Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD
SEP 06 2019
RECEIVED

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☑ DRILL ☐ REENTER	5. Lease Serial No. NMLC0066126
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other	6. If Indian, Allotee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone	7. If Unit or CA Agreement, Name and No.
	8. Lease Name and Well No. LAGUNA 23 ~~FED COM~~ 2BS FEDERAL COM 4H (326098)
2. Name of Operator CHISHOLM ENERGY OPERATING LLC (372137)	9. API Well No. 30-025-46349
3a. Address 801 Cherry St., Suite 1200 Unit 20 Fort Worth TX 76102	3b. Phone No. *(include area code)* (817)469-1104
	10. Field and Pool, or Exploratory (97580) LEA / BONE SPRING, SOUTH
4. Location of Well *(Report location clearly and in accordance with any State requirements.*)* At surface LOT M / 20 FSL / 720 FWL / LAT 32.551425 / LONG -103.537166 At proposed prod. zone LOT D / 100 FNL / 380 FWL / LAT 32.565615 / LONG -103.538284	11. Sec., T. R. M. or Blk. and Survey or Area SEC 23 / T20S / R34E / NMP

14. Distance in miles and direction from nearest town or post office* 25 miles	12. County or Parish LEA	13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 20 feet	16. No of acres in lease 800	17. Spacing Unit dedicated to this well 160
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 100 feet	19. Proposed Depth 10508 feet / 15528 feet	20. BLM/BIA Bond No. in file FED: NMB001468
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3681 feet	22. Approximate date work will start* 06/01/2019	23. Estimated duration 30 days

24. Attachments

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

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

25. Signature (Electronic Submission)	Name *(Printed/Typed)* Jennifer Elrod / Ph: (817)953-3728	Date 11/14/2018
Title Senior Regulatory Technician		
Approved by *(Signature)* (Electronic Submission)	Name *(Printed/Typed)* Cody Layton / Ph: (575)234-5959	Date 09/04/2019
Title Assistant Field Manager Lands & Minerals	Office CARLSBAD	

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

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

GCP Rec 09/06/19

KZ 09/06/19

APPROVED WITH CONDITIONS

Approval Date: 09/04/2019

(Continued on page 2)

*(Instructions on page 2)

Additional Operator Remarks

Location of Well

1. SHL: LOT M / 20 FSL / 720 FWL / TWSP: 20S / RANGE: 34E / SECTION: 23 / LAT: 32.551425 / LONG: -103.537166 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT M / 330 FSL / 380 FWL / TWSP: 20S / RANGE: 34E / SECTION: 23 / LAT: 32.552278 / LONG: -103.538269 (TVD: 10557 feet, MD: 10850 feet)
   PPP: LOT E / 2640 FSL / 378 FWL / TWSP: 20S / RANGE: 34E / SECTION: 23 / LAT: 32.5558614 / LONG: -103.5382777 (TVD: 10557 feet, MD: 13160 feet)
   BHL: LOT D / 100 FNL / 380 FWL / TWSP: 20S / RANGE: 34E / SECTION: 23 / LAT: 32.565615 / LONG: -103.538284 (TVD: 10508 feet, MD: 15528 feet)

BLM Point of Contact

Name: Tenille Ortiz
Title: Legal Instruments Examiner
Phone: 5752342224
Email: tortiz@blm.gov

Approval Date: 09/04/2019

Review and Appeal Rights

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

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Chisholm Energy Operating LLC**
LEASE NO.:	**NMLC0066126**
WELL NAME & NO.:	Laguna 23 Fed Com 2BS 4H
SURFACE HOLE FOOTAGE:	200'/S & 2240'/W
BOTTOM HOLE FOOTAGE	100'/N & 2140'/W
LOCATION:	Section 23, T.20 S., R.34 E., NMPM
COUNTY:	Lea County, New Mexico

COA

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

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Yates-7 Rivers** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1650 feet** (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

is greater. (This is to include the lead cement)

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

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing shall be set at approximately **5675 feet** is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.
  Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by

0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

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

    - Cement should tie-back at least **50 feet** on top of **Capitan Reef**. Operator shall provide method of verification.

C. PRESSURE CONTROL

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

2.

Option 1:

a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **3000 (3M)** psi.

Option 2:

1. 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 **3000 (3M)** psi.

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

e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

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

GENERAL REQUIREMENTS

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

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

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

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

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

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

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

B. PRESSURE CONTROL

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

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

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

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

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

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

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

hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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

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

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chisholm Energy Operating LLC
WELL NAME & NO.:	Laguna 23 Fed Com 2BS 4H
SURFACE HOLE FOOTAGE:	20'/S & 720'/W
BOTTOM HOLE FOOTAGE	100'/N & 380'/W
LOCATION:	Section 23, T.20 S., R.34 E., NMPM
COUNTY:	Lea County, New Mexico

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

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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)

Watershed
Surface disturbance will not be allowed (within x feet of drainage; or describe pad restriction).
The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.
Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.
Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control.

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

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

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

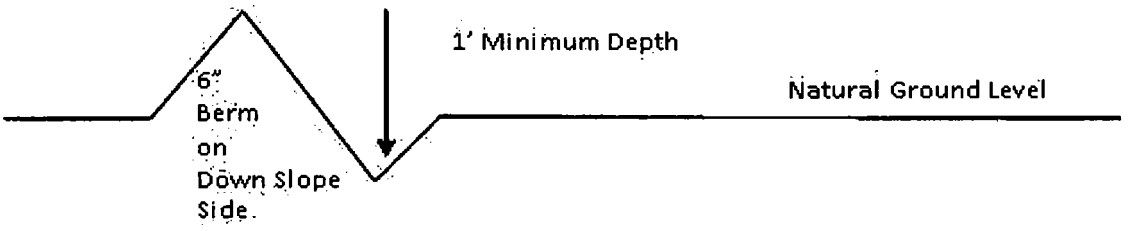
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

Public access on this road shall not be restricted by the operator without specific

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

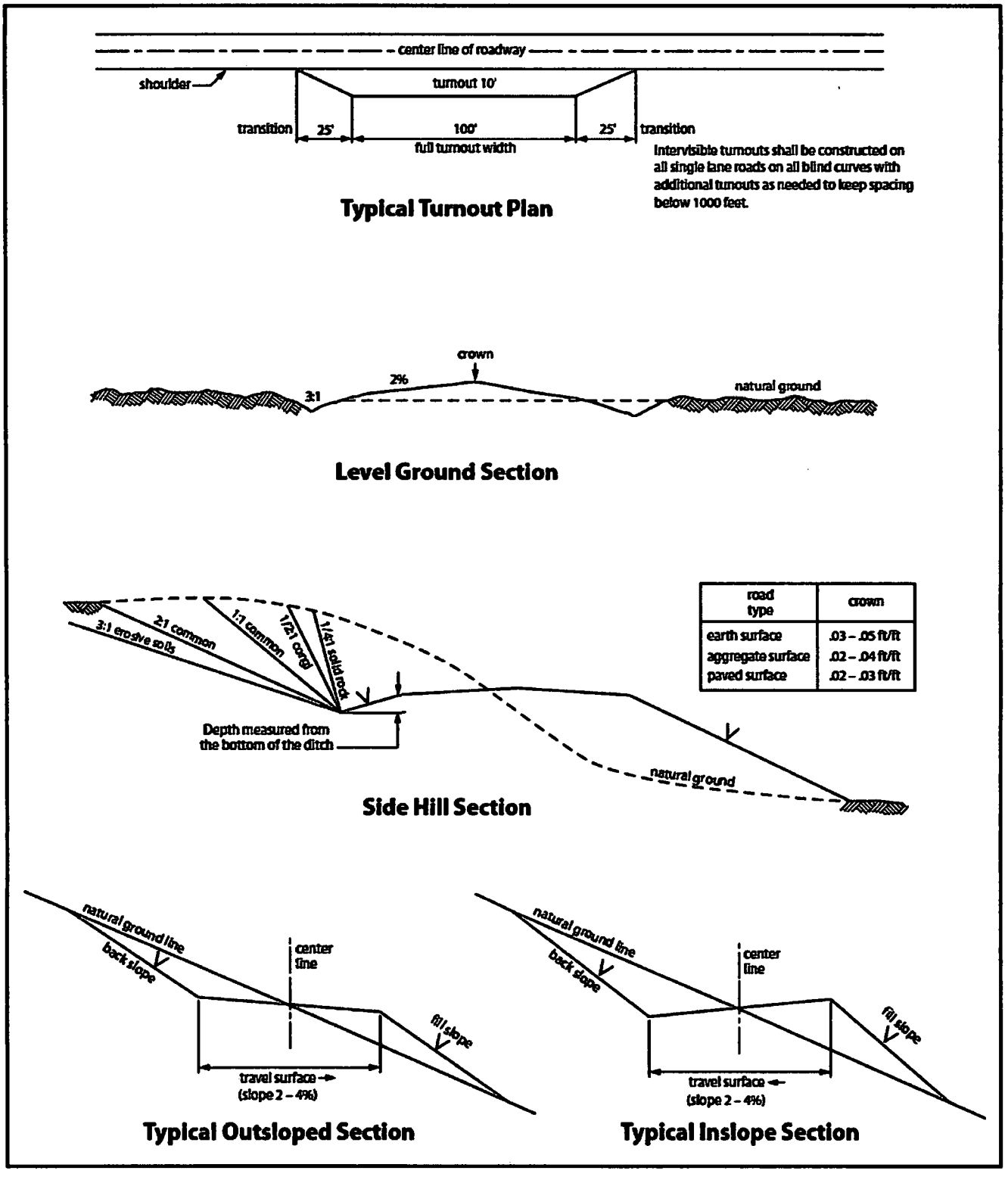


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

written approval granted by the Authorized Officer.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production

equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

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

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

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

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

*Pounds of pure live seed:

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

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BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

09/05/2019

Operator Certification

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

NAME: Jennifer Elrod **Signed on:** 11/14/2018

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:

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BUREAU OF LAND MANAGEMENT

Application Data Report

09/05/2019

APD ID: 10400035844 **Submission Date:** 11/14/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

[redacted]

Show Final Text

Well Type: OIL WELL **Well Work Type:** Drill

Section 1 - General

APD ID: 10400035844 **Tie to previous NOS?** **Submission Date:** 11/14/2018

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: NMLC0066126 **Lease Acres:** 800

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? NO **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 **Master Development Plan name:**

Well in Master SUPO? EXISTING **Master SUPO name:** Minis West

Well in Master Drilling Plan? EXISTING **Master Drilling Plan name:** Minis BS

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** LEA **Pool Name:** BONE SPRING, SOUTH

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

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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

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

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** LAGUNA 23 FED **Number:** 2H, 4H

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 25 Miles **Distance to nearest well:** 100 FT **Distance to lease line:** 20 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: LAGUNA_23_FED_COM_2BS_4H_APD_C012_10302018_20181031133536.pdf

Well work start Date: 06/01/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 34060 **Reference Datum:**

	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	20	FSL	720	FWL	20S	34E	23	Lot M	32.551425	-103.537166	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0066126	3681	0	0
KOP Leg #1	20	FSL	720	FWL	20S	34E	23	Lot M	32.551425	-103.537166	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0066126	-6401	10095	10082
PPP Leg #1	330	FSL	380	FWL	20S	34E	23	Lot M	32.552278	-103.538269	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0066126	-6876	10850	10557

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	2640	FSL	378	FWL	20S	34E	23	Lot E	32.5558614	-103.5382777	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 124662	-6876	13160	10557
EXIT Leg #1	100	FNL	380	FWL	20S	34E	23	Lot D	32.565615	-103.538284	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 078273	-6827	15528	10508
BHL Leg #1	100	FNL	380	FWL	20S	34E	23	Lot D	32.565615	-103.538284	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 078273	-6827	15528	10508

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BUREAU OF LAND MANAGEMENT

Drilling Plan Data Report

09/05/2019

APD ID: 10400035844 **Submission Date:** 11/14/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	RUSTLER	3681	1589	1589	ANHYDRITE	USEABLE WATER	N
2	SALADO	1727	1954	1954	SALT	NONE	N
3	YATES	144	3537	3537	SHALE,SANDSTONE	NATURAL GAS,OIL	N
4	CAPITAN REEF	-149	3830	3830	LIMESTONE,DOLOMITE	USEABLE WATER,POTASH	N
5	DELAWARE	-1945	5626	5626	SILTSTONE,SHALE,SANDSTONE	NATURAL GAS,OIL	N
6	BONE SPRING	-4846	8527	8527	LIMESTONE,SHALE	NATURAL GAS,OIL	N
7	BONE SPRING 1ST	-5974	9655	9655	SILTSTONE,SHALE,SANDSTONE	NATURAL GAS,OIL	N
8	BONE SPRING 2ND	-6479	10160	10160	SILTSTONE,SHALE,SANDSTONE	NATURAL GAS,OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 12000

Equipment: Rotating Head, remote kill line, mud-gas sperator

Requesting Variance? YES

Variance request: WE PROPOSE UTILIZING A CACTUS SPEED HEAD MULTI-BOWL WELLHEAD FOR THIS WELL. PLEASE SEE ATTACHED DIAGRAM AND PRESSURE TESTING STATEMENT. ALSO WE REQUEST TO USE A FLEX CHOKE HOSE; PLEASE SEE ATTACHMENT.

Testing Procedure: BOP will be tested by an independent service company to 250 psi low and 5000 psi high, per onshore order 2. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked each trip out of the hole.

Choke Diagram Attachment:

5M_Choke_Manifold_Diagram_20181031144616.pdf

BOP Diagram Attachment:

5m_BOP_Diagram_2_20190516131721.pdf

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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	1650	0	1650	3702	2202	1650	J-55	54.5	BUTT	1.57	3.79	DRY	9.49	DRY	10.11
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	5675	0	5675	3702	-1698	5675	J-55	40	LT&C	1.71	1.31	DRY	2.78	DRY	2.29
3	PRODUCTION	8.75	5.5	NEW	API	N	0	15528	0	10509	3702	-7823	15528	P-110	20	BUTT	2.2	2.51	DRY	3.05	DRY	3.17

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator___Laguna_23_Fed_Com_2BS_4H_20181031144944.xlsx

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator___Laguna_23_Fed_Com_2BS_4H_20181031144936.xlsx

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator___Laguna_23_Fed_Com_2BS_4H_20181031144929.xlsx

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					1.86					
SURFACE	Tail										
INTERMEDIATE	Lead					3.79					
INTERMEDIATE	Tail										

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead					3.97					
INTERMEDIATE	Tail										
PRODUCTION	Lead					2.97					
PRODUCTION	Tail										

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: Pason PVT system will be in place throughout the well as well as visual checks

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	1650	SPUD MUD	8.2	8.4							
5675	1050	OIL-BASED	9	9.5							

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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
1650	5675	SALT SATURATED	9.8	10.2							

Section 6 - Test, Logging, Coring

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

None

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

CBL,DS,GR,MWD

Coring operation description for the well:

None

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5254 **Anticipated Surface Pressure:** 2931.46

Anticipated Bottom Hole Temperature(F): 163

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:

Lea_County_H2S_plan_20181101131717.pdf

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Laguna_23_Fed_Com_2BS__4H___Design__2___AC_Report_20181101132258.pdf

Laguna_23_Fed_Com_2BS__4H___Design__2_20181101132259.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Other Variance attachment:

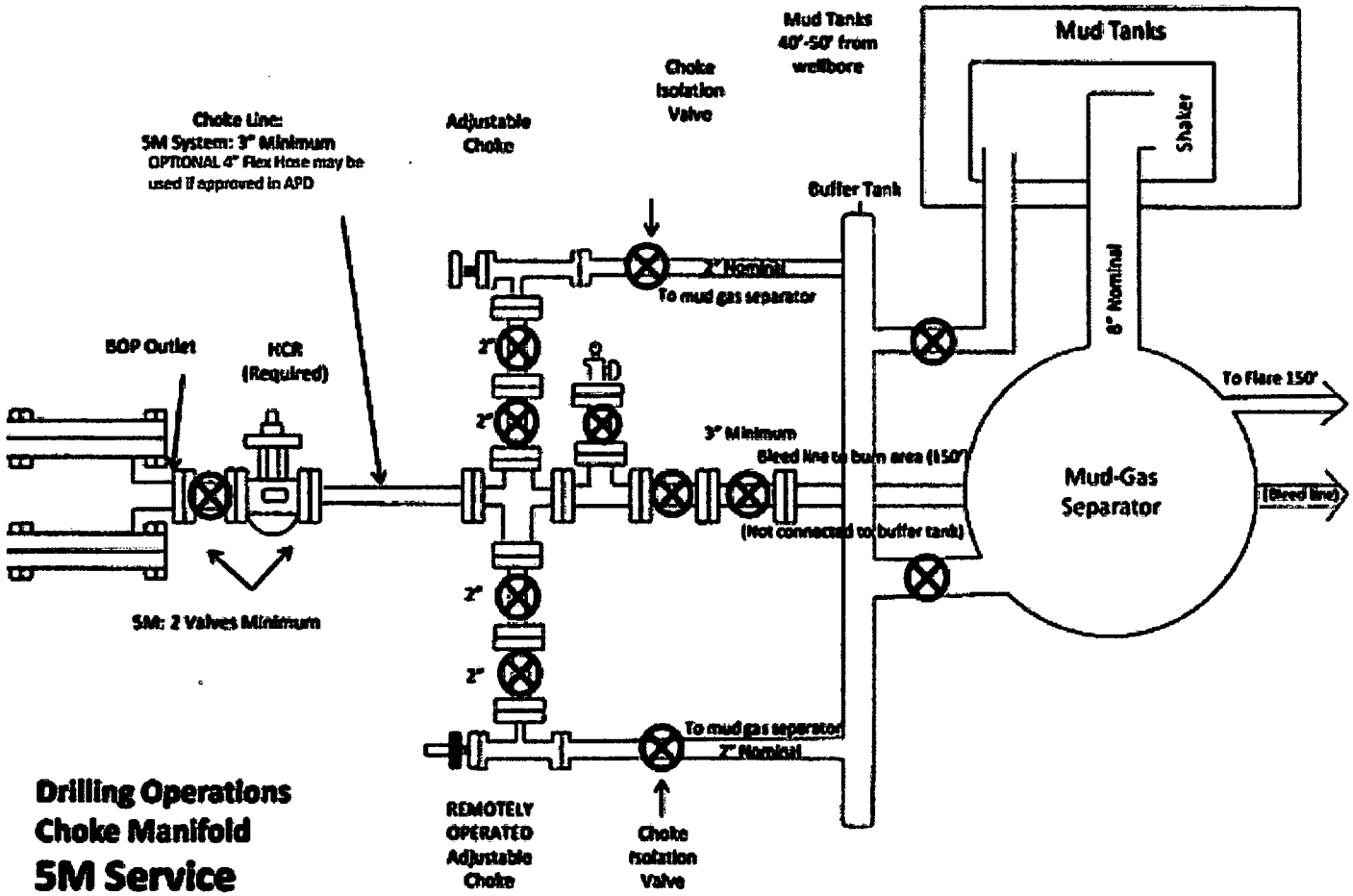
Cactus_Speed_Head_Installation_Procedure_20181101132010.pdf

Cactus_Speed_Head_Pressure_Testing_Statement_20181101132011.pdf

Cactus_Speedhead_Diagram_20181101132011.pdf

Choke_Hose_M55_1_07102017_145204_66_1225_04_14_2014__20181101132012.pdf

Choke_Hose_M55_2_07102017_145421_66_1042_05_03_2013__20181101132012.pdf



Drilling Operations
Choke Manifold
5M Service

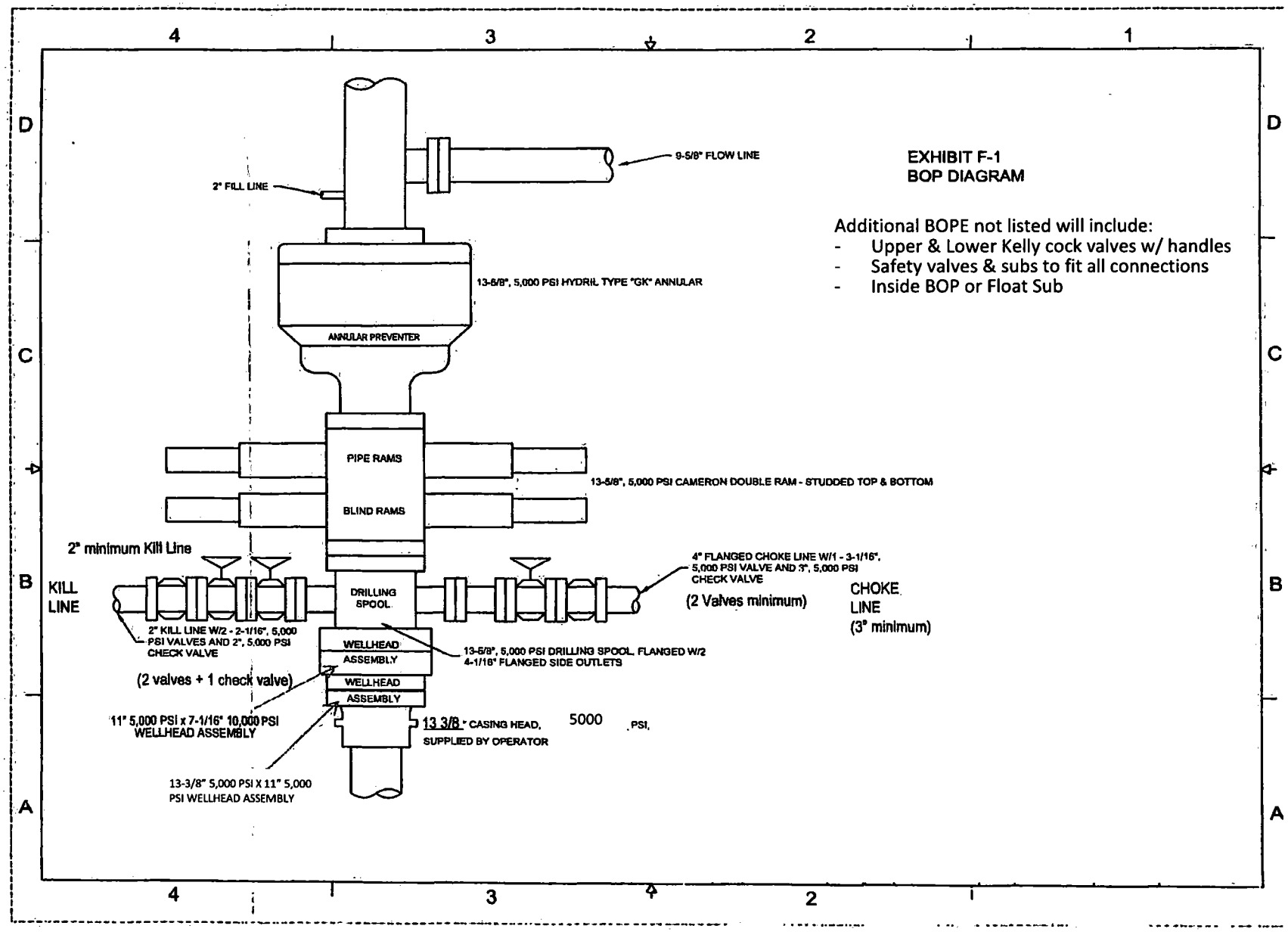


EXHIBIT F-1
BOP DIAGRAM
Additional BOPE not listed will include:
- Upper & Lower Kelly cock valves w/ handles
- Safety valves & subs to fit all connections
- Inside BOP or Float Sub
9-5/8" FLOW LINE
2" FILL LINE
13-5/8", 5,000 PSI HYDRIL TYPE "GK" ANNULAR
ANNULAR PREVENTER
PIPE RAMS
BLIND RAMS
13-5/8", 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 3", 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
(2 valves + 1 check valve)
WELLHEAD ASSEMBLY
WELLHEAD ASSEMBLY
13-5/8", 5,000 PSI DRILLING SPOOL, FLANGED W/2 4-1/16" FLANGED SIDE OUTLETS
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: Laguna (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)	Collap (psi
Surface												
17.5"	0'	1,650'	1,650'	13 3/8"	54.5	J-55	BTC	New	8.4	2730	3.79	113
Intermediate												
12.25"	0'	5,675'	5,675'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.31	257
Production												
8.75"	0'	15,528'	10,509'	5 1/2"	20	P-110	BTC	New	9.2	12640	2.51	110

Casing Design Criteria and Casing Loading Assumptions:

Surface

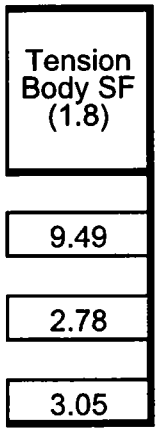
Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.4 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 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 1/2 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:	9.2 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	9.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.2 ppg


Tension
Body SF
(1.8)
9.49
2.78
3.05

Casing Program: Laguna (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)	Collap (psi
Surface												
17.5"	0'	1,650'	1,650'	13 3/8"	54.5	J-55	BTC	New	8.4	2730	3.79	113
Intermediate												
12.25"	0'	5,675'	5,675'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.31	257
Production												
8.75"	0'	15,528'	10,509'	5 1/2"	20	P-110	BTC	New	9.2	12640	2.51	110

Casing Design Criteria and Casing Loading Assumptions:

Surface

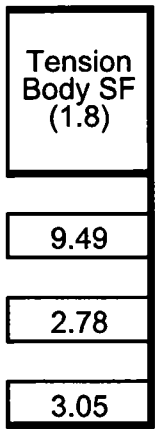
Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.4 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 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 1/2 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:	9.2 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	9.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.2 ppg


Tension
Body SF
(1.8)
9.49
2.78
3.05

Casing Program: Laguna (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)	Collap (psi
Surface												
17.5"	0'	1,650'	1,650'	13 3/8"	54.5	J-55	BTC	New	8.4	2730	3.79	113
Intermediate												
12.25"	0'	5,675'	5,675'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.31	257
Production												
8.75"	0'	15,528'	10,509'	5 1/2"	20	P-110	BTC	New	9.2	12640	2.51	110

Casing Design Criteria and Casing Loading Assumptions:

Surface

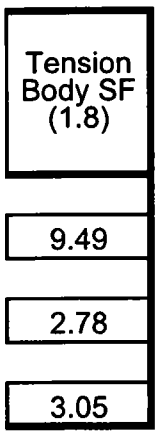
Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.4 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 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 1/2 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:	9.2 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	9.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.2 ppg


Tension
Body SF
(1.8)
9.49
2.78
3.05

Chisholm Energy Operating, LLC

801 Cherry St., Suite 1200-Unit 20

Fort Worth, TX 76102

H2S Contingency Plan

Lea County, NM

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crew should then block entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are NO homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'
100 ppm H2S concentration shall trigger activation of this plan

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. See list of phone numbers attached.
« 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. Chisholm Energy Operating, LLC response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMERP).

Hydrogen Sulfide Drilling Operations Plan

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 H25 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 Assistance Telephone List

Chisholm Energy Holdings, LLC

Chisholm Energy Operating, LLC	Office:	(817)953-6063
Vice President of Operations-Brad Grandstaff	Office:	(817)953-3150
	Cell:	(972)977-9221
Drilling Superintendent-Russell Simons	Cell:	(830)285-7501
Production Superintendent-Paul Martinez	Cell:	(325)206-1722

Public Safety:			**911 or**
Lea County Sheriff's Department		Number:	(575)396-3611
Lea County Emergency Management-Lorenzo Velasquez		Number:	(575)391-2983
Lea County Fire Marshal			
Lorenzo Velasquez, Director		Number:	(575)391-2983
Jeff Broom, Deputy Fire Marshal		Number:	(575)391-2988
Fire Department:			
Knowles Fire Department		Number:	(505)392-2810
City of Hobbs Fire Department		Number:	(505)397-9308
Jal Volunteer Fire Department		Number:	(505)395-2221
Lovington Fire Department		Number:	(575)396-2359
Maljamar Fire Department		Number:	(505)676-4100
Tatum Volunteer Fire Department		Number:	(505)398-3473
Eunice Fire Department		Number:	(575)394-3258
Hospital: Lea Regional Medical Center		Number:	(575)492-5000
AirMed: Medevac		Number:	(888)303-9112
Dept. of Public Safety		Number:	(505)827-9000
New Mexico OCD-Dist. 1-Hobbs-	Office	Number:	(575)393-6161
	Emergency	Number:	(575)370-3186
Lea County Road Department		Number:	(575)391-2940
NMDOT		Number:	(505)827-5100

CHISHOLM ENERGY

Chisholm Energy

Lea Co, NM
Laguna 23 Fed Com
Laguna 23 Fed Com 2BS #4H

Laguna 23 Fed Com 2BS #4H
Design #2

Anticollision Report

08 October, 2018

gyro|data

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Reference	Design #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 35,000.00 usft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program **Date** 10/8/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	15,527.97	Design #2 (Laguna 23 Fed Com 2BS #4H)	MWD+HRGM	OWSG MWD + HRGM

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Laguna 23 Fed Com						
Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 2	7,704.50	7,697.91	67.96	20.17	1.422	Level 3, CC, ES, SF
Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 2	7,704.50	7,697.91	67.96	20.17	1.422	Level 3, CC, ES, SF

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - Cim

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	6.00	0.00	0.00	-71.99	29.30	-90.10	94.93				
100.00	100.00	93.81	99.81	0.12	0.13	-71.82	29.60	-90.10	94.84	94.58	0.26	367.935	
200.00	200.00	193.72	199.71	0.48	0.41	-71.33	30.45	-90.10	95.11	94.21	0.89	106.384	
300.00	300.00	293.68	299.67	0.84	0.77	-70.76	31.44	-90.10	95.43	93.82	1.61	59.381	
400.00	400.00	393.64	399.62	1.20	1.12	-70.14	32.55	-90.10	95.80	93.48	2.32	41.292	
500.00	500.00	493.59	499.57	1.56	1.48	-69.46	33.76	-90.10	96.22	93.19	3.03	31.725	
600.00	600.00	593.55	599.52	1.92	1.83	-68.72	35.08	-90.10	96.69	92.95	3.74	25.819	
700.00	700.00	693.51	699.47	2.27	2.19	-67.95	36.50	-90.10	97.21	92.76	4.46	21.814	
800.00	800.00	793.46	799.41	2.63	2.54	-67.13	38.01	-90.10	97.79	92.62	5.17	18.923	
900.00	900.00	893.41	899.35	2.99	2.89	-66.27	39.60	-90.10	98.42	92.54	5.88	16.741	
1,000.00	1,000.00	1,006.64	999.28	3.35	3.29	-65.38	41.30	-90.10	99.12	92.48	6.64	14.934	
1,100.00	1,100.00	1,093.34	1,099.25	3.71	3.60	-64.47	43.04	-90.10	99.86	92.56	7.30	13.678	
1,200.00	1,200.00	1,193.33	1,199.22	4.07	3.95	-63.57	44.79	-90.10	100.62	92.61	8.01	12.561	
1,300.00	1,300.00	1,293.31	1,299.19	4.43	4.30	-62.69	46.53	-90.10	101.41	92.69	8.72	11.629	
1,400.00	1,400.00	1,393.30	1,399.16	4.78	4.66	-61.82	48.28	-90.10	102.22	92.79	9.43	10.840	
1,500.00	1,500.00	1,493.28	1,499.13	5.14	5.01	-60.96	50.02	-90.10	103.06	92.92	10.14	10.164	
1,600.00	1,600.00	1,593.27	1,599.10	5.50	5.36	-60.12	51.77	-90.10	103.92	93.07	10.85	9.579	
1,700.00	1,700.00	1,693.25	1,699.07	5.86	5.71	-59.29	53.51	-90.10	104.80	93.24	11.56	9.069	
1,800.00	1,800.00	1,793.24	1,799.04	6.22	6.06	-58.48	55.26	-90.10	105.70	93.43	12.26	8.618	
1,900.00	1,900.00	1,893.22	1,899.01	6.58	6.41	-57.68	57.00	-90.10	106.62	93.65	12.97	8.219	
2,000.00	2,000.00	1,993.27	1,999.04	6.93	6.76	-56.92	58.70	-90.10	107.54	93.86	13.68	7.861	
2,100.00	2,100.00	2,093.32	2,099.07	7.29	7.10	-56.21	60.29	-90.10	108.41	94.03	14.39	7.535	
2,200.00	2,200.00	2,193.37	2,199.12	7.65	7.45	-55.57	61.77	-90.10	109.24	94.15	15.10	7.237	
2,300.00	2,300.00	2,293.43	2,299.17	8.01	7.80	-54.98	63.14	-90.10	110.03	94.22	15.80	6.962	
2,400.00	2,400.00	2,393.43	2,399.16	8.37	8.15	-54.42	64.45	-90.10	110.78	94.27	16.51	6.710	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - Cim

Offset Site Error: 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,500.00	2,500.00	2,493.42	2,499.14	8.73	8.50	-53.88	65.76	-90.10	111.55	94.33	17.22	6.479	
2,600.00	2,600.00	2,593.41	2,599.12	9.09	8.85	-53.34	67.07	-90.10	112.33	94.40	17.93	6.266	
2,700.00	2,700.00	2,693.40	2,699.10	9.44	9.20	-52.80	68.38	-90.10	113.11	94.48	18.63	6.070	
2,800.00	2,800.00	2,793.40	2,799.09	9.80	9.55	-52.28	69.69	-90.10	113.91	94.57	19.34	5.889	
2,900.00	2,900.00	2,893.33	2,899.01	10.16	9.89	-51.75	71.03	-90.10	114.74	94.69	20.05	5.723	
3,000.00	3,000.00	2,993.25	2,998.92	10.52	10.24	-51.19	72.47	-90.10	115.63	94.88	20.76	5.571	
3,100.00	3,100.00	3,093.17	3,098.83	10.88	10.59	-50.60	74.00	-90.10	116.60	95.14	21.46	5.432	
3,200.00	3,200.00	3,193.09	3,198.74	11.24	10.94	-49.99	75.62	-90.10	117.64	95.48	22.17	5.305	
3,300.00	3,300.00	3,293.02	3,298.65	11.59	11.29	-49.36	77.33	-90.10	118.74	95.86	22.88	5.190	
3,400.00	3,400.00	3,393.00	3,398.62	11.95	11.64	-48.73	79.07	-90.10	119.89	96.30	23.59	5.082	
3,500.00	3,500.00	3,492.99	3,498.59	12.31	11.99	-48.11	80.82	-90.10	121.04	96.75	24.30	4.982	
3,600.00	3,600.00	3,592.97	3,598.56	12.67	12.34	-47.50	82.56	-90.10	122.22	97.21	25.01	4.888	
3,700.00	3,700.00	3,692.96	3,698.53	13.03	12.69	-46.90	84.31	-90.10	123.40	97.69	25.71	4.799	
3,800.00	3,800.00	3,792.94	3,798.50	13.39	13.04	-46.32	86.05	-90.10	124.60	98.18	26.42	4.716	
3,900.00	3,900.00	3,892.93	3,898.47	13.75	13.39	-45.74	87.80	-90.10	125.81	98.68	27.13	4.637	
4,000.00	4,000.00	3,992.91	3,998.44	14.10	13.74	-45.18	89.54	-90.10	127.04	99.20	27.84	4.563	
4,100.00	4,100.00	4,092.89	4,098.41	14.46	14.09	-44.62	91.29	-90.10	128.27	99.73	28.55	4.493	
4,200.00	4,200.00	4,192.88	4,198.38	14.82	14.44	-44.08	93.03	-90.10	129.52	100.27	29.26	4.427	
4,300.00	4,300.00	4,292.92	4,298.41	15.18	14.79	-43.56	94.76	-90.10	130.77	100.80	29.97	4.364	
4,400.00	4,400.00	4,393.01	4,398.48	15.54	15.14	-43.07	96.39	-90.10	131.95	101.28	30.67	4.302	
4,500.00	4,500.00	4,493.10	4,498.55	15.90	15.49	-42.62	97.92	-90.10	133.07	101.69	31.38	4.240	
4,600.00	4,600.00	4,593.19	4,598.64	16.25	15.84	-42.21	99.35	-90.10	134.13	102.03	32.09	4.179	
4,700.00	4,700.00	4,693.28	4,698.72	16.61	16.19	-41.83	100.67	-90.10	135.11	102.31	32.80	4.119	
4,800.00	4,800.00	4,792.75	4,798.18	16.97	16.54	-41.37	102.31	-90.10	136.34	102.83	33.51	4.069	
4,900.00	4,900.00	4,892.38	4,897.78	17.33	16.89	-40.83	104.25	-90.10	137.81	103.60	34.21	4.028	
5,000.00	5,000.00	4,991.99	4,997.37	17.69	17.24	-40.22	106.54	-90.10	139.56	104.64	34.92	3.996	
5,100.00	5,100.00	5,091.94	5,097.28	18.05	17.59	-39.55	109.09	-90.10	141.51	105.88	35.63	3.972	
5,200.00	5,200.00	5,192.16	5,197.48	18.41	17.94	-38.95	111.47	-90.10	143.36	107.01	36.34	3.945	
5,300.00	5,300.00	5,292.39	5,297.68	18.76	18.29	-38.41	113.63	-90.10	145.03	107.98	37.05	3.914	
5,400.00	5,400.00	5,392.63	5,397.91	19.12	18.64	-37.94	115.56	-90.10	146.55	108.79	37.76	3.881	
5,500.00	5,500.00	5,495.85	5,501.12	19.48	18.88	-37.61	116.59	-89.82	147.18	108.83	38.35	3.838	
5,600.00	5,600.00	5,597.95	5,603.20	19.84	18.98	-37.60	115.08	-88.63	145.29	106.50	38.80	3.745	
5,700.00	5,700.00	5,697.63	5,702.88	20.20	18.99	-37.68	113.34	-87.47	143.20	104.03	39.17	3.656	
5,800.00	5,800.00	5,797.74	5,802.95	20.56	19.01	-37.73	111.67	-86.39	141.22	101.67	39.54	3.571	
5,900.00	5,900.00	5,898.12	5,903.30	20.92	19.03	-37.80	109.78	-85.17	138.99	99.06	39.92	3.481	
6,000.00	6,000.00	5,998.12	6,003.27	21.27	19.06	-37.88	107.77	-83.82	136.57	96.25	40.31	3.388	
6,100.00	6,100.00	6,097.98	6,103.11	21.63	19.10	-37.89	105.69	-82.40	134.21	93.50	40.71	3.297	
6,200.00	6,200.00	6,197.94	6,203.04	21.99	19.14	-37.87	104.10	-80.95	131.91	90.79	41.11	3.208	
6,300.00	6,300.00	6,297.91	6,302.99	22.35	19.19	-37.86	102.29	-79.52	129.60	88.08	41.52	3.121	
6,400.00	6,400.00	6,398.16	6,403.20	22.71	19.25	-37.91	100.33	-78.13	127.20	85.26	41.94	3.033	
6,500.00	6,500.00	6,498.41	6,503.41	23.07	19.32	-38.05	98.06	-76.75	124.57	82.22	42.36	2.941	
6,550.50	6,550.50	6,548.74	6,553.73	23.25	19.35	-38.17	96.85	-76.13	123.23	80.65	42.58	2.894	
6,600.00	6,600.00	6,598.10	6,603.07	23.42	19.39	51.85	95.64	-75.62	121.69	78.91	42.79	2.844	
6,700.00	6,699.93	6,697.77	6,702.70	23.76	19.48	52.79	93.14	-74.87	117.13	73.93	43.20	2.711	
6,800.50	6,800.18	6,797.83	6,802.73	24.11	19.55	55.17	90.59	-74.40	110.66	67.03	43.63	2.536	
6,900.00	6,899.30	6,896.87	6,901.74	24.45	19.64	58.40	88.03	-74.14	103.60	59.54	44.06	2.351	
7,000.00	6,998.92	6,996.54	7,001.38	24.79	19.73	62.12	85.39	-73.84	96.81	52.31	44.50	2.176	
7,100.00	7,098.54	7,096.20	7,101.00	25.14	19.83	66.43	82.68	-73.43	90.38	45.44	44.94	2.011	
7,200.00	7,198.16	7,195.85	7,200.60	25.48	19.94	71.39	79.87	-72.94	84.42	39.02	45.40	1.860	
7,300.00	7,297.78	7,295.33	7,300.04	25.83	20.05	77.03	76.99	-72.43	79.10	33.24	45.86	1.725	
7,400.00	7,397.40	7,394.87	7,399.54	26.18	20.17	83.27	74.21	-72.13	74.78	28.45	46.33	1.614	
7,500.00	7,497.02	7,494.56	7,499.19	26.53	20.30	90.23	71.28	-71.76	71.31	24.51	46.80	1.524	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - Cim — **Offset Site Error:** 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,600.00	7,596.84	7,594.07	7,598.65	26.88	20.43	97.92	68.22	-71.23	68.88	21.60	47.28	1.457	Level 3
7,700.00	7,696.26	7,693.44	7,697.97	27.23	20.56	106.26	65.25	-70.34	67.97	20.20	47.77	1.423	Level 3
7,704.50	7,700.74	7,697.91	7,702.44	27.25	20.57	106.65	65.12	-70.29	67.96	20.17	47.79	1.422	Level 3, CC, ES, SF
7,800.00	7,795.88	7,792.98	7,797.47	27.58	20.71	114.62	62.41	-69.45	68.65	20.39	48.26	1.422	Level 3
7,900.00	7,895.50	7,892.78	7,897.23	27.93	20.85	121.90	59.78	-69.53	70.43	21.68	48.75	1.445	Level 3
8,000.00	7,995.12	7,991.89	7,996.32	28.29	21.00	127.96	57.76	-70.31	73.32	24.07	49.25	1.489	Level 3
8,100.00	8,094.74	8,091.09	8,095.51	28.64	21.15	132.78	56.95	-71.33	77.69	27.95	49.74	1.562	
8,200.00	8,194.36	8,191.12	8,195.53	29.00	21.30	136.72	56.59	-72.65	82.66	32.42	50.24	1.645	
8,300.00	8,293.98	8,290.06	8,294.46	29.35	21.45	139.96	56.64	-73.97	88.21	37.47	50.74	1.739	
8,400.00	8,393.60	8,389.04	8,393.43	29.71	21.61	142.36	57.79	-75.08	94.86	43.62	51.24	1.851	
8,500.00	8,493.22	8,488.49	8,492.86	30.06	21.77	144.53	59.10	-75.73	102.13	50.39	51.74	1.974	
8,600.00	8,592.84	8,587.86	8,592.23	30.42	21.93	146.79	59.94	-75.76	109.78	57.53	52.25	2.101	
8,700.00	8,692.45	8,687.26	8,691.63	30.78	22.10	148.77	60.67	-75.61	117.79	65.03	52.76	2.232	
8,800.00	8,792.07	8,786.63	8,790.99	31.13	22.27	150.38	62.10	-75.44	126.08	72.80	53.28	2.366	
8,900.00	8,891.69	8,885.81	8,890.17	31.49	22.45	152.14	62.72	-74.67	134.72	80.91	53.81	2.504	
9,000.00	8,991.31	8,984.78	8,989.12	31.85	22.63	154.13	62.48	-73.10	143.80	89.47	54.34	2.647	
9,100.00	9,090.93	9,083.53	9,087.84	32.21	22.83	156.00	62.12	-71.01	153.48	98.61	54.87	2.797	
9,200.00	9,190.55	9,183.28	9,187.67	32.57	23.02	157.64	61.93	-68.65	163.59	108.17	55.41	2.952	
9,300.00	9,290.17	9,283.18	9,287.45	32.93	23.22	158.78	62.38	-67.18	173.21	117.25	55.96	3.095	
9,400.00	9,389.79	9,382.03	9,386.29	33.29	23.42	159.70	63.20	-65.65	183.10	126.59	56.51	3.240	
9,500.00	9,489.41	9,481.30	9,485.54	33.65	23.62	160.47	64.29	-63.93	193.29	136.23	57.06	3.388	
9,600.00	9,589.03	9,580.85	9,585.07	34.01	23.83	161.11	65.52	-62.28	203.49	145.88	57.61	3.532	
9,700.00	9,688.65	9,680.68	9,684.88	34.37	24.04	161.69	66.77	-60.73	213.62	155.44	58.18	3.672	
9,800.00	9,788.27	9,780.63	9,784.82	34.73	24.25	162.28	67.70	-59.29	223.56	164.81	58.74	3.806	
9,900.00	9,887.89	9,879.39	9,883.56	35.09	24.47	162.89	68.36	-57.79	233.53	174.22	59.31	3.938	
10,000.00	9,987.51	9,977.84	9,981.99	35.46	24.69	163.51	68.88	-55.82	243.92	184.05	59.87	4.074	
10,095.50	10,082.64	10,074.91	10,079.04	35.80	24.91	164.14	69.00	-53.96	253.71	193.27	60.44	4.198	
10,100.00	10,087.13	10,079.50	10,083.63	35.82	24.92	157.98	68.99	-53.89	254.15	193.68	60.46	4.203	
10,125.00	10,112.01	10,104.98	10,109.11	35.91	24.98	129.20	68.92	-53.54	256.32	195.71	60.61	4.229	
10,150.00	10,136.82	10,130.37	10,134.50	36.00	25.04	112.55	68.81	-53.24	258.12	197.36	60.76	4.248	
10,175.00	10,161.47	10,155.61	10,159.74	36.09	25.10	103.69	68.65	-53.00	259.57	198.66	60.91	4.262	
10,200.00	10,185.91	10,180.61	10,184.74	36.18	25.16	98.90	68.46	-52.81	260.74	199.68	61.05	4.271	
10,225.00	10,210.06	10,204.87	10,208.99	36.27	25.21	96.35	68.25	-52.65	261.72	200.52	61.20	4.277	
10,250.00	10,233.86	10,228.87	10,232.99	36.36	25.27	95.21	68.04	-52.52	262.61	201.27	61.34	4.281	
10,275.00	10,257.25	10,252.44	10,256.56	36.44	25.33	94.98	67.81	-52.42	263.51	202.04	61.47	4.287	
10,300.00	10,280.16	10,275.50	10,279.62	36.52	25.38	95.40	67.58	-52.34	264.56	202.95	61.61	4.294	
10,325.00	10,302.53	10,298.00	10,302.11	36.60	25.43	96.27	67.34	-52.28	265.87	204.13	61.74	4.306	
10,350.00	10,324.29	10,319.86	10,323.98	36.68	25.48	97.47	67.10	-52.24	267.59	205.72	61.87	4.325	
10,375.00	10,345.39	10,341.03	10,345.15	36.75	25.53	98.88	66.86	-52.23	269.87	207.88	61.99	4.353	
10,400.00	10,365.76	10,361.46	10,365.57	36.82	25.58	100.40	66.61	-52.23	272.85	210.74	62.11	4.393	
10,425.00	10,385.36	10,381.16	10,385.28	36.89	25.63	101.98	66.37	-52.25	276.67	214.43	62.23	4.446	
10,450.00	10,404.13	10,400.03	10,404.14	36.95	25.67	103.52	66.15	-52.29	281.44	219.10	62.35	4.514	
10,475.00	10,422.02	10,418.00	10,422.11	37.01	25.72	104.98	65.95	-52.34	287.29	224.83	62.45	4.600	
10,500.00	10,438.97	10,435.03	10,439.14	37.07	25.76	106.29	65.76	-52.41	294.29	231.73	62.56	4.704	
10,525.00	10,454.95	10,451.07	10,455.17	37.13	25.79	107.40	65.58	-52.49	302.51	239.85	62.65	4.828	
10,550.00	10,469.91	10,466.07	10,470.18	37.18	25.83	108.28	65.43	-52.57	311.98	249.24	62.74	4.972	
10,575.00	10,483.80	10,479.99	10,484.10	37.24	25.86	108.89	65.28	-52.66	322.73	259.90	62.83	5.137	
10,600.00	10,496.60	10,492.80	10,496.91	37.29	25.89	109.20	65.15	-52.75	334.72	271.82	62.90	5.321	
10,625.00	10,508.25	10,504.46	10,508.56	37.35	25.92	109.17	65.04	-52.84	347.93	284.96	62.97	5.525	
10,650.00	10,518.74	10,514.93	10,519.03	37.41	25.95	108.77	64.93	-52.92	362.29	299.26	63.03	5.748	
10,675.00	10,528.04	10,524.18	10,528.29	37.47	25.97	107.98	64.85	-53.00	377.75	314.67	63.08	5.989	
10,700.00	10,536.11	10,532.19	10,536.30	37.53	25.99	106.75	64.77	-53.08	394.20	331.09	63.12	6.245	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - Cim — **Offset Site Error:** 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,725.00	10,542.94	10,538.94	10,543.04	37.59	26.00	105.06	64.71	-53.14	411.58	348.43	63.15	6.517	
10,750.00	10,548.50	10,544.40	10,548.50	37.66	26.02	102.89	64.66	-53.20	429.77	366.59	63.18	6.802	
10,775.00	10,552.79	10,548.55	10,552.65	37.72	26.03	100.19	64.62	-53.24	448.68	385.48	63.20	7.100	
10,800.00	10,555.79	10,551.39	10,555.49	37.78	26.03	96.97	64.59	-53.27	468.21	405.00	63.21	7.407	
10,825.00	10,557.49	10,552.90	10,557.00	37.84	26.04	93.23	64.58	-53.28	488.25	425.03	63.22	7.724	
10,850.13	10,557.88	10,553.07	10,557.17	37.91	26.04	88.98	64.58	-53.29	508.80	445.59	63.22	8.049	
10,900.00	10,557.36	10,552.08	10,556.18	38.04	26.03	88.79	64.59	-53.28	550.68	487.47	63.21	8.712	
11,000.00	10,556.31	10,550.09	10,554.19	38.35	26.03	88.39	64.61	-53.26	638.12	574.91	63.21	10.095	
11,100.00	10,555.27	10,548.10	10,552.20	38.70	26.02	87.99	64.62	-53.23	728.78	665.58	63.21	11.530	
11,200.00	10,554.22	10,546.09	10,550.19	39.11	26.02	87.59	64.64	-53.21	821.62	758.41	63.21	12.998	
11,300.00	10,553.18	10,544.08	10,548.18	39.56	26.02	87.19	64.66	-53.19	915.95	852.74	63.21	14.490	
11,400.00	10,552.13	10,542.07	10,546.17	40.06	26.01	86.79	64.68	-53.17	1,011.38	948.16	63.22	15.998	
11,500.00	10,551.09	10,540.04	10,544.14	40.61	26.01	86.39	64.70	-53.15	1,107.60	1,044.38	63.22	17.519	
11,600.00	10,550.04	10,538.01	10,542.11	41.19	26.00	85.99	64.72	-53.13	1,204.44	1,141.21	63.23	19.048	
11,700.00	10,548.99	10,535.97	10,540.07	41.82	26.00	85.59	64.74	-53.11	1,301.75	1,238.51	63.24	20.584	
11,800.00	10,547.95	10,533.93	10,538.03	42.49	25.99	85.18	64.75	-53.09	1,399.44	1,336.19	63.25	22.125	
11,900.00	10,546.90	10,531.87	10,535.97	43.20	25.99	84.78	64.77	-53.08	1,497.43	1,434.17	63.26	23.670	
12,000.00	10,545.86	10,529.81	10,533.91	43.95	25.98	84.37	64.79	-53.06	1,595.67	1,532.40	63.27	25.218	
12,100.00	10,544.81	10,527.74	10,531.85	44.73	25.98	83.96	64.81	-53.04	1,694.12	1,630.83	63.29	26.768	
12,200.00	10,543.77	10,525.67	10,529.77	45.54	25.97	83.55	64.83	-53.02	1,792.73	1,729.42	63.30	28.320	
12,300.00	10,542.72	10,523.59	10,527.69	46.38	25.97	83.14	64.85	-53.00	1,891.48	1,828.17	63.32	29.873	
12,400.00	10,541.67	10,521.50	10,525.60	47.25	25.96	82.74	64.87	-52.98	1,990.36	1,927.03	63.34	31.426	
12,500.00	10,540.63	10,519.40	10,523.50	48.15	25.96	82.32	64.89	-52.96	2,089.34	2,025.99	63.35	32.980	
12,600.00	10,539.58	10,517.29	10,521.40	49.07	25.95	81.91	64.91	-52.94	2,188.42	2,125.05	63.37	34.533	
12,700.00	10,538.54	10,515.18	10,519.28	50.02	25.95	81.50	64.93	-52.93	2,287.57	2,224.18	63.39	36.087	
12,800.00	10,537.49	10,513.06	10,517.16	51.00	25.94	81.09	64.95	-52.91	2,386.79	2,323.38	63.41	37.640	
12,900.00	10,536.45	10,510.93	10,515.03	51.99	25.94	80.68	64.97	-52.89	2,486.07	2,422.64	63.43	39.192	
13,000.00	10,535.40	10,508.80	10,512.90	53.01	25.93	80.27	64.99	-52.87	2,585.41	2,521.95	63.46	40.743	
13,100.00	10,534.35	10,506.65	10,510.76	54.04	25.93	79.85	65.02	-52.85	2,684.79	2,621.31	63.48	42.294	
13,200.00	10,533.31	10,504.50	10,508.60	55.10	25.92	79.44	65.04	-52.84	2,784.22	2,720.71	63.50	43.843	
13,300.00	10,532.26	10,502.34	10,506.45	56.17	25.92	79.02	65.06	-52.82	2,883.68	2,820.15	63.53	45.391	
13,400.00	10,531.22	10,500.17	10,504.28	57.25	25.91	78.61	65.08	-52.80	2,983.18	2,919.62	63.56	46.937	
13,500.00	10,530.17	10,498.00	10,502.10	58.36	25.91	78.19	65.10	-52.79	3,082.71	3,019.13	63.58	48.482	
13,600.00	10,529.13	10,495.82	10,499.92	59.48	25.90	77.78	65.12	-52.77	3,182.27	3,118.65	63.61	50.025	
13,700.00	10,528.08	10,493.63	10,497.73	60.61	25.90	77.36	65.14	-52.75	3,281.85	3,218.21	63.64	51.567	
13,800.00	10,527.03	10,491.43	10,495.53	61.75	25.89	76.95	65.17	-52.74	3,381.46	3,317.78	63.67	53.107	
13,900.00	10,525.99	10,489.22	10,493.32	62.91	25.89	76.53	65.19	-52.72	3,481.08	3,417.38	63.70	54.644	
14,000.00	10,524.94	10,487.00	10,491.11	64.08	25.88	76.12	65.21	-52.71	3,580.73	3,516.99	63.74	56.180	
14,100.00	10,523.90	10,484.78	10,488.89	65.26	25.87	75.70	65.23	-52.69	3,680.40	3,616.63	63.77	57.713	
14,200.00	10,522.85	10,482.55	10,486.65	66.45	25.87	75.29	65.26	-52.67	3,780.08	3,716.27	63.80	59.245	
14,300.00	10,521.81	10,480.31	10,484.41	67.65	25.86	74.87	65.28	-52.66	3,879.78	3,815.94	63.84	60.774	
14,400.00	10,520.76	10,478.06	10,482.17	68.86	25.86	74.46	65.30	-52.64	3,979.49	3,915.61	63.88	62.300	
14,500.00	10,519.71	10,475.80	10,479.91	70.08	25.85	74.04	65.33	-52.63	4,079.21	4,015.30	63.91	63.824	
14,600.00	10,518.67	10,473.54	10,477.65	71.31	25.85	73.63	65.35	-52.62	4,178.95	4,114.99	63.95	65.346	
14,700.00	10,517.62	10,471.27	10,475.37	72.54	25.84	73.21	65.37	-52.60	4,278.69	4,214.70	63.99	66.865	
14,800.00	10,516.58	10,468.98	10,473.09	73.78	25.84	72.80	65.40	-52.59	4,378.45	4,314.42	64.03	68.381	
14,900.00	10,515.53	10,466.69	10,470.80	75.03	25.83	72.39	65.42	-52.57	4,478.22	4,414.15	64.07	69.895	
15,000.00	10,514.49	10,464.39	10,468.50	76.29	25.83	71.97	65.44	-52.56	4,577.99	4,513.88	64.11	71.406	
15,100.00	10,513.44	10,462.09	10,466.19	77.56	25.82	71.56	65.47	-52.55	4,677.78	4,613.62	64.15	72.914	
15,200.00	10,512.40	10,459.77	10,463.88	78.83	25.82	71.15	65.49	-52.53	4,777.57	4,713.37	64.20	74.419	
15,300.00	10,511.35	10,457.44	10,461.55	80.10	25.81	70.73	65.52	-52.52	4,877.37	4,813.13	64.24	75.921	
15,400.00	10,510.30	10,455.11	10,459.22	81.38	25.80	70.32	65.54	-52.51	4,977.18	4,912.89	64.29	77.420	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - Cim

Offset Site Error: 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,500.00	10,509.26	10,452.77	10,456.88	82.67	25.80	69.91	65.57	-52.49	5,076.99	5,012.66	64.33	78.916	
15,528.47	10,508.96	10,452.10	10,456.21	83.04	25.80	69.79	65.57	-52.49	5,105.42	5,041.07	64.35	79.341	

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - ST

Offset Site Error: 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG, 10499-MWD - OSWG

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	6.00	0.00	0.00	-71.99	29.30	-90.10	94.93				
100.00	100.00	93.81	99.81	0.12	0.13	-71.82	29.60	-90.10	94.84	94.58	0.26	367.935	
200.00	200.00	193.72	199.71	0.48	0.41	-71.33	30.45	-90.10	95.11	94.21	0.89	106.384	
300.00	300.00	293.68	299.67	0.84	0.77	-70.76	31.44	-90.10	95.43	93.82	1.61	59.381	
400.00	400.00	393.64	399.62	1.20	1.12	-70.14	32.55	-90.10	95.80	93.48	2.32	41.292	
500.00	500.00	493.59	499.57	1.56	1.48	-69.46	33.76	-90.10	96.22	93.19	3.03	31.725	
600.00	600.00	593.55	599.52	1.92	1.83	-68.72	35.08	-90.10	96.69	92.85	3.74	25.819	
700.00	700.00	693.51	699.47	2.27	2.19	-67.95	36.50	-90.10	97.21	92.76	4.46	21.814	
800.00	800.00	793.46	799.41	2.63	2.54	-67.13	38.01	-90.10	97.79	92.62	5.17	18.923	
900.00	900.00	893.41	899.35	2.99	2.89	-66.27	39.60	-90.10	98.42	92.54	5.88	16.741	
1,000.00	1,000.00	1,006.64	999.28	3.35	3.29	-65.38	41.30	-90.10	99.12	92.48	6.64	14.934	
1,100.00	1,100.00	1,093.34	1,099.25	3.71	3.60	-64.47	43.04	-90.10	99.86	92.56	7.30	13.678	
1,200.00	1,200.00	1,193.33	1,199.22	4.07	3.95	-63.57	44.79	-90.10	100.62	92.61	8.01	12.561	
1,300.00	1,300.00	1,293.31	1,299.19	4.43	4.30	-62.69	46.53	-90.10	101.41	92.69	8.72	11.629	
1,400.00	1,400.00	1,393.30	1,399.16	4.78	4.66	-61.82	48.28	-90.10	102.22	92.79	9.43	10.840	
1,500.00	1,500.00	1,493.28	1,499.13	5.14	5.01	-60.96	50.02	-90.10	103.06	92.92	10.14	10.164	
1,600.00	1,600.00	1,593.27	1,599.10	5.50	5.36	-60.12	51.77	-90.10	103.92	93.07	10.85	9.579	
1,700.00	1,700.00	1,693.25	1,699.07	5.86	5.71	-59.29	53.51	-90.10	104.80	93.24	11.56	9.069	
1,800.00	1,800.00	1,793.24	1,799.04	6.22	6.06	-58.48	55.26	-90.10	105.70	93.43	12.26	8.618	
1,900.00	1,900.00	1,893.22	1,899.01	6.58	6.41	-57.68	57.00	-90.10	106.62	93.65	12.97	8.219	
2,000.00	2,000.00	1,993.27	1,999.04	6.93	6.76	-56.92	58.70	-90.10	107.54	93.86	13.68	7.861	
2,100.00	2,100.00	2,093.32	2,099.07	7.29	7.10	-56.21	60.29	-90.10	108.41	94.03	14.39	7.535	
2,200.00	2,200.00	2,193.37	2,199.12	7.65	7.45	-55.57	61.77	-90.10	109.24	94.15	15.10	7.237	
2,300.00	2,300.00	2,293.43	2,299.17	8.01	7.80	-54.98	63.14	-90.10	110.03	94.22	15.80	6.962	
2,400.00	2,400.00	2,393.43	2,399.16	8.37	8.15	-54.42	64.45	-90.10	110.78	94.27	16.51	6.710	
2,500.00	2,500.00	2,493.42	2,499.14	8.73	8.50	-53.88	65.76	-90.10	111.55	94.33	17.22	6.479	
2,600.00	2,600.00	2,593.41	2,599.12	9.09	8.85	-53.34	67.07	-90.10	112.33	94.40	17.93	6.266	
2,700.00	2,700.00	2,693.40	2,699.10	9.44	9.20	-52.80	68.38	-90.10	113.11	94.48	18.63	6.070	
2,800.00	2,800.00	2,793.40	2,799.09	9.80	9.55	-52.28	69.69	-90.10	113.91	94.57	19.34	5.889	
2,900.00	2,900.00	2,893.33	2,899.01	10.16	9.89	-51.75	71.03	-90.10	114.74	94.69	20.05	5.723	
3,000.00	3,000.00	2,993.25	2,998.92	10.52	10.24	-51.19	72.47	-90.10	115.63	94.88	20.76	5.571	
3,100.00	3,100.00	3,093.17	3,098.83	10.88	10.59	-50.60	74.00	-90.10	116.60	95.14	21.46	5.432	
3,200.00	3,200.00	3,193.09	3,198.74	11.24	10.94	-49.99	75.62	-90.10	117.64	95.46	22.17	5.305	
3,300.00	3,300.00	3,293.02	3,298.65	11.59	11.29	-49.36	77.33	-90.10	118.74	95.86	22.88	5.190	
3,400.00	3,400.00	3,393.00	3,398.62	11.95	11.64	-48.73	79.07	-90.10	119.89	96.30	23.59	5.082	
3,500.00	3,500.00	3,492.99	3,498.59	12.31	11.99	-48.11	80.82	-90.10	121.04	96.75	24.30	4.982	
3,600.00	3,600.00	3,592.97	3,598.56	12.67	12.34	-47.50	82.56	-90.10	122.22	97.21	25.01	4.888	
3,700.00	3,700.00	3,692.96	3,698.53	13.03	12.69	-46.90	84.31	-90.10	123.40	97.69	25.71	4.799	
3,800.00	3,800.00	3,792.94	3,798.50	13.39	13.04	-46.32	86.05	-90.10	124.60	98.18	26.42	4.716	
3,900.00	3,900.00	3,892.93	3,898.47	13.75	13.39	-45.74	87.80	-90.10	125.81	98.68	27.13	4.637	
4,000.00	4,000.00	3,992.91	3,998.44	14.10	13.74	-45.18	89.54	-90.10	127.04	99.20	27.84	4.563	
4,100.00	4,100.00	4,092.89	4,098.41	14.46	14.09	-44.62	91.29	-90.10	128.27	99.73	28.55	4.493	
4,200.00	4,200.00	4,192.88	4,198.38	14.82	14.44	-44.08	93.03	-90.10	129.52	100.27	29.26	4.427	
4,300.00	4,300.00	4,292.92	4,298.41	15.18	14.79	-43.56	94.76	-90.10	130.77	100.80	29.97	4.364	
4,400.00	4,400.00	4,393.01	4,398.48	15.54	15.14	-43.07	96.39	-90.10	131.95	101.28	30.67	4.302	
4,500.00	4,500.00	4,493.10	4,498.55	15.90	15.49	-42.62	97.92	-90.10	133.07	101.69	31.38	4.240	
4,600.00	4,600.00	4,593.19	4,598.64	16.25	15.84	-42.21	99.35	-90.10	134.13	102.03	32.09	4.179	
4,700.00	4,700.00	4,693.28	4,698.72	16.61	16.19	-41.83	100.67	-90.10	135.11	102.31	32.80	4.119	
4,800.00	4,800.00	4,792.75	4,798.18	16.97	16.54	-41.37	102.31	-90.10	136.34	102.83	33.51	4.069	
4,900.00	4,900.00	4,892.38	4,897.78	17.33	16.89	-40.83	104.25	-90.10	137.81	103.60	34.21	4.028	
5,000.00	5,000.00	4,991.99	4,997.37	17.69	17.24	-40.22	106.54	-90.10	139.56	104.64	34.92	3.996	
5,100.00	5,100.00	5,091.84	5,097.28	18.05	17.59	-39.55	109.09	-90.10	141.51	105.88	35.63	3.972	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - ST — **Offset Site Error:** 0.00 usft

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG, 10499-MWD - OSWG — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.00	5,200.00	5,192.16	5,197.48	18.41	17.94	-38.95	111.47	-90.10	143.36	107.01	36.34	3.945	
5,300.00	5,300.00	5,292.39	5,297.68	18.76	18.29	-38.41	113.63	-90.10	145.03	107.98	37.05	3.914	
5,400.00	5,400.00	5,392.63	5,397.91	19.12	18.64	-37.94	115.56	-90.10	146.55	108.79	37.76	3.881	
5,500.00	5,500.00	5,495.85	5,501.12	19.48	18.88	-37.61	116.59	-89.82	147.18	108.83	38.35	3.838	
5,600.00	5,600.00	5,597.95	5,603.20	19.84	18.98	-37.60	115.08	-88.63	145.29	106.50	38.80	3.745	
5,700.00	5,700.00	5,697.63	5,702.86	20.20	18.99	-37.66	113.34	-87.47	143.20	104.03	39.17	3.656	
5,800.00	5,800.00	5,797.74	5,802.95	20.56	19.01	-37.73	111.67	-86.39	141.22	101.67	39.54	3.571	
5,900.00	5,900.00	5,898.12	5,903.30	20.92	19.03	-37.80	109.78	-85.17	138.99	99.06	39.92	3.481	
6,000.00	6,000.00	5,998.12	6,003.27	21.27	19.06	-37.88	107.77	-83.82	136.57	96.25	40.31	3.388	
6,100.00	6,100.00	6,097.98	6,103.11	21.63	19.10	-37.89	105.69	-82.40	134.21	93.50	40.71	3.297	
6,200.00	6,200.00	6,197.94	6,203.04	21.99	19.14	-37.87	104.10	-80.95	131.91	90.79	41.11	3.208	
6,300.00	6,300.00	6,297.91	6,302.99	22.35	19.19	-37.86	102.29	-79.52	129.60	88.08	41.52	3.121	
6,400.00	6,400.00	6,398.16	6,403.20	22.71	19.25	-37.91	100.33	-78.13	127.20	85.26	41.94	3.033	
6,500.00	6,500.00	6,498.41	6,503.41	23.07	19.32	-38.05	98.06	-76.75	124.57	82.22	42.36	2.941	
6,550.50	6,550.50	6,548.74	6,553.73	23.25	19.35	-38.17	96.85	-76.13	123.23	80.65	42.58	2.894	
6,600.00	6,600.00	6,598.10	6,603.07	23.42	19.39	51.85	95.64	-75.62	121.69	78.91	42.79	2.844	
6,700.00	6,699.93	6,697.77	6,702.70	23.76	19.46	52.79	93.14	-74.67	117.13	73.93	43.20	2.711	
6,800.50	6,800.18	6,797.83	6,802.73	24.11	19.55	55.17	90.59	-74.40	110.66	67.03	43.63	2.536	
6,900.00	6,899.30	6,896.87	6,901.74	24.45	19.64	58.40	88.03	-74.14	103.60	59.54	44.06	2.351	
7,000.00	6,998.92	6,996.54	7,001.38	24.79	19.73	62.12	85.39	-73.84	96.81	52.31	44.50	2.176	
7,100.00	7,098.54	7,096.20	7,101.00	25.14	19.83	66.43	82.68	-73.43	90.38	45.44	44.94	2.011	
7,200.00	7,198.16	7,195.85	7,200.60	25.48	19.94	71.39	79.87	-72.94	84.42	39.02	45.40	1.860	
7,300.00	7,297.78	7,295.33	7,300.04	25.83	20.05	77.03	76.99	-72.43	79.10	33.24	45.86	1.725	
7,400.00	7,397.40	7,394.67	7,399.54	26.18	20.17	83.27	74.21	-72.13	74.78	28.45	46.33	1.614	
7,500.00	7,497.02	7,494.56	7,499.19	26.53	20.30	90.23	71.28	-71.76	71.31	24.51	46.80	1.524	
7,600.00	7,596.64	7,594.07	7,598.65	26.88	20.43	97.92	68.22	-71.23	68.88	21.60	47.28	1.457	Level 3
7,700.00	7,696.26	7,693.44	7,697.97	27.23	20.56	106.26	65.25	-70.34	67.97	20.20	47.77	1.423	Level 3
7,704.50	7,700.74	7,697.91	7,702.44	27.25	20.57	106.65	65.12	-70.29	67.96	20.17	47.79	1.422	Level 3, CC, ES, SF
7,800.00	7,795.88	7,792.98	7,797.47	27.58	20.71	114.62	62.41	-69.45	68.65	20.39	48.26	1.422	Level 3
7,900.00	7,895.50	7,892.78	7,897.23	27.93	20.85	121.90	59.78	-69.53	70.43	21.68	48.75	1.445	Level 3
8,000.00	7,995.12	7,991.89	7,996.32	28.29	21.00	127.96	57.76	-70.31	73.32	24.07	49.25	1.489	Level 3
8,100.00	8,094.74	8,091.09	8,095.51	28.64	21.15	132.78	56.95	-71.33	77.69	27.95	49.74	1.562	
8,200.00	8,194.36	8,191.12	8,195.53	29.00	21.30	136.72	56.59	-72.65	82.66	32.42	50.24	1.645	
8,300.00	8,293.98	8,290.06	8,294.46	29.35	21.45	139.96	56.64	-73.97	88.21	37.47	50.74	1.739	
8,400.00	8,393.60	8,389.04	8,393.43	29.71	21.61	142.36	57.79	-75.08	94.86	43.62	51.24	1.851	
8,500.00	8,493.22	8,488.49	8,492.88	30.06	21.77	144.53	59.10	-75.73	102.13	50.39	51.74	1.974	
8,600.00	8,592.84	8,587.86	8,592.23	30.42	21.93	146.79	59.94	-75.76	109.78	57.53	52.25	2.101	
8,700.00	8,692.45	8,687.26	8,691.63	30.78	22.10	148.77	60.87	-75.61	117.79	65.03	52.76	2.232	
8,800.00	8,792.07	8,786.63	8,790.99	31.13	22.27	150.38	62.10	-75.44	126.08	72.80	53.28	2.366	
8,900.00	8,891.69	8,885.81	8,890.17	31.49	22.45	152.14	62.72	-74.67	134.72	80.91	53.81	2.504	
9,000.00	8,991.31	8,984.78	8,989.12	31.85	22.63	154.13	62.48	-73.10	143.80	89.47	54.34	2.647	
9,100.00	9,090.93	9,083.53	9,087.84	32.21	22.83	156.00	62.12	-71.01	153.48	98.61	54.87	2.797	
9,200.00	9,190.55	9,183.28	9,187.57	32.57	23.02	157.64	61.93	-68.65	163.59	108.17	55.41	2.952	
9,300.00	9,290.17	9,283.18	9,287.45	32.93	23.22	158.78	62.38	-67.18	173.21	117.25	55.96	3.095	
9,400.00	9,389.79	9,382.03	9,386.29	33.29	23.42	159.70	63.20	-65.65	183.10	126.59	56.51	3.240	
9,500.00	9,489.41	9,481.30	9,485.54	33.65	23.62	160.47	64.29	-63.93	193.29	136.23	57.06	3.388	
9,600.00	9,589.03	9,580.85	9,585.07	34.01	23.83	161.11	65.52	-62.28	203.49	145.88	57.61	3.532	
9,700.00	9,688.65	9,680.68	9,684.88	34.37	24.04	161.69	66.77	-60.73	213.62	155.44	58.18	3.672	
9,800.00	9,788.27	9,780.63	9,784.82	34.73	24.25	162.28	67.70	-59.29	223.56	164.81	58.74	3.806	
9,900.00	9,887.89	9,879.39	9,883.56	35.09	24.47	162.89	68.36	-57.79	233.53	174.22	59.31	3.938	
10,000.00	9,987.51	9,977.84	9,981.99	35.46	24.69	163.51	68.86	-55.82	243.92	184.05	59.87	4.074	
10,095.50	10,082.64	10,074.91	10,079.04	35.80	24.91	164.14	69.00	-53.96	253.71	193.27	60.44	4.198	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - ST

Survey Program: 130-GYRO-NS, 5549-MWD - OSWG, 10499-MWD - OSWG

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,100.00	10,087.13	10,079.50	10,083.63	35.82	24.92	157.98	68.99	-53.89	254.15	193.68	60.46	4.203	
10,125.00	10,112.01	10,104.98	10,109.11	35.91	24.98	129.20	68.92	-53.54	256.32	195.71	60.61	4.229	
10,150.00	10,136.82	10,130.37	10,134.50	36.00	25.04	112.55	68.81	-53.24	258.12	197.36	60.76	4.248	
10,175.00	10,161.47	10,155.61	10,159.74	36.09	25.10	103.69	68.65	-53.00	259.57	198.66	60.91	4.262	
10,200.00	10,185.91	10,180.61	10,184.74	36.18	25.16	98.90	68.46	-52.81	260.74	199.68	61.05	4.271	
10,225.00	10,210.06	10,204.87	10,208.99	36.27	25.21	96.35	68.25	-52.65	261.72	200.52	61.20	4.277	
10,250.00	10,233.86	10,228.87	10,232.99	36.36	25.27	95.21	68.04	-52.52	262.61	201.27	61.34	4.281	
10,275.00	10,257.25	10,252.44	10,256.56	36.44	25.33	94.98	67.81	-52.42	263.51	202.04	61.47	4.287	
10,300.00	10,280.16	10,275.50	10,279.62	36.52	25.38	95.40	67.58	-52.34	264.56	202.95	61.61	4.294	
10,325.00	10,302.53	10,298.00	10,302.11	36.60	25.43	96.27	67.34	-52.28	265.87	204.13	61.74	4.306	
10,350.00	10,324.29	10,319.86	10,323.98	36.68	25.48	97.47	67.10	-52.24	267.59	205.72	61.87	4.325	
10,375.00	10,345.39	10,341.03	10,345.15	36.75	25.53	98.88	66.86	-52.23	269.87	207.88	61.99	4.353	
10,400.00	10,365.76	10,361.46	10,365.57	36.82	25.58	100.40	66.61	-52.23	272.85	210.74	62.11	4.393	
10,425.00	10,385.36	10,381.07	10,385.18	36.89	25.63	101.97	66.37	-52.25	276.67	214.44	62.23	4.446	
10,450.00	10,404.13	10,400.18	10,404.27	36.95	25.63	103.43	66.83	-52.15	281.43	219.13	62.30	4.517	
10,475.00	10,422.02	10,419.07	10,423.17	37.01	25.65	104.90	67.44	-52.04	287.18	224.79	62.39	4.603	
10,500.00	10,438.97	10,437.64	10,441.72	37.07	25.68	106.30	68.34	-51.89	293.96	231.48	62.48	4.705	
10,525.00	10,454.95	10,455.88	10,459.90	37.13	25.70	107.59	69.54	-51.70	301.80	239.24	62.56	4.824	
10,550.00	10,469.91	10,473.69	10,477.87	37.18	25.72	108.75	70.99	-51.48	310.70	248.07	62.64	4.960	
10,575.00	10,483.80	10,491.09	10,494.98	37.24	25.74	109.76	72.69	-51.22	320.68	257.97	62.71	5.114	
10,600.00	10,496.60	10,508.33	10,512.10	37.29	25.76	110.64	74.67	-50.91	331.71	268.96	62.75	5.286	
10,625.00	10,508.25	10,525.75	10,529.34	37.35	25.76	111.40	77.13	-50.48	343.75	280.97	62.78	5.476	
10,650.00	10,518.74	10,545.80	10,549.08	37.41	25.76	112.40	80.59	-49.84	356.69	293.92	62.77	5.682	
10,675.00	10,528.04	10,568.64	10,571.37	37.47	25.76	113.61	85.49	-49.00	370.36	307.65	62.71	5.906	
10,700.00	10,536.11	10,595.22	10,597.02	37.53	25.77	115.18	92.38	-48.04	384.60	322.03	62.57	6.146	
10,725.00	10,542.94	10,624.19	10,624.81	37.59	25.77	116.90	101.18	-47.24	399.28	336.94	62.34	6.405	
10,750.00	10,548.50	10,642.04	10,641.46	37.66	25.78	117.04	107.08	-46.91	414.54	352.32	62.23	6.662	
10,775.00	10,552.79	10,658.66	10,657.09	37.72	25.78	116.91	112.72	-46.68	430.57	368.46	62.11	6.933	
10,800.00	10,555.79	10,670.05	10,667.79	37.78	25.78	115.92	116.63	-46.54	447.41	385.36	62.05	7.210	
10,825.00	10,557.49	10,680.87	10,677.93	37.84	25.78	114.67	120.38	-46.42	465.04	403.06	61.99	7.502	
10,850.13	10,557.88	10,691.18	10,687.60	37.91	25.78	113.13	123.94	-46.30	483.61	421.60	61.91	7.810	
10,900.00	10,557.36	10,714.36	10,709.31	38.04	25.79	116.60	132.09	-46.19	521.52	459.82	61.69	8.453	
11,000.00	10,556.31	10,821.18	10,806.52	38.35	25.82	129.90	176.11	-48.08	598.96	538.74	60.22	9.946	
11,100.00	10,555.27	11,497.35	11,117.30	38.70	27.79	152.23	731.66	-50.28	635.17	584.64	50.54	12.569	
11,200.00	10,554.22	11,609.40	11,115.83	39.11	28.53	152.11	843.70	-49.87	635.49	584.28	51.21	12.408	
11,300.00	10,553.18	11,717.59	11,113.29	39.56	29.33	152.06	951.85	-50.92	634.27	582.33	51.93	12.213	
11,400.00	10,552.13	11,826.87	11,110.54	40.06	30.24	152.22	1,061.03	-54.69	631.75	579.09	52.66	11.996	
11,500.00	10,551.09	11,931.07	11,107.62	40.61	31.18	152.54	1,165.03	-60.38	628.04	574.68	53.36	11.770	
11,600.00	10,550.04	12,032.67	11,104.69	41.19	32.17	152.90	1,266.38	-66.69	623.94	569.88	54.06	11.541	
11,700.00	10,548.99	12,133.50	11,101.82	41.82	33.21	153.32	1,366.94	-73.48	619.65	564.87	54.78	11.311	
11,800.00	10,547.95	12,235.26	11,099.01	42.49	34.32	153.82	1,468.38	-81.20	615.10	559.58	55.52	11.078	
11,900.00	10,546.90	12,330.74	11,096.35	43.20	35.41	154.25	1,563.58	-87.91	610.82	554.56	56.26	10.857	
12,000.00	10,545.86	12,424.35	11,093.89	43.95	36.51	154.54	1,657.03	-92.67	607.46	550.39	57.07	10.644	
12,100.00	10,544.81	12,519.22	11,091.54	44.73	37.65	154.69	1,751.81	-96.08	605.06	547.06	58.00	10.431	
12,200.00	10,543.77	12,616.11	11,089.05	45.54	38.84	154.71	1,848.66	-97.84	603.27	544.20	59.07	10.213	
12,300.00	10,542.72	12,709.47	11,086.62	46.38	40.01	154.56	1,941.98	-97.57	602.34	542.12	60.22	10.002	
12,338.46	10,542.32	12,745.62	11,085.68	46.71	40.47	154.45	1,978.11	-96.86	602.27	541.55	60.71	9.920	
12,400.00	10,541.67	12,802.24	11,084.21	47.25	41.20	154.22	2,034.68	-95.08	602.47	540.95	61.52	9.793	
12,500.00	10,540.63	12,888.55	11,083.21	48.15	42.31	153.88	2,120.91	-91.57	604.50	541.72	62.79	9.628	
12,600.00	10,539.58	12,993.56	11,083.38	49.07	43.69	153.57	2,225.88	-88.44	607.28	542.96	64.32	9.442	
12,700.00	10,538.54	13,103.64	11,083.31	50.02	45.18	153.53	2,335.95	-88.30	608.58	542.76	65.82	9.246	
12,800.00	10,537.49	13,206.94	11,082.99	51.00	46.61	153.63	2,439.24	-89.91	608.91	541.75	67.16	9.066	

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

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Offset Design Laguna 23 Fed Com - Cimarex Laguna 23 Federal Com 2H - Cimarex Laguna 23 Federal Com 2H - ST

Offset Site Error: 0.00 usft

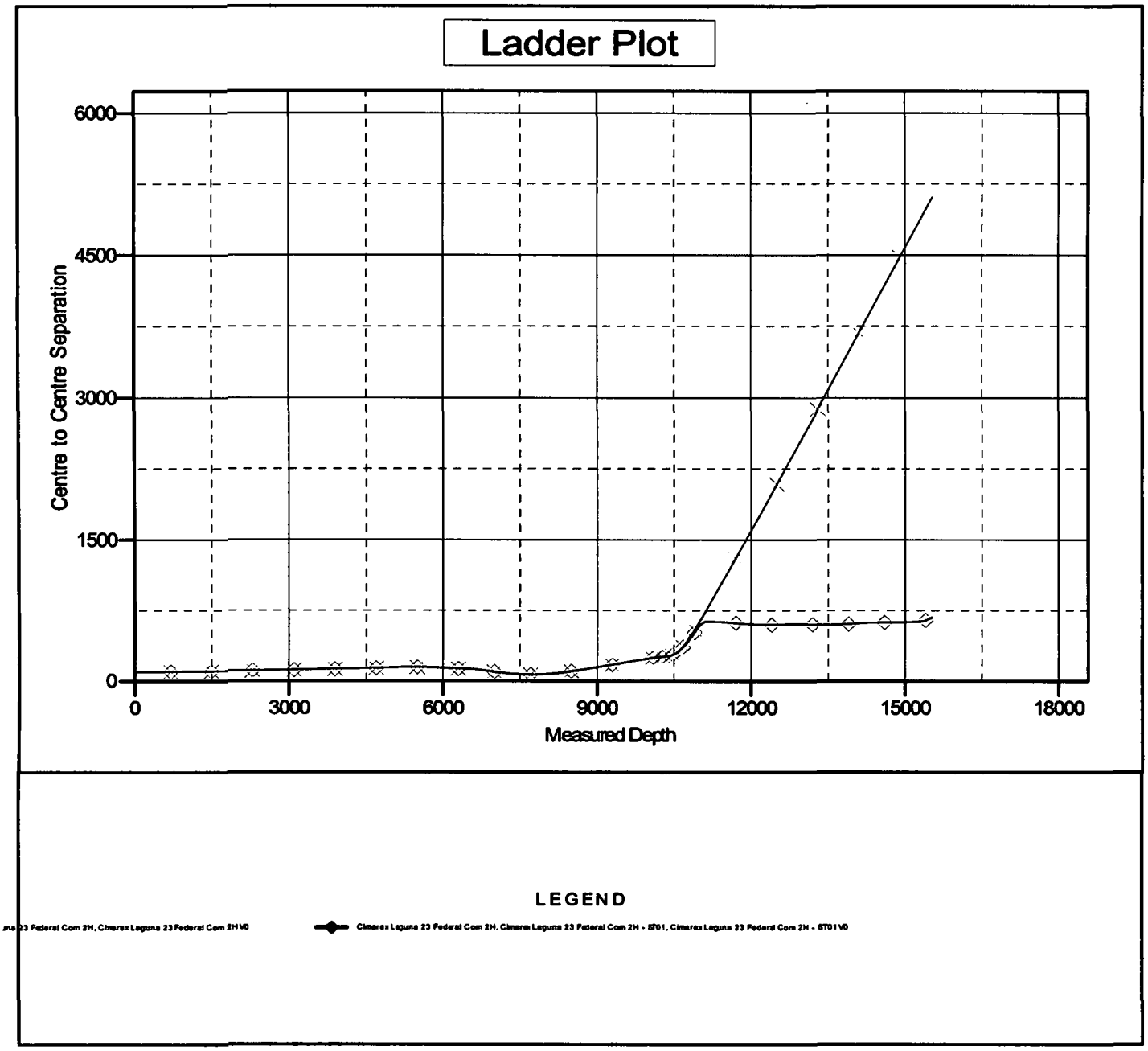
Survey Program: 130-GYRO-NS, 5549-MWD - OSWG, 10499-MWD - OSWG

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,900.00	10,536.45	13,311.69	11,082.39	51.99	48.08	153.77	2,643.95	-92.30	608.69	540.17	68.52	8.883	
13,000.00	10,535.40	13,412.97	11,081.74	53.01	49.53	154.06	2,645.15	-96.28	607.69	537.94	69.75	8.712	
13,100.00	10,534.35	13,512.58	11,081.77	54.04	50.97	154.44	2,744.65	-101.12	606.92	536.02	70.90	8.560	
13,200.00	10,533.31	13,612.72	11,081.67	55.10	52.43	154.82	2,844.67	-105.95	606.05	533.99	72.06	8.410	
13,300.00	10,532.26	13,713.27	11,081.31	56.17	53.91	155.15	2,945.13	-110.28	605.20	531.92	73.28	8.259	
13,400.00	10,531.22	13,809.84	11,080.76	57.25	55.34	155.39	3,041.63	-113.73	604.50	529.89	74.61	8.113	
13,500.00	10,530.17	13,909.57	11,080.66	58.36	56.83	155.70	3,141.28	-117.84	604.25	528.51	75.74	7.978	
13,538.85	10,529.77	13,948.69	11,080.82	58.79	57.38	155.80	3,178.39	-118.93	604.17	527.96	76.22	7.927	
13,600.00	10,529.13	14,003.25	11,080.83	59.48	58.23	155.89	3,234.93	-120.21	604.41	527.43	76.98	7.851	
13,700.00	10,528.08	14,098.30	11,080.84	60.61	59.66	155.89	3,329.97	-120.44	605.61	527.19	78.42	7.723	
13,800.00	10,527.03	14,191.75	11,080.78	61.75	61.05	155.69	3,423.41	-118.50	607.70	527.70	80.01	7.596	
13,900.00	10,525.99	14,293.73	11,080.41	62.91	62.57	155.30	3,525.30	-114.47	610.31	528.36	81.95	7.448	
14,000.00	10,524.94	14,388.37	11,079.20	64.08	63.98	154.73	3,619.75	-108.67	613.05	529.09	83.95	7.302	
14,100.00	10,523.90	14,477.09	11,077.78	65.26	65.29	153.91	3,708.02	-99.93	617.20	531.08	86.12	7.167	
14,200.00	10,522.85	14,573.75	11,076.94	66.45	66.72	152.96	3,804.06	-89.12	622.75	534.12	88.63	7.026	
14,300.00	10,521.81	14,709.70	11,076.25	67.65	68.78	152.45	3,939.83	-83.70	625.37	533.84	91.53	6.832	
14,400.00	10,520.76	14,810.63	11,074.80	68.86	70.35	152.48	4,040.74	-85.04	624.79	531.57	93.22	6.702	
14,406.71	10,520.69	14,816.43	11,074.76	68.94	70.44	152.48	4,046.54	-85.14	624.79	531.47	93.32	6.695	
14,500.00	10,519.71	14,900.87	11,075.07	70.08	71.75	152.58	4,130.97	-86.45	625.63	530.98	94.64	6.610	
14,600.00	10,518.67	15,001.00	11,076.31	71.31	73.32	152.76	4,231.08	-88.34	627.17	531.00	96.17	6.522	
14,700.00	10,517.62	15,104.17	11,077.60	72.54	74.94	153.04	4,334.20	-91.38	628.25	530.61	97.64	6.434	
14,800.00	10,516.58	15,206.60	11,078.97	73.78	76.56	153.39	4,436.53	-95.38	629.00	529.99	99.00	6.353	
14,900.00	10,515.53	15,308.98	11,080.28	75.03	78.18	153.82	4,538.78	-100.30	629.31	529.04	100.27	6.276	
15,000.00	10,514.49	15,406.96	11,081.45	76.29	79.74	154.23	4,636.65	-105.07	629.55	528.08	101.47	6.204	
15,100.00	10,513.44	15,500.53	11,082.36	77.56	81.23	154.48	4,730.16	-107.75	630.50	527.70	102.80	6.133	
15,200.00	10,512.40	15,591.83	11,083.70	78.83	82.68	154.57	4,821.45	-108.70	632.69	528.47	104.22	6.071	
15,300.00	10,511.35	15,689.03	11,085.32	80.10	84.21	154.52	4,918.63	-107.65	635.96	530.00	105.96	6.002	
15,400.00	10,510.30	15,689.00	11,085.32	81.38	84.21	154.52	4,918.60	-107.65	647.06	542.28	104.78	6.176	
15,500.00	10,509.26	15,689.00	11,085.32	82.67	84.21	154.52	4,918.60	-107.65	673.00	570.68	102.32	6.577	
15,528.47	10,508.96	15,689.00	11,085.32	83.04	84.21	154.52	4,918.60	-107.65	682.89	581.44	101.45	6.731	

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to (GE=3680+KB=31) @ 3711.00usft	Coordinates are relative to: Laguna 23 Fed Com 2BS #4H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: 0.43°

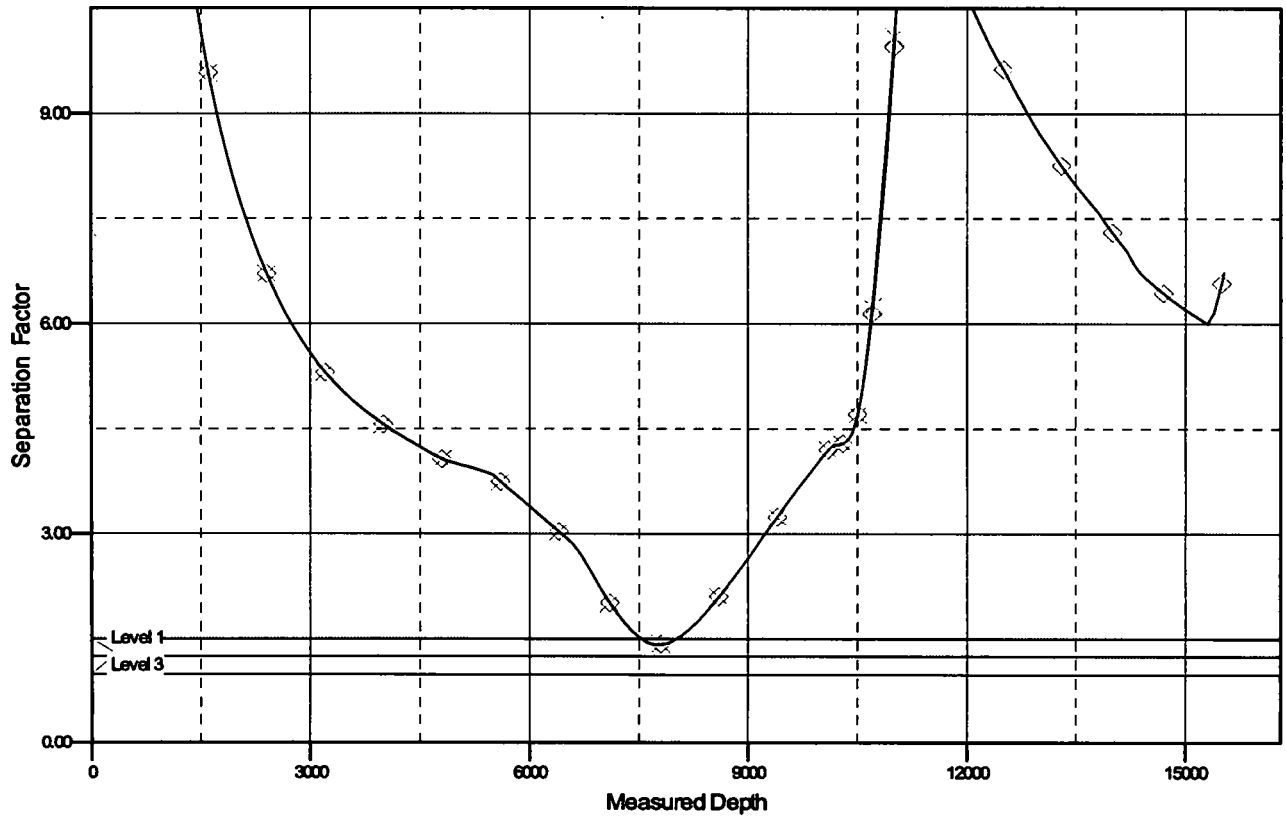


CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Chisholm Energy	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Project:	Lea Co, NM	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Reference Site:	Laguna 23 Fed Com	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Laguna 23 Fed Com 2BS #4H	**Database:**	Gyrodata NWDB
Reference Design:	Design #2	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to (GE=3680+KB=31) @ 3711.00usft	Coordinates are relative to: Laguna 23 Fed Com 2BS #4H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: 0.43°

Separation Factor Plot



LEGEND

Cimarex Laguna 23 Federal Com 2H, Cimarex Laguna 23 Federal Com 2H - ST01, Cimarex Laguna 23 Federal Com 2H - ST01 V0

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

CHISHOLM ENERGY

Chisholm Energy

Lea Co, NM
Laguna 23 Fed Com
Laguna 23 Fed Com 2BS #4H

Laguna 23 Fed Com 2BS #4H

Plan: Design #2

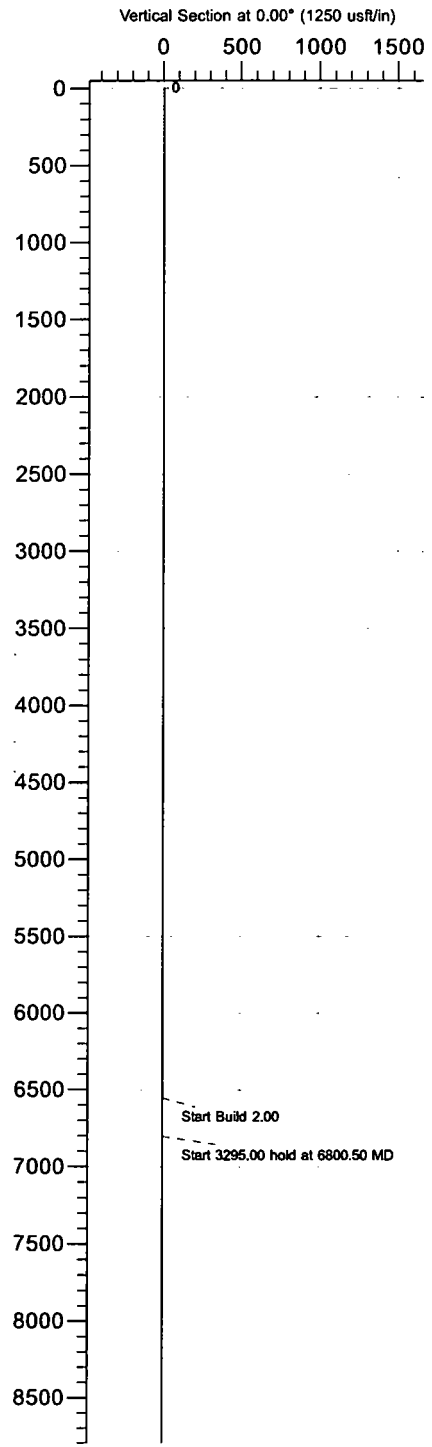
Standard Planning Report

08 October, 2018

gyro|data

CHISHOLM ENERGY

Lea Co, NM
Laguna 23 Fed Com
Laguna 23 Fed Com 2BS #4H
Laguna 23 Fed Com 2BS #4H
Plan: Design #2 (Laguna 23 Fed Com 2BS #4H/Laguna 23 Fed Com 2BS #4H)
(GE=3680+KB=31) @ 3711.00usft



WELLBORE TARGET DETAILS

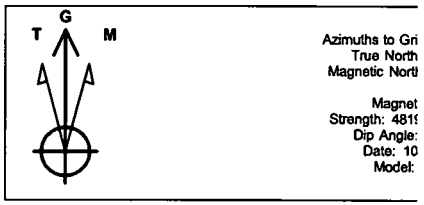
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Laguna 23 Fed Com 2BS #4H - BHL	10508.96	5160.00	-383.10	570416.20	786271.50	Point
Laguna 23 Fed Com 2BS #4H - LP	10559.78	307.70	-342.20	565563.90	786312.40	Point

PROJECT DETAILS: Lea Co, NM

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
North Reference: Grid
System Datum: Mean Sea Level
To convert a Magnetic Direction to a Grid Direction, Add 6.27
To convert a Magnetic Direction to a True Direction, Add 6.70° E
To convert a True Direction to a Grid Direction, Subtract 0.43

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	6550.50	0.00	0.00	6550.50	0.00	0.00	0.00	0.00	0.00	
3	6800.50	5.00	270.00	6800.18	0.00	-10.90	2.00	270.00	0.00	
4	10095.50	5.00	270.00	10082.64	0.00	-298.08	0.00	0.00	0.00	
5	10850.13	90.60	359.52	10557.88	482.07	-344.12	12.00	89.47	482.07	
6	15528.47	90.60	359.52	10508.96	5160.00	-383.10	0.00	0.00	5160.00	Laguna 23 Fed Com 2BS #4H - BHL



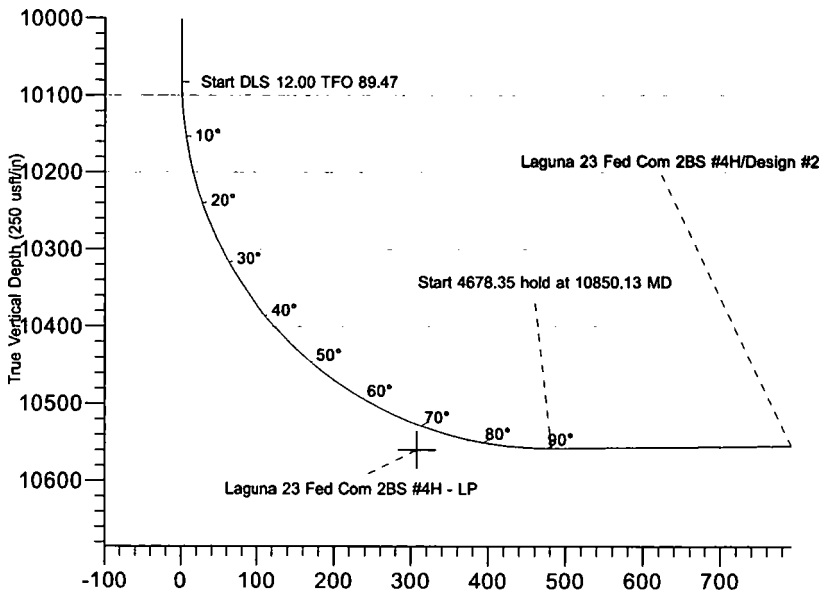
Azimuths to Gri
True North
Magnetic Nort

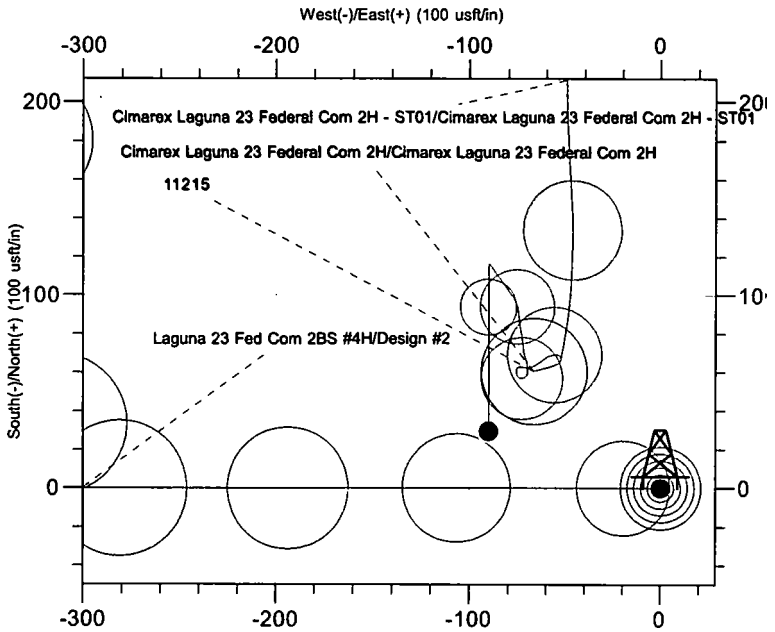
Magnet
Strength: 481
Dip Angle:
Date: 10
Model:

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1589.00	1589.00	Anhy
1954.00	1954.00	Salt
3537.00	3537.00	SS & SH
3830.00	3830.00	Dol & LS
5626.00	5626.00	SS, SLTST, & SH
8527.00	8533.91	LS & SH
9655.00	9666.22	SS, SLTST, & SH
10160.00	10173.50	SS, SLTST, & SH

Notice: Section Lines and Hardlines are estimates only and are subject to customer approval





Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Project	Lea Co, NM		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Laguna 23 Fed Com				
Site Position:		**Northing:**	565,256.20 usft	**Latitude:**	32.551425
From:	Map	**Easting:**	786,654.60 usft	**Longitude:**	-103.537167
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.20 in	**Grid Convergence:**	0.43 °

Well	Laguna 23 Fed Com 2BS #4H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	565,256.20 usft	**Latitude:**	32.551425
	+E/-W	0.00 usft	**Easting:**	786,654.60 usft	**Longitude:**	-103.537167
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,680.00 usft

Wellbore	Laguna 23 Fed Com 2BS #4H				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	HDGM	10/4/2018	6.70	60.48	48,195.00000000

Design	Design #2				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	0.00	

Plan Survey Tool Program **Date** 10/8/2018

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	15,527.97	Design #2 (Laguna 23 Fed Com 2	MWD+HRGM	
				OWSG MWD + HRGM	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,550.50	0.00	0.00	6,550.50	0.00	0.00	0.00	0.00	0.00	0.00	
6,800.50	5.00	270.00	6,800.18	0.00	-10.90	2.00	2.00	0.00	270.00	
10,095.50	5.00	270.00	10,082.64	0.00	-298.08	0.00	0.00	0.00	0.00	
10,850.13	90.60	359.52	10,557.88	482.07	-344.12	12.00	11.34	11.86	89.47	
15,528.47	90.60	359.52	10,508.96	5,160.00	-383.10	0.00	0.00	0.00	0.00	Laguna 23 Fed Com :

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
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
1,589.00	0.00	0.00	1,589.00	0.00	0.00	0.00	0.00	0.00	0.00
Anhy									
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
1,954.00	0.00	0.00	1,954.00	0.00	0.00	0.00	0.00	0.00	0.00
Salt									
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
3,537.00	0.00	0.00	3,537.00	0.00	0.00	0.00	0.00	0.00	0.00
SS & SH									
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
3,830.00	0.00	0.00	3,830.00	0.00	0.00	0.00	0.00	0.00	0.00
Dol & LS									
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

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	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
5,626.00	0.00	0.00	5,626.00	0.00	0.00	0.00	0.00	0.00	0.00
SS, SLTST, & SH									
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
6,550.50	0.00	0.00	6,550.50	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.99	270.00	6,600.00	0.00	-0.43	0.00	2.00	2.00	0.00
6,700.00	2.99	270.00	6,699.93	0.00	-3.90	0.00	2.00	2.00	0.00
6,800.50	5.00	270.00	6,800.18	0.00	-10.90	0.00	2.00	2.00	0.00
6,900.00	5.00	270.00	6,899.30	0.00	-19.57	0.00	0.00	0.00	0.00
7,000.00	5.00	270.00	6,998.92	0.00	-28.29	0.00	0.00	0.00	0.00
7,100.00	5.00	270.00	7,098.54	0.00	-37.00	0.00	0.00	0.00	0.00
7,200.00	5.00	270.00	7,198.16	0.00	-45.72	0.00	0.00	0.00	0.00
7,300.00	5.00	270.00	7,297.78	0.00	-54.44	0.00	0.00	0.00	0.00
7,400.00	5.00	270.00	7,397.40	0.00	-63.15	0.00	0.00	0.00	0.00
7,500.00	5.00	270.00	7,497.02	0.00	-71.87	0.00	0.00	0.00	0.00
7,600.00	5.00	270.00	7,596.64	0.00	-80.58	0.00	0.00	0.00	0.00
7,700.00	5.00	270.00	7,696.26	0.00	-89.30	0.00	0.00	0.00	0.00
7,800.00	5.00	270.00	7,795.88	0.00	-98.01	0.00	0.00	0.00	0.00
7,900.00	5.00	270.00	7,895.50	0.00	-106.73	0.00	0.00	0.00	0.00
8,000.00	5.00	270.00	7,995.12	0.00	-115.44	0.00	0.00	0.00	0.00
8,100.00	5.00	270.00	8,094.74	0.00	-124.16	0.00	0.00	0.00	0.00
8,200.00	5.00	270.00	8,194.36	0.00	-132.88	0.00	0.00	0.00	0.00
8,300.00	5.00	270.00	8,293.98	0.00	-141.59	0.00	0.00	0.00	0.00
8,400.00	5.00	270.00	8,393.60	0.00	-150.31	0.00	0.00	0.00	0.00
8,500.00	5.00	270.00	8,493.22	0.00	-159.02	0.00	0.00	0.00	0.00
8,533.91	5.00	270.00	8,527.00	0.00	-161.98	0.00	0.00	0.00	0.00
LS & SH									
8,600.00	5.00	270.00	8,592.84	0.00	-167.74	0.00	0.00	0.00	0.00
8,700.00	5.00	270.00	8,692.45	0.00	-176.45	0.00	0.00	0.00	0.00
8,800.00	5.00	270.00	8,792.07	0.00	-185.17	0.00	0.00	0.00	0.00
8,900.00	5.00	270.00	8,891.69	0.00	-193.88	0.00	0.00	0.00	0.00
9,000.00	5.00	270.00	8,991.31	0.00	-202.60	0.00	0.00	0.00	0.00
9,100.00	5.00	270.00	9,090.93	0.00	-211.32	0.00	0.00	0.00	0.00
9,200.00	5.00	270.00	9,190.55	0.00	-220.03	0.00	0.00	0.00	0.00
9,300.00	5.00	270.00	9,290.17	0.00	-228.75	0.00	0.00	0.00	0.00

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,400.00	5.00	270.00	9,389.79	0.00	-237.46	0.00	0.00	0.00	0.00
9,500.00	5.00	270.00	9,489.41	0.00	-246.18	0.00	0.00	0.00	0.00
9,600.00	5.00	270.00	9,589.03	0.00	-254.89	0.00	0.00	0.00	0.00
9,666.22	5.00	270.00	9,655.00	0.00	-260.67	0.00	0.00	0.00	0.00
SS, SLTST, & SH									
9,700.00	5.00	270.00	9,688.65	0.00	-263.61	0.00	0.00	0.00	0.00
9,800.00	5.00	270.00	9,788.27	0.00	-272.33	0.00	0.00	0.00	0.00
9,900.00	5.00	270.00	9,887.89	0.00	-281.04	0.00	0.00	0.00	0.00
10,000.00	5.00	270.00	9,987.51	0.00	-289.76	0.00	0.00	0.00	0.00
10,095.50	5.00	270.00	10,082.64	0.00	-298.08	0.00	0.00	0.00	0.00
10,100.00	5.03	276.17	10,087.13	0.02	-298.47	0.02	12.00	0.75	137.01
10,125.00	6.15	305.19	10,112.01	0.91	-300.66	0.91	12.00	4.47	116.10
10,150.00	8.26	322.42	10,136.82	3.11	-302.85	3.11	12.00	8.45	68.93
10,173.50	10.64	331.72	10,160.00	6.36	-304.91	6.36	12.00	10.13	39.56
SS, SLTST, & SH									
10,175.00	10.80	332.18	10,161.47	6.60	-305.04	6.60	12.00	10.60	30.22
10,200.00	13.53	338.15	10,185.91	11.39	-307.22	11.39	12.00	10.91	23.89
10,225.00	16.35	342.12	10,210.06	17.45	-309.39	17.45	12.00	11.29	15.89
10,250.00	19.22	344.94	10,233.86	24.78	-311.54	24.78	12.00	11.50	11.28
10,275.00	22.13	347.05	10,257.25	33.34	-313.66	33.34	12.00	11.63	8.43
10,300.00	25.06	348.69	10,280.16	43.13	-315.76	43.13	12.00	11.71	6.55
10,325.00	28.00	350.00	10,302.53	54.10	-317.82	54.10	12.00	11.77	5.26
10,350.00	30.95	351.08	10,324.29	66.23	-319.83	66.23	12.00	11.81	4.33
10,375.00	33.91	351.99	10,345.39	79.49	-321.80	79.49	12.00	11.84	3.64
10,400.00	36.88	352.77	10,365.76	93.85	-323.72	93.85	12.00	11.86	3.12
10,425.00	39.85	353.45	10,385.36	109.25	-325.57	109.25	12.00	11.88	2.72
10,450.00	42.82	354.05	10,404.13	125.66	-327.37	125.66	12.00	11.89	2.40
10,475.00	45.80	354.59	10,422.02	143.04	-329.09	143.04	12.00	11.91	2.15
10,500.00	48.78	355.07	10,438.97	161.33	-330.75	161.33	12.00	11.92	1.94
10,525.00	51.76	355.52	10,454.95	180.49	-332.32	180.49	12.00	11.92	1.77
10,550.00	54.74	355.92	10,469.91	200.46	-333.81	200.46	12.00	11.93	1.63
10,575.00	57.72	356.30	10,483.80	221.20	-335.22	221.20	12.00	11.93	1.51
10,600.00	60.71	356.66	10,496.60	242.63	-336.54	242.63	12.00	11.94	1.42
10,625.00	63.69	356.99	10,508.25	264.71	-337.76	264.71	12.00	11.94	1.34
10,650.00	66.68	357.31	10,518.74	287.37	-338.89	287.37	12.00	11.94	1.27
10,675.00	69.67	357.61	10,528.04	310.55	-339.92	310.55	12.00	11.95	1.21
10,682.64	70.58	357.70	10,530.63	317.73	-340.21	317.73	12.00	11.95	1.18
Laguna 23 Fed Com 2BS #4H - LP									
10,700.00	72.65	357.90	10,536.11	334.19	-340.84	334.19	12.00	11.95	1.16
10,725.00	75.64	358.19	10,542.94	358.23	-341.66	358.23	12.00	11.95	1.13
10,750.00	78.63	358.46	10,548.50	382.59	-342.38	382.59	12.00	11.95	1.10
10,775.00	81.62	358.73	10,552.79	407.20	-342.98	407.20	12.00	11.95	1.08
10,800.00	84.61	359.00	10,555.79	432.02	-343.47	432.02	12.00	11.95	1.06
10,825.00	87.60	359.26	10,557.49	456.95	-343.85	456.95	12.00	11.95	1.05
10,850.13	90.60	359.52	10,557.88	482.07	-344.12	482.07	12.00	11.95	1.05
10,900.00	90.60	359.52	10,557.36	531.94	-344.53	531.94	0.00	0.00	0.00
11,000.00	90.60	359.52	10,556.31	631.93	-345.36	631.93	0.00	0.00	0.00
11,100.00	90.60	359.52	10,555.27	731.92	-346.20	731.92	0.00	0.00	0.00
11,200.00	90.60	359.52	10,554.22	831.91	-347.03	831.91	0.00	0.00	0.00
11,300.00	90.60	359.52	10,553.18	931.91	-347.86	931.91	0.00	0.00	0.00
11,400.00	90.60	359.52	10,552.13	1,031.90	-348.70	1,031.90	0.00	0.00	0.00
11,500.00	90.60	359.52	10,551.09	1,131.89	-349.53	1,131.89	0.00	0.00	0.00
11,600.00	90.60	359.52	10,550.04	1,231.88	-350.36	1,231.88	0.00	0.00	0.00

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,700.00	90.60	359.52	10,548.99	1,331.87	-351.20	1,331.87	0.00	0.00	0.00
11,800.00	90.60	359.52	10,547.95	1,431.86	-352.03	1,431.86	0.00	0.00	0.00
11,900.00	90.60	359.52	10,546.90	1,531.85	-352.86	1,531.85	0.00	0.00	0.00
12,000.00	90.60	359.52	10,545.86	1,631.84	-353.70	1,631.84	0.00	0.00	0.00
12,100.00	90.60	359.52	10,544.81	1,731.83	-354.53	1,731.83	0.00	0.00	0.00
12,200.00	90.60	359.52	10,543.77	1,831.82	-355.36	1,831.82	0.00	0.00	0.00
12,300.00	90.60	359.52	10,542.72	1,931.82	-356.20	1,931.82	0.00	0.00	0.00
12,400.00	90.60	359.52	10,541.67	2,031.81	-357.03	2,031.81	0.00	0.00	0.00
12,500.00	90.60	359.52	10,540.63	2,131.80	-357.86	2,131.80	0.00	0.00	0.00
12,600.00	90.60	359.52	10,539.58	2,231.79	-358.70	2,231.79	0.00	0.00	0.00
12,700.00	90.60	359.52	10,538.54	2,331.78	-359.53	2,331.78	0.00	0.00	0.00
12,800.00	90.60	359.52	10,537.49	2,431.77	-360.36	2,431.77	0.00	0.00	0.00
12,900.00	90.60	359.52	10,536.45	2,531.76	-361.20	2,531.76	0.00	0.00	0.00
13,000.00	90.60	359.52	10,535.40	2,631.75	-362.03	2,631.75	0.00	0.00	0.00
13,100.00	90.60	359.52	10,534.35	2,731.74	-362.86	2,731.74	0.00	0.00	0.00
13,200.00	90.60	359.52	10,533.31	2,831.74	-363.70	2,831.74	0.00	0.00	0.00
13,300.00	90.60	359.52	10,532.26	2,931.73	-364.53	2,931.73	0.00	0.00	0.00
13,400.00	90.60	359.52	10,531.22	3,031.72	-365.36	3,031.72	0.00	0.00	0.00
13,500.00	90.60	359.52	10,530.17	3,131.71	-366.20	3,131.71	0.00	0.00	0.00
13,600.00	90.60	359.52	10,529.13	3,231.70	-367.03	3,231.70	0.00	0.00	0.00
13,700.00	90.60	359.52	10,528.08	3,331.69	-367.86	3,331.69	0.00	0.00	0.00
13,800.00	90.60	359.52	10,527.03	3,431.68	-368.70	3,431.68	0.00	0.00	0.00
13,900.00	90.60	359.52	10,525.99	3,531.67	-369.53	3,531.67	0.00	0.00	0.00
14,000.00	90.60	359.52	10,524.94	3,631.66	-370.36	3,631.66	0.00	0.00	0.00
14,100.00	90.60	359.52	10,523.90	3,731.65	-371.20	3,731.65	0.00	0.00	0.00
14,200.00	90.60	359.52	10,522.85	3,831.65	-372.03	3,831.65	0.00	0.00	0.00
14,300.00	90.60	359.52	10,521.81	3,931.64	-372.86	3,931.64	0.00	0.00	0.00
14,400.00	90.60	359.52	10,520.76	4,031.63	-373.70	4,031.63	0.00	0.00	0.00
14,500.00	90.60	359.52	10,519.71	4,131.62	-374.53	4,131.62	0.00	0.00	0.00
14,600.00	90.60	359.52	10,518.67	4,231.61	-375.36	4,231.61	0.00	0.00	0.00
14,700.00	90.60	359.52	10,517.62	4,331.60	-376.20	4,331.60	0.00	0.00	0.00
14,800.00	90.60	359.52	10,516.58	4,431.59	-377.03	4,431.59	0.00	0.00	0.00
14,900.00	90.60	359.52	10,515.53	4,531.58	-377.86	4,531.58	0.00	0.00	0.00
15,000.00	90.60	359.52	10,514.49	4,631.57	-378.70	4,631.57	0.00	0.00	0.00
15,100.00	90.60	359.52	10,513.44	4,731.57	-379.53	4,731.57	0.00	0.00	0.00
15,200.00	90.60	359.52	10,512.40	4,831.56	-380.36	4,831.56	0.00	0.00	0.00
15,300.00	90.60	359.52	10,511.35	4,931.55	-381.20	4,931.55	0.00	0.00	0.00
15,400.00	90.60	359.52	10,510.30	5,031.54	-382.03	5,031.54	0.00	0.00	0.00
15,500.00	90.60	359.52	10,509.26	5,131.53	-382.86	5,131.53	0.00	0.00	0.00
15,528.47	90.60	359.52	10,508.96	5,160.00	-383.10	5,160.00	0.00	0.00	0.00
Laguna 23 Fed Com 2BS #4H - BHL									

Database:	Gyrodata NWDB	**Local Co-ordinate Reference:**	Well Laguna 23 Fed Com 2BS #4H
Company:	Chisholm Energy	**TVD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Project:	Lea Co, NM	**MD Reference:**	(GE=3680+KB=31) @ 3711.00usft
Site:	Laguna 23 Fed Com	**North Reference:**	Grid
Well:	Laguna 23 Fed Com 2BS #4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Laguna 23 Fed Com 2BS #4H		
Design:	Design #2		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Laguna 23 Fed Com 2B: - plan hits target center - Point	0.00	0.01	10,508.96	5,160.00	-383.10	570,416.20	786,271.50	32.565615	-103.538285
Laguna 23 Fed Com 2B: - plan misses target center by 30.89usft at 10682.64usft MD (10530.63 TVD, 317.73 N, -340.21 E) - Point	0.00	0.01	10,559.78	307.70	-342.20	565,563.90	786,312.40	32.552278	-103.538270

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,589.00	1,589.00	Anhy			
1,954.00	1,954.00	Salt			
3,537.00	3,537.00	SS & SH			
3,830.00	3,830.00	Dol & LS			
5,626.00	5,626.00	SS, SLTST, & SH			
8,533.91	8,527.00	LS & SH			
9,666.22	9,655.00	SS, SLTST, & SH			
10,173.50	10,160.00	SS, SLTST, & SH			

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

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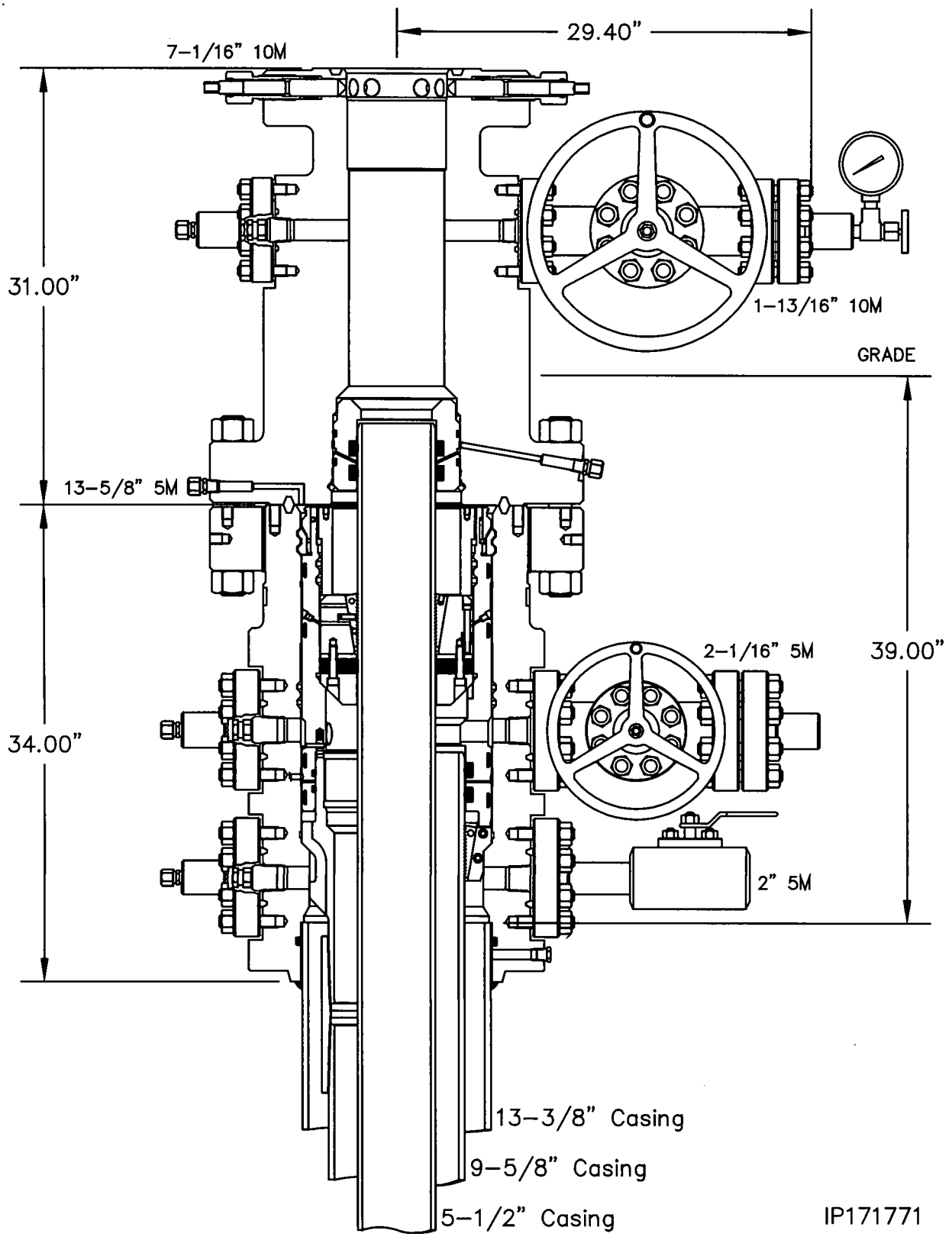
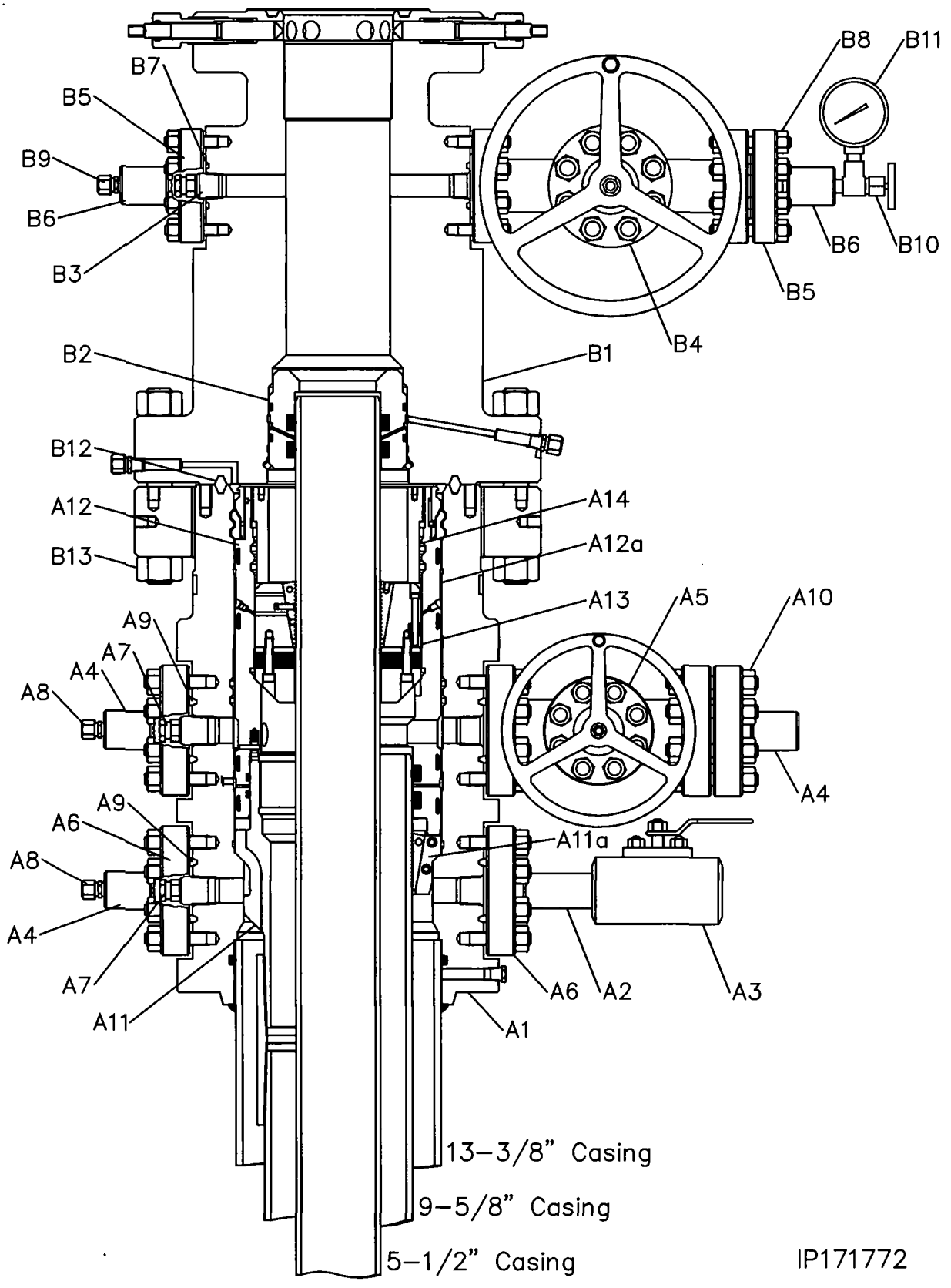
System Drawing



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 Part # 117620
A2	1	Nipple, 2" line pipe x 6" long 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 Part # 115184
A4	3	Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K 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) Part # 610003
A6	4	Companion Flange, 2-1/16" 5M x 2" line pipe, 4130 CMS-102, CMS-002 Part # 200002
A7	2	VR Plug, 1-1/2" Sharp Vee x 1-1/4" hex Part # VR2
A8	2	Fitting, grease, vented cap, 1/2" NPT alloy non-nace Part # FTG1
A9	5	Ring Gasket, R-24, 2-1/16" 3/5M Part # R24
A10	8	Studs, all thread with two nuts, black, 7/8" x 6-1/2" long, B7/2H 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 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 Part # 117152
A13	1	Casing Hanger, C2, 11" x 5-1/2" 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 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 Part #
B2	1	Secondary Seal, CW, HPS-F, 9 MOD x 5-1/2", 6A-PU-DD-NL-1-2 Part # 110503
B3	1	VR Plug, 1-1/4" Sharp Vee x 1-1/4" hex 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) Part # 103188
B5	2	Companion Flange, 1-13/16" 10M x 2" LP, 5000 psi max WP, 6A-KU-EE-NL-1 Part # 200010
B6	2	Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K Part # BP2T
B7	3	Ring Gasket, BX151, 1-13/16" 10M Part # BX-151
B8	8	Studs, all thread with two nuts, black, 3/4" x 5-1/2" long, B7/2H Part # 780080
B9	1	Fitting, grease, vented cap, 1/2" NPT alloy non-nace Part # FTG1
B10	1	Needle Valve, MFA, 1/2" NPT 10M service Part # NVA
B11	1	Pressure Gauge, 5M, 4-1/2" face, liquid filled, 1/2" NPT PG5M
B12	1	Ring Gasket, BX-160, 13-5/8" 15M Part # BX-160
B13	16	Studs, all thread with two nuts, black, 1-5/8" x 12-3/4" long, B7/2H 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 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 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 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 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 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 Part # 117310
ST7	1	Test Plug, CW, MBU-2LR Inner, 11" x 4-1/2" IF, 1-1/4" LP bypass 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 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 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 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 Part # 117317
	1	Secondary Seal Bushing, CW, HPS, 9" x 5-1/2 Part # 109026
R4	4	Lift Eyes, 3/4", side pull hoist ring 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 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 Part # 117184

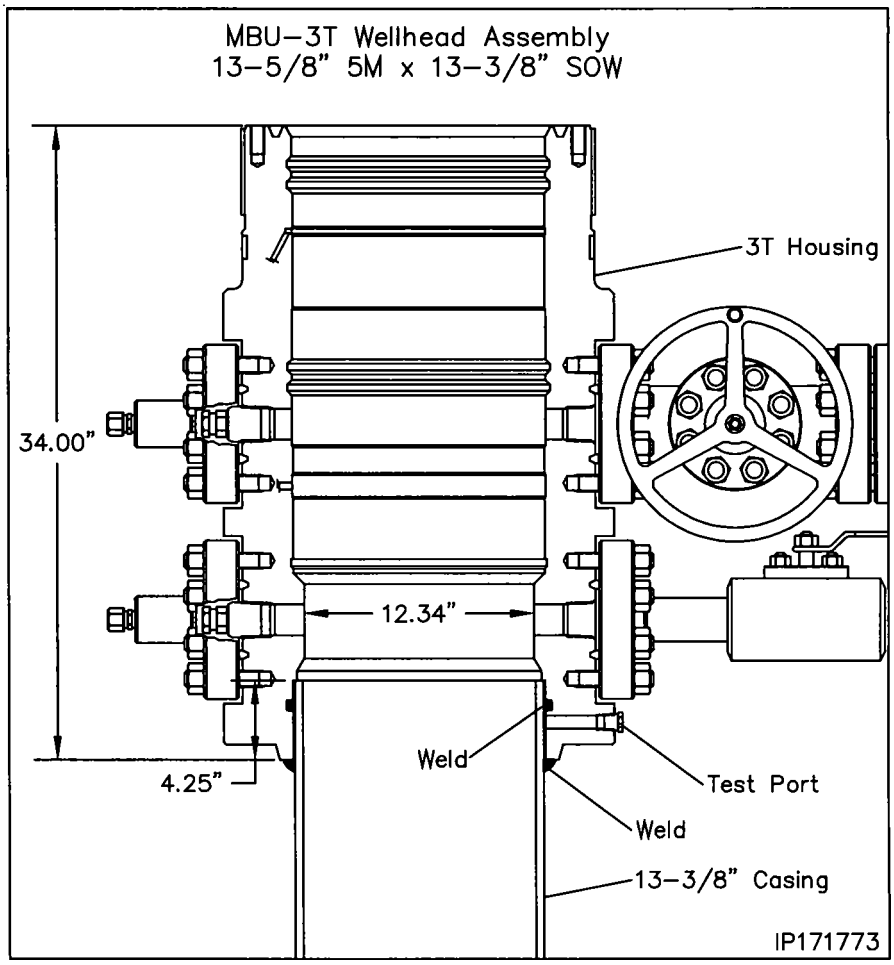
Stage 1 — Install the MBU-3T Housing

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.

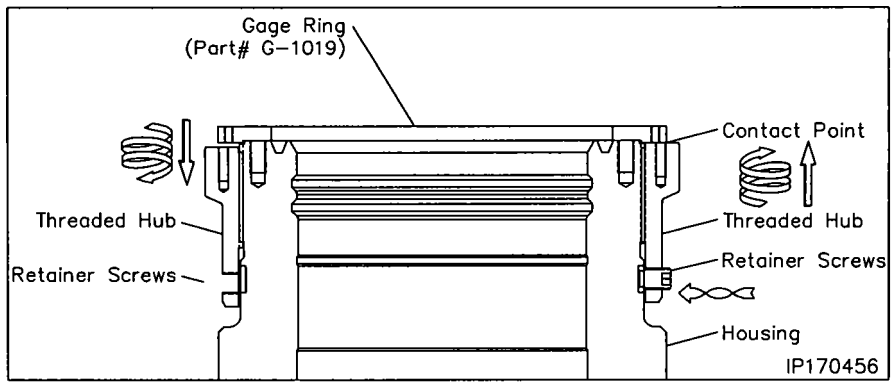
Refer to the back of this publication for the **Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal** and for field testing of the weld connection.

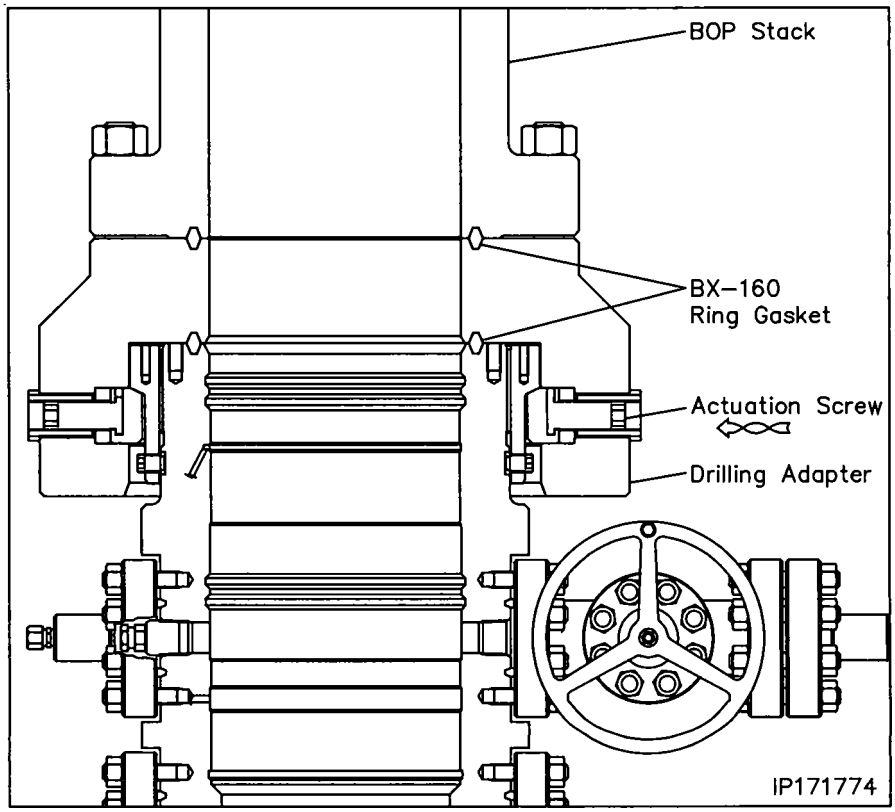
Stage 2 — Nipple Up The BOP Stack

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.

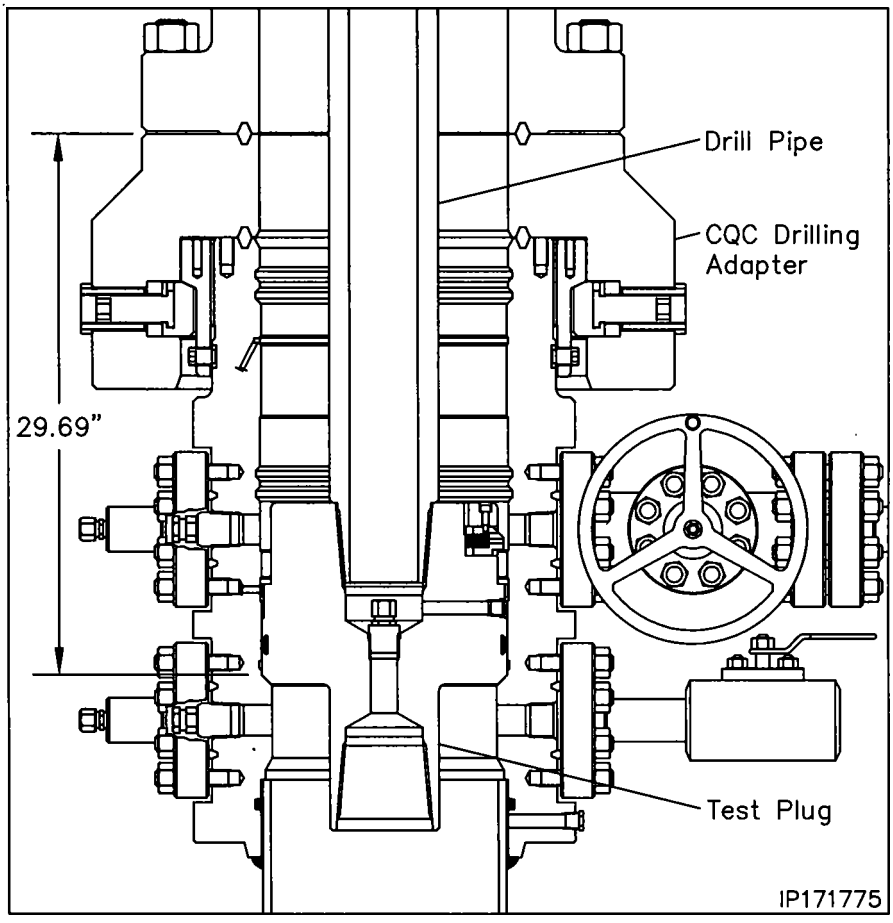
5. Lightly lubricate the test plug seal with oil or light grease.

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

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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.

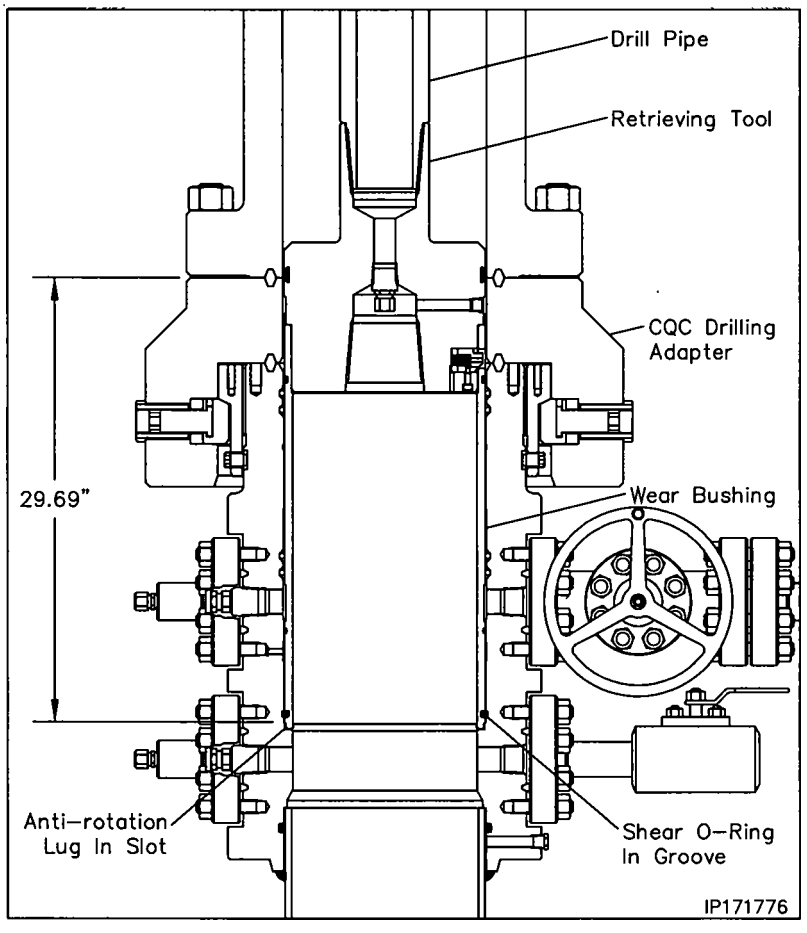
5. **Apply a heavy coat of grease, not dope, to the OD of the bushing.**

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.

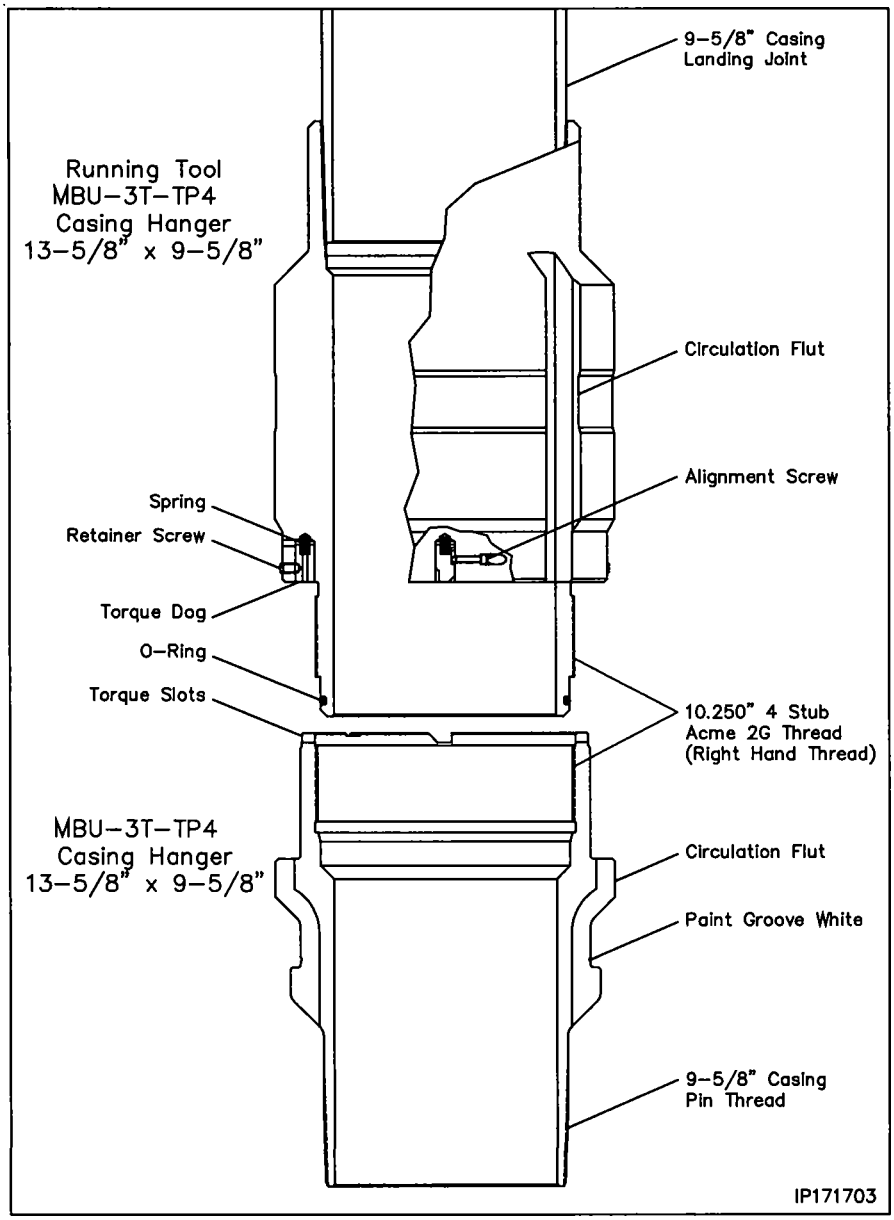
4. On the pipe rack, examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Mandrel Casing Hanger (Item A11).*** Verify the following:
   - internal bore and threads are clean and in good condition
   - neck seal area is clean and undamaged
   - torque slots are clean and in good condition
   - pin threads are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



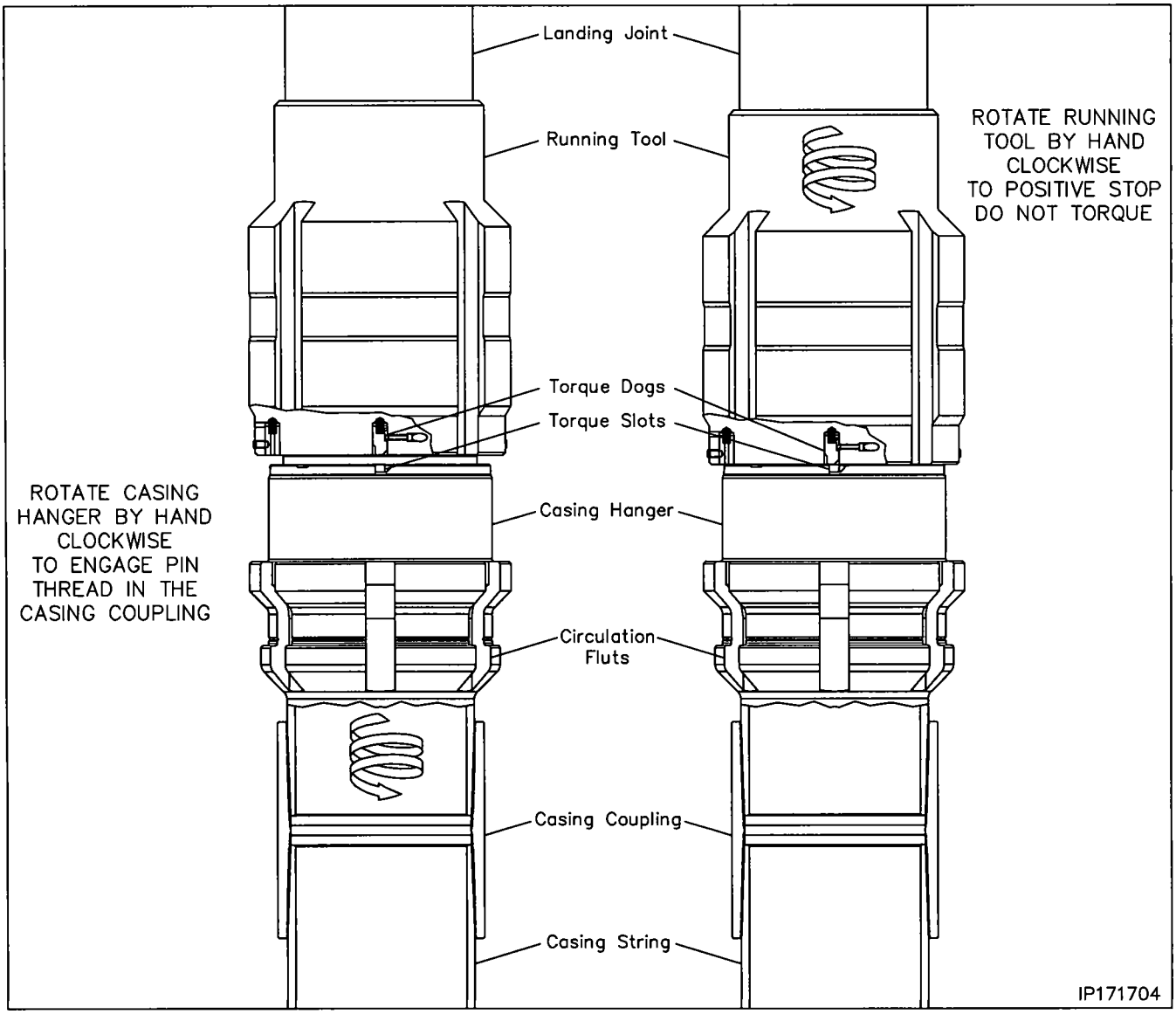
7. Calculate the total landing dimension by adding the previously determined RKB dimension and 29.69", the depth of the wellhead.

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

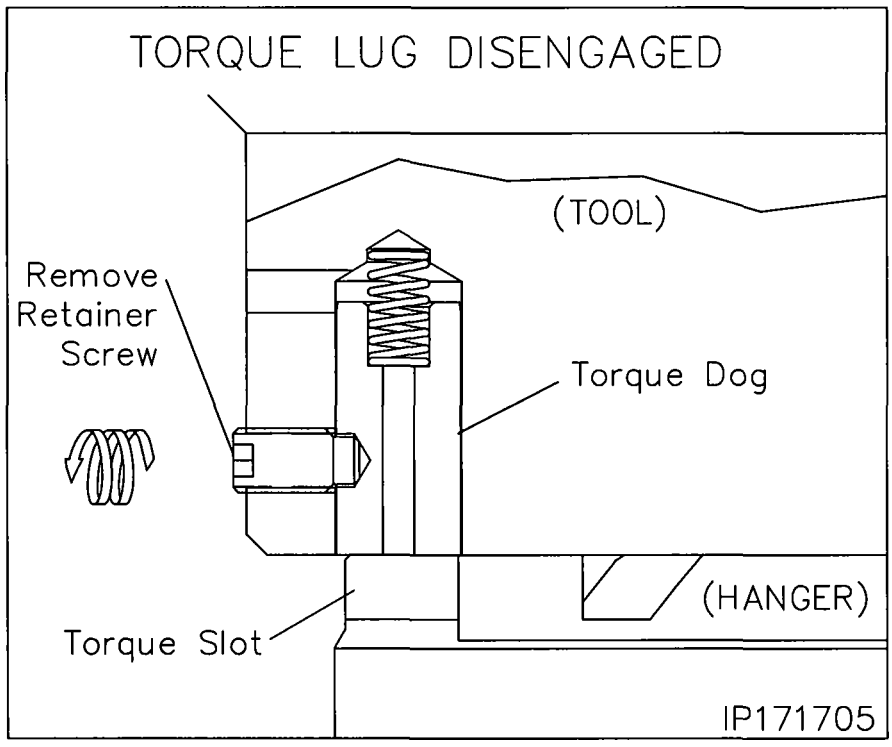
14. **Locate the (4) 3/8" socket head set screws in the side of the hanger running tool and remove the screws.**

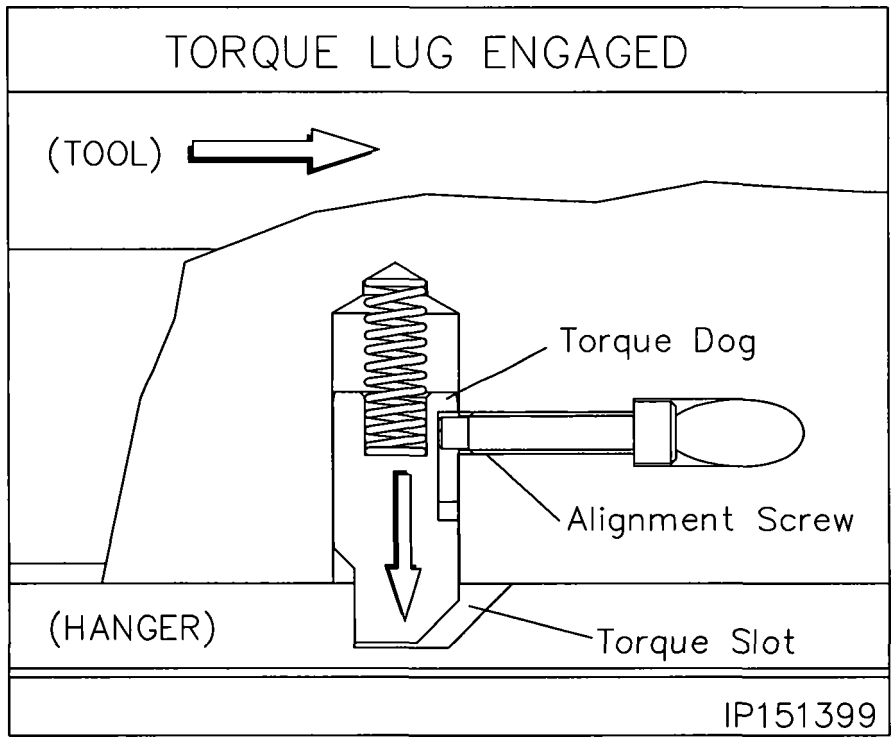
WARNING: Place the screws in a safe place to reinstall in the tool when the job is completed.

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.**

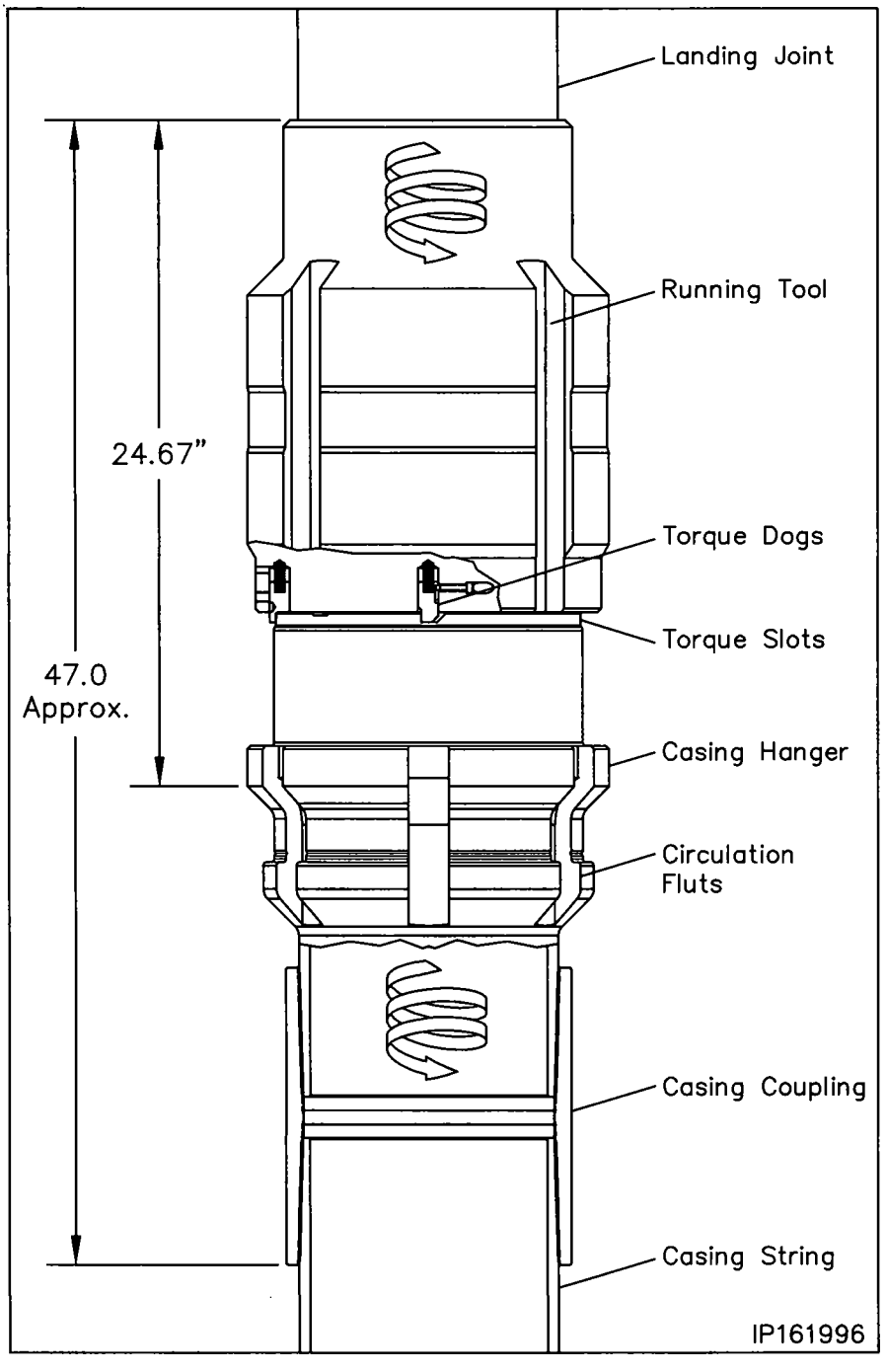
WARNING: Do not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement





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.



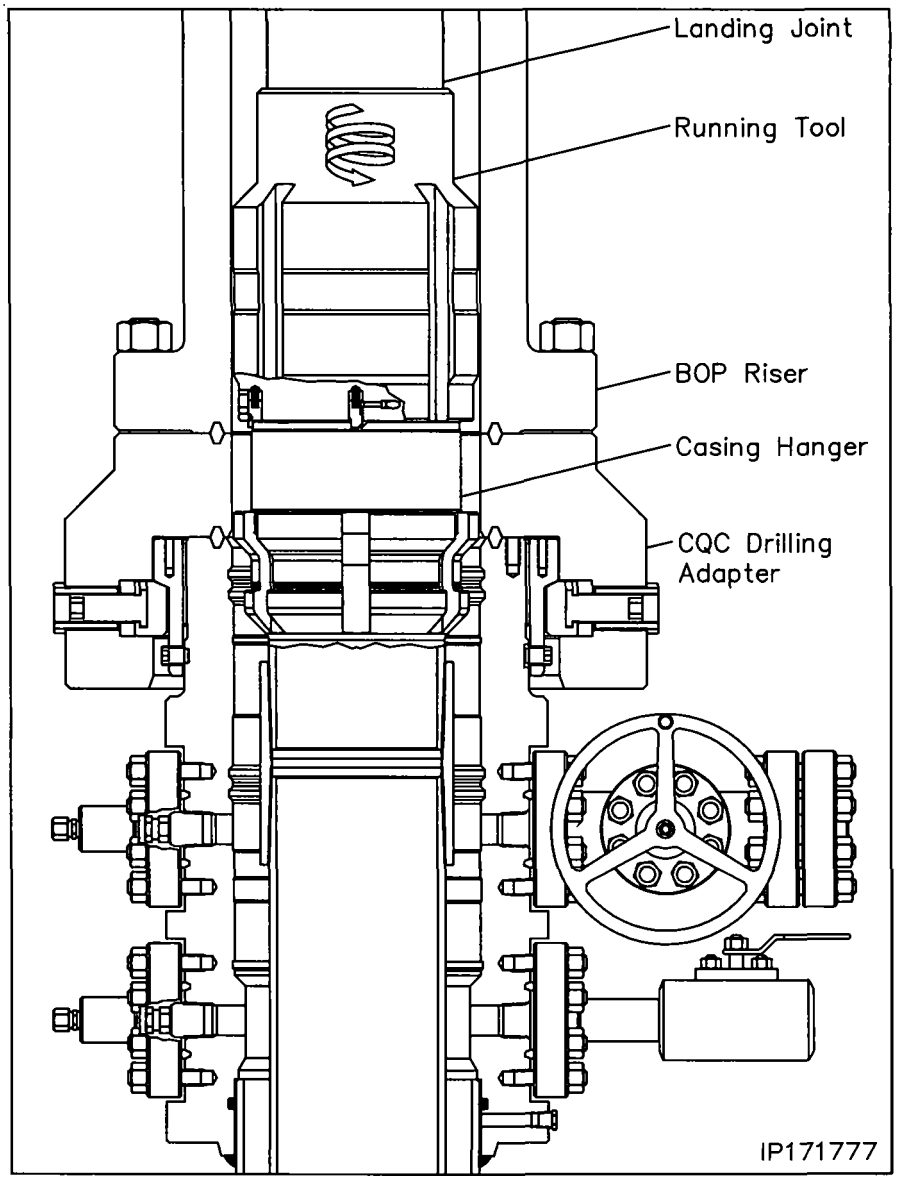
Stage 5 — Hang Off the 9-5/8" Casing

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.

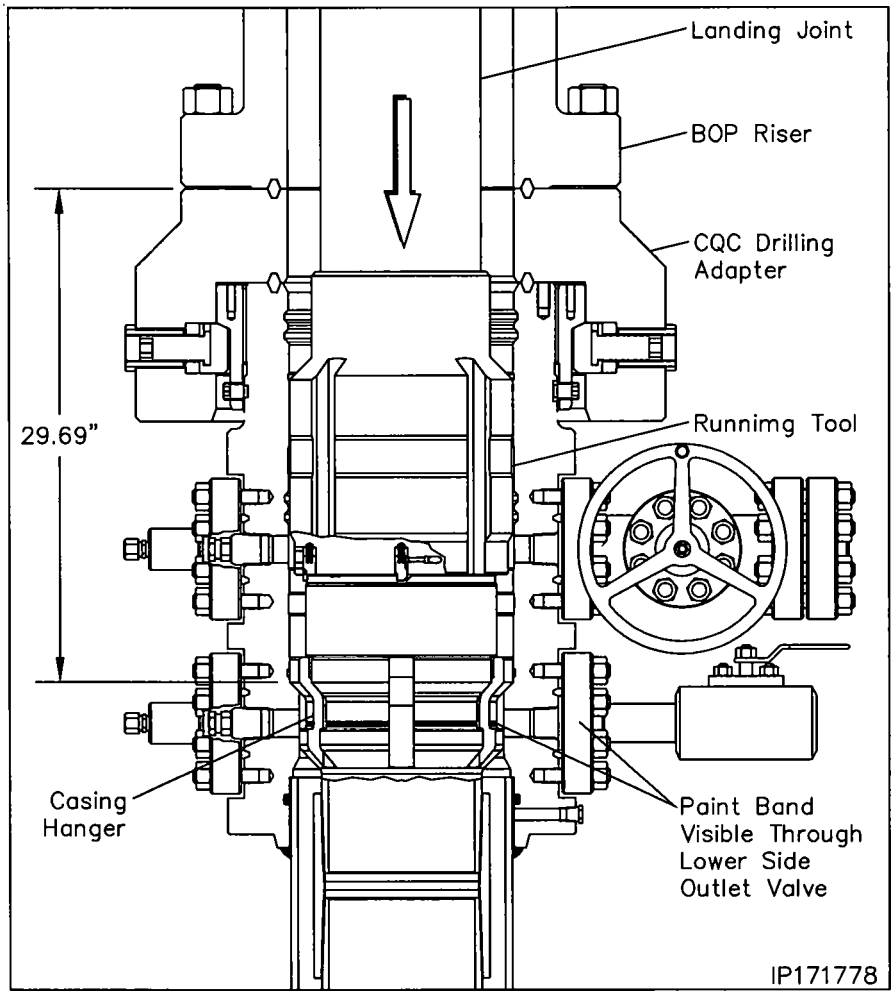
25. Cement the casing as required.

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.

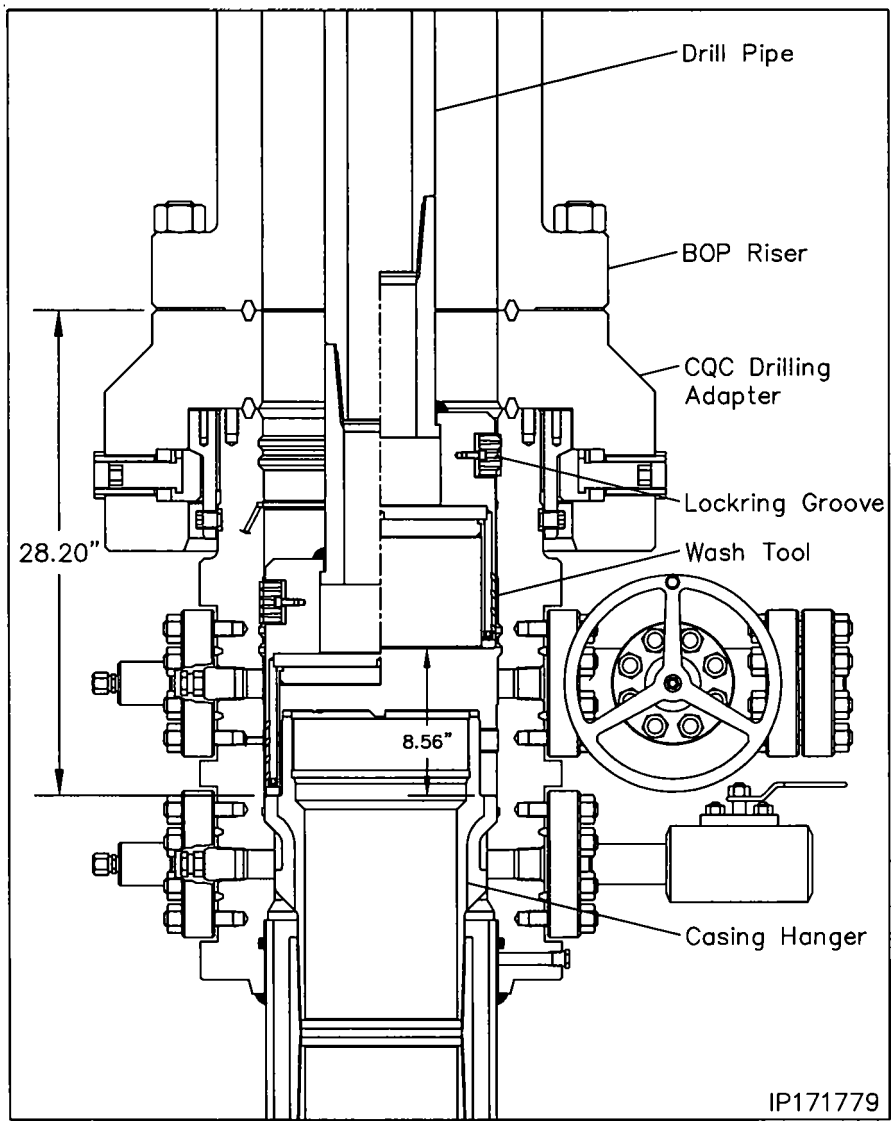
WARNING: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



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.

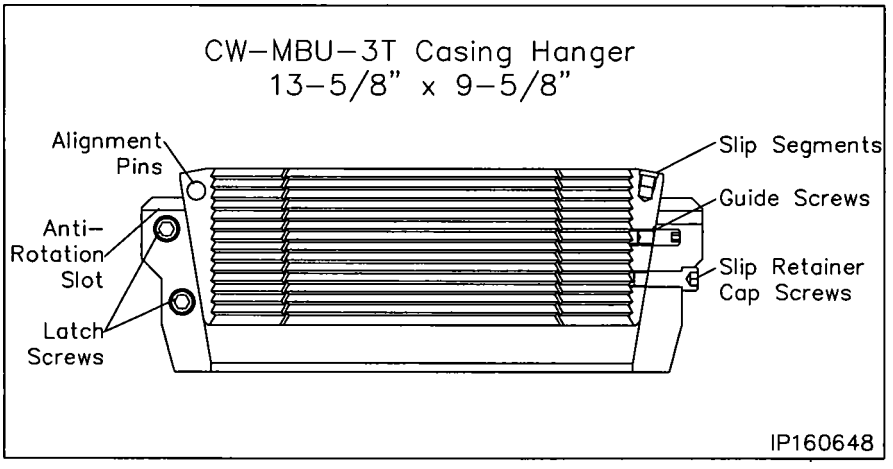
Note: Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.

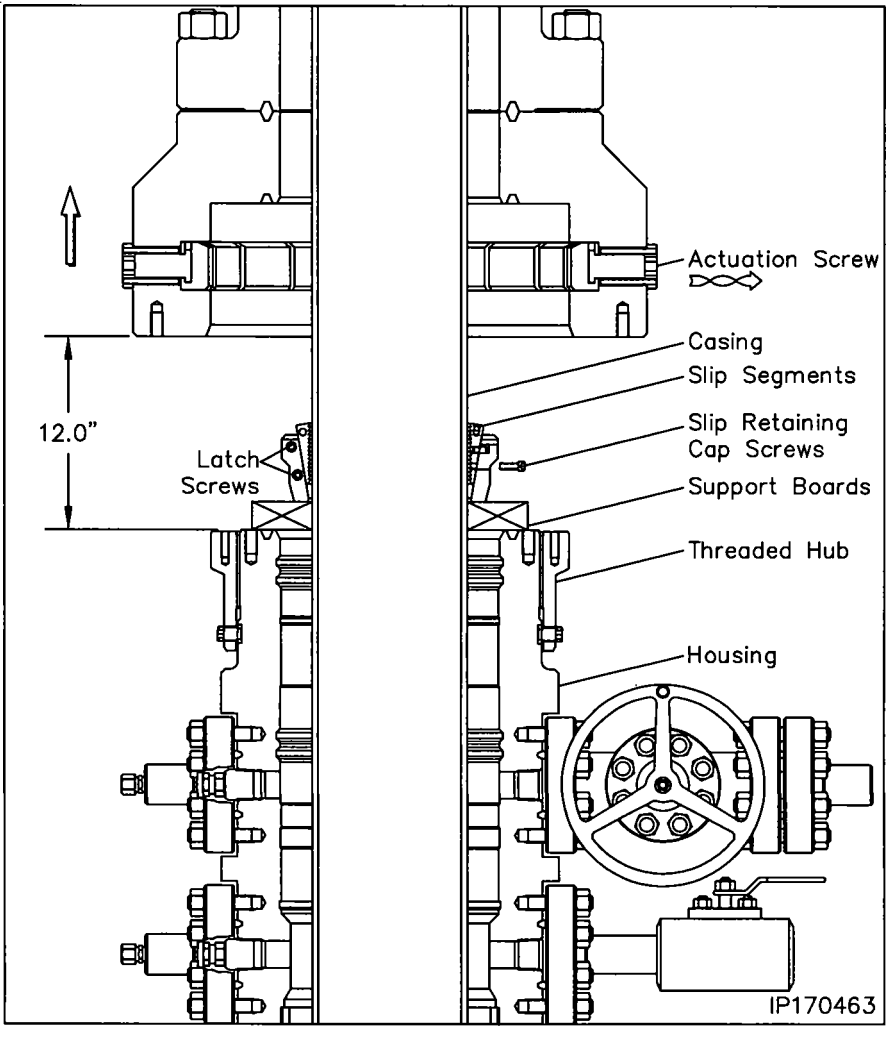
12. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
13. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure that there are no dark areas on top of the flutes of the hanger.

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.

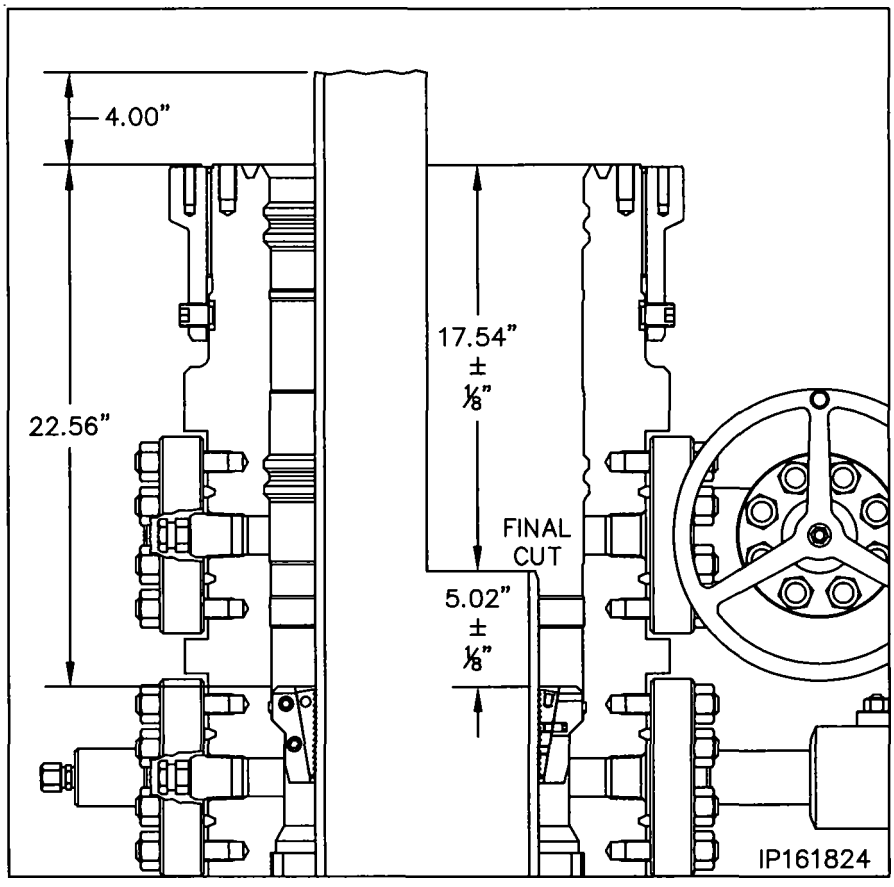
Note: A sharp decrease on the weight indicator will signify that the hanger has taken weight and at what point, If this does not occur, pull tension again and slack off once more.

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.

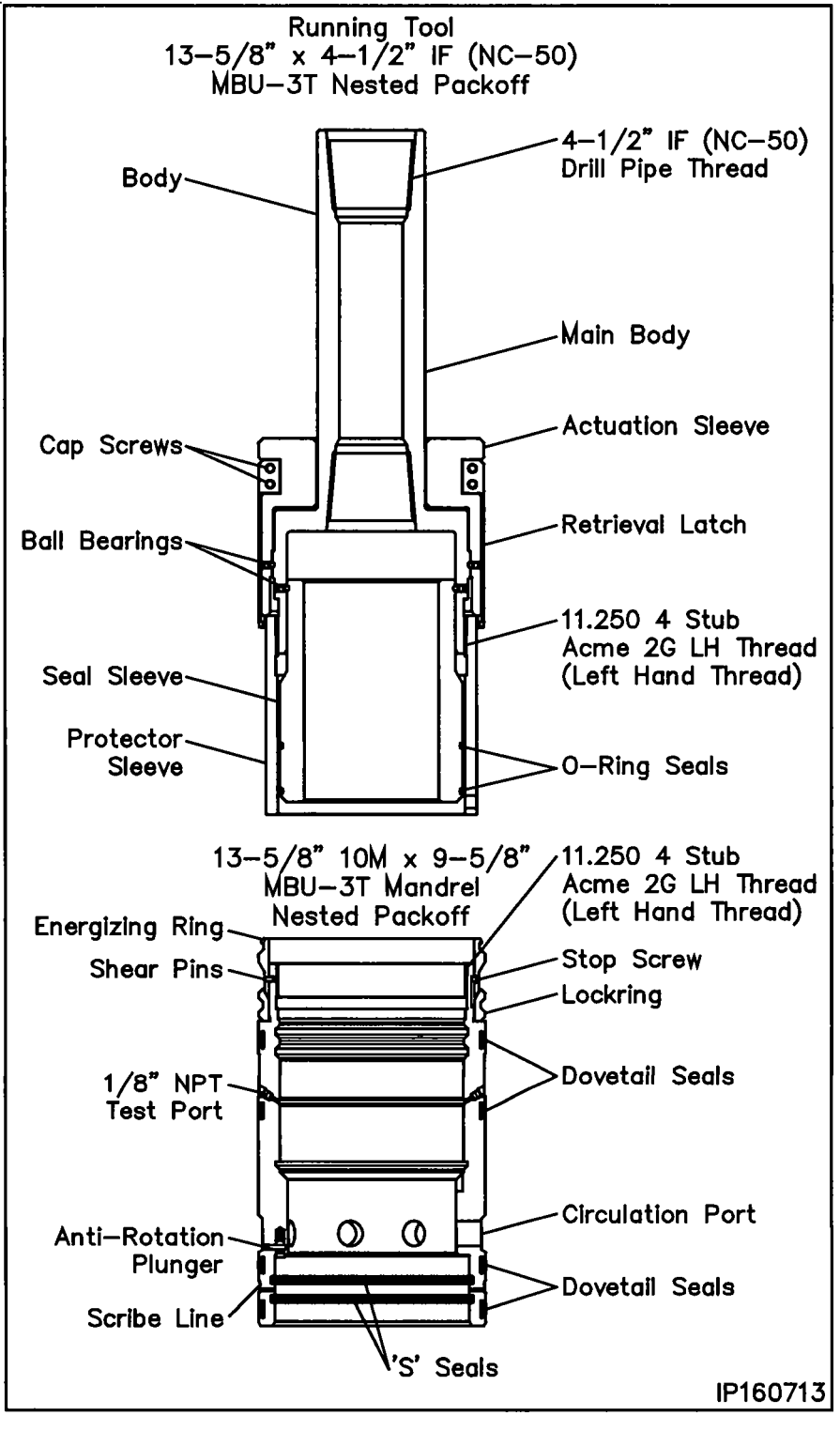
23. Place a straight edge on top of the slip bowl and in line with the center of one of the notches.

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.

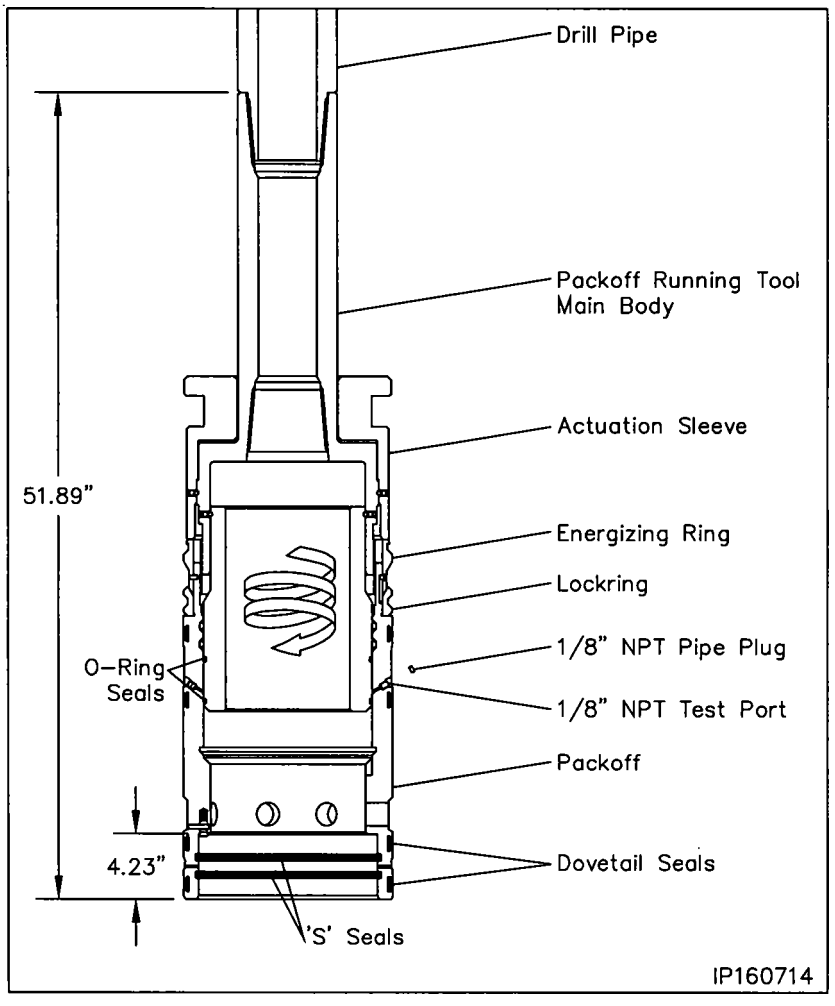


Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

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

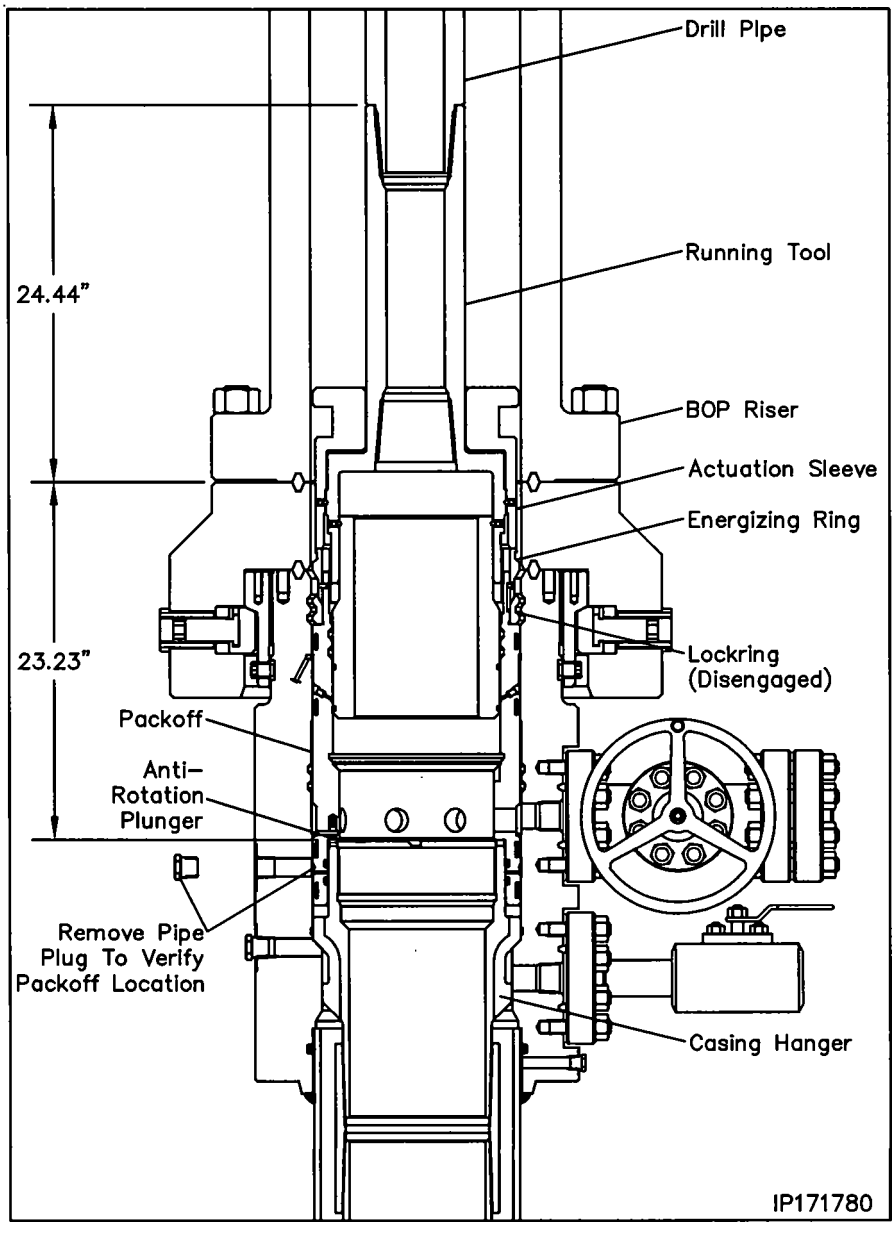
15. Pick up the assembly and thoroughly clean and lightly lubricate the packoff ID 'S' seals and the OD dovetail seals with oil or light grease.



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.

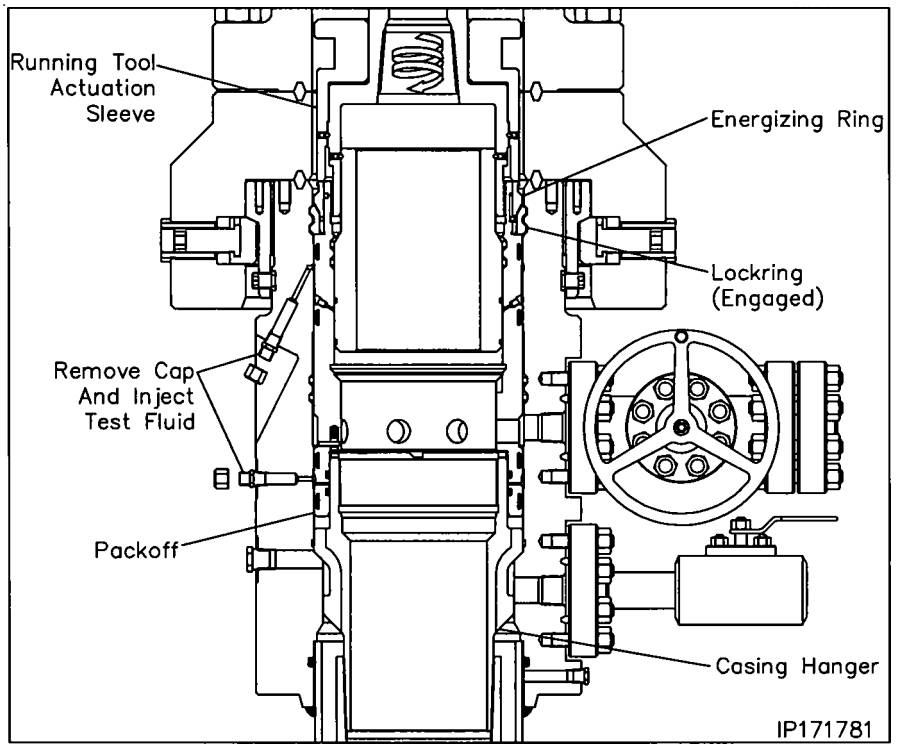
29. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.

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

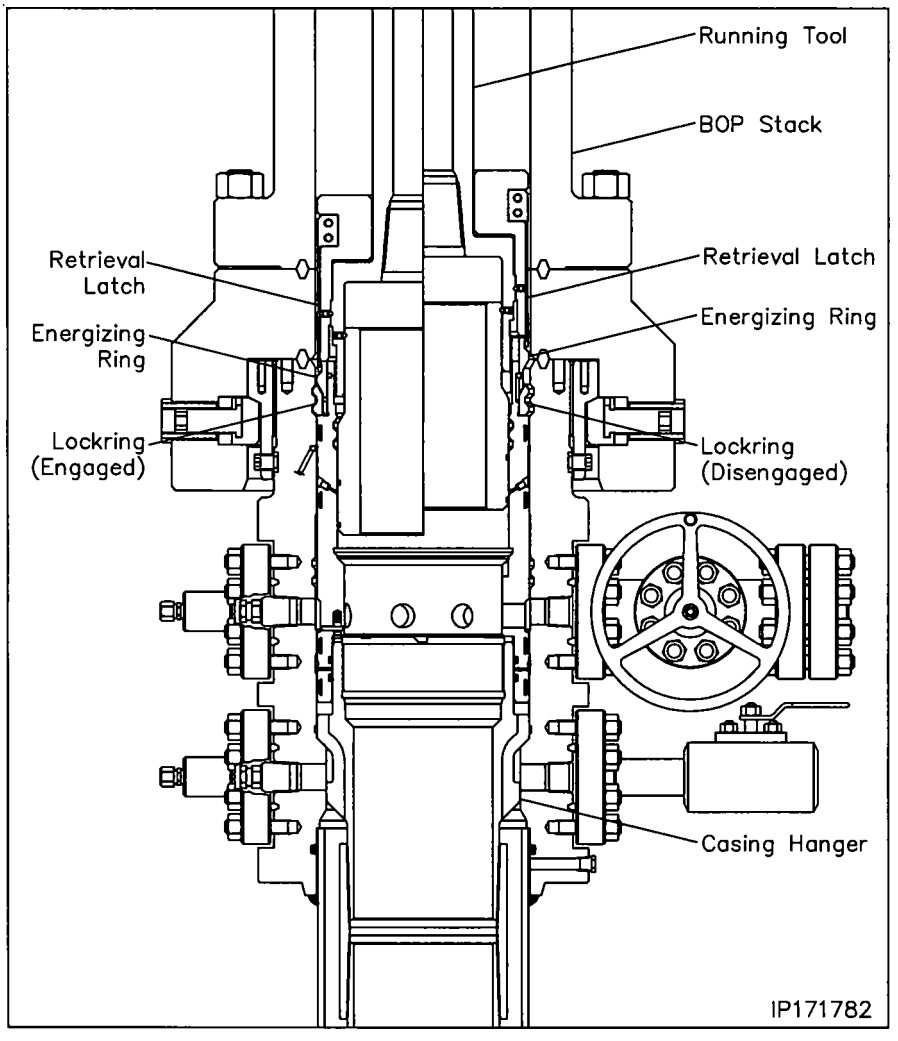
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
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

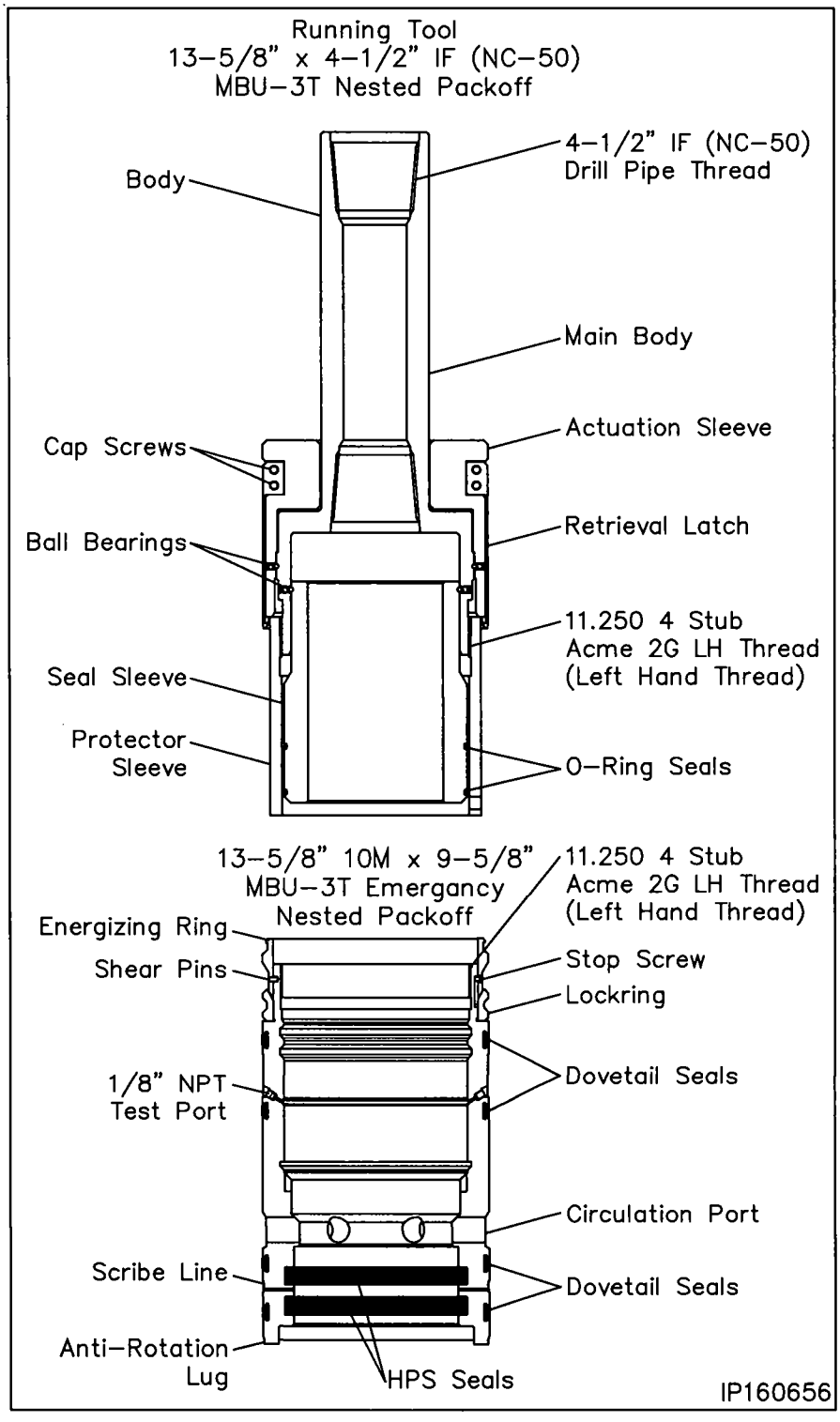
1. Examine the ***13-5/8" 10M x 9-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Emergency Nested Packoff Assembly (Item A12a).*** Verify the following:
   - all elastomer seals are in place and undamaged
   - internal bore, and ports, are clean and in good condition
   - lockring is fully retracted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

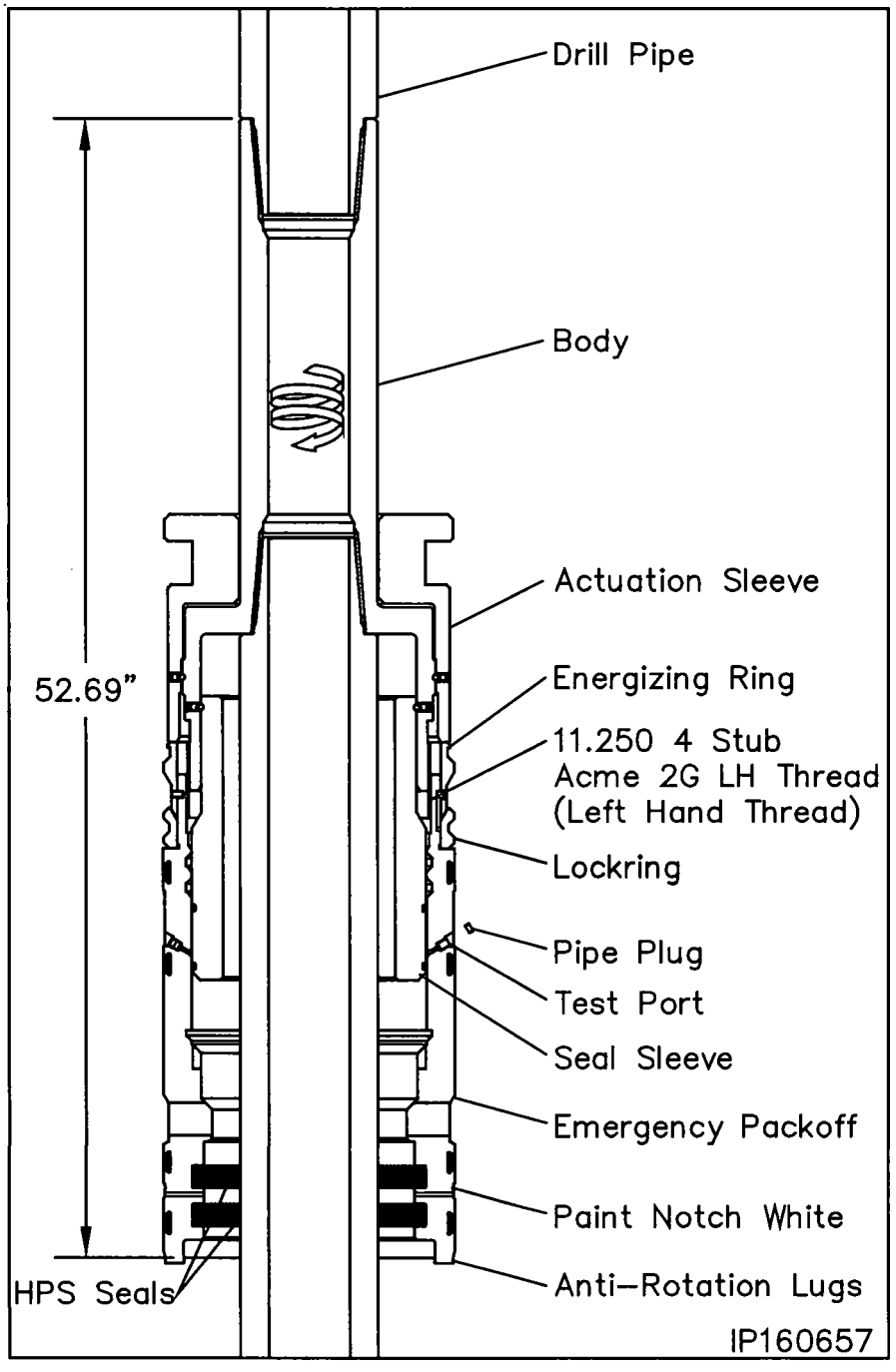
13. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5,000 psi is achieved.

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.

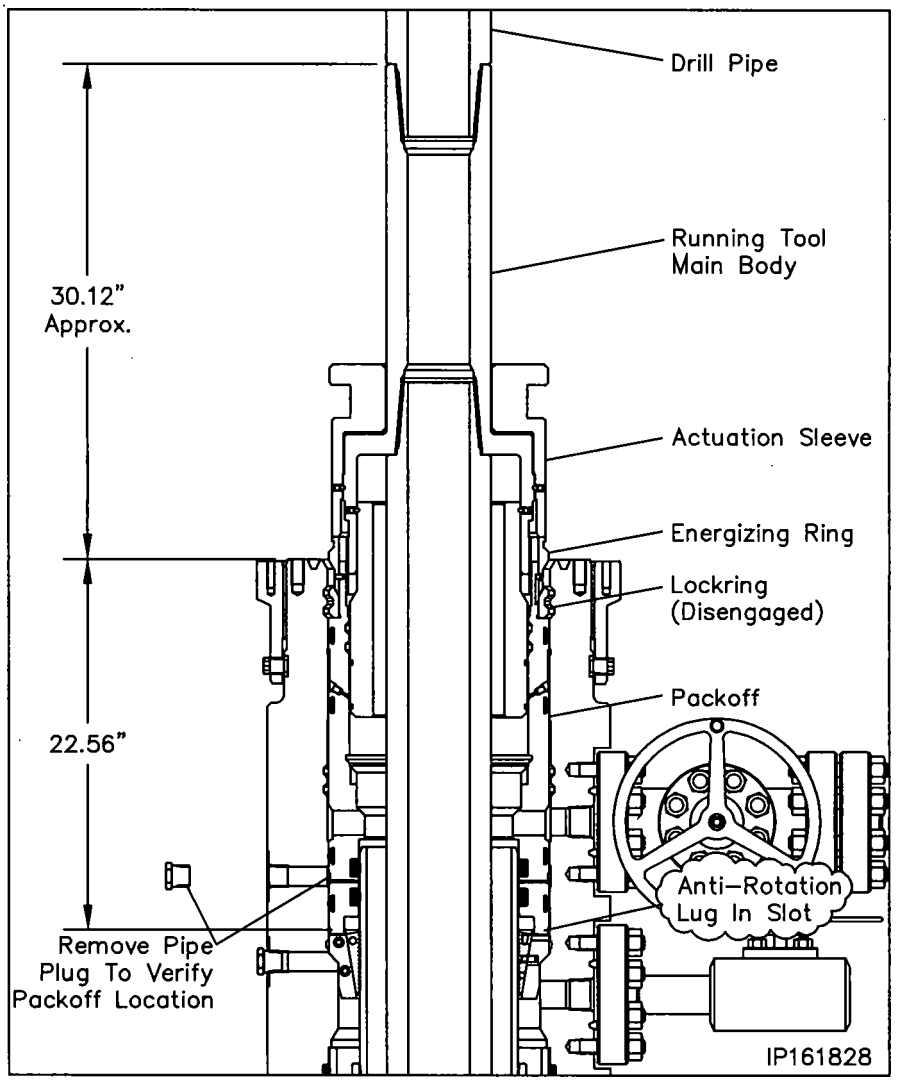
20. Align the white paint line with the existing paint mark on top of the housing.

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

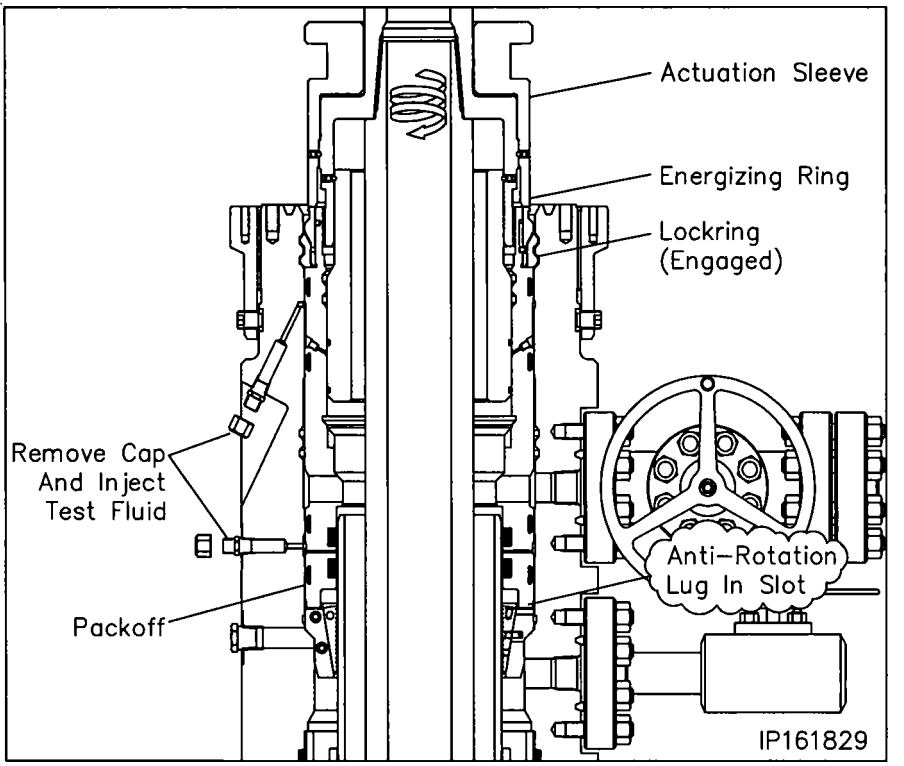
Seal Test

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

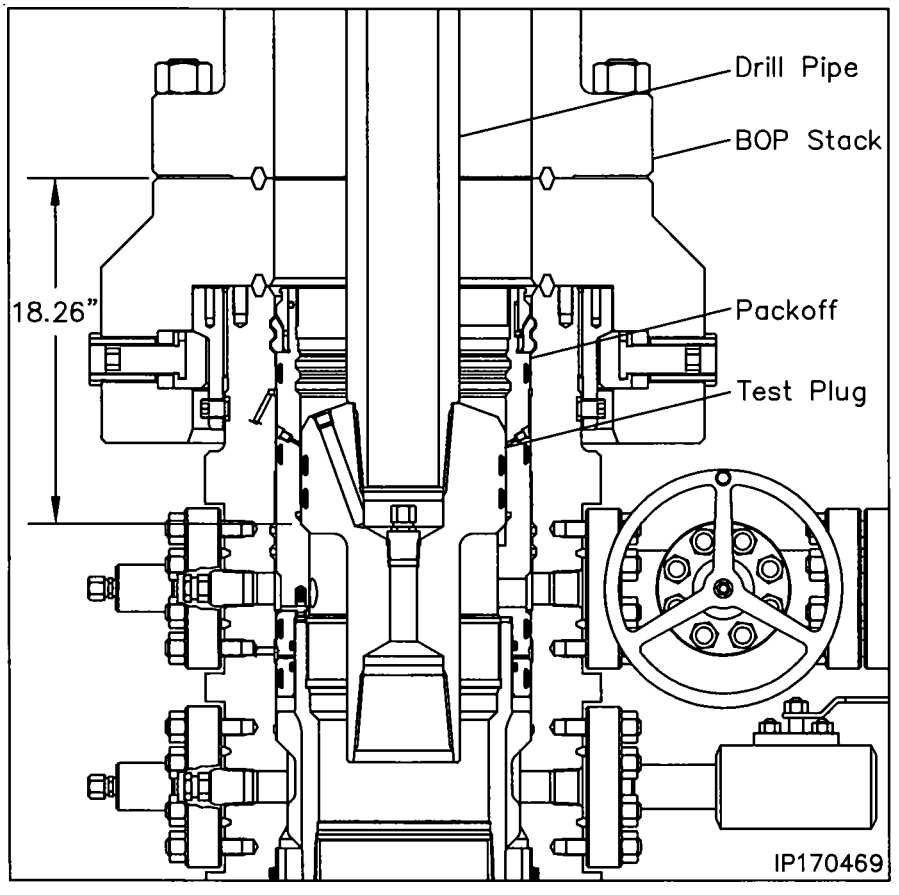
3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

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.

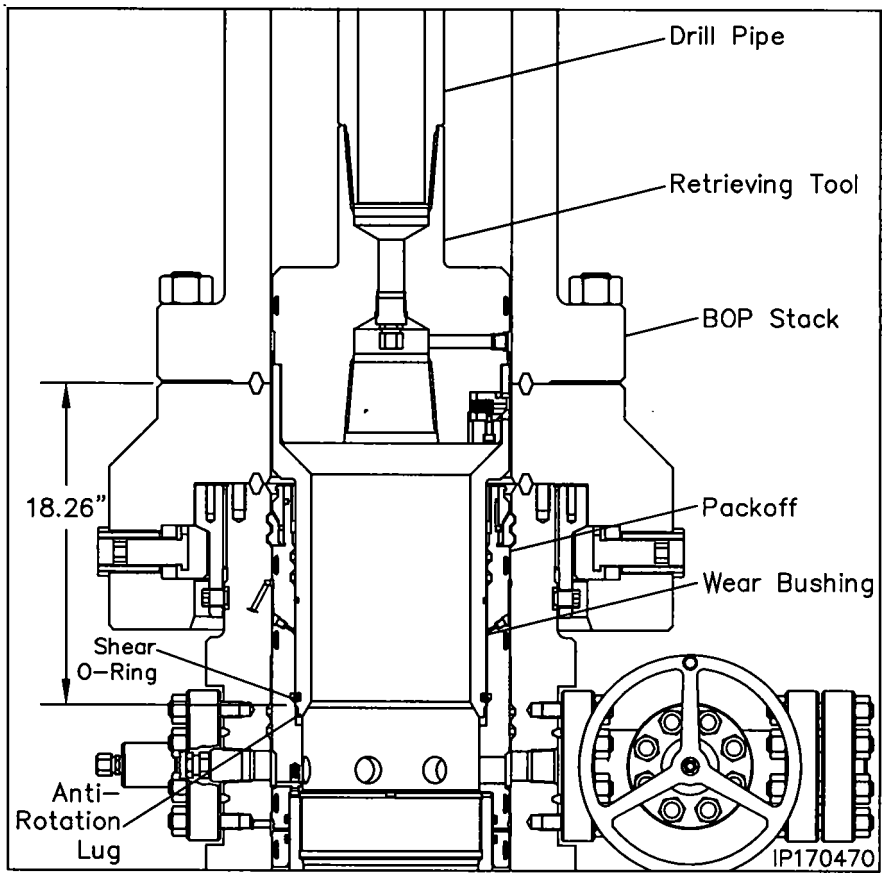
Note: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

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

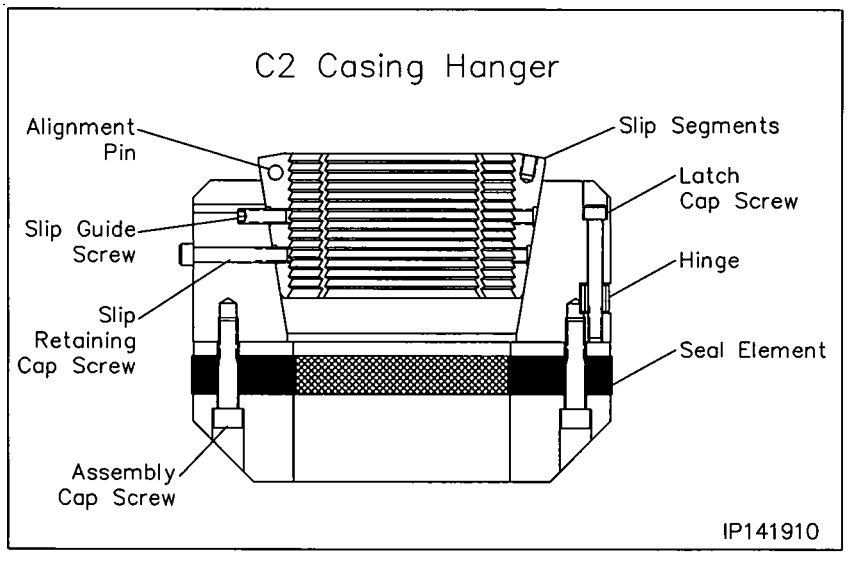
1. Run and cement the 5-1/2" casing string as required.
2. Open the housing upper side outlet valve to drain the BOP stack.
3. Clean the ID of the BOP stack and OD of the casing with a high pressure water hose until returns through the open side outlet valve are clean and free of debris.
4. Thoroughly 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.

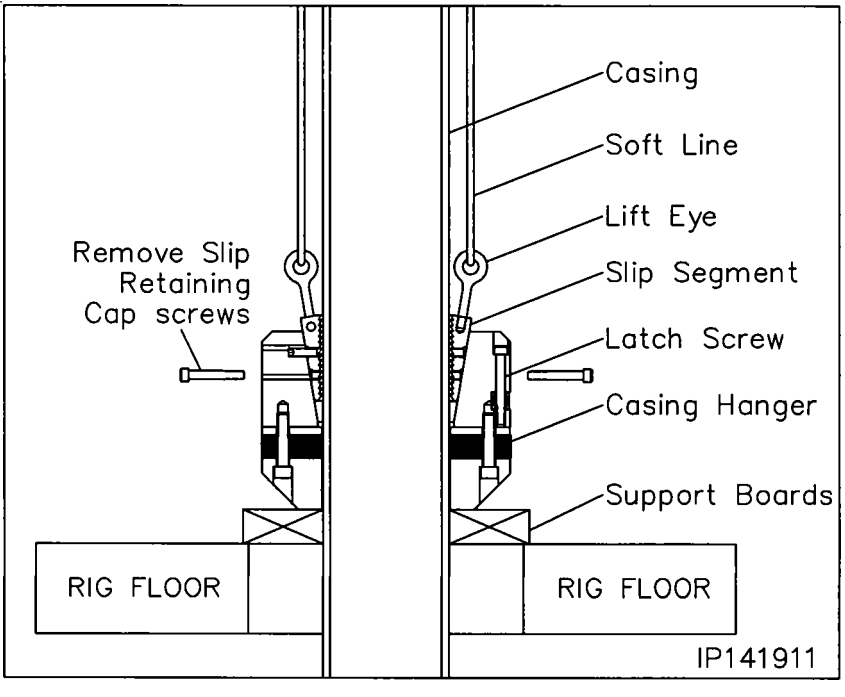
Note: Side outlet valve to remain open while setting the casing hanger.

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.

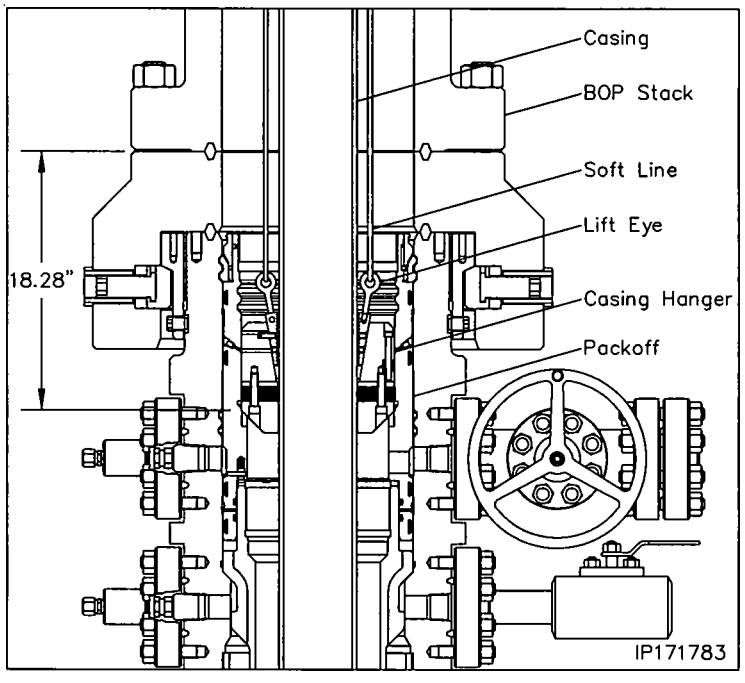
24. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.

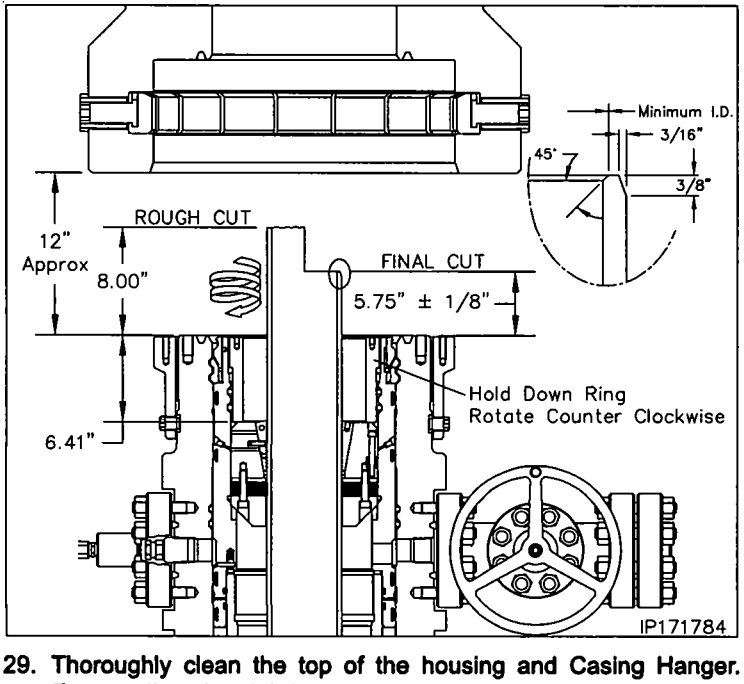
25. Remove the four lift eyes.

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.

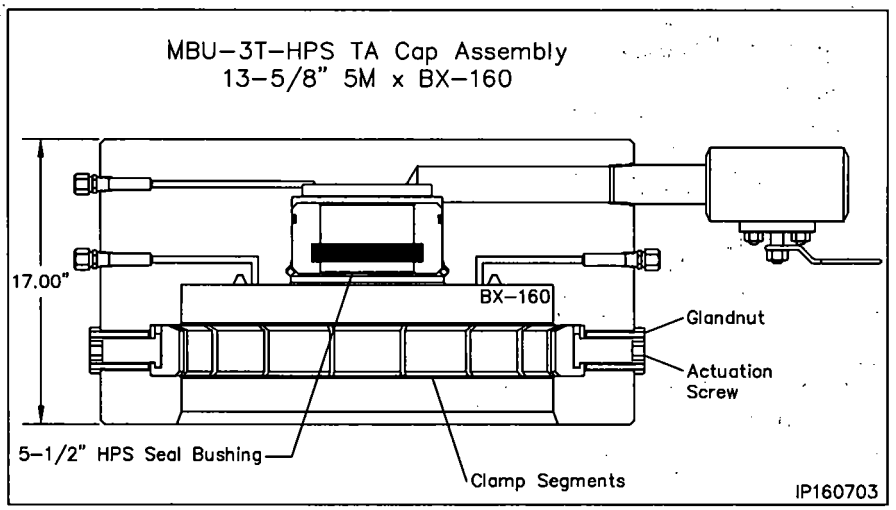
30. Thoroughly clean and lightly lubricate the mating acme threads of the MBU-3T packoff and the slip ***Hold Down Ring (Item A14)***.

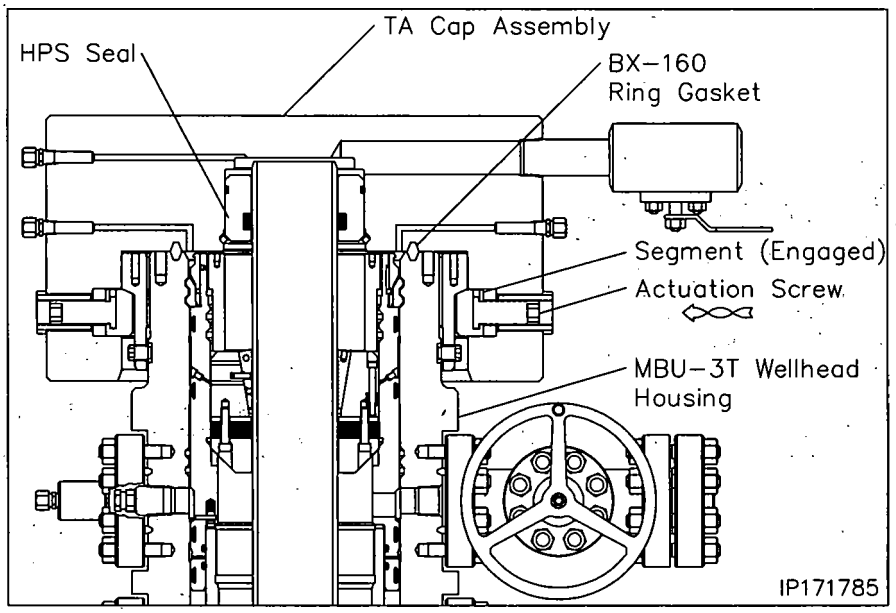
31. Thread the ring into the packoff with counter clockwise rotation to a positive stop on top of the slip hanger.

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.

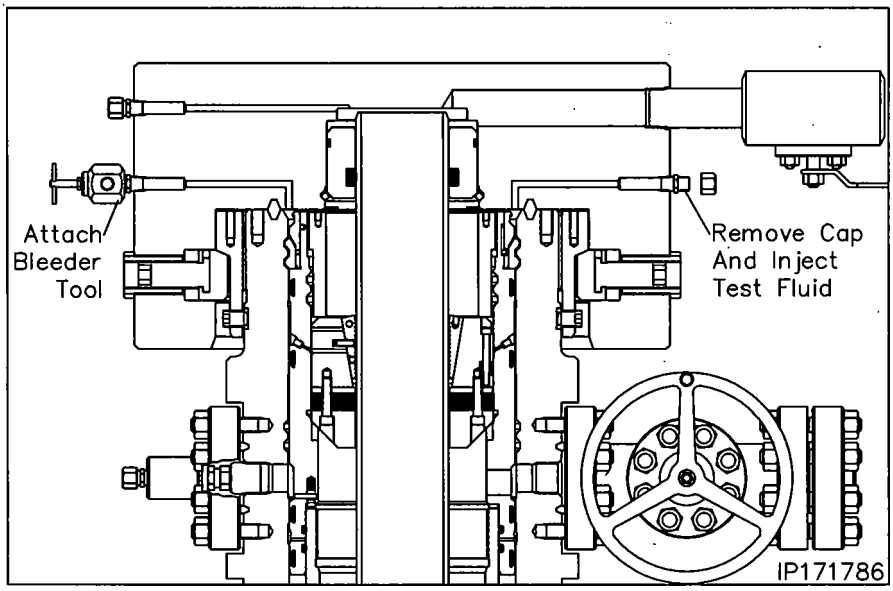




Stage 10 — Install the 'Quick Connect' TA Cap Assembly

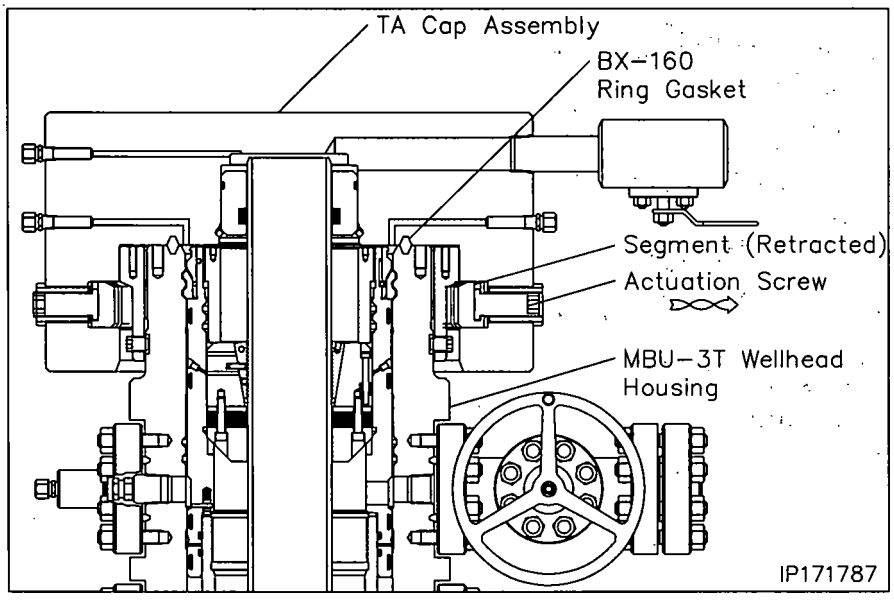
Connection Test

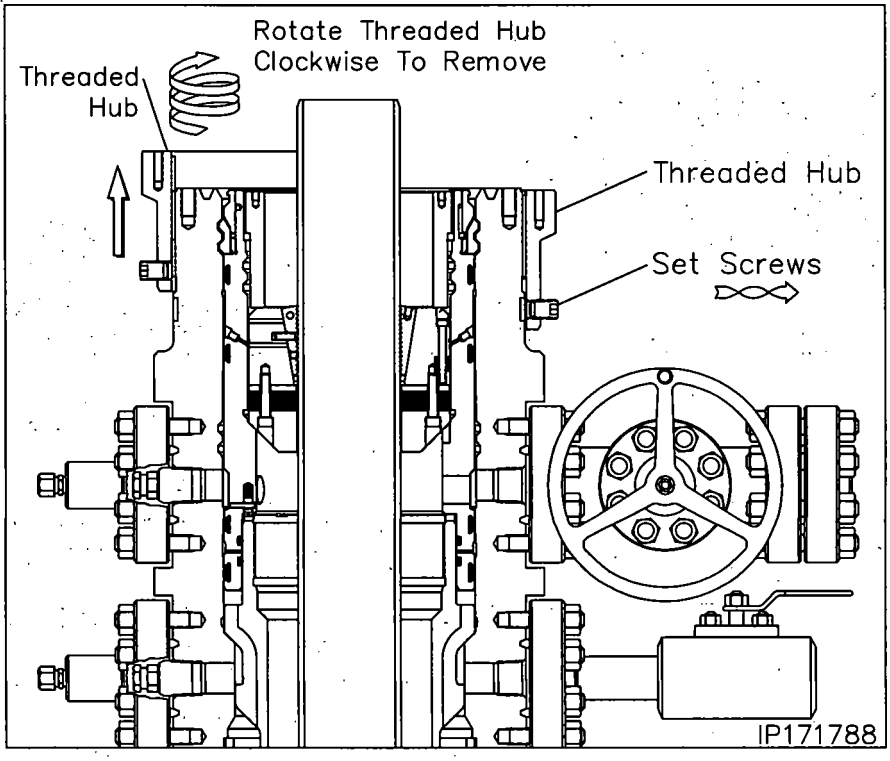
1. Open the TA Cap ball valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked flange test and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fitting and open the tool.
4. Attach a test pump to the remaining open fitting 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

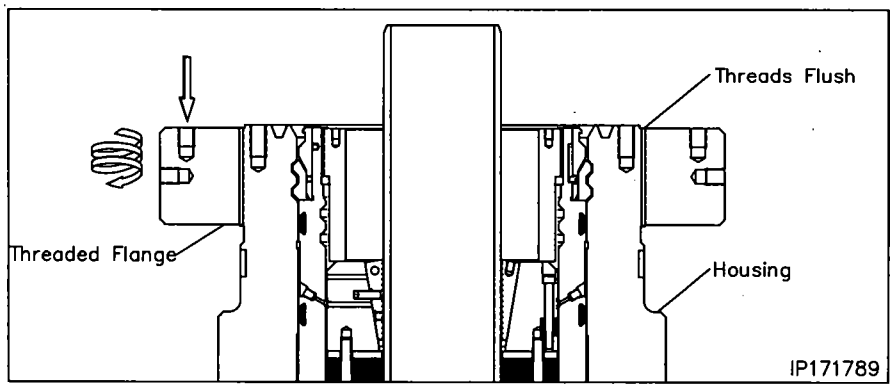
1. Open the ball valve on the TA cap to check for trapped pressure above the casing hanger.
2. Locate the actuation screws on the OD of the TA Cap Assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
4. Install a lift eye with pick 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

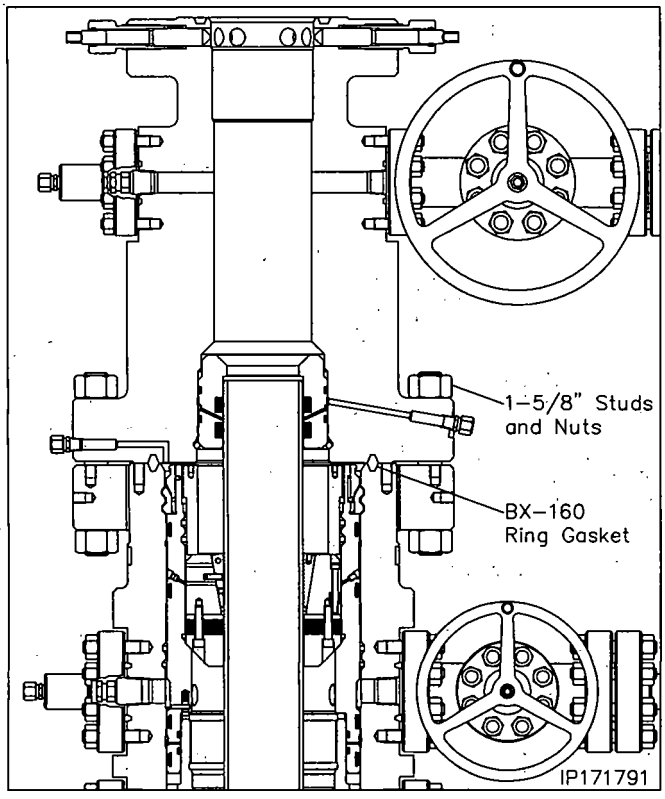
7. Examine the 13-5/8" 5M Thread Flange. Verify the following:
   - Acme thread are clean and in good condition
8. Thoroughly clean and lightly lubricate the mating threads of the housing and the Thread Flange with Copper Coat or Never Seize.
9. Pick up the flange and carefully thread it onto the top 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.

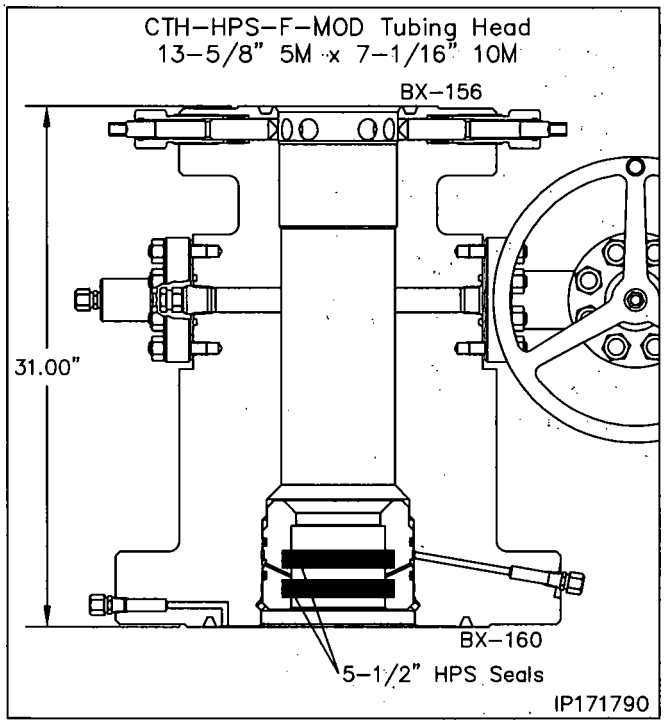


Stage 12 — Install the Tubing Head

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.

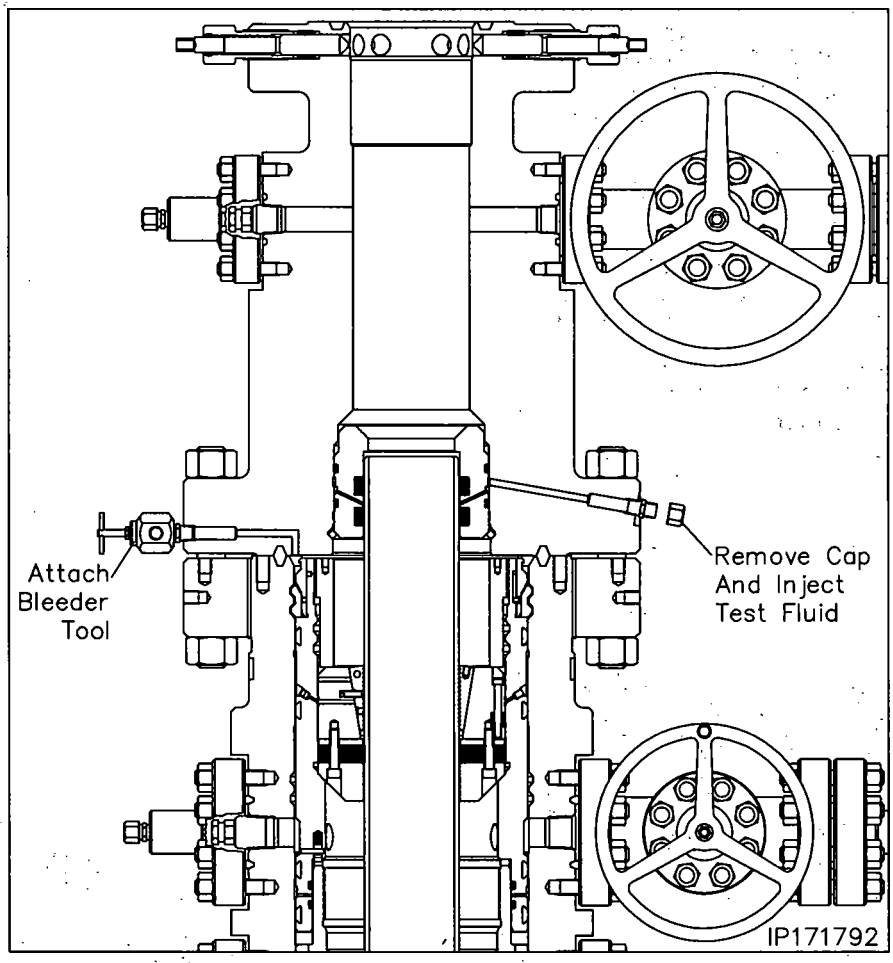
Warning: Do Not damage the 'HPS' seals or their sealing ability will be impaired!

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.

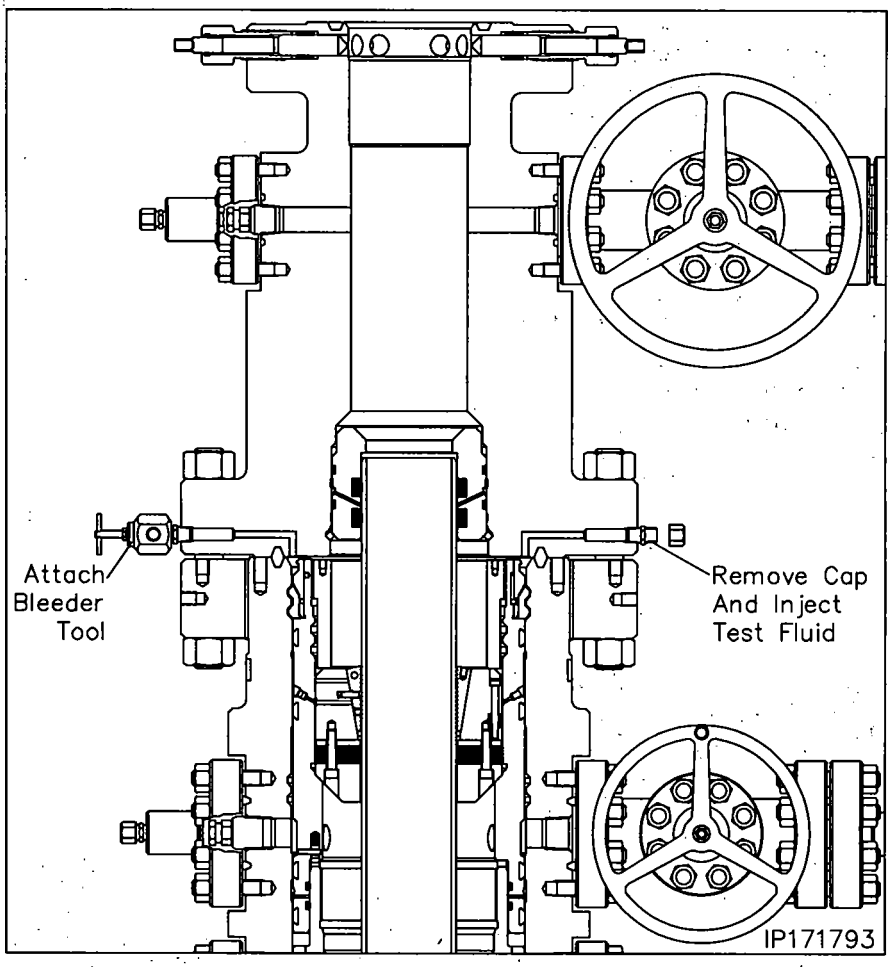


Seal Test	
Leak Location	**Appropriate Action**
Open bleeder tool - Lower HPS seal is leaking	Remove Tubing Head and replace leaking seals. Re land and retest seals
Into the tubing head bore - Upper HPS seal is leaking	

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.

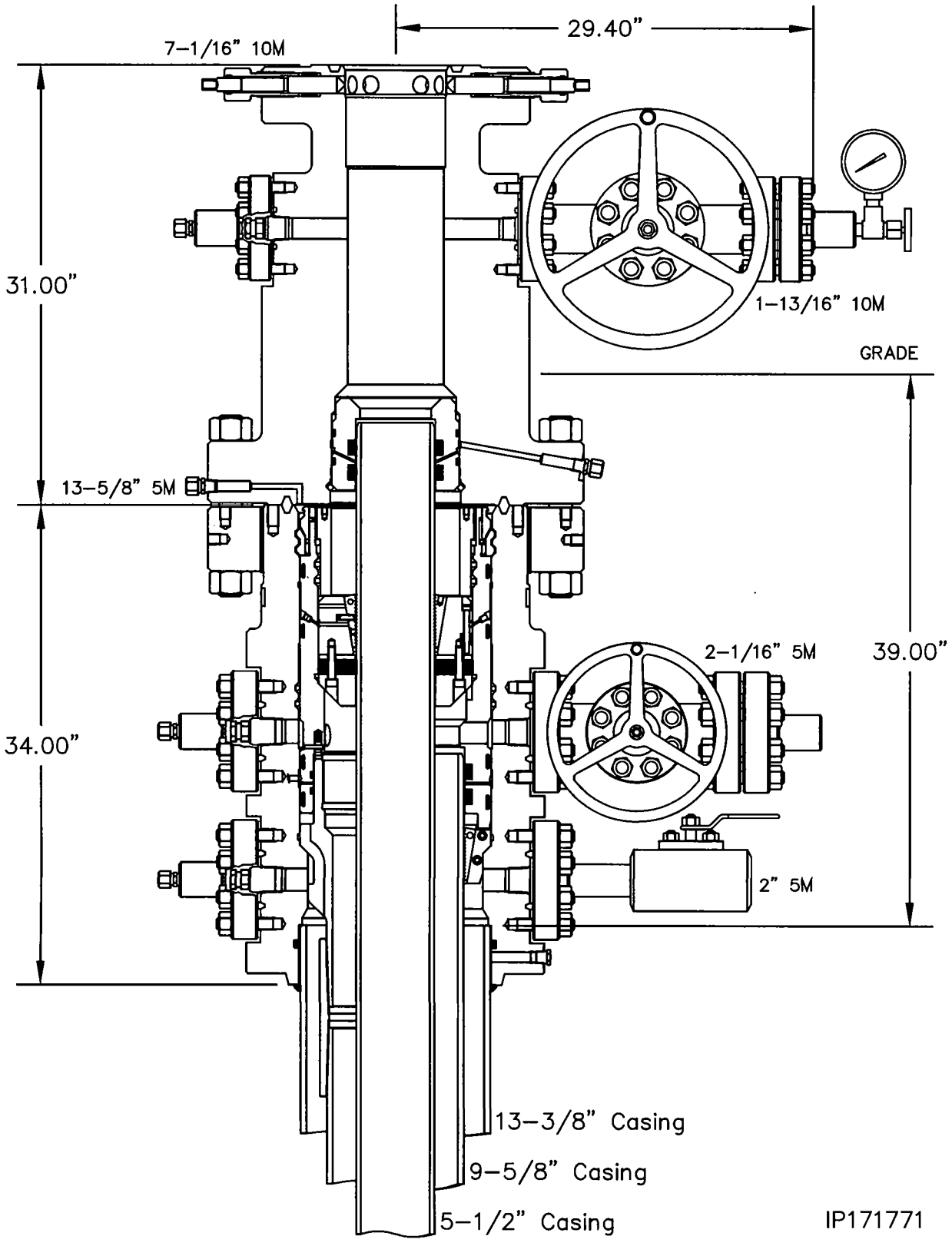
11. **Cooling.** ***Rapid cooling must be avoided.*** To assure slow cooling, welds should be protected from extreme weather conditions (cold, rain, high winds, etc.) by the use of suitable insulating material. (Specially designed insulating blankets are available at many welding supply stores.) Particular 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.

System Drawing



Continental

ContiTech

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 247/ 2014
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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*

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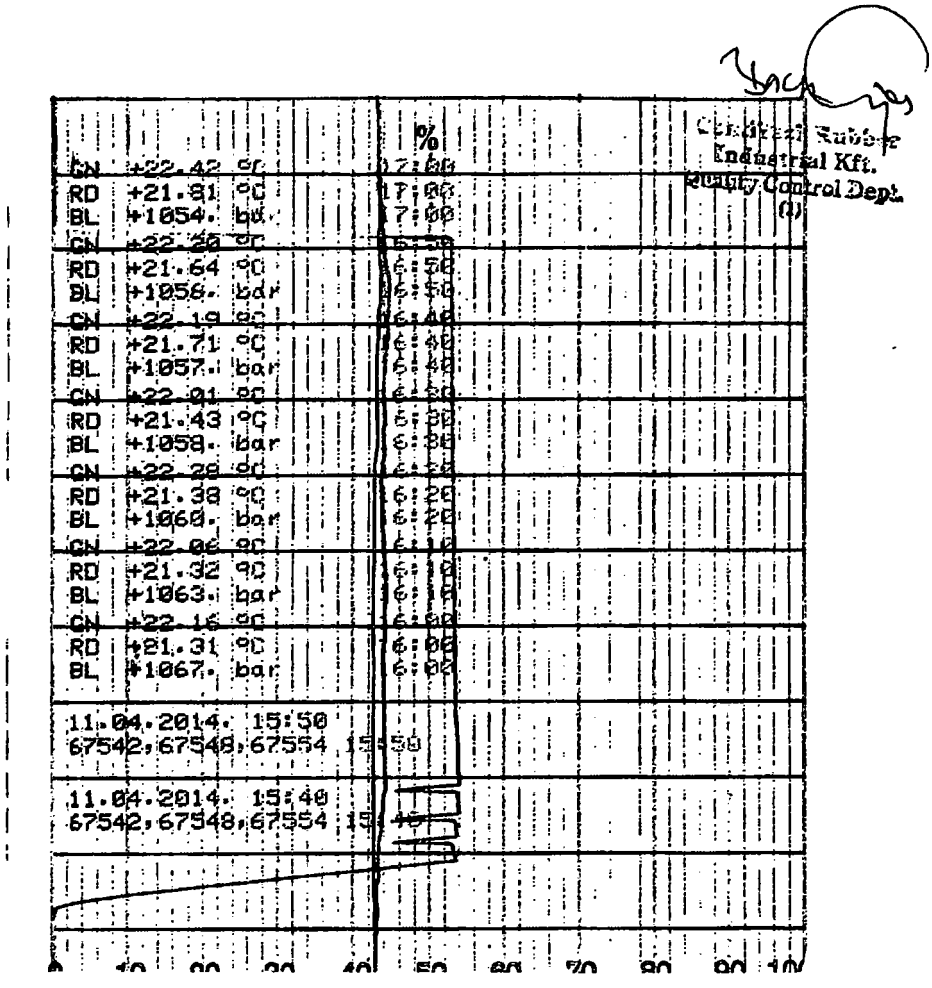

Industrial Kft.
Quality Control Dept.
(1)

Hose Data Sheet

CRI Order No.	538448
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

Continental CONTITECH

CONTITECH RUBBER Industrial Kft.	No:QC-DB- 248 /2013
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QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. N°: 731

PURCHASER:	ContiTech Oil & Marine Corp.	P.O. N°:	4500300249
CONTITECH RUBBER order N°:	536555	HOSE TYPE:	3" ID Choke and Kill Hose
HOSE SERIAL N°:	65346	NOMINAL / ACTUAL LENGTH:	7,62 m / 7,66 m

W.P.	T.P.	Duration:
68,9 MPa 10000 psi	103,4 MPa 15000 psi	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	3428 3433	AISI 4130	A1031U
4 1/16" API 10K Swivel Flange end		AISI 4130	034435 54961
Hub		AISI 4130	A0462U

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

66 – 1042 NBRSN661042 **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
03. May 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No: 728,730,731*

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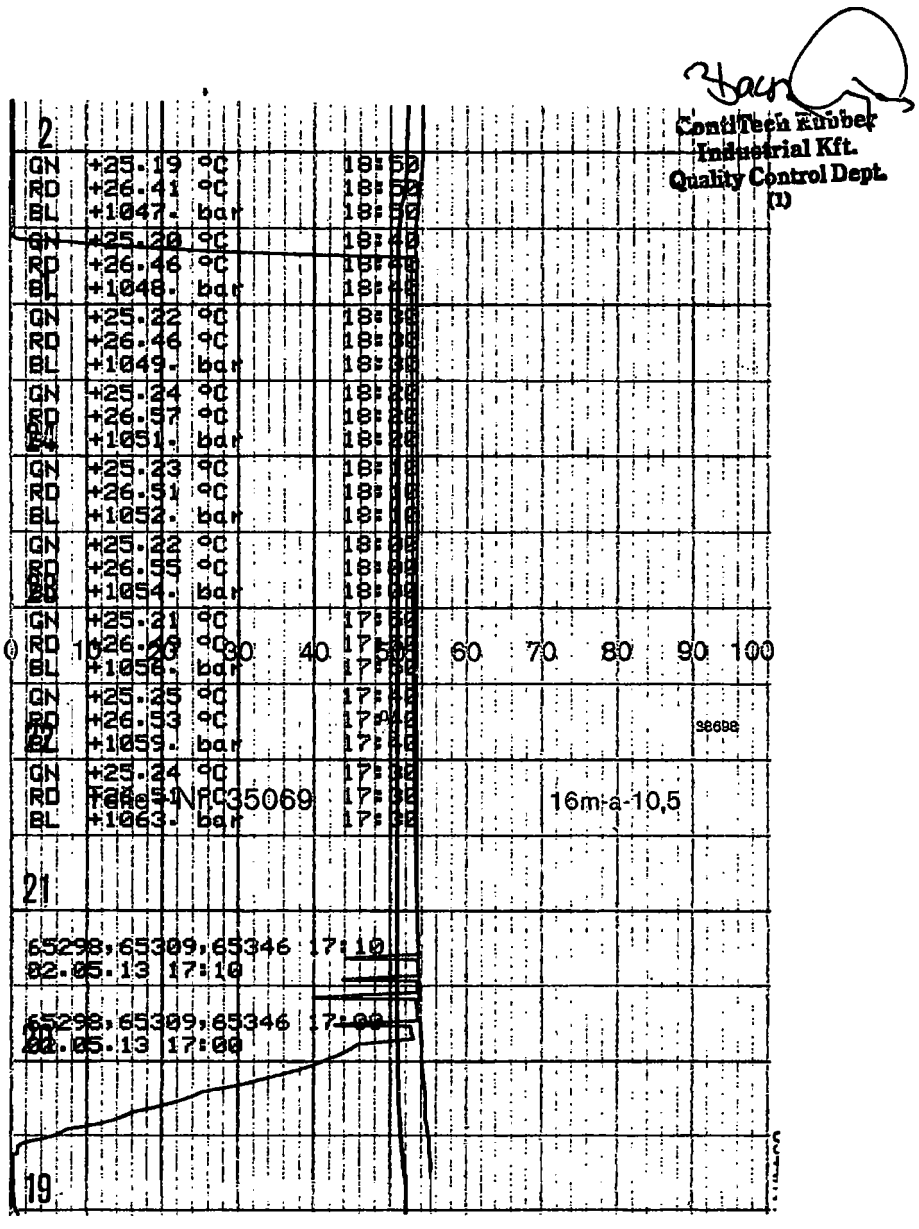

Continental CONTITECH

Hose Data Sheet

CRI Order No.	536555
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500300249 CBC384527
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	25 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGEC/W BX155 ST/ST INLAID RING GR
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155 ST/ST INLAID RING 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 RESISTANT
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
MBR operating [m]	1,60
MBR storage [m]	1,40
Type of packing	WOODEN CRATE ISPM-15

AFMSS

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

SUPO Data Report

09/05/2019

APD ID: 10400035844

Submission Date: 11/14/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS

Well Number: 4H

Well Type: OIL 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:

LAGUNA_23_FED_COM_2BS_4H_route_map_10302018_20181101140857.pdf
LAGUNA_23_FED_COM_2BS_4H_VICINITY_MAP_10302018_20181101140858.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: If well is productive, a tank battery will be installed on well pad. Tank battery construction and instillation plans will be submitted via Sundry Notice.

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: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: PIPELINE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 120000

Source volume (acre-feet): 15.467172

Source volume (gal): 5040000

Water source and transportation map:

LAGUNA_23_FED_COM_2BS_4H_water_map_10302018_20181101141929.pdf

Water source comments: CHISHOLM ENERGY OPERATING, LLC HAS NOT MADE A DECISION AS TO WHERE WE WILL BE GETTING WATER FOR DRILLING/COMPLETION OPERATIONS. ATTACHED IS A MAP WITH VIABLE OPTIONS FOR OBTAINING WATER.

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:**

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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

Using any construction materials: YES

Construction Materials description: Construction materials from the location will be used. No additional needs are anticipated.

Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: COMPLETIONS/STIMULATION

Waste content description: Completions Fluids

Amount of waste: 2000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel Tanks

Safe containmant attachment:

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

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: DRILLING

Waste content description: Drilling Fluids and Cuttings

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

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Waste type: SEWAGE

Waste content description: Human Waste

Amount of waste: 50 pounds

Waste disposal frequency : Weekly

Safe containment description: Portable Toilets

Safe containmant attachment:

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

Disposal type description:

Disposal location description: Serviced by toilet rental company

Waste type: GARBAGE

Waste content description: Trash and Debris

Amount of waste: 200 pounds

Waste disposal frequency : One Time Only

Safe containment description: roll off bin with netted top

Safe containmant attachment:

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

Disposal type description:

Disposal location description: Truck to commercial waste facility

Waste type: PRODUCED WATER

Waste content description: Produced water

Amount of waste: 4000 barrels

Waste disposal frequency : One Time Only

Safe containment description: Steel Tanks

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** PRIVATE

Disposal type description: Private

Disposal location description: Trucked to tank battery

Waste type: FLOWBACK

Waste content description: Oil

Amount of waste: 1000 barrels

Waste disposal frequency : One Time Only

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** PRIVATE

Disposal type description: Private

Disposal location description: Haul to tank battery

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

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

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

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

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Stored in steel bin and hauled to disposal site by truck

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:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Section 9 - Well Site Layout

Well Site Layout Diagram:

LAGUNA_23_FED_COM_2BS_4H_SITE_MAP.1_10302018_20181101142015.pdf

LAGUNA_23_FED_COM_2BS_4H_SITE_MAP.2_10302018_20181101142015.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** LAGUNA 23 FED

Multiple Well Pad Number: 2H, 4H

Recontouring attachment:

Drainage/Erosion control construction: Drainage systems, if an, will be reshaped to the 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 state as much as possible.

Well pad proposed disturbance (acres): 0	**Well pad interim reclamation (acres):** 4.78	**Well pad long term disturbance (acres):** 4.78
Road proposed disturbance (acres): 0	**Road interim reclamation (acres):** 0.76	**Road long term disturbance (acres):** 0.76
Powerline proposed disturbance (acres): 0	**Powerline interim reclamation (acres):** 0	**Powerline long term disturbance (acres):** 0
Pipeline proposed disturbance (acres): 0	**Pipeline interim reclamation (acres):** 0	**Pipeline long term disturbance (acres):** 0
Other proposed disturbance (acres): 0	**Other interim reclamation (acres):** 0	**Other long term disturbance (acres):** 0
Total proposed disturbance: 0	**Total interim reclamation:** 5.54	**Total long term disturbance:** 5.54

Disturbance Comments:

Reconstruction method: No interim reclamation planned due to future development on this pad, as well as tank battery construction if the well is productive.

Topsoil redistribution: After the area has been reshaped and contoured, topsoil from the spoil pile 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, shinnery oak

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: mesquite, shinnery oak

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: no other disturbance

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: 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: Tim **Last Name:** Green

Phone: (432)686-8235 **Email:** tgreen@chisholmenergy.com

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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: Monitoring by lease operators during each visit

Monitoring plan attachment:

Success standards: N/A

Pit closure description: No pit, utilizing closed loop system

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information:

Use a previously conducted onsite? YES

Previous Onsite information: 4H well on existing location. Per BLM, no on-site needed.

Other SUPO Attachment

LAGUNA_23_FED_COM_2BS_4H_LOC_VERIFICATION_10302018_20181101142421.pdf
GCP_LAGUNA_23_FED_COM_2BS_4H_11012018_20181101142738.pdf

AFMSS

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

PWD Data Report

09/05/2019

APD ID: 10400035844 **Submission Date:** 11/14/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

Well Type: OIL WELL **Well Work Type:** Drill

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:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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

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?

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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):**

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS **Well Number:** 4H

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

09/05/2019

APD ID: 10400035844

Submission Date: 11/14/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: LAGUNA 23 FED COM 2BS

Well Number: 4H

Well Type: OIL WELL

Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

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: