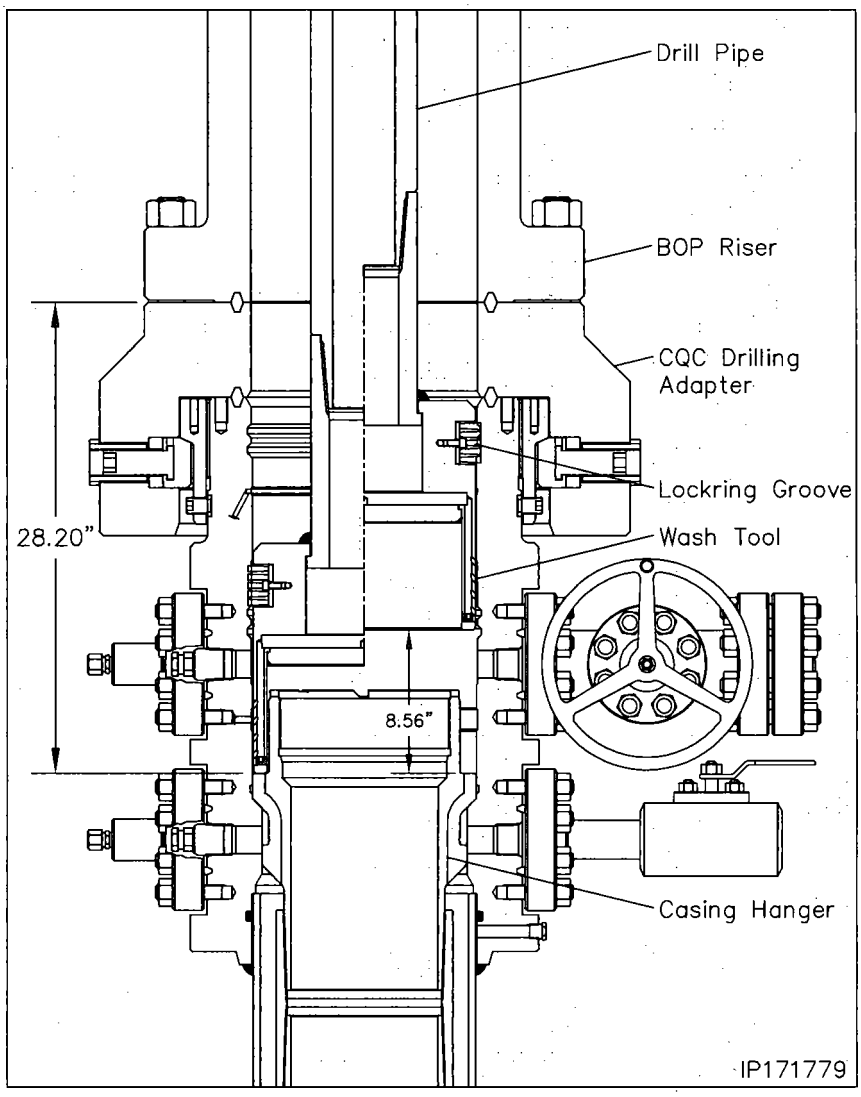
**WARNING:** The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



# Stage 5 — Hang Off the 9-5/8" Casing

## Running the 13-5/8" Wash Tool

1. Examine the ***13-5/8" x 4-1/2" IF Wash Tool (Item ST5).*** Verify the following:
   - drill pipe threads and bore are clean and in good condition
   - all ports are open and free of debris
2. Orient the Wash Tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the Wash Tool through the BOP and land it on top of the 9-5/8" casing hanger, 28.20" below the top flange of the wellhead housing.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Open the housing lower side outlet valve and drain the BOP stack.
6. Using chain tongs, rotate the tool clockwise approximately 6 turns to loosen any debris that may be on top of the hanger flutes.
7. Pick up on the tool approximately 1" and attach a high pressure water line or the top drive to the end of the drill pipe and pump water (at approximately 200 to 300 PSI on the rig pump) through the tool and up the BOP stack.
8. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. The drill pipe should be slowly rotated (approximately 20 RPM) while raising and lowering to wash the inside of the housing and BOP stack to remove all caked on debris.
9. Once washing is complete, land the wash tool on the hanger flutes.
10. Shut down pumps and allow the BOP stack to drain.




11. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle ensuring the stopping point is with the was tool resting on top of the hanger flutes.

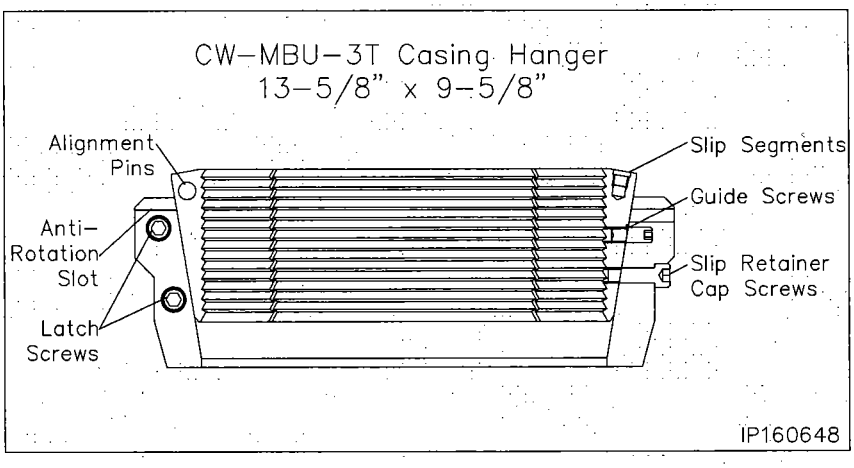
**Note:** Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.

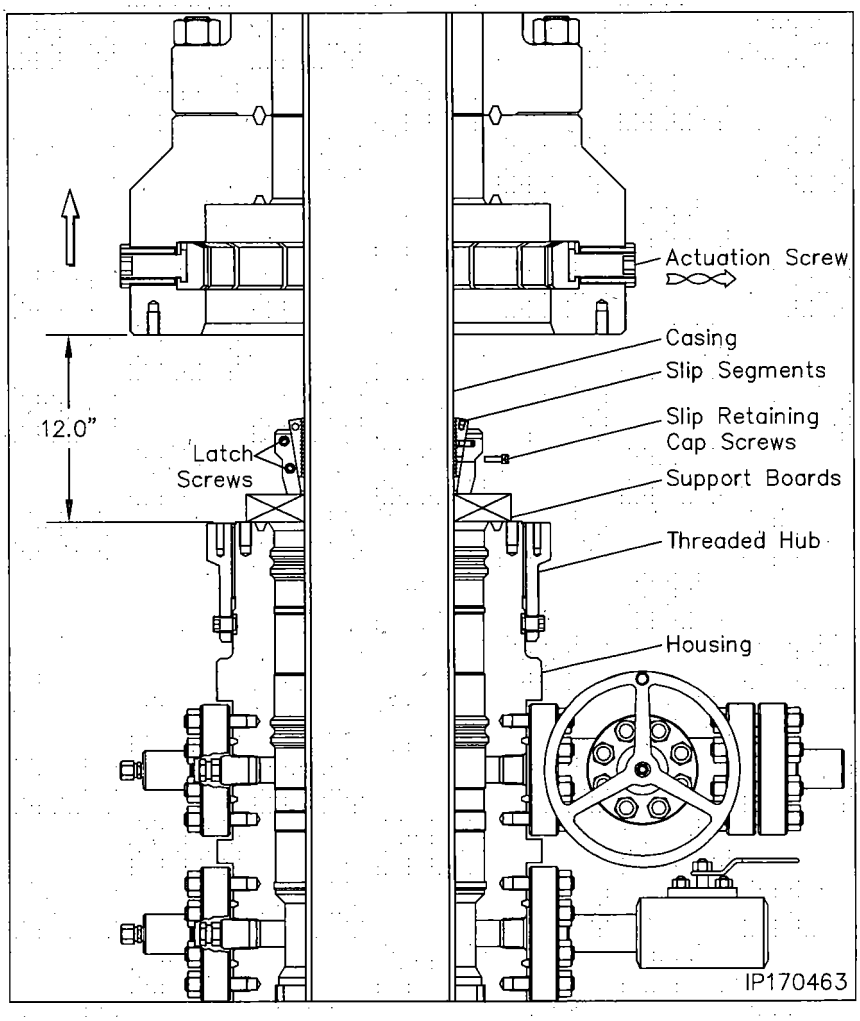
12. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
13. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure that there are no dark areas on top of the flutes of the hanger.

**WARNING:** Continue washing until all debris is removed.

# Stage 5A — Hang Off the 9-5/8" Casing (Emergency)

1. Cement the hole as required.
2. Drain the BOP stack through the housing side outlet valve.
3. Locate the actuation screw on the OD of the drilling adapter.
4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
5. Pick up on the BOP stack a minimum of 12" above the housing hub and secure with safety slings.
6. Washout as required.
7. Examine the ***13-5/8" x 9-5/8" MBU-3T Slip Casing Hanger (Item A11a).*** Verify the following:
   - slips and internal bore are clean and in good condition
   - all screws are in place
8. There are two latch screws located in the top of the casing hanger. Using a 5/16" Allen wrench, remove the two latch screws located 180° apart and separate the hanger into two halves.
9. Place two boards on the lower adapter against the casing to support the Hanger.
10. Pick up one half of the hanger and place it around the casing and on top of the boards.
11. Pick up the second hanger half and place it around the casing adjacent the first half.
12. Slide the two hanger halves together ensuring the slip alignment pins properly engage the opposing hanger half.
13. Reinstall the latch screws and tighten securely.
14. Prepare to lower the hanger into the housing bowl.



# Stage 5A — Hang Off the 9-5/8" Casing (Emergency)

**WARNING: Do Not** Drop the Casing Hanger!

15. Grease the Casing Hanger's body and remove the slip retaining screws.

16. Remove the boards and allow the hanger to slide into the housing bowl. When properly positioned the top of the hanger will be approximately 22.56" below the top of the housing.

17. Pull tension on the casing to the desired hanging weight and then slack off.

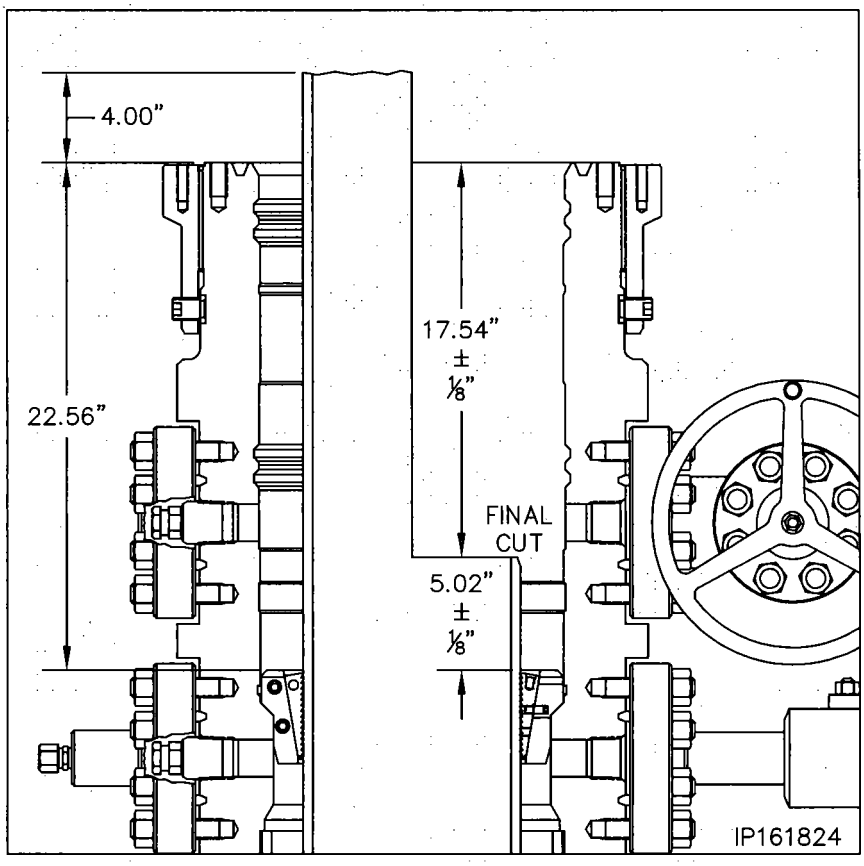
**Note:** A sharp decrease on the weight indicator will signify that the hanger has taken weight and at what point, If this does not occur, pull tension again and slack off once more.

**WARNING:** Because of the potential fire hazard and the risk of loss of life and property, It is highly recommended to check the casing annulus and pipe bore for gas with an approved sensing device prior to cutting off the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use a air driven mechanical cutter which is spark free.

18. Rough cut the casing approximately 4" above the top of the housing and move the excess casing out of the way.

19. Using the Wach's internal casing cutter, final cut the casing at 17.54" ± 1/8" below the top of the lower adapter or 5.02" ± 1/8" above the hanger body.

20. Remove the internal casing cutter assembly and reconfigure the assembly to bevel the casing. Reinstall the cutter assembly and then place a 3/16" x 3/8" bevel on the O.D. and a I.D. chamfer to match the minimum bore of the packoff to be installed.




**Note:** There must not be any rough edges on the casing or the seals of the Packoff will be damaged.

21. Thoroughly clean the housing bowl, removing all **CEMENT AND CUTTING DEBRIS.**

22. Locate the two anti-rotation notches in the top of the sip bowl.

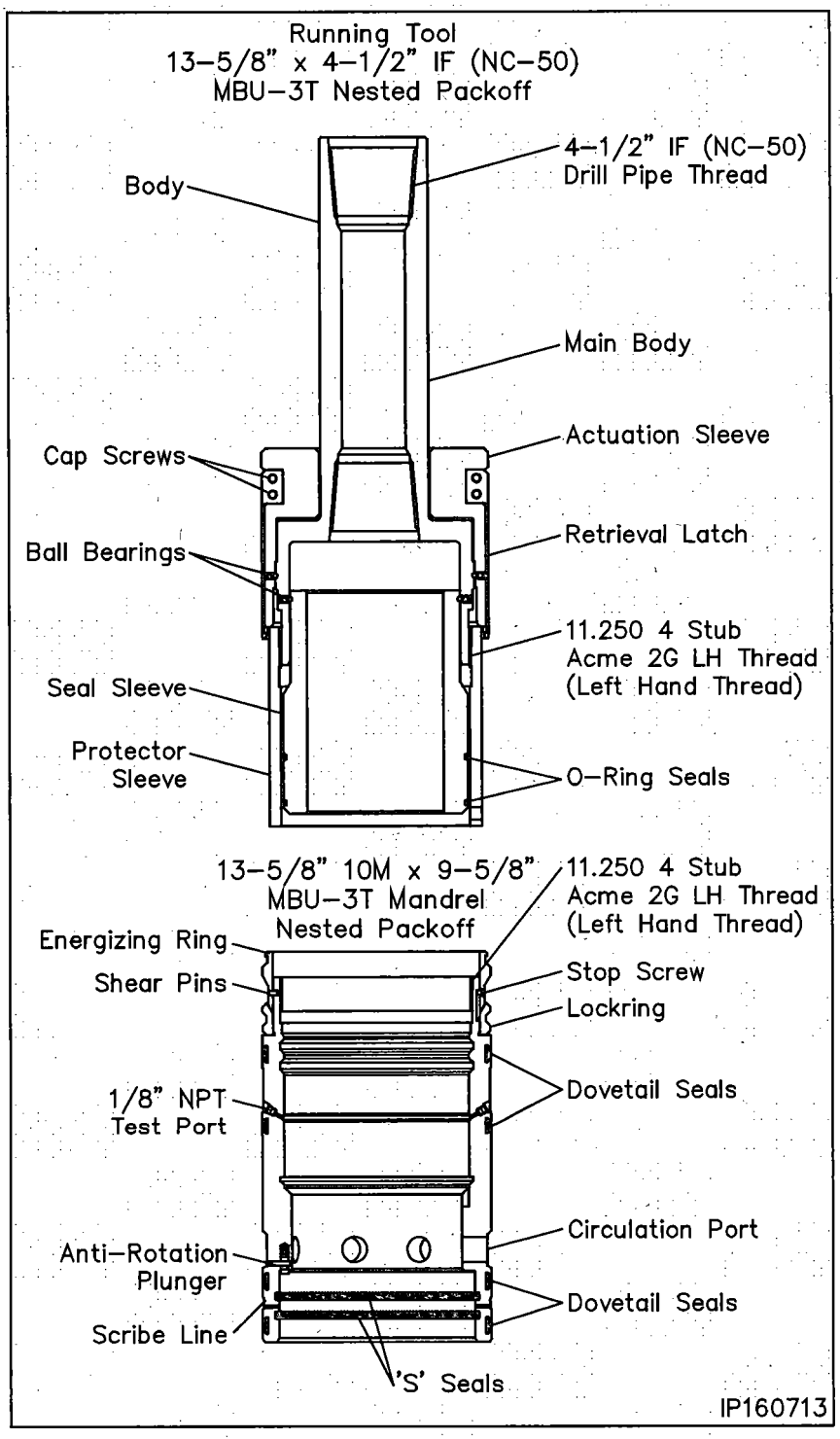
23. Place a straight edge on top of the slip bowl and in line with the center of one of the notches.

24. Ensure the straight edge is vertical and then place a paint mark on top of the housing in line with the notch in the slip bowl.

# Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

The following steps detail the installation of the MBU-3T Nested Packoff Assembly for the mandrel hanger. If the casing was landed using the emergency slip hanger, skip this step and proceed with Stage 6A for installing the emergency MBU-3T Nested packoff.

1. Examine the ***13-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Mandrel Hanger Nested Packoff Assembly (Item A12).*** Verify the following:
   - all elastomer seals are in place and undamaged
   - internal bore, and ports, are clean and in good condition
   - lockring is fully retracted
   - energizer ring is in its upper most position and retained with shear pins and stop screws are loose
   - anti-rotation plungers are in place, free to move
2. Inspect the ID and OD seals for any damage and replace as necessary.
3. Examine the ***13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST6).*** Verify the following:
   - Acme threads are clean and in good condition
   - retrieval latch is in position and retained with cap screws
   - Remove seal sleeve protector sleeve
   - seal sleeve is in position and rotates freely
   - seal sleeve o-rings are in place and in good condition
   - reinstall seal sleeve protector
4. Remove the retrieval latch and set aside.

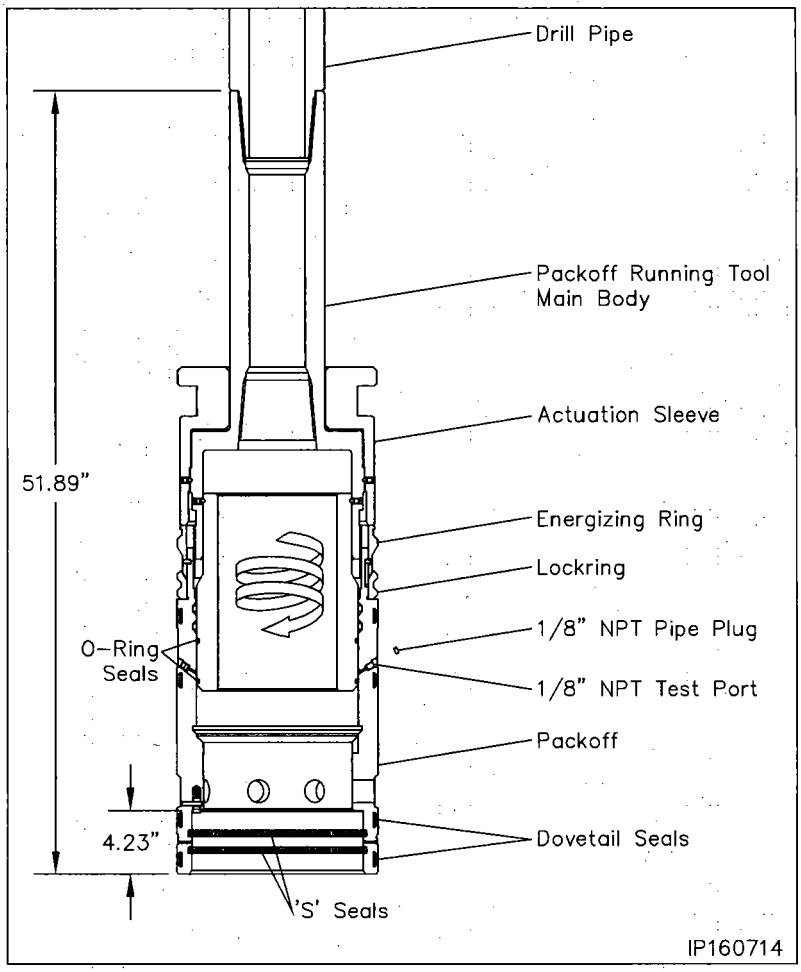


# Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

5. Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.
6. Pick up the Running Tool with landing joint and suspend it above the packoff.
7. Remove the tool protector sleeve with counter clockwise rotation and set the sleeve aside.
8. Thoroughly clean and lightly lubricate the mating Acme threads of the running tool and packoff with oil or light grease.
9. Lightly lubricate the seal sleeve o-rings with oil or a light grease.
10. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) until the tool upper body makes contact with the packoff Energizing Ring. Approximately 4 turns.
11. Install (1) 1/8" NPT pipe plug in the OD test port of the packoff and tighten securely.
12. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5000 psi is achieved.
13. If the test fails, remove the tool and replace the leaking o-rings.
14. After a satisfactory test is achieved remove the test pump and the 1/8" pipe plug from the opposite test port.

**WARNING:** All 1/8" pipe plugs must be removed prior to installing the packoff

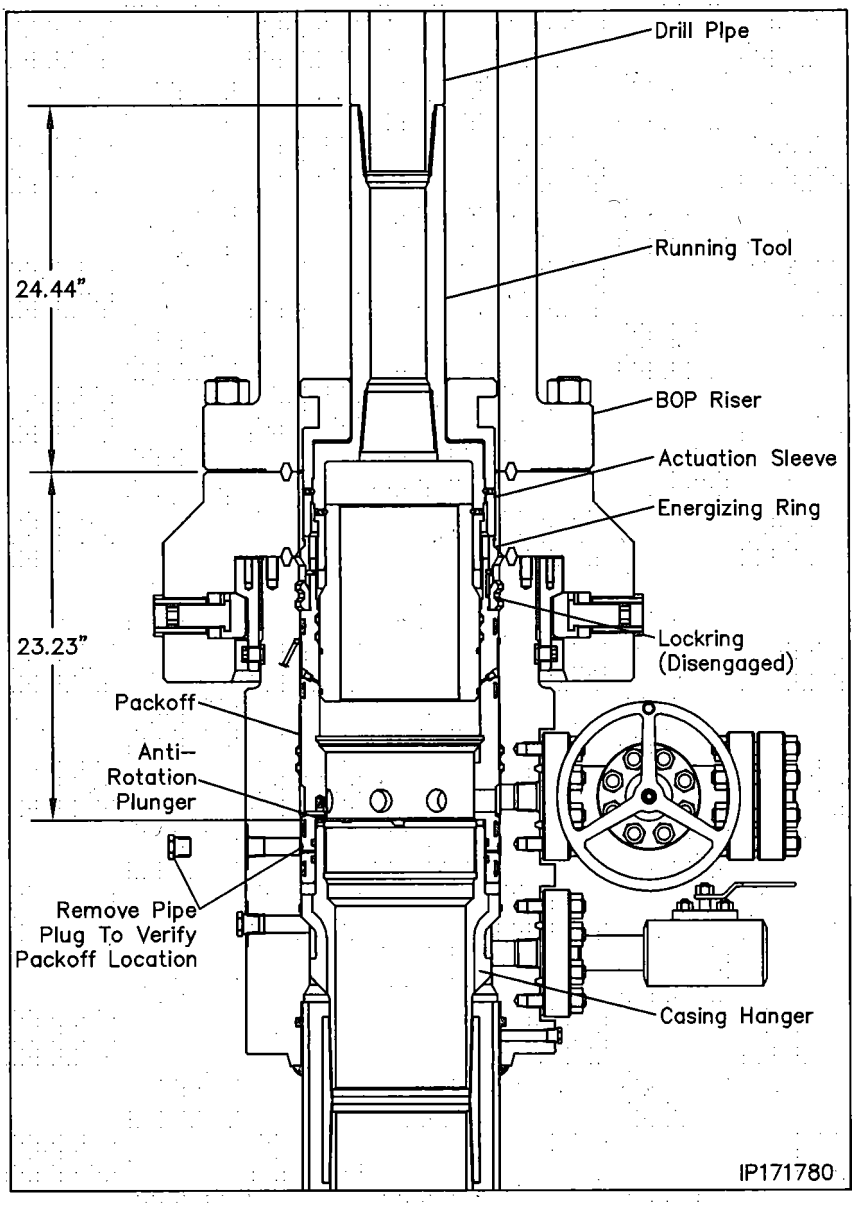
15. Pick up the assembly and thoroughly clean and lightly lubricate the packoff ID 'S' seals and the OD dovetail seals with oil or light grease.



# Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

## Landing the Packoff

16. Remove the hole cover.
17. Measure up 5 foot from the paint mark on the OD of the packoff and place a paint mark on the drill pipe.
18. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP marking the landing joint every five feet until the calculated dimension is reached.
19. Place a paint mark on the landing joint at that dimension and mark land off. Place an additional mark 1-1/2" above the first one and mark engaged.
20. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger neck, 23.23" below the top of the drilling adapter.
21. Locate the upper 1" sight port pipe plug and remove the plug
22. Look through the port to verify that the packoff is properly landed. The white paint scribe line will be clearly visible in the center of the open port.
23. Reinstall the pipe plug and tighten securely.



# Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

## Seal Test

24. Locate the upper and lower seal test fittings on the O.D. of the housing and remove the dust cap from the fittings.

25. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of 5,000 psi is achieved.

26. Hold test pressure for 5 minutes.

27. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.

28. Repeat steps 24 through 27 for the remaining seal test.

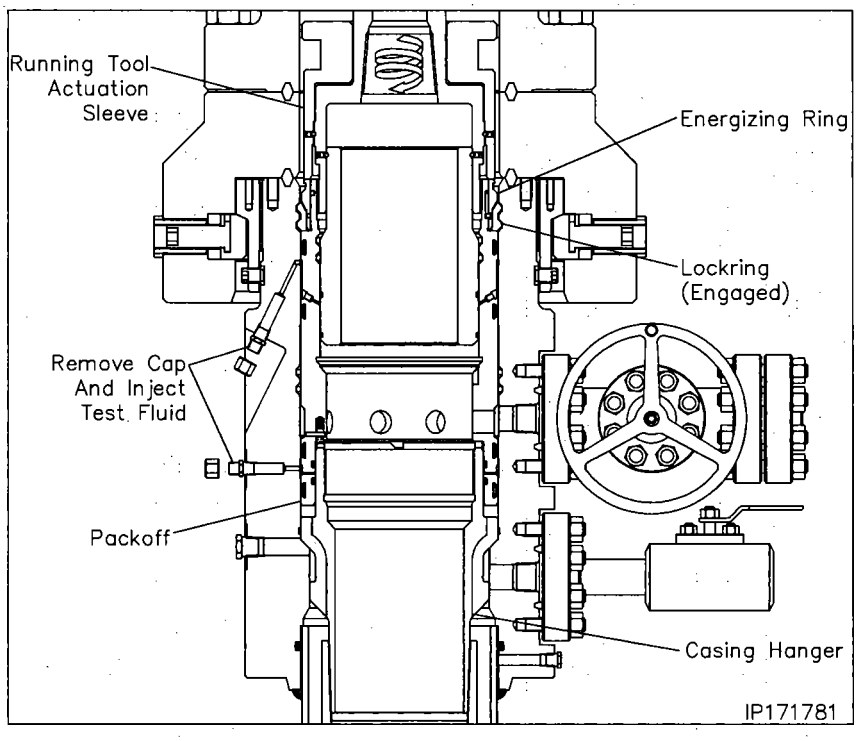
29. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.

## Engaging the Lockring

30. Using chain tongs only located 180° apart, slowly rotate the drill pipe counter clockwise until the anti-rotation plungers align with the slots in the top of the hanger. Expect torque of approximately 400 ft lbs. to rotate the packoff.

31. Using only chain tongs, rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise to engage the packoff lockring in its mating groove in the bore of the MBU-LR housing.

**Note:** Approximately 800 to 900 ft. lbs. of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the lockring out. A positive stop will be encountered when the lockring is fully engaged.




**Note:** When properly engaged the second paint mark on the landing joint will align with the rig floor. VERIFY PAINT MARKS.

WARNING: It is imperative that the landing joint remain concentric with the well bore when rotating to engage the lockring. This can be accomplished with the use of the air hoist.

WARNING: If the required turns to engage the lockring are not achieved or excessive torque is encountered, remove the packoff and first call local branch and then Houston Engineering.

32. Back off the landing joint/running tool approximately three turns. Using the top drive, exert a 40,000 lbs. pull on the landing joint.

33. Reattach the test pump to the open test manifolds and retest the packoff seals to 5,000 psi for 15 minutes. This will also verify that the packoff is in place.

34. After satisfactory test is achieved, bleed off all test pressure, remove test pump and reinstall the dust cap on the open fittings.

35. Using only chain tongs, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 9 to 9-1/2 turns) and then retrieve the tool with a straight vertical lift.

# Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

In the event the packoff is required to be removed after the lockring is engaged the following procedure is to be followed.

## Retrieving the Packoff

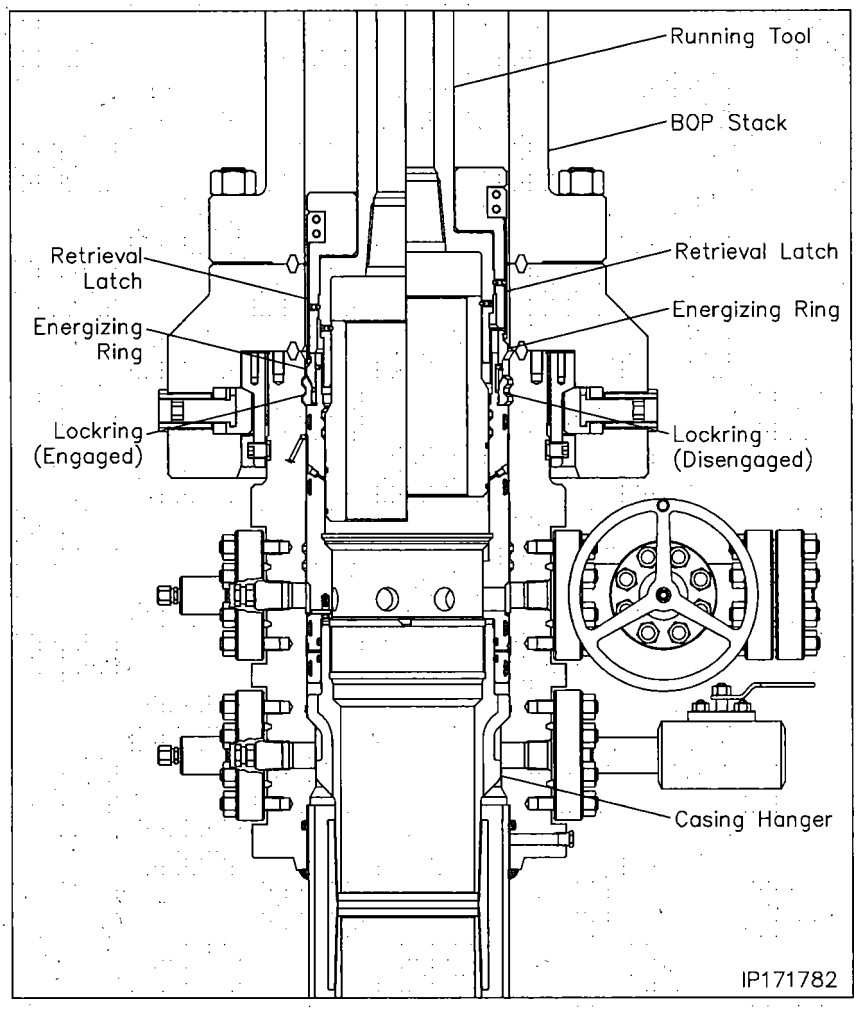
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
5. Rotate the drill pipe clockwise (Right) to locate the thread start and then counter clockwise (Left) (approximately 9 to 9-1/2 turns) to a positive stop.

**Note:** At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 6 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

**Warning:** Do not exceed the 6 turns or the packoff may be seriously damaged.

7. Carefully pick up on the drill pipe and remove the packoff from the MBU-3T wellhead with a straight vertical lift.
8. Rotate the packoff 1 turn clockwise to relax the retrieval latch.
9. Remove the (4) 1/2" cap screws and remove the latch assembly.




10. Redress the Packoff and reset as previously outlined.
11. Once the packoff is properly set, reinstall the retrieval latch on the tool.

# Stage 6A — Install the MBU-3T Emergency Packoff

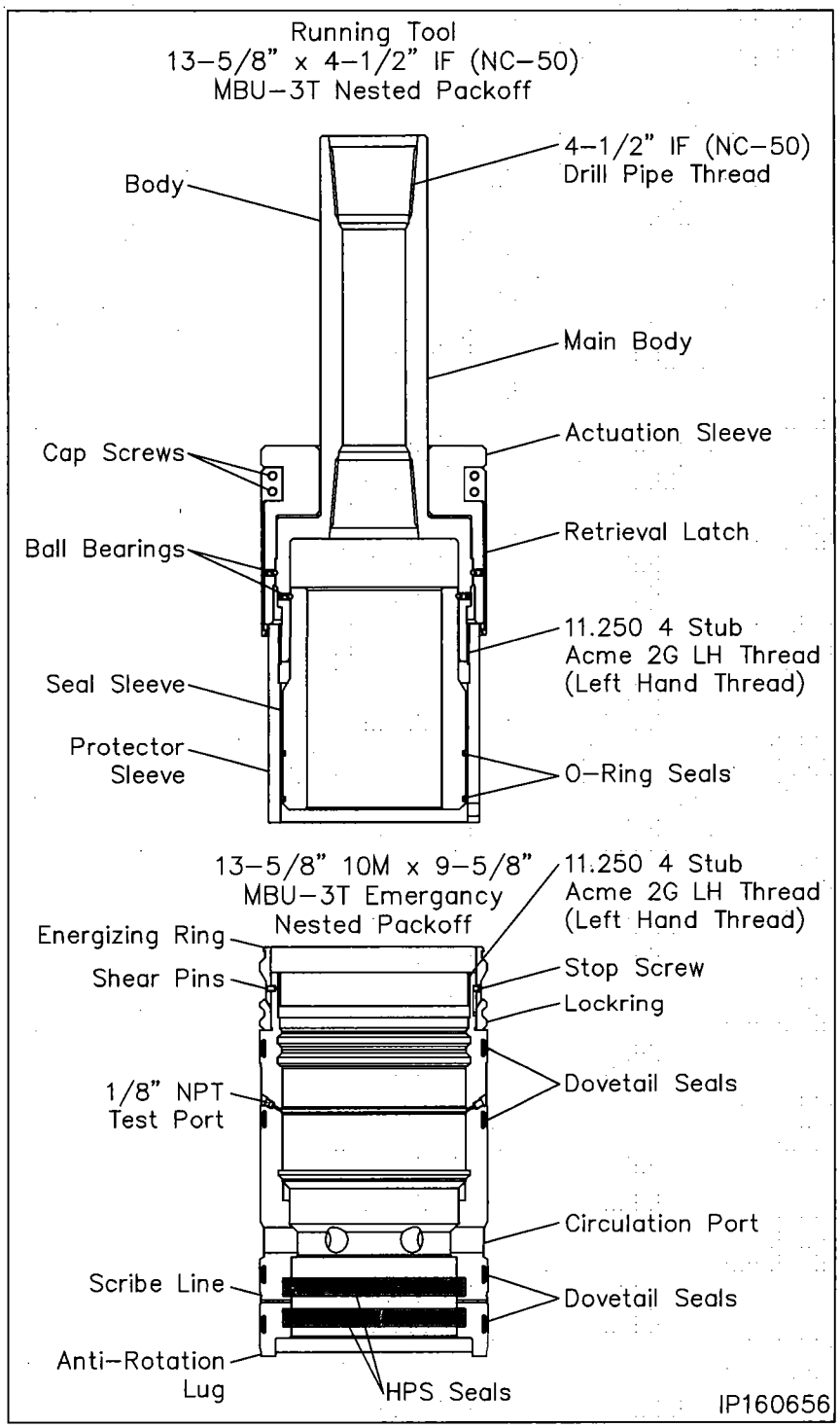
1. Examine the ***13-5/8" 10M x 9-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Emergency Nested Packoff Assembly (Item A12a).*** Verify the following:
   - all elastomer seals are in place and undamaged
   - internal bore, and ports, are clean and in good condition
   - lockring is fully retracted
   - energizer ring is in its upper most position and retained with shear pins

2. Inspect the ID and OD seals for any damage and replace as necessary.

3. Examine the ***13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST6).*** Verify the following:
   - Acme threads are clean and in good condition
   - retrieval latch is in position and retained with cap screws
   - seal sleeve is in position and rotates freely
   - seal sleeve o-rings are in place and in good condition
   - reinstall seal sleeve protector

4. Make up a joint 4-1/2" IF (NC-50) drill pipe to the top of the Running Tool and tighten connection to thread manufacturer's maximum make up torque.

5. Run in the hole with two stands of drill pipe and set in floor slips.



# Stage 6A — Install the MBU-2LR Emergency Packoff

6. Pick up the packoff and carefully pass it over the drill pipe and set it on top of the floor slips.

7. Pick up the running tool with landing joint and remove the tool protector sleeve with counter clockwise rotation and set the sleeve aside.

8. Thoroughly clean and lightly lubricate the mating acme threads of the running tool and packoff with oil or light grease.

9. Lightly lubricate the seal sleeve o-rings with oil or a light grease.

10. Make up the running tool to the drill pipe in the floor slips using the appropriate length pip x pin sub.

11. Pick up the packoff and thread it onto the running tool with clockwise (Right) rotation until the Energizing Ring makes contact with the lower body of the tool. (Approximately 4 turns).

12. Install (1) 1/8" NPT pipe plug in the OD test port of the packoff and tighten securely

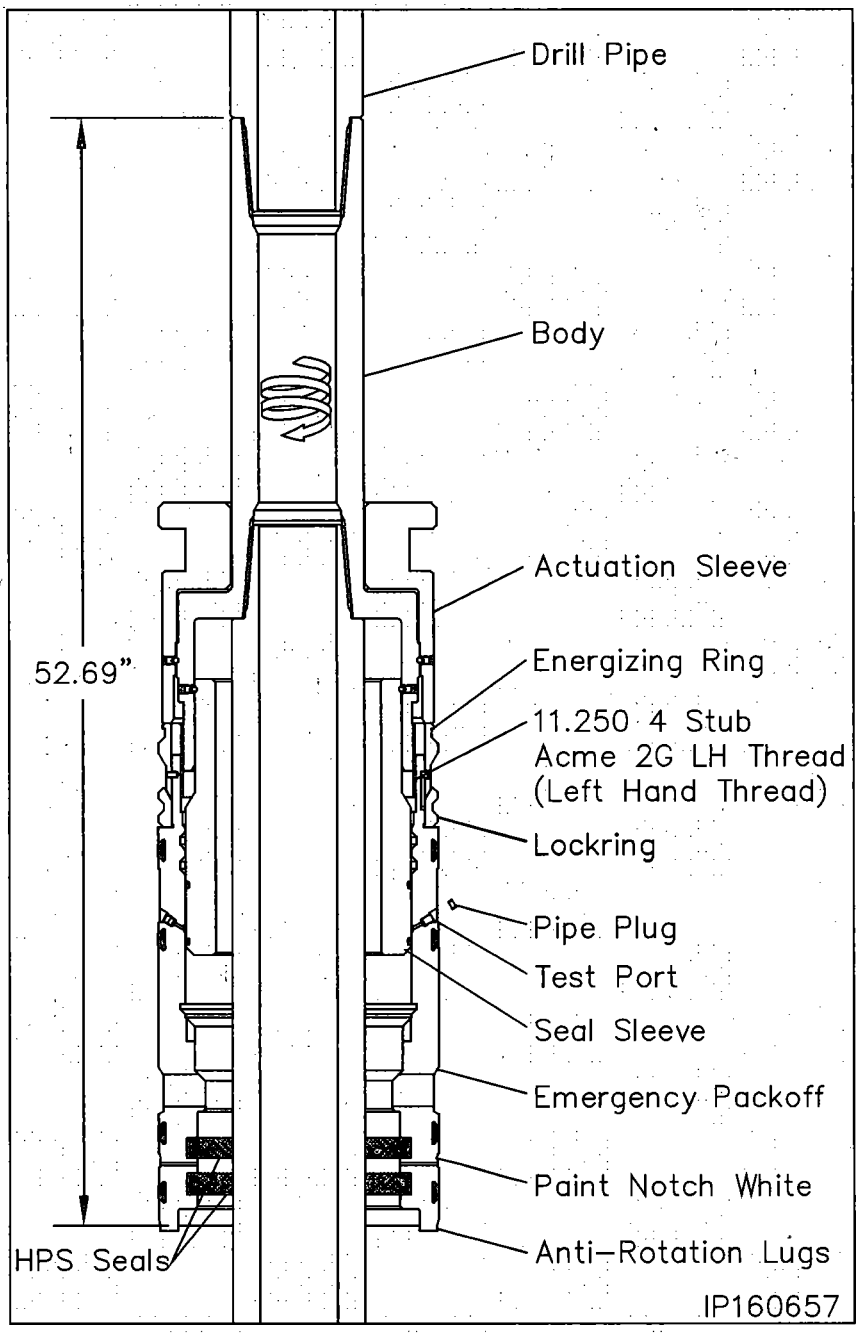
13. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5,000 psi is achieved.

14. If the test fails, remove the tool and replace the leaking o-rings.

15. After a satisfactory test is achieved remove the test pump and the 1/8" pipe plug from the opposite test port.

**WARNING:** All 1/8" pipe plugs must be removed prior to installing the packoff

16. Thoroughly clean and lightly lubricate the packoff ID 'HPS' seals and the OD dovetail seals with oil or light grease.




17. Using a straight edge positioned vertically and centered on the anti-rotation lug on the bottom of the packoff, place a white paint mark up the side of the packoff in line with the lug.

**Note:** The line will be used to guide the packoff anti-rotation lug into its mating notch in the slip bowl.

# Stage 6A — Install the MBU-2LR Emergency Packoff

## Landing the Packoff

18. Pick up the drill string and remove the floor slips.

19. Carefully lower the packoff through the rig floor and position it just above the housing.

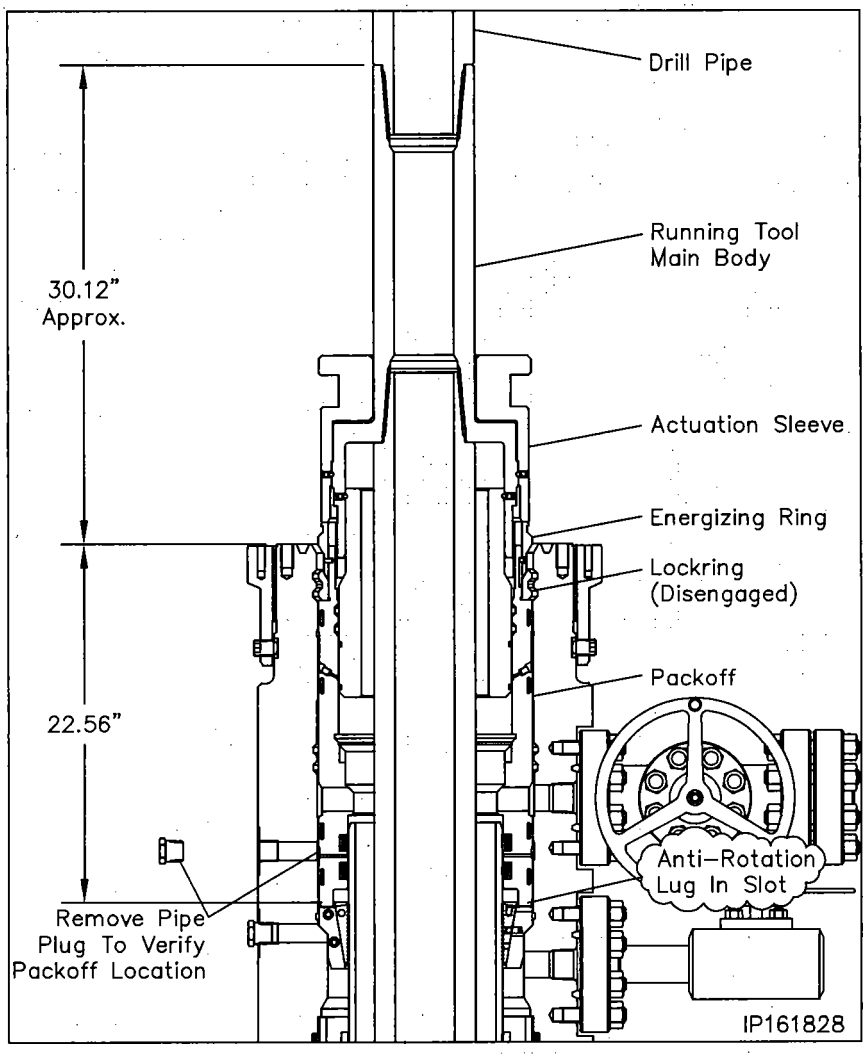
20. Align the white paint line with the existing paint mark on top of the housing.

21. While holding the packoff to maintain alignment, carefully lower the packoff into the housing until it lands on top of the slip hanger.

**Note:** When properly positioned the top of the running tool will be approximately 30.12" above the top of the MBU-3T Housing.

22. Remove the upper 1" LP pipe plug from the sight port to verify the packoff is properly landed. The 5/16" scribe line should be clearly visible in the center of the port.

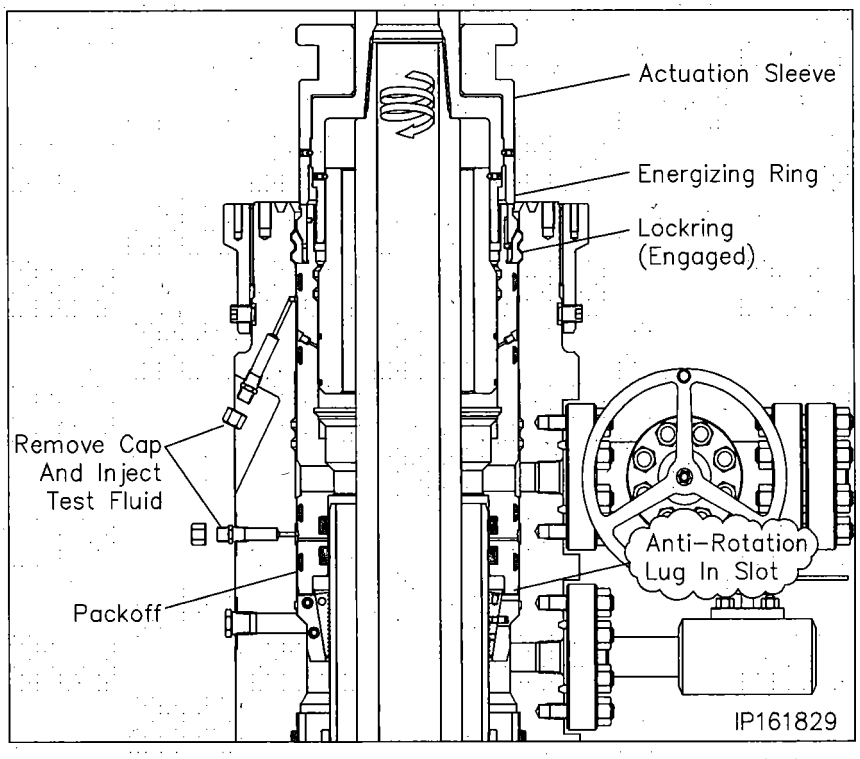
With landing verified, reinstall the pipe plug and tighten securely.



# Stage 6A — Install the MBU-2LR Emergency Packoff

## Seal Test

1. Locate the upper and lower seal test fittings on the O.D. of the housing and remove the dust cap from the fittings.
2. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of 5,000 psi is achieved.
3. Hold test pressure for 5 minutes.
4. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
5. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.
6. Repeat steps 1 through 5 for the upper seal test port.




## Engaging the Lockring

7. Using only chain tongs, rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise (Left) to engage the packoff lockring in its mating groove in the bore of the MBU-3T housing.

**Note:** Approximately 800 to 900 ft. lbs. of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the lockring out. A positive stop will be encountered when the lockring is fully engaged.

WARNING: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the lockring. This can be accomplished with the use of the air hoist.

WARNING: If the required turns to engage the lockring are not achieved or excessive torque is encountered, remove the packoff and first call local branch and then Houston Engineering.

8. Back off the landing joint/running tool approximately three turns. Using the top drive, exert a 40,000 lbs. pull on the landing joint.
9. Reattach the test pump to the open test manifolds and retest the packoff seals to 5,000 psi for 15 minutes. This will also verify that the packoff is in place.
10. After satisfactory test is achieved, bleed off all test pressure, remove test pump and reinstall the dust cap on the open fittings.
11. Using only chain tongs, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 9 to 9-1/2 turns) and then retrieve the tool with a straight vertical lift.
12. Reinstall and nipple up the BOP stack.

# Stage 7 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the ***11" Nominal x 4-1/2" IF (NC-50) CW Test Plug/ Retrieving Tool (Item ST7)***. Verify the following:
   - 1-1/4" VR plug and weep hole plug are in place and tightened securely
   - elastomer seal is in place and in good condition
   - retractable lift lugs are in place, clean, and free to move
   - drill pipe threads are clean and in good condition

2. Position the test plug with the elastomer seal down and the lift lugs up and make up the tool to a joint of drill pipe.

**WARNING:** Ensure that the lift lugs are up and the elastomer seal is down

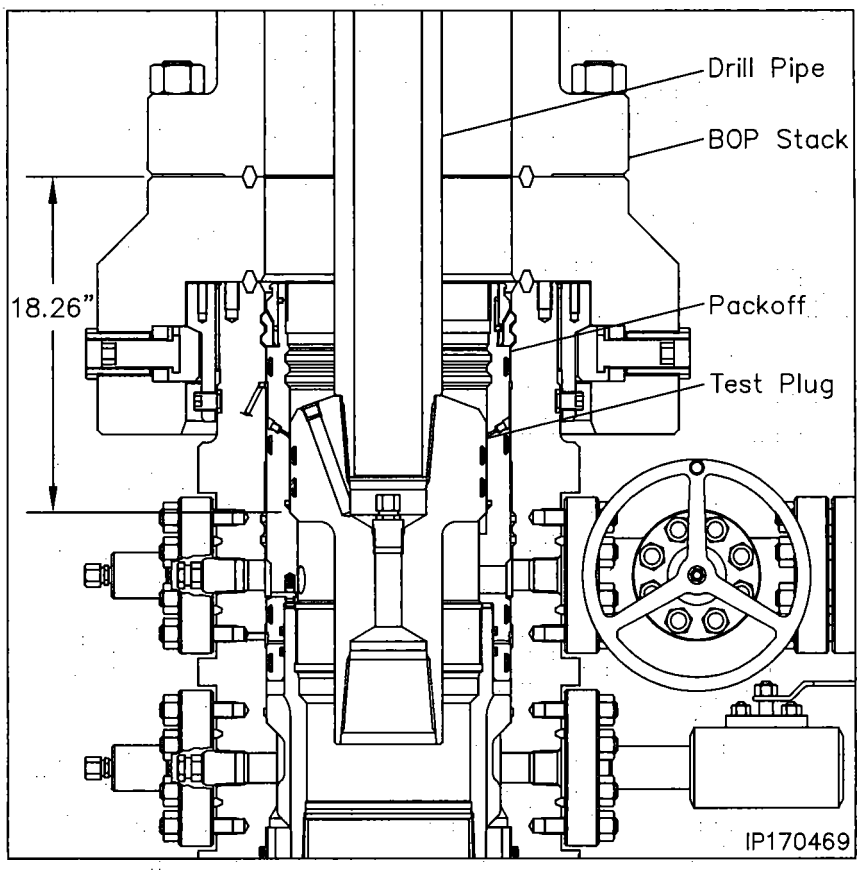
3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

4. Open the housing upper side outlet valve.

5. Lightly lubricate the test plug seal with oil or light grease.

6. Carefully lower the test plug through the BOP and land it on the load shoulder in the packoff, 18.26" below the top of the drilling adapter.

7. Close the BOP rams on the pipe and test the BOP to 5,000 psi.




**Note:** Any leakage past the test plug will be clearly visible at the open side outlet valve.

8. After a satisfactory test is achieved, release the pressure and open the rams.

9. Remove as much fluid as possible from the BOP stack and the retrieve the test plug with a straight vertical lift.

**Note:** When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting from it with the drill pipe.

10. Repeat this procedure as required during the drilling of the hole section.

# Stage 8 — Run the Upper Wear Bushing

**Note: Always** use a Wear Bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The Wear Bushing **must be retrieved** prior to running the casing.

1. Examine the ***13-5/8" x 11" x 9.00" ID MBU-3T-UPR Wear Bushing (Item ST8).*** Verify the following
   - internal bore is clean and in good condition
   - o-ring is in place and in good condition
   - shear o-ring cord is in place and in good condition
   - paint anti-rotation lugs white and allow paint to dry

## Run the Wear Bushing Before Drilling

2. Orient the ***13-5/8" Nominal x 4-1/2" IF (NC-50) CW Test Plug/ Retrieving Tool (Item ST1)*** with drill pipe connection up.

3. Attach the Retrieving Tool to a joint of drill pipe.

**WARNING:** Ensure that the lift lugs are down and the elastomer seal is up

4. Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the Wear Bushing until the lugs snap into place.

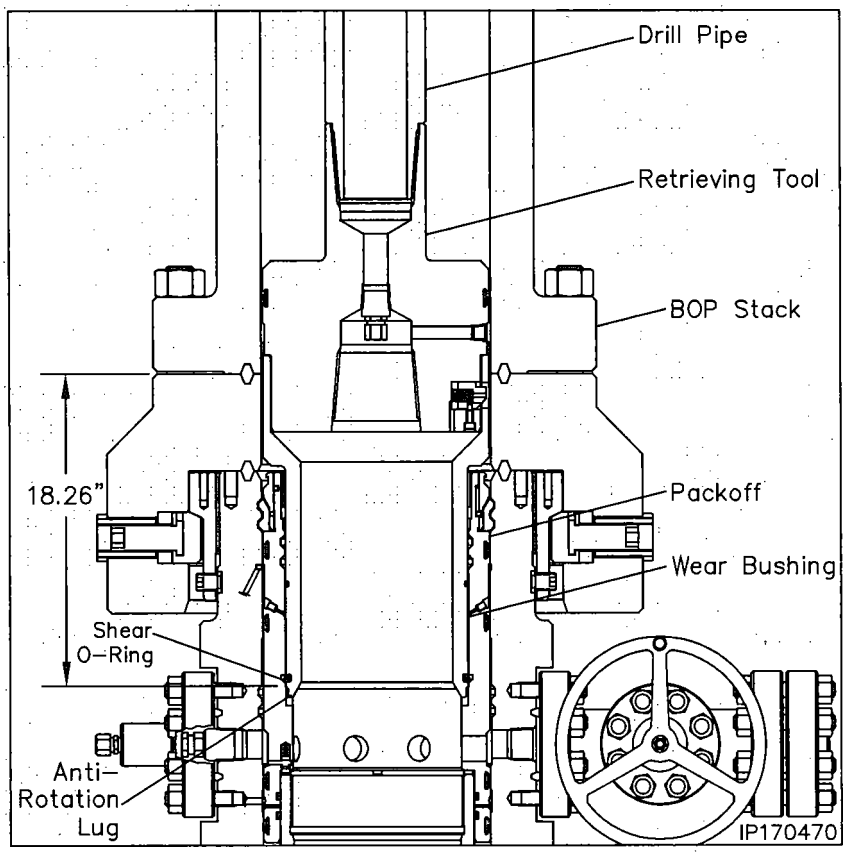
**Note:** If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

5. **Apply a heavy coat of grease, not dope, to the OD of the bushing.**

6. Ensure the BOP stack is drained and free of any debris from previous test.

7. Slowly lower the Tool/Bushing Assembly through the BOP stack and land it on the load shoulder in the housing, 18.26" below the top of the drilling adapter.

8. Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".




**Note:** The Shear O-Ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

9. Remove the tool from the Wear Bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight up.

10. Drill as required.

**Note:** It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

## Retrieve the Wear Bushing After Drilling

11. Make up the Retrieving Tool to the drill pipe.

12. Drain BOP stack and wash out if necessary.

13. Slowly lower the tool into the Wear Bushing.

14. Rotate the Retrieving Tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.

15. Using the top drive, slowly pick up on the landing joint in 1000 lbs increments until the busing starts to rise. This action should take a minimum of 3000 lbs pull. Do Not Exceed 60,000 lbs.

16. Retrieve the Wear Bushing, and remove it and the Retrieving Tool from the drill string.

# Stage 9 — Hang Off the 5-1/2" Casing

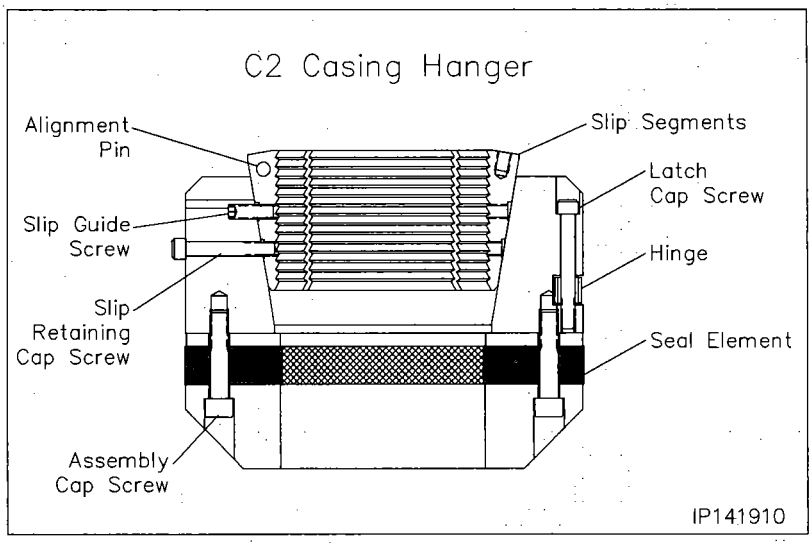
1. Run and cement the 5-1/2" casing string as required.
2. Open the housing upper side outlet valve to drain the BOP stack.
3. Clean the ID of the BOP stack and OD of the casing with a high pressure water hose until returns through the open side outlet valve are clean and free of debris.
4. Thoroughly inspect the BOP stack to ensure all rams are fully retracted into their respective ram bores, the annular rubber is fully relaxed, all drilling adapters/spools are full opening and there are no casing collars between the rig floor and the wellhead.

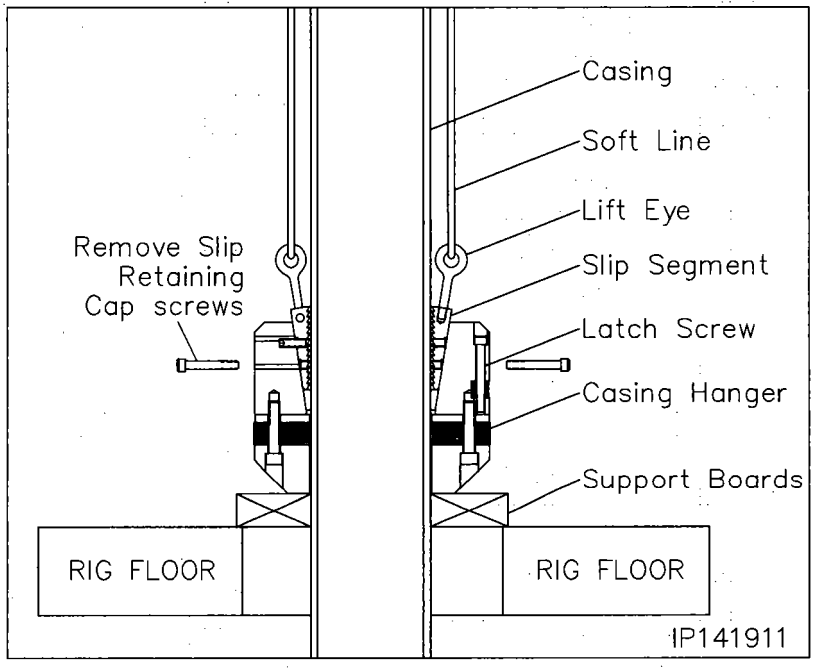
**Note:** Side outlet valve to remain open while setting the casing hanger.

5. Examine the ***11" x 5-1/2" C2 Slip Casing Hanger (Item A13).*** Verify the following:
   - slips and internal bore are clean and in good condition
   - all screws are in place
   - packoff rubber is in good condition

**Note:** Ensure that the packoff rubber does not protrude beyond the O.D. of the casing hanger body. If it does, loosen the cap screws in the bottom of the hanger.

6. Measure the distance from the rig floor to the top of the wellhead flange and record this measurement.
7. Pour a light oil through the BOP stack to thoroughly coat the OD of the casing.
8. Using a 5/16" Allen wrench, remove the two latch screws located 180° apart on top of the hanger and separate the hanger into two halves.
9. Place two boards on the housing flange against the casing to support the hanger.
10. Pick up one half of the hanger and place it around the casing and on top of the boards.
11. Pick up the second hanger half and place it around the casing adjacent the first half.




12. Slide the two hanger halves together ensuring the slip guide pins properly engage the opposing hanger half.
13. Reinstall the latch screws and tighten securely.
14. Using a 5/16" allen wrench, remove the slip retainer cap screws and discard them.
15. Lubricate the OD of the Casing Hanger liberally with a light grease or oil.
16. Prepare to lower the hanger through the BOP stack.

# Stage 9 — Hang Off the 5-1/2" Casing

**WARNING:** Do not drop or allow the hanger to fall through the BOP stack.

One method commonly used is to loop or tie four lengths of soft line through the hanger eye bolts as shown. Tie a knot in the soft line at the measurement noted in step six (6).

**Note:** The soft line may stretch and give an imprecise indication of the Casing Hanger's location.

17. Remove the boards and allow the Casing Hanger to slide through the BOP and into the MBU-3T packoff bowl using the cat line to center that casing if necessary.

18. When the Casing Hanger is down as indicated by the knots in the soft line, pull tension to the desired hanging weight and slack off.

**Note:** A sharp decrease on the weight indicator will signify that the Hanger has taken weight and at what point.

19. Untie the soft lines and pull them back through the lift eyes or drop them inside the BOP stack.

20. Prior to nippling down the BOP the integrity of the slip hanger seal can be verified by closing the BOP annular on the casing string and applying customer specific pressure through the kill line.

21. Once a satisfactory test is achieved, bleed off all test pressure, and drain the BOP stack.

22. Locate the actuation screws on the OD of the lower drilling adapter.

23. Using a hex drive, fully retract the (16) actuation screws until they are slightly over flush with the glandnuts.

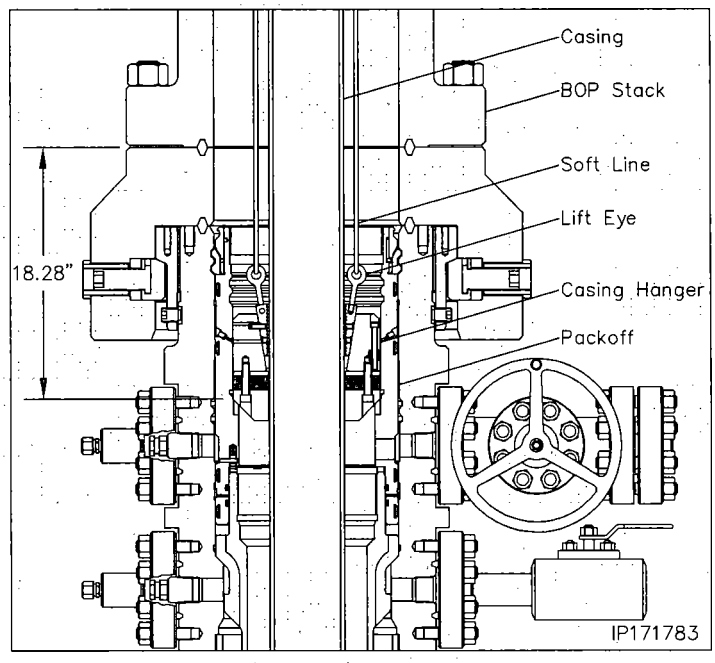
24. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.

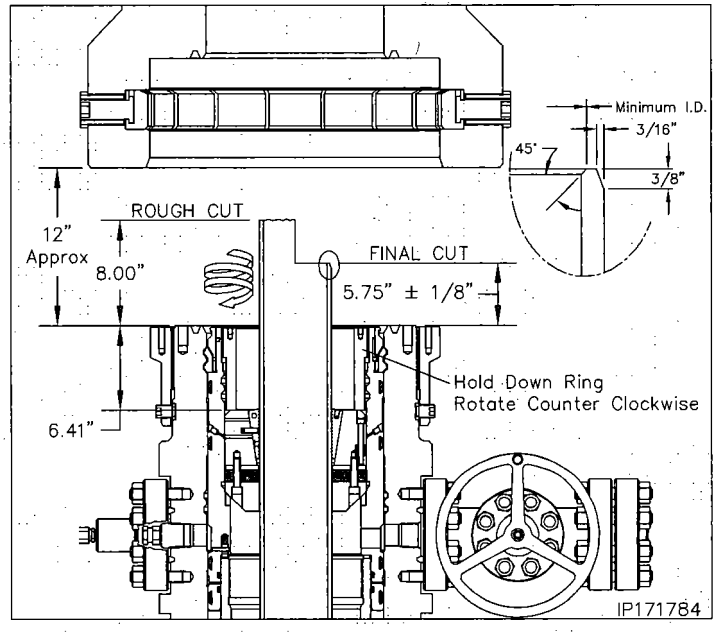
25. Remove the four lift eyes.

26. Rough cut the casing approximately 8" above the top of the housing and move the excess casing out of the way.

27. Final cut the casing at 5-3/4" ± 1/8" above the top flange of the housing.

28. Grind the casing stub level and then place a 3/16" x 3/8" bevel on the O.D. and a I.D. chamfer to match the minimum bore of the tubing head to be installed.




29. Thoroughly clean the top of the housing and Casing Hanger. Ensure all cutting debris are removed.

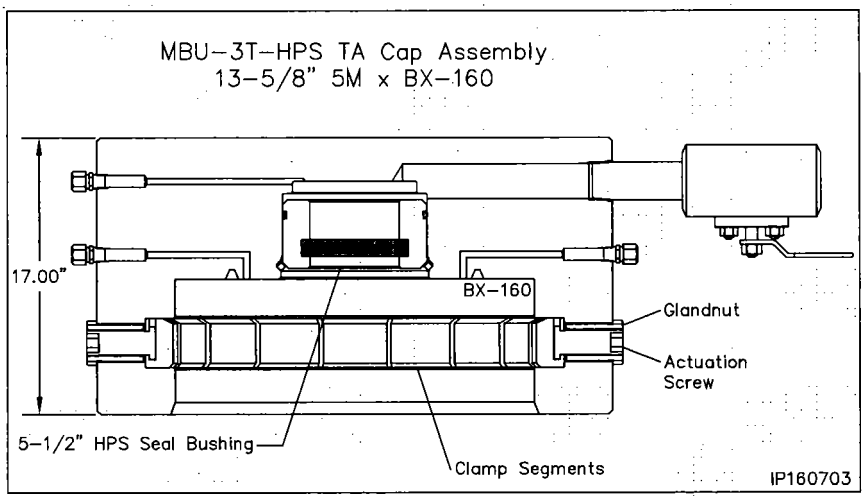
30. Thoroughly clean and lightly lubricate the mating acme threads of the MBU-3T packoff and the slip ***Hold Down Ring (Item A14)***.

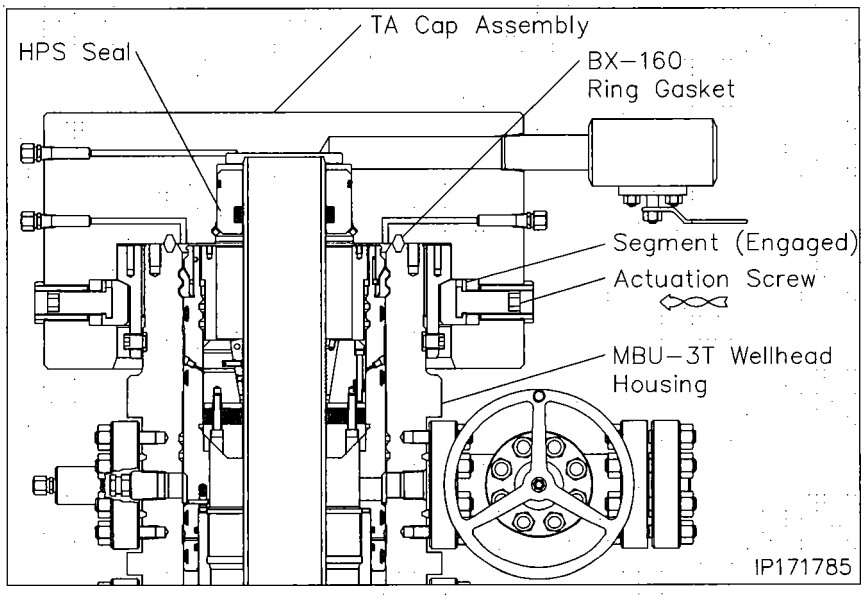
31. Thread the ring into the packoff with counter clockwise rotation to a positive stop on top of the slip hanger.

32. Re-land the BOP stack and prepare to remove the upper adapter with the BOP stack

# Stage 10 — Install the 'Quick Connect' TA Cap Assembly

1. Examine the ***13-5/8" 5M 'Quick Connect' TA Cap Assembly (Item R3).*** Verify the following:
   - bore is clean and free of debris
   - ring groove is clean and undamaged
   - (16) drive screws and clamp segments are properly installed and fully retracted
   - 5-1/2" HPS seal bushing is in place and properly retained with the square snap wire
2. Thoroughly clean the top of the MBU-3T housing, thread hub, and the mating seal surfaces of the TA Cap.
3. Install a new ***BX-160 Ring Gasket*** into the ring groove of the housing.
4. Using a suitable lifting devise with weight rated slings, pick up the TA Cap assembly and carefully lower it over the casing stub and land it on the ring gasket.
5. Ensure the TA Cap is level and then carefully run in all of the drive screws of the TA Cap to contact point.
6. Ensure the assembly remains level, run in one actuation and torque to 100 ft lbs.
7. Locate the screw 180° from the first and torque to 100 ft lbs.
8. Locate the screws 90° to the right and left and torque to 100 ft lbs.
9. Position the second 4 point sequence 90° from the first and torque each screw to 200 ft lbs
10. Run in all remaining screws to contact and then torque each screw to 400 ft lbs.
11. Make one additional round until a stable torque of 400 ft lbs on all (16) screws is achieved.

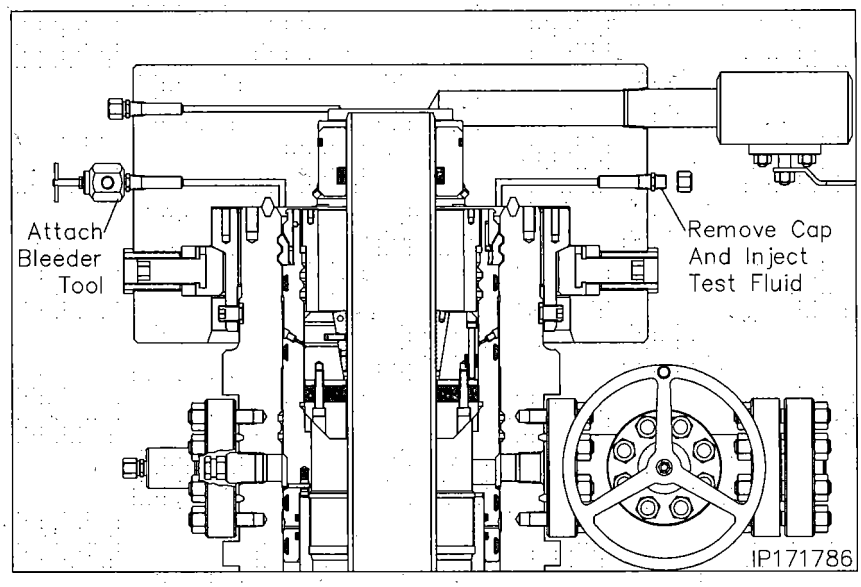


# Stage 10 — Install the 'Quick Connect' TA Cap Assembly

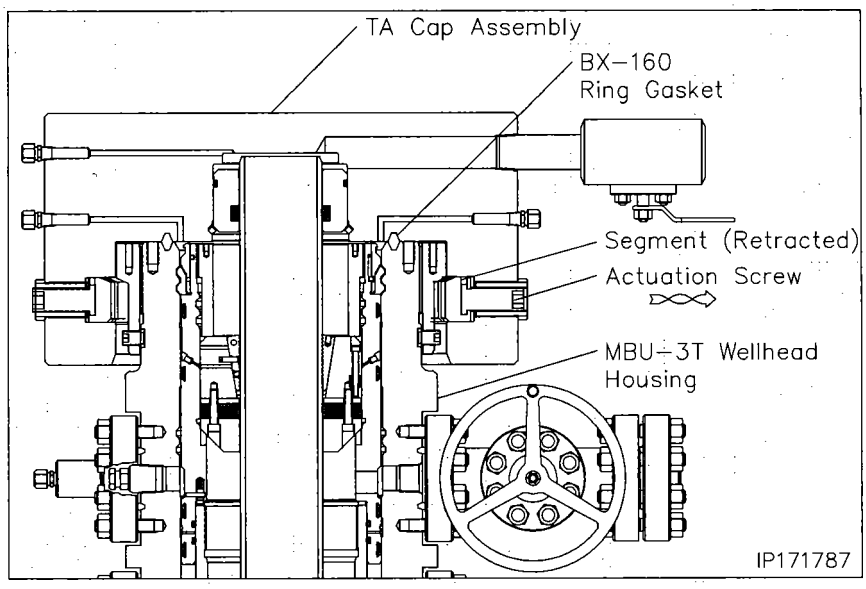
## Connection Test

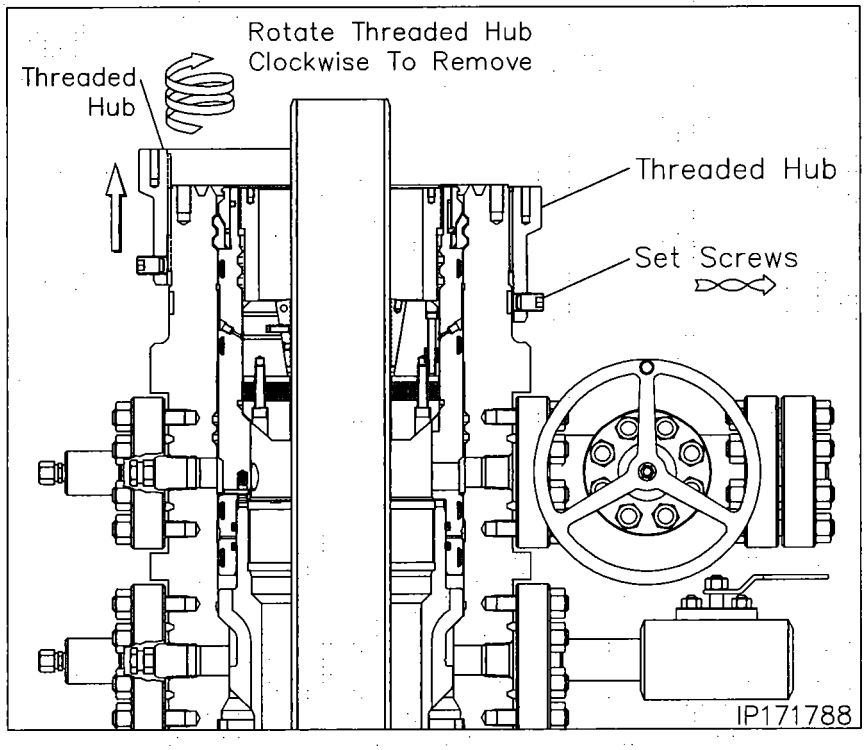
1. Open the TA Cap ball valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked flange test and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fitting and open the tool.
4. Attach a test pump to the remaining open fitting and pump clean test fluid into the void area until a continuous stream flows from the open bleeder tool.
5. Close the tool and continue pumping fluid until a stable test pressure of 5,000 psi or 80% of casing collapse is achieved, whichever is less.
6. Hold test pressure for 15 minutes.
7. After a satisfactory test is achieved, bleed off the test pressure, drain the fluid, remove the bleeder tool and re install the dust cap on the open fittings.
8. Close all open valves.



# Stage 11 — Remove the TA Cap Assembly

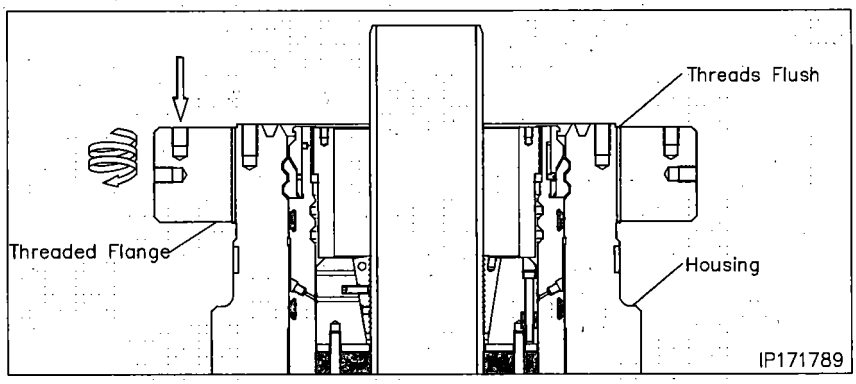
1. Open the ball valve on the TA cap to check for trapped pressure above the casing hanger.
2. Locate the actuation screws on the OD of the TA Cap Assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
4. Install a lift eye with pick up sling to the top of the TA Cap and lift the cap free of the wellhead.
5. Remove the thread hub set screws.
6. Remove the thread hub from the top of the housing with clockwise rotation.



# Stage 11 — Remove the TA Cap Assembly

7. Examine the 13-5/8" 5M Thread Flange. Verify the following:
   - Acme thread are clean and in good condition
8. Thoroughly clean and lightly lubricate the mating threads of the housing and the Thread Flange with Copper Coat or Never Seize.
9. Pick up the flange and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the flange is level with the top of the Acme thread of the housing.
10. Rotate the flange in either direction to two hole.
11. Prepare to install the tubing head.



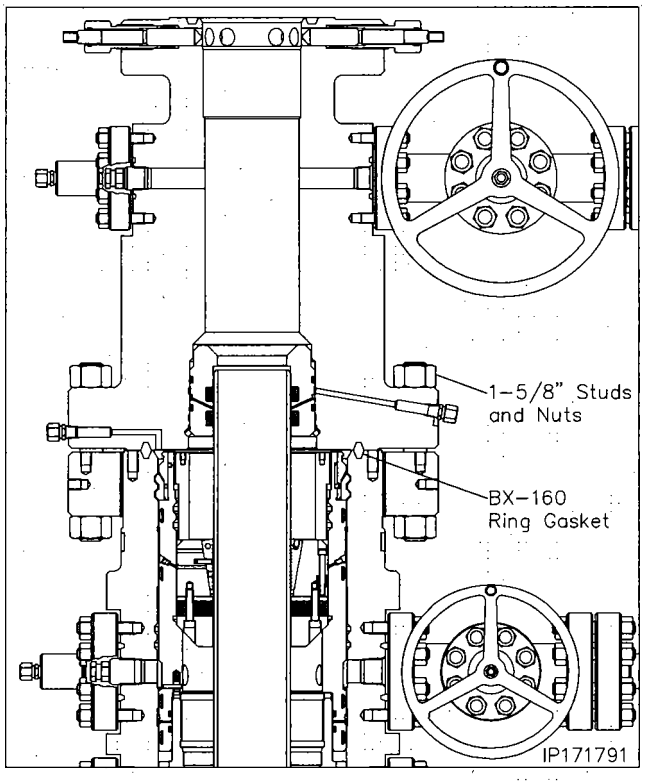
# Stage 12 — Install the Tubing Head

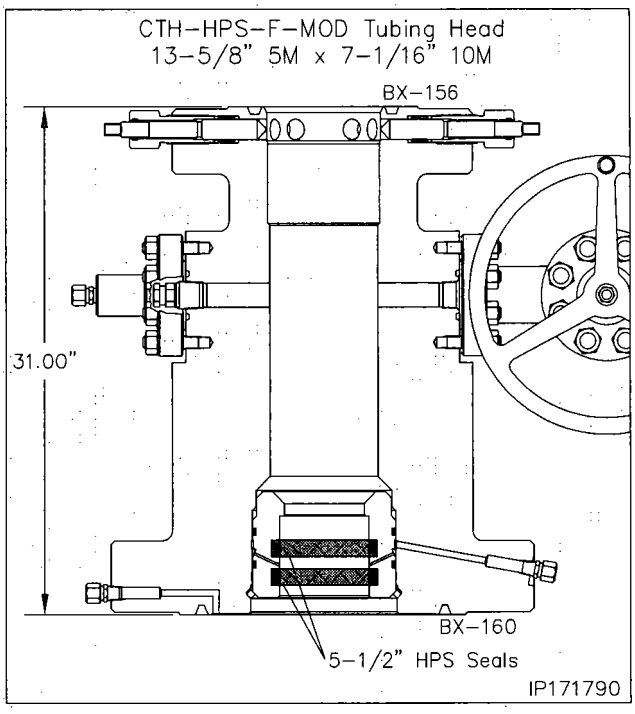
**Note:** The tubing head may be shipped to location with the lower frac valve pre installed and tested.

1. Examine the ***13-5/8" 5M x 7-1/16" 10M CW, CTH-HPS-F MOD Tubing Head With 5-1/2" DBLHPS Bottom (Item B1)*** Verify the following:
   - seal area and bore are clean and in good condition
   - ***HPS-F MOD Secondary Seal Bushing*** is in place and properly retained with a square snap wire
   - all peripheral equipment is intact and undamaged

2. Clean the mating ring grooves of the MBU-3T Housing and tubing head.

3. Lightly lubricate the I.D. of the tubing head 'HPS' seals and the casing stub with a light oil or grease.




**Note:** Excessive oil or grease may prevent a good seal from forming!

4. Install a new ***BX-160 Ring Gasket (Item B12)*** in the ring groove of the housing.

5. Pick up the tubing head and suspend it above the housing.

6. Orient the head so that the outlets properly align with the housing upper outlets and then carefully lower the head over the casing stub and then land it on the ring gasket.

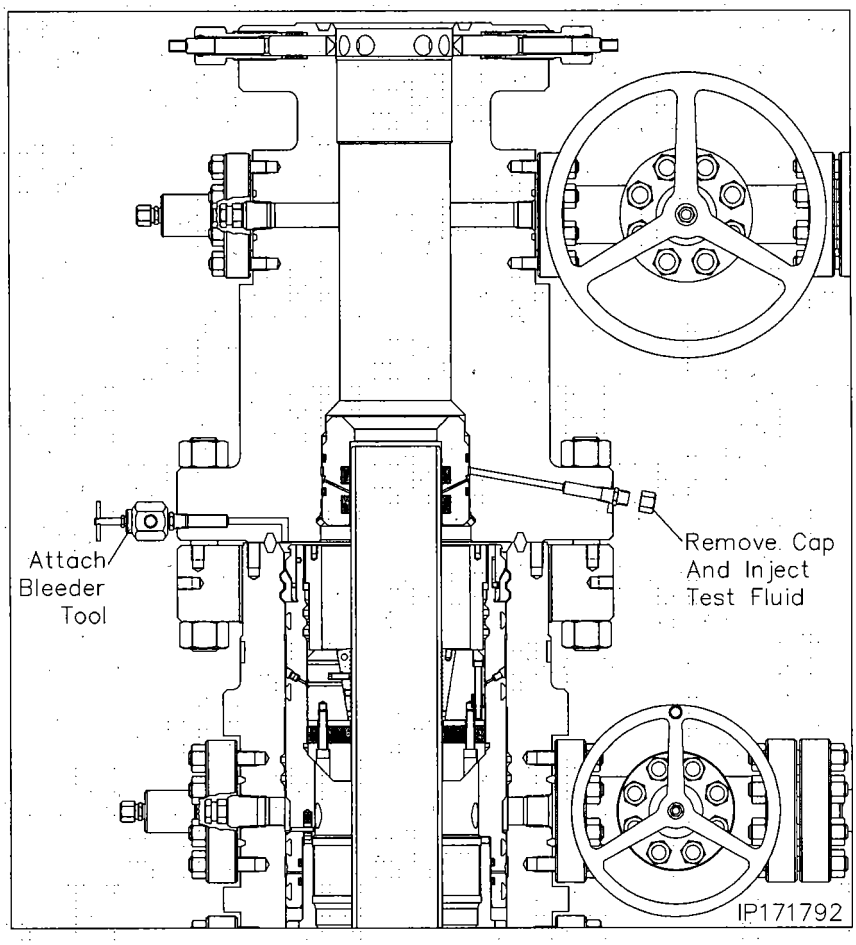
**Warning:** Do Not damage the 'HPS' seals or their sealing ability will be impaired!

7. Make up the flange connection using the appropriate size ***studs and nuts (Item B13)***, tightening them in an alternating cross pattern.

# Stage 12 — Install the Tubing Head

## Seal Test

1. Locate the seal test fitting and one flange test fitting on the Tubing Head lower flange and remove the dust cap from both fittings.
2. Attach a Bleeder Tool to one of the open flange test fittings and open the Tool.
3. Attach a test pump to the seal test fitting and pump clean test fluid between the HPS Seals until a test pressure of ***10,000 psi or 80% of casing collapse - Whichever is less.***
4. Hold test pressure for 15 minutes.
5. If pressure drops, a leak has developed. Bleed off test pressure and take the appropriate action in the adjacent table.
6. After a satisfactory test is achieved, remove the Test Pump, drain test fluid and reinstall the dust cap on the open seal test fitting.

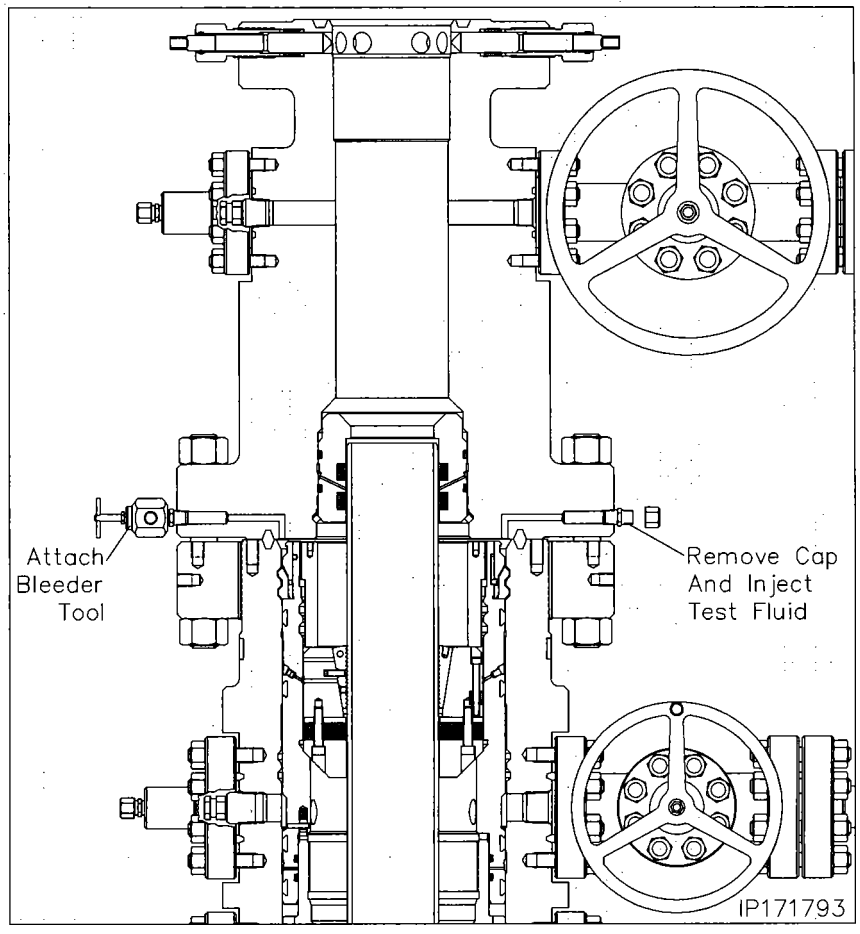



| Seal Test | |
|---|---|
| **Leak Location** | **Appropriate Action** |
| Open bleeder tool - Lower HPS seal is leaking | Remove Tubing Head and replace leaking seals. Re land and retest seals |
| Into the tubing head bore - Upper HPS seal is leaking | |

# Stage 12 — Install the Tubing Head

## Flange Test

1. Locate the remaining flange test fitting on the Tubing Head lower flange and remove the dust cap from the fitting.
2. Attach a test pump to the open flange test fitting and inject test fluid into the flange connection until a continuous stream flows from the opposite flange test bleeder tool.
3. Close the bleeder tool and continue to pumping test fluid to ***5,000 psi or 80% of casing collapse - Whichever is less..***
4. Hold test pressure for 15 minutes.
5. If pressure drops a leak has developed. Take the appropriate action from the adjacent chart.
6. Repeat this procedure until a satisfactory test is achieved.
7. Once a satisfactory test is achieved, remove the test pump and bleeder tool, drain all test fluid, and reinstall the dust caps.




| Flange Test | |
|---|---|
| **Leak Location** | **Appropriate Action** |
| Between flanges - Ring gasket is leaking | Verify flange bolt torque. If correct, remove tubing head to clean, inspect and possibly replace damaged ring gasket. |

# Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal

1. **Introduction and Scope.** The following recommended procedure has been prepared with particular regard to attaining pressure-tight weld when attaching casing heads, flanges, etc., to casing. Although most of the high strength casing used (such as N-80) is not normally considered field weldable, some success may be obtained by using the following or similar procedures.

---

**Caution:** In some wellheads, the seal weld is also a structural weld and can be subjected to high tensile stresses. Consideration must therefore be given by competent authority to the mechanical properties of the weld and its heat affected zone.

---

   a. The steels used in wellhead parts and in casing are high strength steels that are susceptible to cracking when welded. It is imperative that the finished weld and adjacent metal be free from cracks. The heat from welding also affects the mechanical properties. This is especially serious if the weld is subjected to service tension stresses.

   b. This procedure is offered only as a recommendation. The responsibility for welding lies with the user and results are largely governed by the welder's skill. Weldability of the several makes and grades of casing varies widely, thus placing added responsibility on the welder. Transporting a qualified welder to the job, rather than using a less-skilled man who may be at hand, will, in most cases, prove economical. The responsible operating representative should ascertain the welder's qualifications and, if necessary, assure himself by instruction or demonstration, that the welder is able to perform the work satisfactorily.

2. **Welding Conditions.** Unfavorable welding conditions must be avoided or minimized in every way possible, as even the most skilled welder cannot successfully weld steels that are susceptible to cracking under adverse working conditions, or when the work is rushed. Work above the welder on the drilling floor should be avoided. The weld should be protected from dripping mud, water, and oil and from wind, rain, or other adverse weather conditions. The drilling mud, water, or other fluids must be lowered in the casing and kept at a low level until the weld has properly cooled. It is the responsibility of the user to provide supervision that will assure favorable working conditions, adequate time, and the necessary cooperation of the rig personnel.

3. **Welding.** The welding should be done by the shielded metal-arc or other approved process.

4. **Filler Metal.** Filler Metals. For root pass, it's recommended to use E6010, E6011 (AC), E6019 or equivalent electrodes. The E7018 or E7018-A1 electrodes may also be used for root pass operations but has the tendency to trap slag in tight grooves. The E6010, E6011 and E6019 offer good penetration and weld deposit ductility with relatively high intrinsic hydrogen content. Since the E7018 and E7018-A1 are less susceptible to hydrogen induced cracking, it is recommended for use as the filler metal for completion of the weld groove after the root pass is completed. The E6010, E6011 (AC), E6019, E7018 and E7018-A1 are classified under one of the following codes AWS A5.1 (latest edition): Mild Steel covered electrodes or the AWS A5.5 (latest edition): Low Alloy Steel Covered Arc-Welding Electrodes. The low hydrogen electrodes, E7018 and E7018-A1, should not be exposed to the atmosphere until ready for use. It's recommended that hydrogen electrodes remain in their sealed containers. When a job arises, the container shall be opened and all unused remaining electrodes to be stored in heat electrode storage ovens. Low hydrogen electrodes exposed to the atmosphere, except water, for more than two hours should be dried 1 to 2 hours at 600°F to 700 °F (316°C to 371 °C) just before use. It's recommended for any low hydrogen electrode containing water on the surface should be scrapped.

5. **Preparation of Base Metal.** The area to be welded should be dry and free of any paint, grease/oil and dirt. All rust and heat-treat surface scale shall be ground to bright metal before welding.

# Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal

6. **Preheating.** Prior to any heating, the wellhead member shall be inspected for the presence of any o-rings or other polymeric seals. If any o-rings or seals are identified then preheating requires close monitoring as noted in paragraph 6a. Before applying preheat, the fluid should be bailed out of the casing to a point several inches (>6" or 150 mm) below the weld joint/location. Preheat both the casing and wellhead member for a minimum distance of three (3) inches on each side of the weld joint using a suitable preheating torch in accordance with the temperatures shown below in a and b. The preheat temperature should be checked by the use of heat sensitive crayons. Special attention must be given to preheating the thick sections of wellhead parts to be welded, to insure uniform heating and expansion with respect to the relatively thin casing.

   a. Wellhead members containing o-rings and other polymeric seals have tight limits on the preheat and interpass temperatures. Those temperatures must be controlled at 200°F to 325°F or 93 °C to 160°C and closely monitored to prevent damage to the o-ring or seals.
   b. Wellhead members not containing o-rings and other polymeric seals should be maintained at a preheat and interpass temperature of 400°F to 600°F or 200°C to 300°C.

7. **Welding Technique.** Use a 1/8 or 5/32-inch (3.2 or 4.0 mm) E6010 or E7018 electrode and step weld the first bead (root pass); that, weld approximately 2 to 4 inches (50 to 100 mm) and then move diametrically opposite this point and weld 2 to 4 inches (50 to 100 mm) halfway between the first two welds, move diametrically opposite this weld, and so on until the first pass is completed. This second pass should be made with a 5/32-inch (4.0 mm) low hydrogen electrode of the proper strength and may be continuous. The balance of the welding groove may then be filled with continuous passes without back stepping or lacing, using a 3/16-inch (4.8 mm) low hydrogen electrode. All beads should be stringer beads with good penetration. There should be no undercutting and weld shall be workmanlike in appearance.

   a. Test ports should be open when welding is performed to prevent pressure buildup within the test cavity.
   b. During welding the temperature of the base metal on either side of the weld should be maintained at 200 to 300°F (93 to 149°C).
   c. Care should be taken to insure that the welding cable is properly grounded to the casing, but ground wire should not be welded to the casing or the wellhead. Ground wire should be firmly clamped to the casing, the wellhead, or fixed in position between pipe slips. Bad contact may cause sparking, with resultant hard spots beneath which incipient cracks may develop. The welding cable should not be grounded to the steel derrick, nor to the rotary-table base.

8. **Cleaning.** All slag or flux remaining on any welding bead should be removed before laying the next bead. This also applies to the completed weld.

9. **Defects.** Any cracks or blow holes that appear on any bead should be removed to sound metal by chipping or grinding before depositing the next bead.

10. **Postheating.** Post-heating should be performed at the temperatures shown below and held at that temperature for no less than one hour followed by a slow cooling. The post-heating temperature should be in accordance with the following paragraphs.

    a. Wellhead members containing o-rings and other polymeric seals have tight limits on the post-heating temperatures. Those temperatures must be controlled at 250°F to 300°F or 120 °C to 150°C and closely monitored to prevent damage to the o-ring or seals.
    b. Wellhead members not containing o-rings and other polymeric seals should be post-heated at a temperature of 400°F to 600°F or 200°C to 300°C.

11. **Cooling.** ***Rapid cooling must be avoided.*** To assure slow cooling, welds should be protected from extreme weather conditions (cold, rain, high winds, etc.) by the use of suitable insulating material. (Specially designed insulating blankets are available at many welding supply stores.) Particular attention should be given to maintaining uniform cooling of the thick sections of the wellhead parts and the relatively thin casing, as the relatively thin casing will pull away from the head or hanger if allowed to cool more rapidly. The welds should cool in air to less than 200°F (93°C) (measured with a heat sensitive crayon) prior to permitting the mud to rise in the casing.

12. **Test the Weld.** After cooling, test the weld. The weld must be cool otherwise the test media will crack the weld. The test pressure should be no more than 80% of the casing collapse pressure.

**Cactus Speed Head Pressure Testing Statement**

Our procedure is to nipple up BOP's to the surface casing, pressure test the BOP's to 5000 psi high and 250 psi low. We do not anticipate breaking any seals on the BOP from that point until rig release, however if we do break any seal, the entire BOP will be retested to 5000 psi high and 250 psi low.

# QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. N°: 702

| | | | |
|---|---|---|---|
| PURCHASER: | ContiTech Oil & Marine Corp. | P.O. N°: | 4500421193 |
| CONTITECH ORDER N°: | 538448 | HOSE TYPE: | 3" ID Choke & Kill Hose |
| HOSE SERIAL N°: | 67554 | NOMINAL / ACTUAL LENGTH: | 10,67 m / 10,66 m |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| W.P. | 68,9 | MPa | 10000 | psi | T.P. 103,4 | MPa | 15000 | psi | Duration: 60 min. |

Pressure test with water at ambient temperature

See attachment. ( 1 page )

↑ 10 mm = 10 Min.

→ 10 mm = 20 MPa

| COUPLINGS Type | Serial N° | Quality | Heat N° |
|---|---|---|---|
| 3" coupling with | 1525 1519 | AISI 4130 | A0579N |
| 4 1/16" 10K API Swivel Flange end | | AISI 4130 | 035608 |
| Hub | | AISI 4130 | A1126U |

**Not Designed For Well Testing** **API Spec 16 C**

**Tag No.: 66 – 1225** **Temperature rate:"B"**

All metal parts are flawless

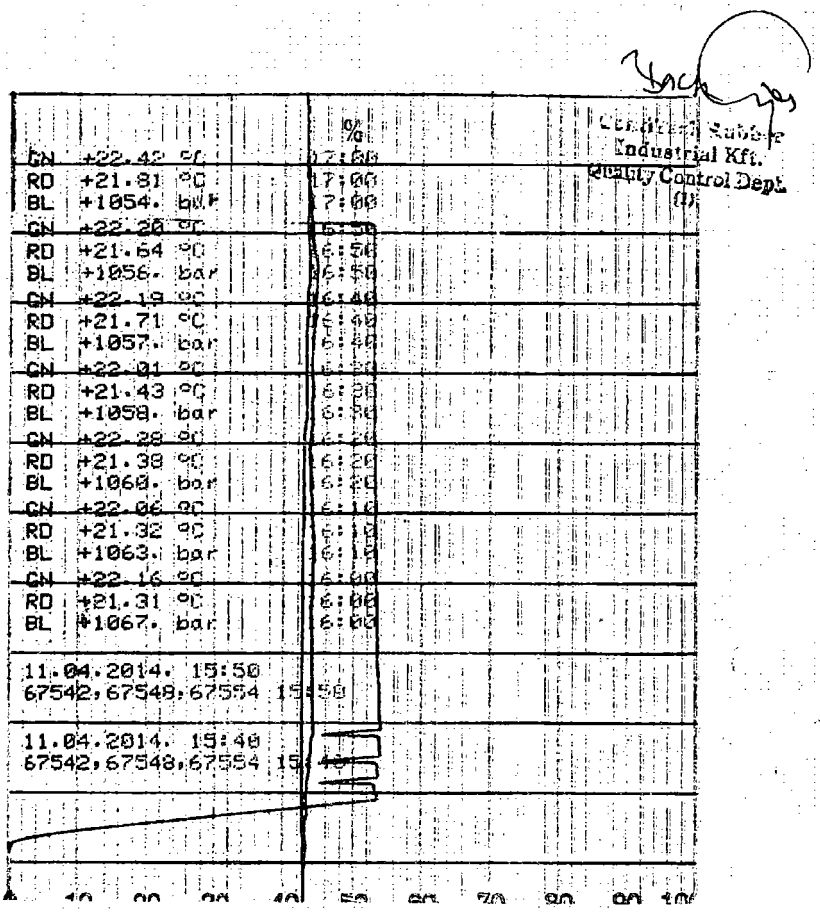
**WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.**

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

| Date: | Inspector | Quality Control |
|---|---|---|
| 14. April 2014. | | ContiTech Rubber Industrial Kft. Quality Control Dept. (1) |

*ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE* **No: 696, 701, 702**



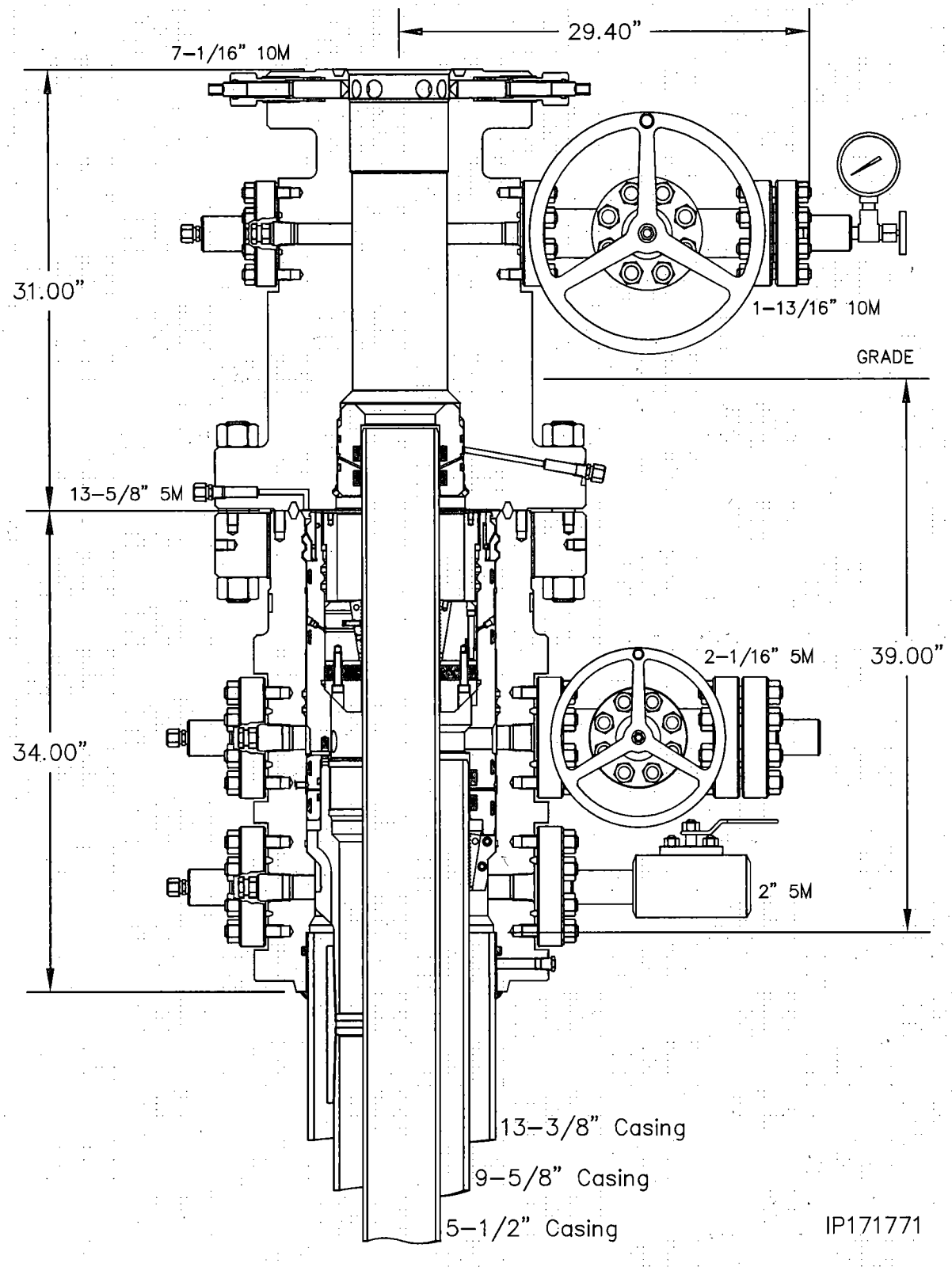



Industrial Kft.
Quality Control Dept.

## Hose Data Sheet

| | |
|---|---|
| CRI Order No. | 536448 |
| Customer | ContiTech Oil & Marine Corp. |
| Customer Order No | CBC557116 4500421193 |
| Item No. | 1 |
| Hose Type | Flexible Hose |
| **Standard** | **API SPEC 16 C** |
| Inside dia in inches | 3 |
| Length | 35 ft |
| Type of coupling one end | FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOURC/W BX155 ST/ST INLAID R.GR. |
| Type of coupling other end | FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOUR C/W BX155 ST/ST INLAID R.GR. |
| H2S service NACE MR0175 | Yes |
| Working Pressure | 10 000 psi |
| Design Pressure | 10 000 psi |
| Test Pressure | 15 000 psi |
| Safety Factor | 2,25 |
| Marking | USUAL PHOENIX |
| Cover | NOT FIRE RESISTANT |
| Outside protection | St steel outer wrap |
| Internal stripwound tube | No |
| Lining | OIL + GAS RESISTANT SOUR |
| Safety clamp | Yes |
| Lifting collar | Yes |
| Element C | Yes |
| Safety chain | Yes |
| Safety wire rope | No |
| Max.design temperature [°C] | 100 |
| Min.design temperature [°C] | -20 |
| Min. Bend Radius operating [m] | 0,90 |
| Min. Bend Radius storage [m] | 0,90 |
| Electrical continuity | The Hose is electrically continuous |
| Type of packing | WOODEN CRATE ISPM-15 |

# System Drawing



**APD ID:** 10400021455 **Submission Date:** 09/19/2017

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

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

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

COTTONWOOD_29_32_FED_COM_WCA_9H_LOCATION_VERIFICATION_09062017_20170915090936.pdf
COTTONWOOD_29_32_FED_COM_WCA_9H_VICINITY_MAP_09062017_6_20170915090937.pdf
Cottonwood_Lease_Access_Route_20170915090945.jpg

**Existing Road Purpose:** ACCESS,FLUID TRANSPORT **Row(s) Exist?** YES

### ROW ID(s)

**ID:** 134601

**Do the existing roads need to be improved?** NO

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

## Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** YES

**New Road Map:**

COTTONWOOD_29_32_FED_COM_WCA_9H_PAD_PROP_LSE_RD_PLAT_09062017_20170919081628.pdf

**New road type:** RESOURCE

**Length:** 5126 Feet **Width (ft.):** 30

**Max slope (%):** 2 **Max grade (%):** 1

**Army Corp of Engineers (ACOE) permit required?** NO

**ACOE Permit Number(s):**

**New road travel width:** 15

**New road access erosion control:** Road will be crowned and ditched to prevent erosion.

**New road access plan or profile prepared?** NO

**New road access plan attachment:**

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Access surfacing type:** OTHER

**Access topsoil source:** BOTH

**Access surfacing type description:** 6" rolled and compacted caliche

**Access onsite topsoil source depth:** 6

**Offsite topsoil source description:** Surfacing material will consist of native caliche obtained from well site if possible. Otherwise, caliche will be hauled from nearest caliche pit.
**Onsite topsoil removal process:** Grading

**Access other construction information:**

**Access miscellaneous information:**

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

## Drainage Control

**New road drainage crossing:** OTHER

**Drainage Control comments:** Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and be consistent with local drainage patterns.
**Road Drainage Control Structures (DCS) description:** No drainage control necessary.

**Road Drainage Control Structures (DCS) attachment:**

## Access Additional Attachments

**Additional Attachment(s):**

## Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Attach Well map:**

COTTONWOOD_29_32_FED_COM_WCA_9H_MILE_RADIUS_09062017_20170915091006.pdf

**Existing Wells description:**

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

**Submit or defer a Proposed Production Facilities plan?** DEFER

**Estimated Production Facilities description:** If the well is productive, the anticipated facility will consist of a tank battery constructed in accordance with API standards, a flow line will be installed in accordance to the API standards and laid to a 3 phase separator, lines will then be laid from the separator to the tank battery.

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## Section 5 - Location and Types of Water Supply

### Water Source Table

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

**Water source type:** GW WELL

**Describe type:**

**Source latitude:**

**Source longitude:**

**Source datum:**

**Water source permit type:** WATER WELL

**Source land ownership:** PRIVATE

**Water source transport method:** PIPELINE

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 140000

**Source volume (acre-feet):** 18.045033

**Source volume (gal):** 5880000

**Water source and transportation map:**

Cottonwood_Water_Source_Map_20170915091213.pdf

**Water source comments:** Water will be utilized from a private owner via pipeline to location

**New water well?** NO

### New Water Well Info

**Well latitude:** **Well Longitude:** **Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):** **Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):** **Well casing type:**

**Well casing outside diameter (in.):** **Well casing inside diameter (in.):**

**New water well casing?** **Used casing source:**

**Drilling method:** **Drill material:**

**Grout material:** **Grout depth:**

**Casing length (ft.):** **Casing top depth (ft.):**

**Well Production type:** **Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

## Section 6 - Construction Materials

**Construction Materials description:**

**Construction Materials source location attachment:**

## Section 7 - Methods for Handling Waste

**Waste type:** DRILLING

**Waste content description:** Drilling Fluids

**Amount of waste:** 6000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Steel tanks

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** Trucked to approved disposal facility. Estimated 6000 bbls total

**Waste type:** FLOWBACK

**Waste content description:** Flowback Water

**Amount of waste:** 25000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Steel frac tanks

**Safe containmant attachment:**

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

**Disposal type description:**

**Disposal location description:** Haul to approved SWD facility.

**Waste type:** DRILLING

**Waste content description:** Cuttings

**Amount of waste:** 2000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Steel bins, roll-offs

**Safe containmant attachment:**

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

**Disposal location description:** Truck to an approved disposal facility

**Waste type:** GARBAGE

**Waste content description:** Trash and debris

**Amount of waste:** 200 pounds

**Waste disposal frequency :** Weekly

**Safe containment description:** Roll-off bin with netted top

**Safe containmant attachment:**

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

**Disposal location description:** Truck to commercial waste facility

**Waste type:** SEWAGE

**Waste content description:** Human Waste

**Amount of waste:** 2000 gallons

**Waste disposal frequency :** Weekly

**Safe containment description:** Waste will be properly contained and disposed of at a state approve disposal facility

**Safe containmant attachment:**

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

**Disposal location description:** Haul to a commercial disposal facility

## Reserve Pit

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)** **Reserve pit width (ft.)**

**Reserve pit depth (ft.)** **Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

## Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** NO

**Description of cuttings location**

**Cuttings area length (ft.)** **Cuttings area width (ft.)**

**Cuttings area depth (ft.)** **Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

## Section 8 - Ancillary Facilities

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

## Section 9 - Well Site Layout

**Well Site Layout Diagram:**

COTTONWOOD_29_32_FED_COM_WCA_9H_PAD_PLAT_09062017_20170915091956.pdf
Well_Site_Layout_20170915091958.jpg
**Comments:**

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** No New Surface Disturbance **Multiple Well Pad Name:** COTTONWOOD 29-32 FED COM WCA

**Multiple Well Pad Number:** 6H & 9H

**Recontouring attachment:**

**Drainage/Erosion control construction:** Drainage systems, if any, will be reshaped to original configuration with provisions made to alleviate erosion.
**Drainage/Erosion control reclamation:** Any portion of the site that is not needed for future operations will be reclaimed to the original stat as much as feasible.

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

**Wellpad long term disturbance (acres):** 3.1

**Wellpad short term disturbance (acres):** 3.1

**Access road long term disturbance (acres):** 4.22

**Access road short term disturbance (acres):** 4.22

**Pipeline long term disturbance (acres):** 0

**Pipeline short term disturbance (acres):** 0

**Other long term disturbance (acres):** 0

**Other short term disturbance (acres):** 0

**Total long term disturbance:** 7.32

**Total short term disturbance:** 7.32

**Reconstruction method:** The operator plans to drill additional wells on the well pad. Therefore, no interim reclamation is planned at this time. Any portion of the site that is not needed for future operation and production operations will be re-contoured to the original state as much as possible.
**Topsoil redistribution:** After the area has been shaped and contoured, topsoil from the stockpile will be placed over the disturbed area to the extent possible.
**Soil treatment:** NO treatment necessary.

**Existing Vegetation at the well pad:** Mesquite, shinnery oak

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:** Mesquite, shinner oak

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:** Mesquite, shinnery oak

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:** None.

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## Seed Management

### Seed Table

**Seed type:** PERENNIAL GRASS **Seed source:** COMMERCIAL

**Seed name:** LPC-Seed Mix 2

**Source name:** **Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:** WELL PAD,WELL PAD

**PLS pounds per acre:** 5 **Proposed seeding season:** SPRING

**Total pounds/Acre:** 5

**Seed Summary**

| Seed Type | Pounds/Acre |
|---|---|
| PERENNIAL GRASS | 5 |

**Seed reclamation attachment:**

## Operator Contact/Responsible Official Contact Info

**First Name:** Jennifer **Last Name:** Elrod

**Phone:** (817)953-3728 **Email:** jelrod@chisholmenergy.com

**Seedbed prep:** Rip and add topsoil

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** All areas will be monitored and weeds will be treated.

**Weed treatment plan attachment:**

**Monitoring plan description:** Monitor after final reclaim

**Monitoring plan attachment:**

**Success standards:** N/A

**Pit closure description:** No pit utilized

**Pit closure attachment:**

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## Section 11 - Surface Ownership

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

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

**Disturbance type:** EXISTING ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

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

**Disturbance type:** PIPELINE

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

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

## Section 12 - Other Information

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

**ROW Type(s):**

## ROW Applications

**SUPO Additional Information:** GCP ATTACHED

**Use a previously conducted onsite?** YES

**Previous Onsite information:** Previous onsite was conducted for the Cottonwood 29-32 Fed Com 2BS 1H & 2H. There will be no new disturbance. Per the BLM, the previous onsite done at this location is sufficient for the new APD.

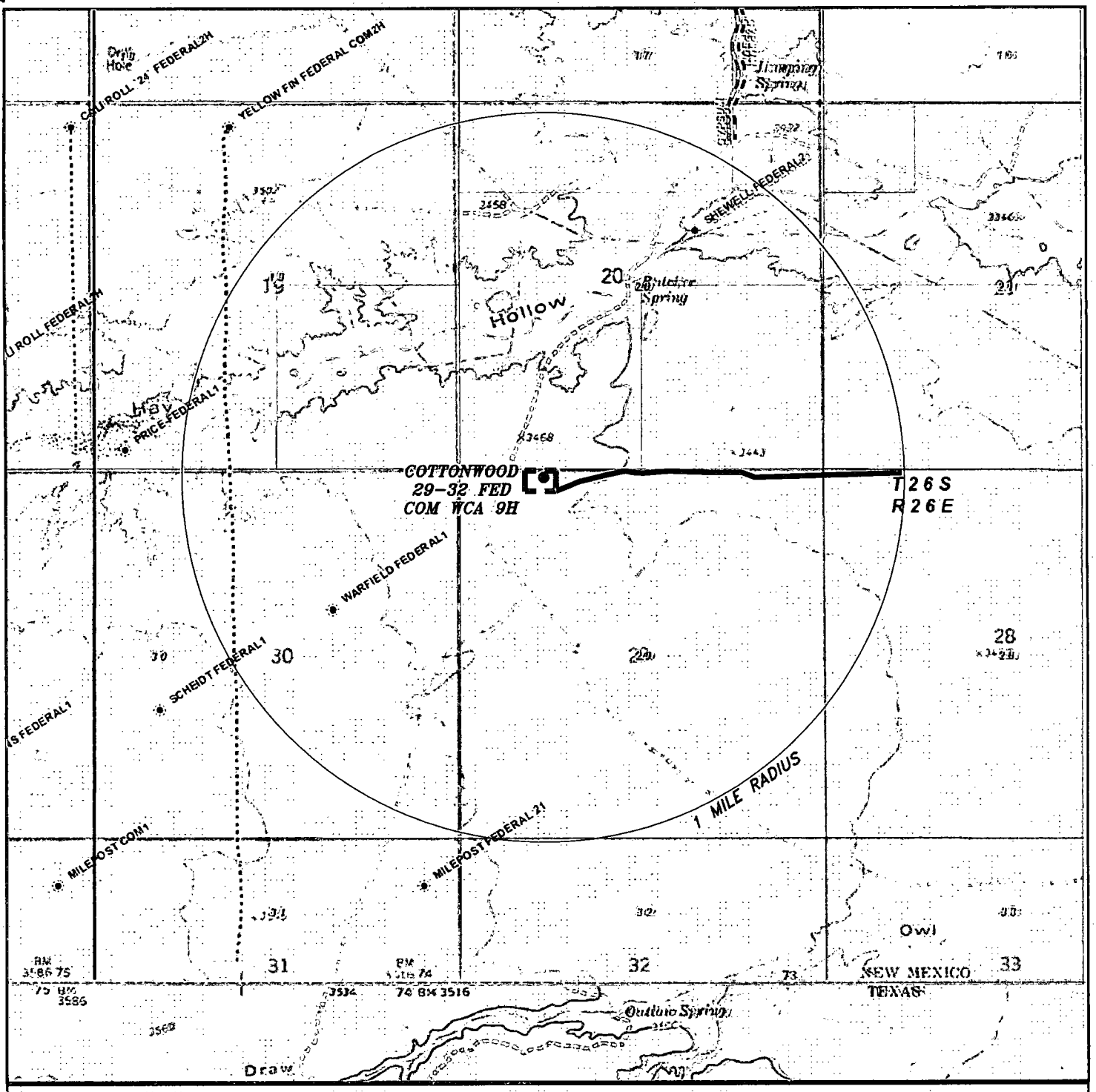
**Operator Name:** CHISHOLM ENERGY OPERATING LLC

**Well Name:** COTTONWOOD 29-32 FED COM WCA **Well Number:** 9H

## Other SUPO Attachment

GCP_COTTONWOOD_29_32_FED_COM_WCA_9H_170907_20180320070933.docx

## LOCATION VERIFICATION MAP




# COTTONWOOD 29-32 FED COM WCA 9H
## Located 100' FNL and 1205' FWL
## Section 29, Township 26 South, Range 26 East, N.M.P.M., Eddy County, New Mexico.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P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com


0' 1000' 2000' 3000' 4000'
SCALE: 1" = 2000'

W.O. Number: KJG 33113

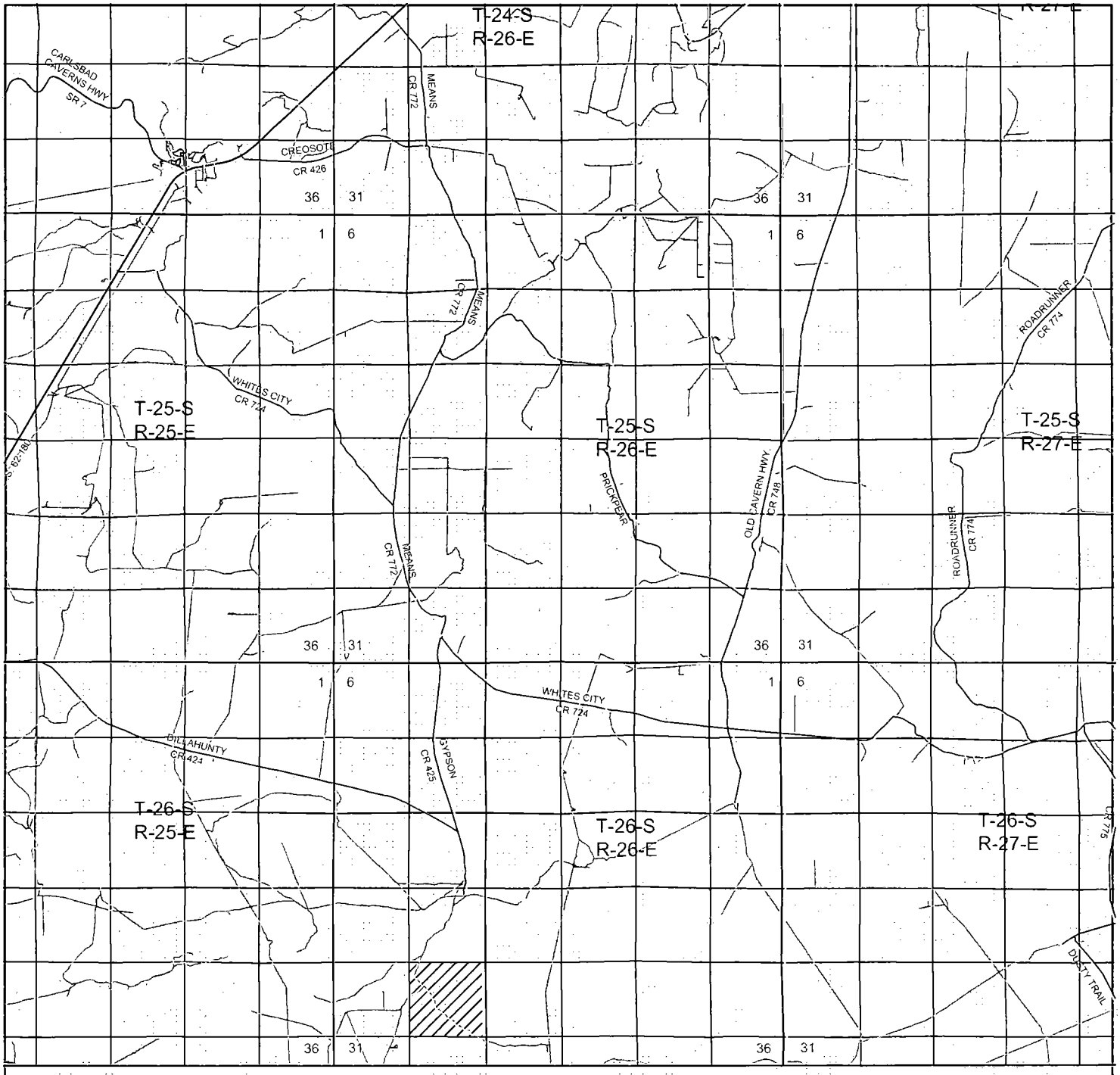
Survey Date: 07-11-2017

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND

N

CHISHOLM ENERGY OPERATING, LLC

## VICINITY MAP




# COTTONWOOD 29-32 FED COM WCA 9H

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0 1 MI 2 MI 3 MI 4 MI

SCALE: 1" = 2 MILES

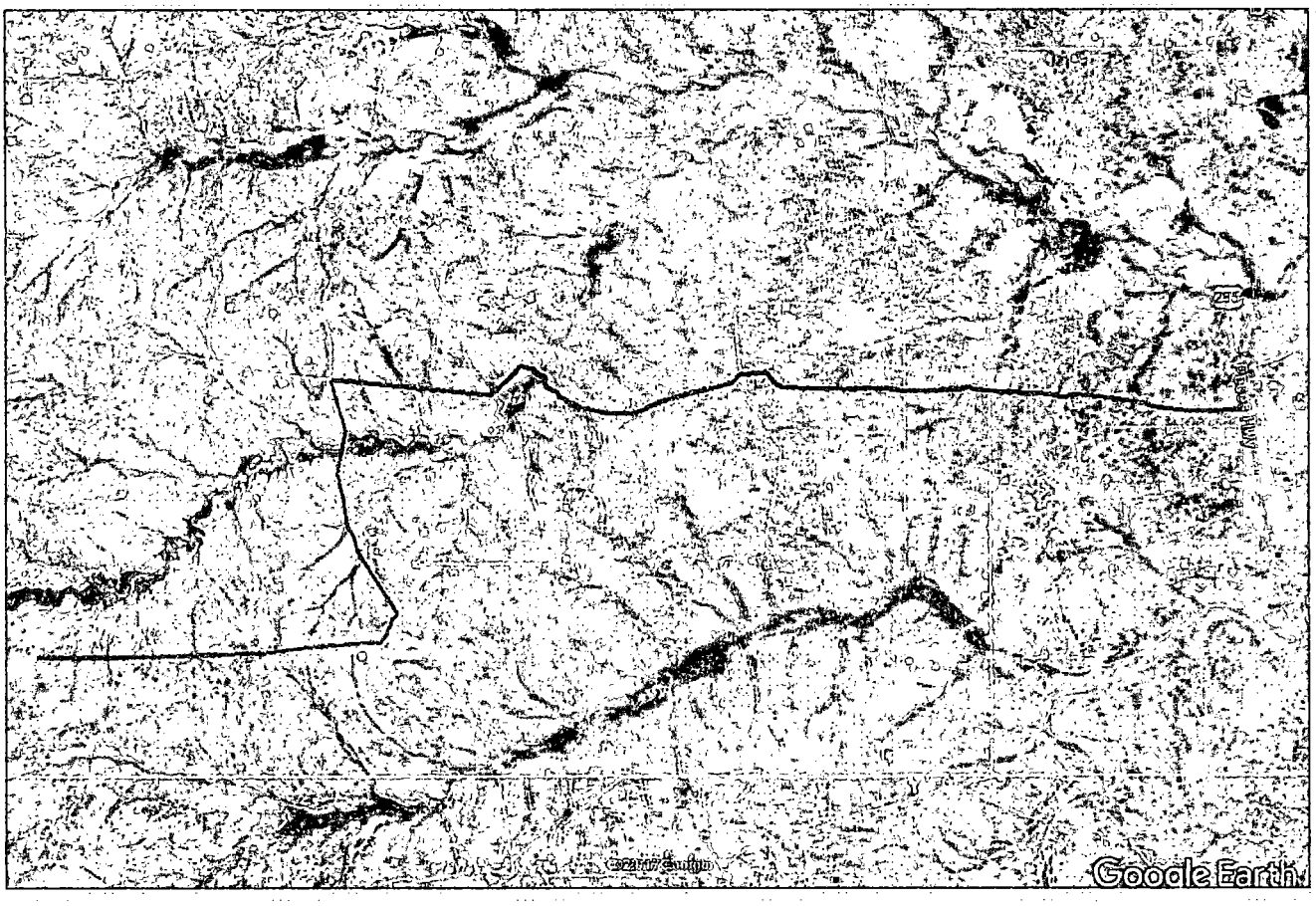
W.O. Number: KJG 33113

Survey Date: 07-11-2017

*YELLOW TINT - USA LAND*
*BLUE TINT - STATE LAND*

N

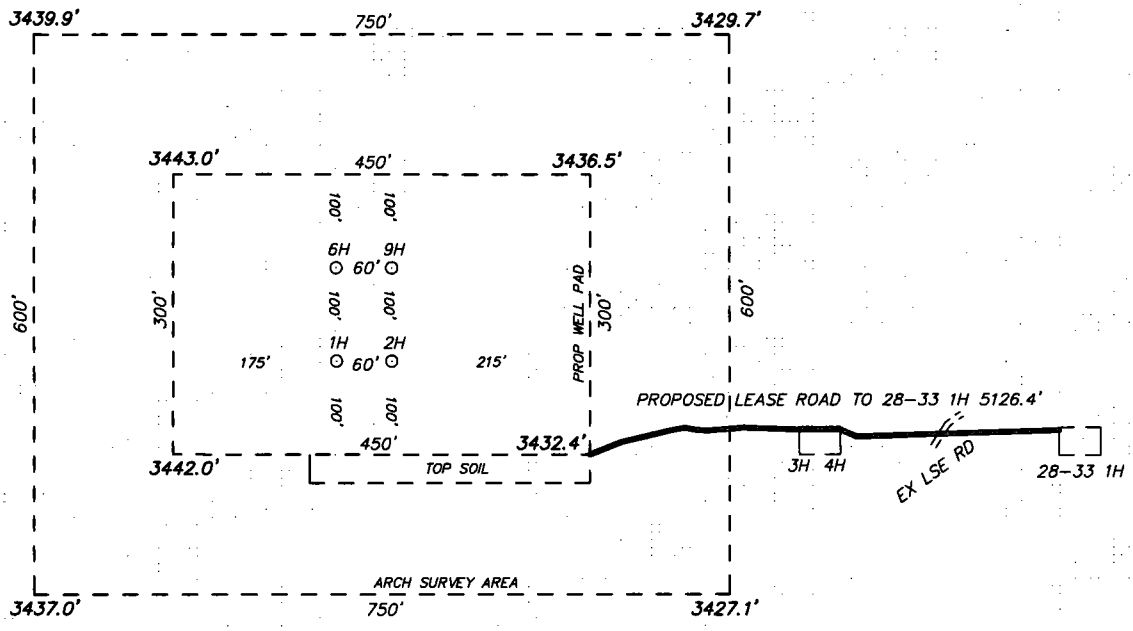
*CHISHOLM ENERGY OPERATING, LLC*


Google Earth

**PAD PLAT W/PROPOSED LEASE ROAD**

# SECTION 29, TOWNSHIP 26 SOUTH, RANGE 26 EAST, N.M.P.M.,

**EDDY COUNTY,** **NEW MEXICO.**




***CHISHOLM ENERGY OPERATING, LLC***
***COTTONWOOD 29-32 FED COM WCA 9H***
***ELEV. - 3433'***

Lat - N 32.02023030°
Long - W 104.31968087°
NMSPCE- N 371098.9
E 545568.7
(NAD-83)

*WHITE CITY, NM IS ±11 MILES TO THE NORTHWEST OF LOCATION.*

200 0 200 400 FEET

SCALE: 1" = 200'

Directions to Location:

FROM THE INTERSECTION OF GYPSUM & DILLAHUNTY ROAD GO SOUTH ON, ON DILLAHUNTY GO SOUTH 1.2 MILES TO LEASE ROAD, CONTINUE 1.2 MILES SOUTHERLY TO PROPOSED LEASE ROAD.

## CHISHOLM ENERGY OPERATING, LLC

REF: COTTONWOOD 29-32 FED COM WCA 9H / WELL PAD TOPO

THE COTTONWOOD 29-32 FED COM WCA 9H LOCATED 100' FROM THE NORTH LINE AND 1205' FROM THE WEST LINE OF SECTION 29, TOWNSHIP 26 SOUTH, RANGE 26 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.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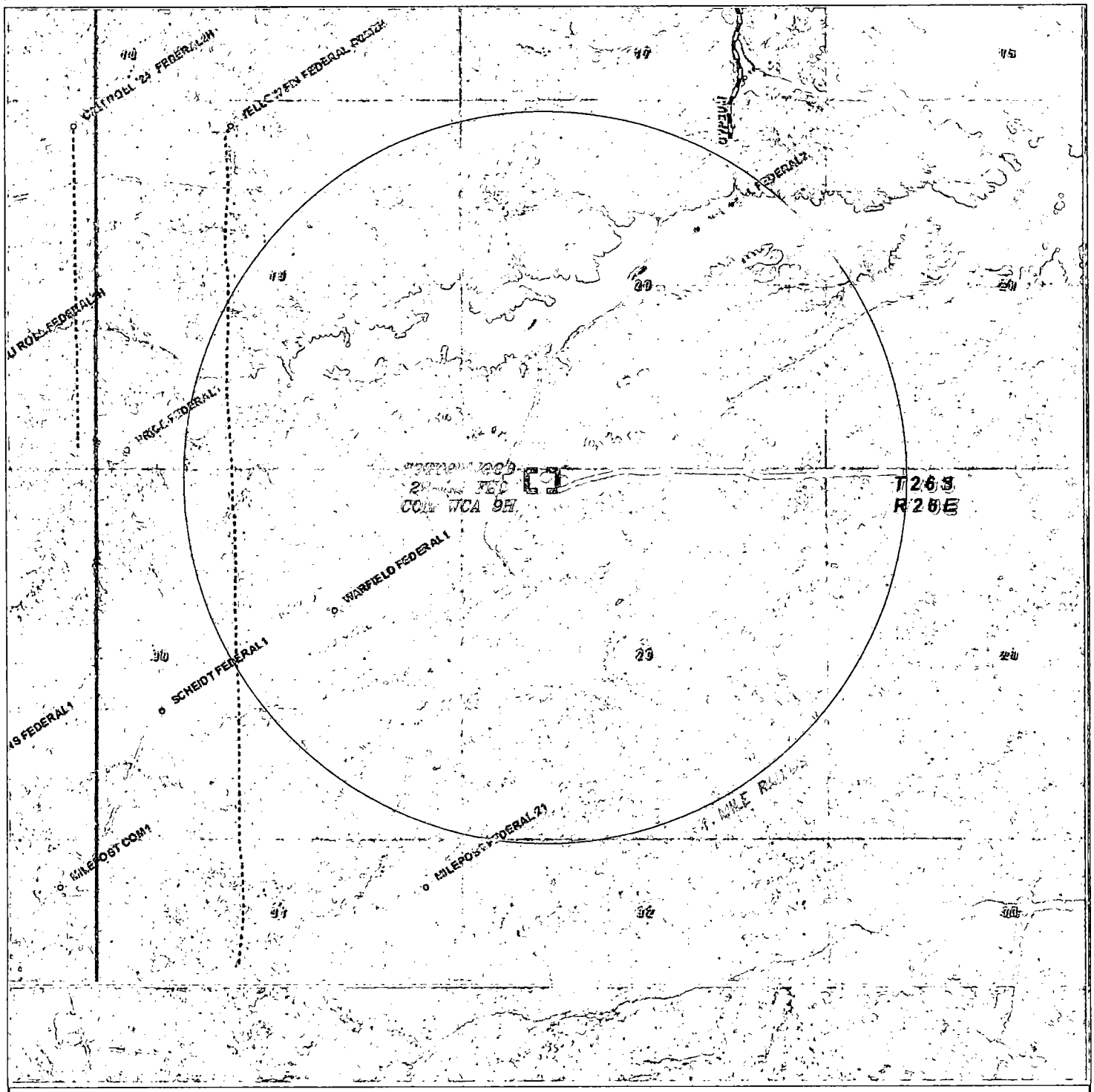
| W.O. Number: 33113 | Drawn By: K. GOAD | Date: 07-19-2017 | Survey Date: 07-11-2017 | Sheet 1 of 1 Sheets |
|---|---|---|---|---|

# MILE RADIUS MAP




## COTTONWOOD 29-32 FED COM WCA 9H

Located 100' FNL and 1205' FWL

Section 29, Township 26 South, Range 26 East,

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0' 1000' 2000' 3000' 4000'

SCALE: 1" = 2000'

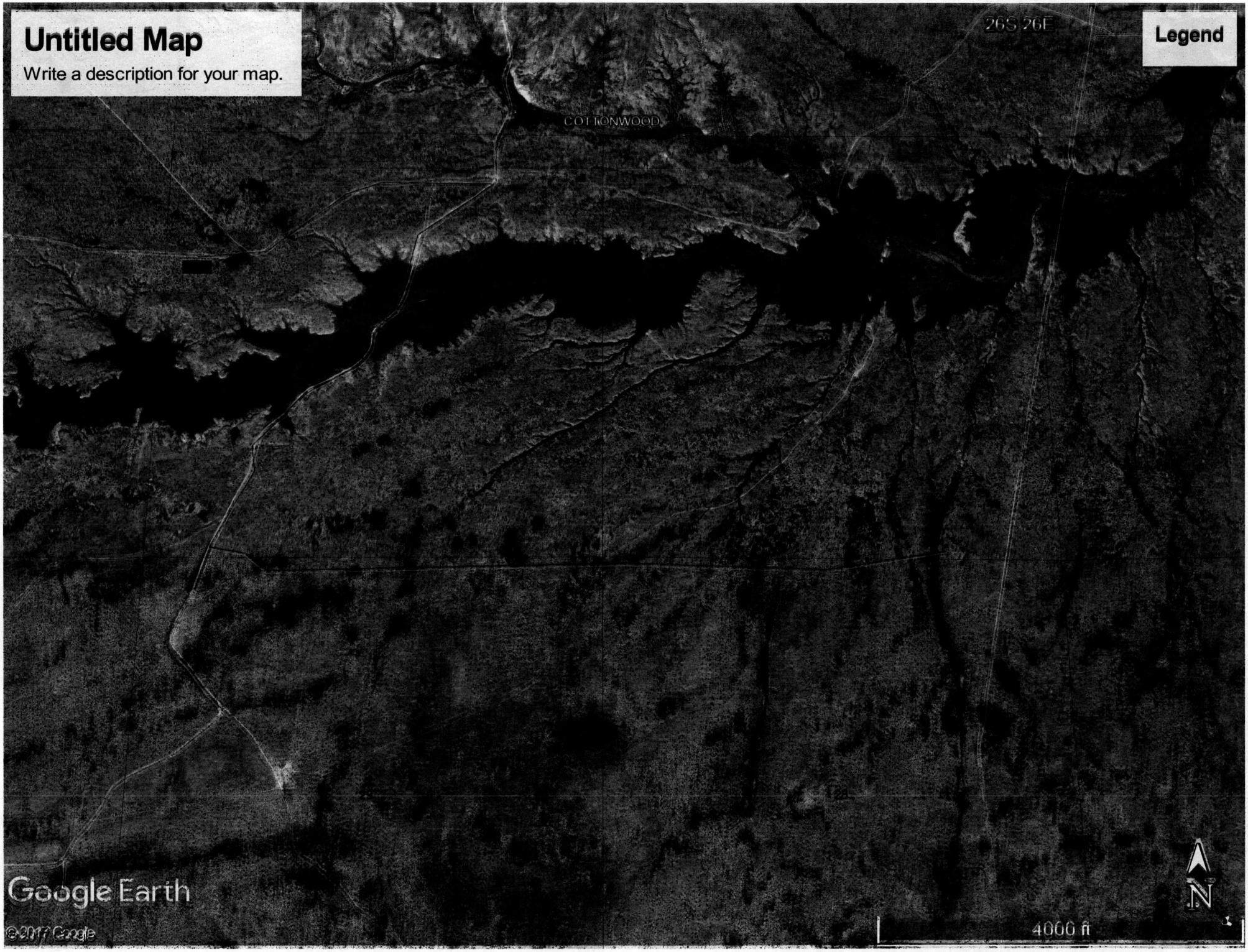
W.O. Number: KJG 33113

Survey Date: 07-11-2017

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND

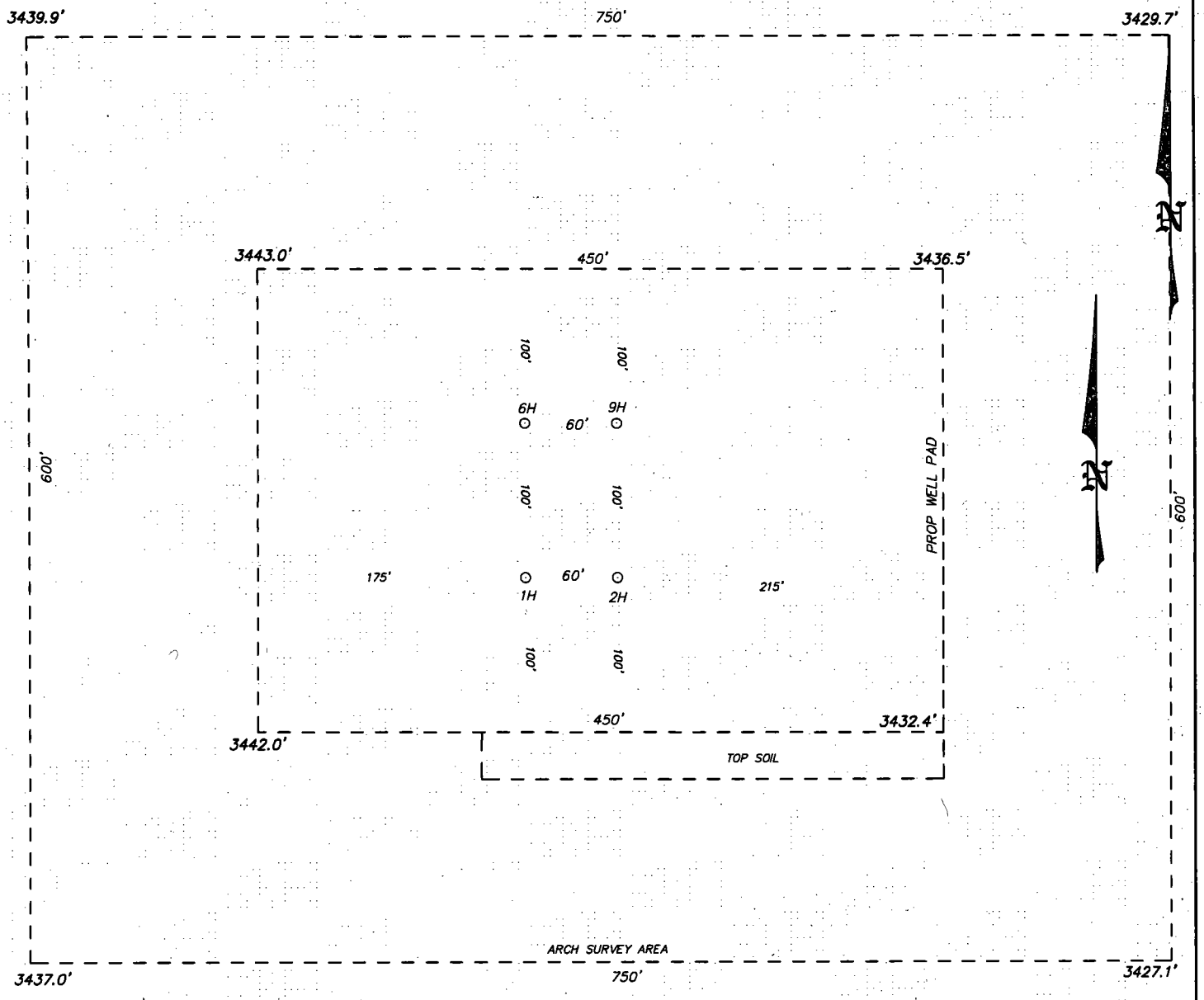
N

CHISHOLM ENERGY OPERATING, LLC


Untitled Map
Write a description for your map.
26S 26E
Legend
COTTONWOOD
Google Earth
©2017 Google
N
4000 ft

PAD PLAT

# SECTION 29, TOWNSHIP 26 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.




100 0 100 200 FEET

SCALE: 1" = 100'

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## CHISHOLM ENERGY OPERATING, LLC

REF: COTTONWOOD 29-32 FED COM WCA 9H / WELL PAD TOPO

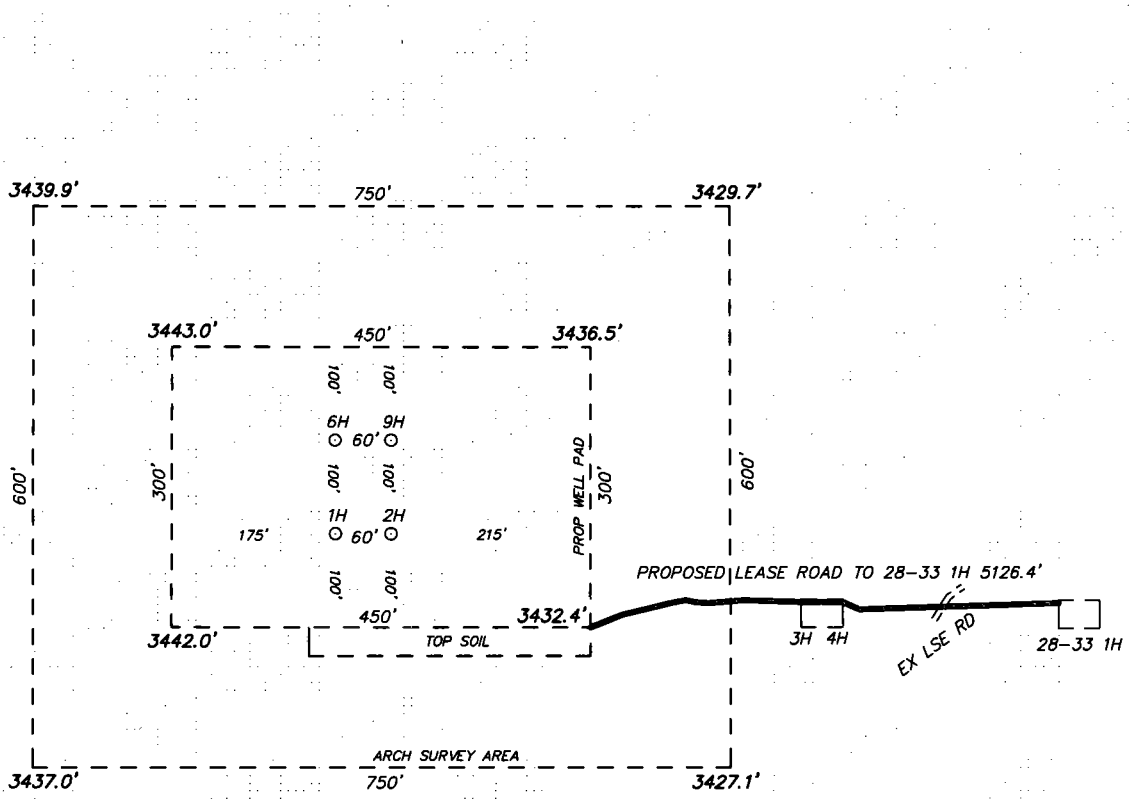
THE COTTONWOOD 29-32 FED COM WCA 9H LOCATED 100' FROM THE NORTH LINE AND 1205' FROM THE WEST LINE OF SECTION 29, TOWNSHIP 26 SOUTH, RANGE 26 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

| W.O. Number: 33113 | Drawn By: K. GOAD | Date: 07-19-2017 | Survey Date: 07-11-2017 | Sheet 1 of 1 Sheets |
|---|---|---|---|---|

**PAD PLAT W/PROPOSED LEASE ROAD**

# SECTION 29, TOWNSHIP 26 SOUTH, RANGE 26 EAST, N.M.P.M.,

**EDDY COUNTY,** **NEW MEXICO.**




***CHISHOLM ENERGY OPERATING, LLC***
***COTTONWOOD 29-32 FED COM WCA 9H***
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| W.O. Number: 33113 | Drawn By: K. GOAD | Date: 07-19-2017 | Survey Date: 07-11-2017 | Sheet 1 of 1 Sheets |
|---|---|---|---|---|

AFMSS

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

# PWD Data Report

04/23/2018

## Section 1 - General

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

## Section 2 - Lined Pits

**Would you like to utilize Lined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Lined pit PWD on or off channel:**

**Lined pit PWD discharge volume (bbl/day):**

**Lined pit specifications:**

**Pit liner description:**

**Pit liner manufacturers information:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Lined pit precipitated solids disposal schedule:**

**Lined pit precipitated solids disposal schedule attachment:**

**Lined pit reclamation description:**

**Lined pit reclamation attachment:**

**Leak detection system description:**

**Leak detection system attachment:**

**Lined pit Monitor description:**

**Lined pit Monitor attachment:**

**Lined pit: do you have a reclamation bond for the pit?**

**Is the reclamation bond a rider under the BLM bond?**

**Lined pit bond number:**

**Lined pit bond amount:**

**Additional bond information attachment:**

## Section 3 - Unlined Pits

**Would you like to utilize Unlined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Unlined pit PWD on or off channel:**

**Unlined pit PWD discharge volume (bbl/day):**

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

**Unlined pit precipitated solids disposal schedule attachment:**

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

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

**Beneficial use user confirmation:**

**Estimated depth of the shallowest aquifer (feet):**

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

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

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

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**

## Section 4 - Injection

**Would you like to utilize Injection PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:** **Injection well name:**

**Assigned injection well API number?** **Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

## Section 5 - Surface Discharge

**Would you like to utilize Surface Discharge PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

## Section 6 - Other

**Would you like to utilize Other PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

AFMSS

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

Bond Info Data Report
04/23/2018

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** NMB001468

**BIA Bond number:**

**Do you have a reclamation bond?** NO

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**

**United States Department of the Interior**
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE
620 E. Greene St.
Carlsbad, NM 88220
blm_nm_cfo_apd@blm.gov

**Attn: MATADOR PRODUCTION COMPANY**
**5400 LBJ FREEWAY, SUITE 1500**
**DALLAS, TX 75240**

**Re: Notice of Decision**

**Operator Name: MATADOR PRODUCTION COMPANY**
**Well Name: PENNZOIL 32 FED**
**Well Number: 112H**
**APD#: 10400008185**

Dear Operator:

The BLM made a decision regarding the above referenced APD. Please see the enclosed permit for details.

Review and Appeal Rights

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

Sincerely,