PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CHISHOLM ENERGY OPERATING
LEASE NO.:	NMNM86144
WELL NAME & NO.:	DIAMONDBACK 24-25 FED 1BS 3H
SURFACE HOLE FOOTAGE:	125'/N & 630'/E
BOTTOM HOLE FOOTAGE	330'/S & 430'/E
LOCATION:	SECTION 24, T19S, R32E, NMPM
COUNTY:	LEA, NEW MEXICO

HOBBS OCD
JUL 19 2018
RECEIVED

COA

H2S	◉ Yes	○ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☑ 4 String Area	☑ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** 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 **1200** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

Operator shall filled 2/3rd casing with fluild while running intermediate casing

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is: Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

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.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:
(Use this for 3 string wells in the Capitan Reef, if 4 string well ensure FW based mud used across the capitan interval)

- 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 200 feet into previous casing string. Operator shall provide method of verification.**Additional cement maybe required. Excess calculates to 20%.**

C. PRESSURE CONTROL

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

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

GENERAL REQUIREMENTS

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

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

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

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

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

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

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

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

A. CASING

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

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

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

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

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

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

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

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

B. PRESSURE CONTROL

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

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

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

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

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

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

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

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

c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

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

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

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.

g. BOP/BOPE must be tested by an independent service company within 500

feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

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PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

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LEASE NO.:	NMNM86144
WELL NAME & NO.:	DIAMONDBACK 24-25 FED 2BS 3H
SURFACE HOLE FOOTAGE:	125'/N & 630'/E
BOTTOM HOLE FOOTAGE	330'/S & 430'/E
LOCATION:	SECTION 24, T19S, R32E, NMPM
COUNTY:	LEA

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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.

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.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

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.

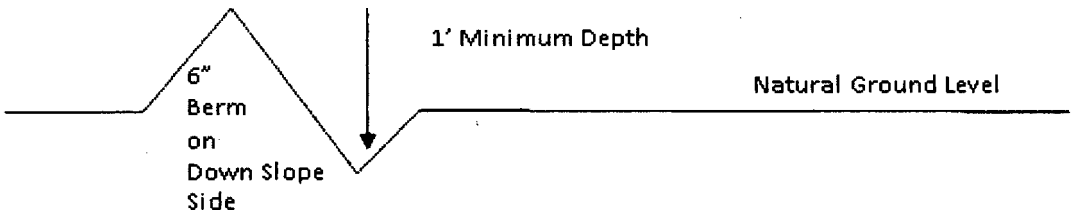
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

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 written approval granted by the Authorized Officer.

Construction Steps

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

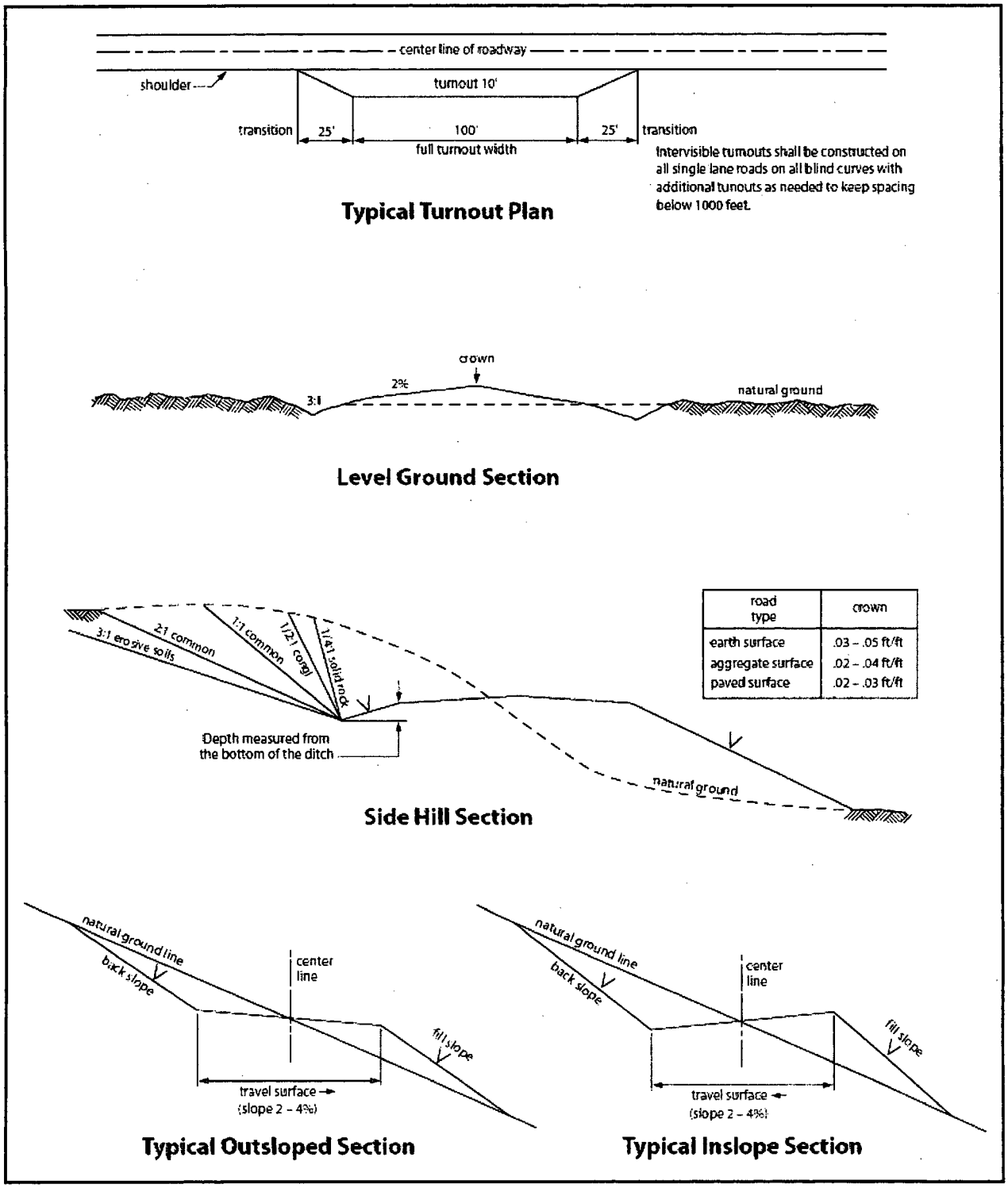


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

without specific 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

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:** 12/05/2017

Title: Senior Regulatory Technician

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

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

Phone: (817)953-3728

Email address: jelrod@chisholmenergy.com

Field Representative

Representative Name:

Street Address:

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

Phone:

Email address:

Chisholm Energy Operating, LLC

801 Cherry St., Suite 1200-Unit 20

Fort Worth, TX 76102

H2S Contingency Plan

Lea County, NM

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

Open Hole Size (Inches)	Casing Depth; From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Tension Joint (klbs)	Air Weight (lbs)	Tension Joint SF (1.8)	Tension Body (klbs)	Air Weight (lbs)	Tension Body SF (1.8)
Surface																			
17.5"	0'	1,205'	1,205'	13 3/8"	54.5	J-55	BTC	New	8.4	2730	5.19	1130	2.15	909,000	65,673	13.84	853,000	65,673	12.99
Intermediate																			
12.25"	0'	5,200'	5,200'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.43	2570	1.40	520,000	208,000	2.50	630,000	208,000	3.03
Production																			
8.75"	0'	19,836'	9,894'	5 1/2"	17	P-110	BTC	New	9.2	10640	2.25	7480	1.58	568,000	168,198	3.38	546,000	168,198	3.25

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 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst	A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Production

Tension	A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	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

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

Job#

Rig: Nabors M55

Chisholm Energy Holdings

Lea County, NM (NAD 83) Diamondback 24 Federal 2BS

API#

3H

Wellbore #1

Sperry Drilling Services

Ellipse Separation
Anticollision Report

Minimum Magnetic Interference Warning level is 50' center to center

Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Reference Design: Diamondback 24 Federal 2BS - 3H - Wellbore #1 - Plan 2

Well Coordinates:	32° 39' 09.76" N 103° 42' 47.55" W	North American Datum 1983 New Mexico Eastern Zone 601,744.85 N 732,196.45 E

Ground Level: 3,619.60 usft

Scan Range: 0.00 to 18,838.28 usft. Measured Depth.

Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Version: 5000.1 Build: 81E

Report Version: Midcon Ellipse v1.50

HALLIBURTON

Anticollision Report for 3H - Plan 2

Anticollision Summary

Reference Design: Diamondback 24 Federal 2BS - 3H - Wellbore #1 - Plan 2

Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Site Name Comparison Well Name - Wellbore Name - Design	Measured Depth (usft)	Minimum Distance (usft)	@Measured Depth (usft)	Ellipse Separation (usft)	@Measured Depth usft	Clearance Factor	Summary Based on Minimum
Diamondback 24 Federal 2BS							
1H - Wellbore #1 - Plan 2							
	1,916.60	119.95	1,916.60	109.63	1,916.80	11.625	Centre Distance
	2,000.00	119.95	2,000.00	109.26	2,000.00	11.221	Ellipse Separation
	18,838.28	1,950.98	18,838.28	1,606.06	20,095.68	5.656	Clearance Factor
2H - Wellbore #1 - Plan 2							
	[redacted]	59.99	8,200.00	21.47	8,201.90	[redacted]	Centre Distance
	[redacted]	59.99	8,201.71	21.46	8,203.61	[redacted]	Ellipse Separation
	[redacted]	60.50	8,300.00	21.53	8,301.89	[redacted]	Clearance Factor

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
100.00	100.00	0.00	0.00	0.51	101.90	101.90	-0.26	-59.99	0.51	59.99	57.06	-90.25	20.456
200.00	200.00	0.00	0.00	0.59	201.90	201.90	-0.26	-59.99	0.59	59.99	56.89	-90.25	19.364
300.00	300.00	0.00	0.00	0.73	301.90	301.90	-0.26	-59.99	0.74	59.99	56.60	-90.25	17.709
400.00	400.00	0.00	0.00	0.91	401.90	401.90	-0.26	-59.99	0.91	59.99	56.25	-90.25	16.028
500.00	500.00	0.00	0.00	1.11	501.90	501.90	-0.26	-59.99	1.11	59.99	55.86	-90.25	14.516
600.00	600.00	0.00	0.00	1.31	601.90	601.90	-0.26	-59.99	1.31	59.99	55.45	-90.25	13.208
700.00	700.00	0.00	0.00	1.52	701.90	701.90	-0.26	-59.99	1.52	59.99	55.03	-90.25	12.089
800.00	800.00	0.00	0.00	1.73	801.90	801.90	-0.26	-59.99	1.74	59.99	54.60	-90.25	11.130
900.00	900.00	0.00	0.00	1.95	901.90	901.90	-0.26	-59.99	1.96	59.99	54.17	-90.25	10.303
1,000.00	1,000.00	0.00	0.00	2.17	1,001.90	1,001.90	-0.26	-59.99	2.17	59.99	53.73	-90.25	9.585
1,100.00	1,100.00	0.00	0.00	2.39	1,101.90	1,101.90	-0.26	-59.99	2.39	59.99	53.29	-90.25	8.957
1,200.00	1,200.00	0.00	0.00	2.61	1,201.90	1,201.90	-0.26	-59.99	2.61	59.99	52.85	-90.25	8.405
1,300.00	1,300.00	0.00	0.00	2.83	1,301.90	1,301.90	-0.26	-59.99	2.83	59.99	52.41	-90.25	7.915
1,400.00	1,400.00	0.00	0.00	3.05	1,401.90	1,401.90	-0.26	-59.99	3.06	59.99	51.97	-90.25	7.478
1,500.00	1,500.00	0.00	0.00	3.27	1,501.90	1,501.90	-0.26	-59.99	3.28	59.99	51.52	-90.25	7.086
1,600.00	1,600.00	0.00	0.00	3.50	1,601.90	1,601.90	-0.26	-59.99	3.50	59.99	51.08	-90.25	6.732
1,700.00	1,700.00	0.00	0.00	3.72	1,701.90	1,701.90	-0.26	-59.99	3.72	59.99	50.63	-90.25	6.412
1,800.00	1,800.00	0.00	0.00	3.94	1,801.90	1,801.90	-0.26	-59.99	3.94	59.99	50.19	-90.25	6.120
1,900.00	1,900.00	0.00	0.00	4.16	1,901.90	1,901.90	-0.26	-59.99	4.17	59.99	49.74	-90.25	5.854
2,000.00	2,000.00	0.00	0.00	4.39	2,001.90	2,001.90	-0.26	-59.99	4.39	59.99	49.30	-90.25	5.609
2,100.00	2,100.00	0.00	0.00	4.61	2,101.90	2,101.90	-0.26	-59.99	4.61	59.99	48.85	-90.25	5.385
2,200.00	2,200.00	0.00	0.00	4.83	2,201.90	2,201.90	-0.26	-59.99	4.84	59.99	48.40	-90.25	5.177
2,300.00	2,300.00	0.00	0.00	5.06	2,301.90	2,301.90	-0.26	-59.99	5.06	59.99	47.96	-90.25	4.984
2,400.00	2,400.00	0.00	0.00	5.28	2,401.90	2,401.90	-0.26	-59.99	5.29	59.99	47.51	-90.25	4.806
2,500.00	2,500.00	0.00	0.00	5.50	2,501.90	2,501.90	-0.26	-59.99	5.51	59.99	47.06	-90.25	4.639
2,600.00	2,600.00	0.00	0.00	5.73	2,601.90	2,601.90	-0.26	-59.99	5.73	59.99	46.61	-90.25	4.484
2,700.00	2,700.00	0.00	0.00	5.95	2,701.90	2,701.90	-0.26	-59.99	5.96	59.99	46.16	-90.25	4.339
2,800.00	2,800.00	0.00	0.00	6.18	2,801.90	2,801.90	-0.26	-59.99	6.18	59.99	45.72	-90.25	4.203
2,900.00	2,900.00	0.00	0.00	6.40	2,901.90	2,901.90	-0.26	-59.99	6.40	59.99	45.27	-90.25	4.075
3,000.00	3,000.00	0.00	0.00	6.62	3,001.90	3,001.90	-0.26	-59.99	6.63	59.99	44.82	-90.25	3.954

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
3,100.00	3,100.00	0.00	0.00	6.85	3,101.90	3,101.90	-0.26	-59.99	6.85	59.99	44.37	-90.25	3.841
3,200.00	3,200.00	0.00	0.00	7.07	3,201.90	3,201.90	-0.26	-59.99	7.08	59.99	43.92	-90.25	3.734
3,300.00	3,300.00	0.00	0.00	7.30	3,301.90	3,301.90	-0.26	-59.99	7.30	59.99	43.47	-90.25	3.632
3,400.00	3,400.00	0.00	0.00	7.52	3,401.90	3,401.90	-0.26	-59.99	7.53	59.99	43.03	-90.25	3.536
3,500.00	3,500.00	0.00	0.00	7.75	3,501.90	3,501.90	-0.26	-59.99	7.75	59.99	42.58	-90.25	3.445
3,600.00	3,600.00	0.00	0.00	7.97	3,601.90	3,601.90	-0.26	-59.99	7.97	59.99	42.13	-90.25	3.359
3,700.00	3,700.00	0.00	0.00	8.19	3,701.90	3,701.90	-0.26	-59.99	8.20	59.99	41.68	-90.25	3.276
3,800.00	3,800.00	0.00	0.00	8.42	3,801.90	3,801.90	-0.26	-59.99	8.42	59.99	41.23	-90.25	3.198
3,900.00	3,900.00	0.00	0.00	8.64	3,901.90	3,901.90	-0.26	-59.99	8.65	59.99	40.78	-90.25	3.123
4,000.00	4,000.00	0.00	0.00	8.87	4,001.90	4,001.90	-0.26	-59.99	8.87	59.99	40.33	-90.25	3.052
4,100.00	4,100.00	0.00	0.00	9.09	4,101.90	4,101.90	-0.26	-59.99	9.10	59.99	39.89	-90.25	2.984
4,200.00	4,200.00	0.00	0.00	9.32	4,201.90	4,201.90	-0.26	-59.99	9.32	59.99	39.44	-90.25	2.919
4,300.00	4,300.00	0.00	0.00	9.54	4,301.90	4,301.90	-0.26	-59.99	9.55	59.99	38.99	-90.25	2.856
4,400.00	4,400.00	0.00	0.00	9.77	4,401.90	4,401.90	-0.26	-59.99	9.77	59.99	38.54	-90.25	2.797
4,500.00	4,500.00	0.00	0.00	9.99	4,501.90	4,501.90	-0.26	-59.99	9.99	59.99	38.09	-90.25	2.739
4,600.00	4,600.00	0.00	0.00	10.21	4,601.90	4,601.90	-0.26	-59.99	10.22	59.99	37.64	-90.25	2.684
4,700.00	4,700.00	0.00	0.00	10.44	4,701.90	4,701.90	-0.26	-59.99	10.44	59.99	37.19	-90.25	2.631
4,800.00	4,800.00	0.00	0.00	10.66	4,801.90	4,801.90	-0.26	-59.99	10.67	59.99	36.74	-90.25	2.580
4,900.00	4,900.00	0.00	0.00	10.89	4,901.90	4,901.90	-0.26	-59.99	10.89	59.99	36.29	-90.25	2.532
5,000.00	5,000.00	0.00	0.00	11.11	5,001.90	5,001.90	-0.26	-59.99	11.12	59.99	35.84	-90.25	2.485
5,100.00	5,100.00	0.00	0.00	11.34	5,101.90	5,101.90	-0.26	-59.99	11.34	59.99	35.40	-90.25	2.439
5,200.00	5,200.00	0.00	0.00	11.56	5,201.90	5,201.90	-0.26	-59.99	11.57	59.99	34.95	-90.25	2.395
5,300.00	5,300.00	0.00	0.00	11.79	5,301.90	5,301.90	-0.26	-59.99	11.79	59.99	34.50	-90.25	2.353
5,400.00	5,400.00	0.00	0.00	12.01	5,401.90	5,401.90	-0.26	-59.99	12.01	59.99	34.05	-90.25	2.312
5,500.00	5,500.00	0.00	0.00	12.24	5,501.90	5,501.90	-0.26	-59.99	12.24	59.99	33.60	-90.25	2.273
5,600.00	5,600.00	0.00	0.00	12.46	5,601.90	5,601.90	-0.26	-59.99	12.46	59.99	33.15	-90.25	2.235
5,700.00	5,700.00	0.00	0.00	12.68	5,701.90	5,701.90	-0.26	-59.99	12.69	59.99	32.70	-90.25	2.198
5,800.00	5,800.00	0.00	0.00	12.91	5,801.90	5,801.90	-0.26	-59.99	12.91	59.99	32.25	-90.25	2.163
5,900.00	5,900.00	0.00	0.00	13.13	5,901.90	5,901.90	-0.26	-59.99	13.14	59.99	31.80	-90.25	2.128

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
6,000.00	6,000.00	0.00	0.00	13.36	6,001.90	6,001.90	-0.26	-59.99	13.36	59.99	31.35	-90.25	2.095
6,100.00	6,100.00	0.00	0.00	13.58	6,101.90	6,101.90	-0.26	-59.99	13.59	59.99	30.90	-90.25	2.062
6,200.00	6,200.00	0.00	0.00	13.81	6,201.90	6,201.90	-0.26	-59.99	13.81	59.99	30.45	-90.25	2.031
6,300.00	6,300.00	0.00	0.00	14.03	6,301.90	6,301.90	-0.26	-59.99	14.04	59.99	30.01	-90.25	2.001
6,400.00	6,400.00	0.00	0.00	14.26	6,401.90	6,401.90	-0.26	-59.99	14.26	59.99	29.56	-90.25	1.971
6,500.00	6,500.00	0.00	0.00	14.48	6,501.90	6,501.90	-0.26	-59.99	14.49	59.99	29.11	-90.25	1.943
6,600.00	6,600.00	0.00	0.00	14.71	6,601.90	6,601.90	-0.26	-59.99	14.71	59.99	28.66	-90.25	1.916
6,700.00	6,700.00	0.00	0.00	14.93	6,701.90	6,701.90	-0.26	-59.99	14.93	59.99	28.21	-90.25	1.888
6,800.00	6,800.00	0.00	0.00	15.16	6,801.90	6,801.90	-0.26	-59.99	15.16	59.99	27.76	-90.25	1.861
6,900.00	6,900.00	0.00	0.00	15.38	6,901.90	6,901.90	-0.26	-59.99	15.38	59.99	27.31	-90.25	1.836
7,000.00	7,000.00	0.00	0.00	15.60	7,001.90	7,001.90	-0.26	-59.99	15.61	59.99	26.86	-90.25	1.811
7,100.00	7,100.00	0.00	0.00	15.83	7,101.90	7,101.90	-0.26	-59.99	15.83	59.99	26.41	-90.25	1.787
7,200.00	7,200.00	0.00	0.00	16.05	7,201.90	7,201.90	-0.26	-59.99	16.06	59.99	25.96	-90.25	1.763
7,300.00	7,300.00	0.00	0.00	16.28	7,301.90	7,301.90	-0.26	-59.99	16.28	59.99	25.51	-90.25	1.740
7,400.00	7,400.00	0.00	0.00	16.50	7,401.90	7,401.90	-0.26	-59.99	16.51	59.99	25.06	-90.25	1.718
7,500.00	7,500.00	0.00	0.00	16.73	7,501.90	7,501.90	-0.26	-59.99	16.73	59.99	24.61	-90.25	1.697
7,600.00	7,600.00	0.00	0.00	16.95	7,601.90	7,601.90	-0.26	-59.99	16.96	59.99	24.16	-90.25	1.676
7,700.00	7,700.00	0.00	0.00	17.18	7,701.90	7,701.90	-0.26	-59.99	17.18	59.99	23.72	-90.25	1.654
7,800.00	7,800.00	0.00	0.00	17.40	7,801.90	7,801.90	-0.26	-59.99	17.41	59.99	23.27	-90.25	1.634
7,900.00	7,900.00	0.00	0.00	17.63	7,901.90	7,901.90	-0.26	-59.99	17.63	59.99	22.82	-90.25	1.614
8,000.00	8,000.00	0.00	0.00	17.85	8,001.90	8,001.90	-0.26	-59.99	17.86	59.99	22.37	-90.25	1.594
8,100.00	8,100.00	0.00	0.00	18.08	8,101.90	8,101.90	-0.26	-59.99	18.08	59.99	21.92	-90.25	1.576
8,200.00	8,200.00	0.00	0.00	18.30	8,201.90	8,201.90	-0.26	-59.99	18.30	59.99	21.47	-90.25	1.557
8,201.71	8,201.71	0.00	0.00	18.30	8,203.61	8,203.61	-0.26	-59.99	18.31	59.99	21.46	179.75	1.557
8,300.00	8,299.99	0.00	0.51	18.52	8,301.89	8,301.89	-0.26	-59.99	18.53	60.50	21.53	179.75	1.561
8,400.00	8,398.68	0.00	15.50	18.72	8,400.58	8,400.58	-0.26	-59.99	18.75	75.49	36.10	179.80	1.917
8,500.00	8,492.92	-2.31	48.53	18.93	8,494.82	8,494.82	-0.26	-59.99	18.96	108.54	68.76	164.63	2.729
8,600.00	8,584.18	-22.45	83.57	19.14	8,586.08	8,586.08	-0.26	-59.99	19.17	145.27	105.14	144.09	3.620
8,700.00	8,669.54	-62.48	116.36	19.37	8,671.44	8,671.44	-0.26	-59.99	19.36	187.00	146.53	135.72	4.621
8,800.00	8,745.27	-120.64	145.45	19.64	8,747.17	8,747.17	-0.26	-59.99	19.53	238.11	197.33	132.11	5.838

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
8,900.00	8,808.05	-194.40	169.58	20.00	8,809.95	8,809.95	-0.26	-59.99	19.67	300.65	259.60	128.34	7.323
9,000.00	8,855.13	-280.53	187.70	20.46	8,857.03	8,857.03	-0.26	-59.99	19.78	374.03	332.77	121.41	9.065
9,100.00	8,884.47	-375.26	199.00	21.04	8,886.37	8,886.37	-0.26	-59.99	19.84	455.74	414.35	109.00	11.009
9,200.00	8,894.82	-474.46	203.01	21.72	8,896.72	8,896.72	-0.26	-59.99	19.87	542.26	500.80	91.84	13.082
9,300.00	8,896.57	-574.45	203.73	22.49	8,898.47	8,898.47	-0.26	-59.99	19.87	631.85	590.38	92.22	15.236
9,400.00	8,898.32	-674.43	204.45	23.38	8,900.22	8,900.22	-0.26	-59.99	19.87	724.17	682.69	92.61	17.454
9,500.00	8,900.07	-774.41	205.16	24.38	8,901.97	8,901.97	-0.26	-59.99	19.88	818.30	776.79	92.99	19.713
9,600.00	8,901.82	-874.39	205.88	25.46	8,903.72	8,903.72	-0.26	-59.99	19.88	913.67	872.14	93.38	21.999
9,700.00	8,903.57	-974.37	206.59	26.63	8,905.47	8,905.47	-0.26	-59.99	19.89	1,009.93	968.38	93.76	24.303
9,800.00	8,905.32	-1,074.36	207.31	27.88	8,907.22	8,907.22	-0.26	-59.99	19.89	1,106.86	1,065.28	94.15	26.620
9,900.00	8,907.07	-1,174.34	208.02	29.18	8,908.97	8,908.97	-0.26	-59.99	19.89	1,204.28	1,162.68	94.53	28.945
10,000.00	8,908.82	-1,274.32	208.74	30.54	11,168.37	9,906.66	-1,266.02	-580.70	32.62	1,270.90	1,224.82	141.60	27.584
10,100.00	8,910.57	-1,374.30	209.46	31.95	11,268.37	9,908.05	-1,366.01	-579.99	33.84	1,270.62	1,222.69	141.59	26.507
10,200.00	8,912.32	-1,474.29	210.17	33.39	11,368.37	9,909.45	-1,466.00	-579.28	35.11	1,270.35	1,220.49	141.58	25.477
10,300.00	8,914.07	-1,574.27	210.89	34.88	11,468.37	9,910.85	-1,565.98	-578.57	36.43	1,270.08	1,218.23	141.57	24.497
10,400.00	8,915.82	-1,674.25	211.60	36.39	11,568.36	9,912.24	-1,665.97	-577.86	37.80	1,269.80	1,215.92	141.56	23.567
10,500.00	8,917.57	-1,774.23	212.32	37.94	11,668.36	9,913.64	-1,765.96	-577.15	39.21	1,269.53	1,213.57	141.55	22.686
10,600.00	8,919.32	-1,874.21	213.04	39.50	11,768.36	9,915.04	-1,865.95	-576.44	40.65	1,269.26	1,211.17	141.54	21.853
10,700.00	8,921.07	-1,974.20	213.75	41.10	11,868.36	9,916.43	-1,965.93	-575.73	42.13	1,268.98	1,208.75	141.53	21.067
10,800.00	8,922.82	-2,074.18	214.47	42.71	11,968.36	9,917.83	-2,065.92	-575.01	43.63	1,268.71	1,206.28	141.52	20.324
10,900.00	8,924.57	-2,174.16	215.18	44.33	12,068.36	9,919.22	-2,165.91	-574.30	45.16	1,268.43	1,203.79	141.51	19.623
11,000.00	8,926.32	-2,274.14	215.90	45.97	12,168.36	9,920.62	-2,265.89	-573.59	46.71	1,268.16	1,201.28	141.50	18.961
11,100.00	8,928.07	-2,374.12	216.61	47.63	12,268.36	9,922.02	-2,365.88	-572.88	48.28	1,267.89	1,198.74	141.49	18.335
11,200.00	8,929.82	-2,474.11	217.33	49.30	12,368.36	9,923.41	-2,465.87	-572.17	49.87	1,267.61	1,196.18	141.48	17.744
11,300.00	8,931.57	-2,574.09	218.05	50.98	12,468.36	9,924.81	-2,565.86	-571.46	51.48	1,267.34	1,193.60	141.47	17.185
11,400.00	8,933.32	-2,674.07	218.76	52.67	12,568.36	9,926.21	-2,665.84	-570.75	53.10	1,267.07	1,191.00	141.46	16.657
11,500.00	8,935.07	-2,774.05	219.48	54.37	12,668.36	9,927.60	-2,765.83	-570.04	54.74	1,266.79	1,188.38	141.45	16.156
11,600.00	8,936.82	-2,874.04	220.19	56.08	12,768.36	9,929.00	-2,865.82	-569.33	56.39	1,266.52	1,185.75	141.44	15.681
11,700.00	8,938.57	-2,974.02	220.91	57.80	12,868.36	9,930.40	-2,965.80	-568.62	58.04	1,266.25	1,183.11	141.43	15.231

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
11,800.00	8,940.32	-3,074.00	221.63	59.52	12,968.36	9,931.79	-3,065.79	-567.91	59.71	1,265.97	1,180.46	141.42	14.804
11,900.00	8,942.07	-3,173.98	222.34	61.25	13,068.36	9,933.19	-3,165.78	-567.20	61.39	1,265.70	1,177.79	141.41	14.398
12,000.00	8,943.82	-3,273.96	223.06	62.98	13,168.35	9,934.58	-3,265.77	-566.49	63.08	1,265.43	1,175.11	141.40	14.011
12,100.00	8,945.57	-3,373.95	223.77	64.72	13,268.35	9,935.98	-3,365.75	-565.78	64.78	1,265.15	1,172.43	141.39	13.644
12,200.00	8,947.32	-3,473.93	224.49	66.47	13,368.35	9,937.38	-3,465.74	-565.07	66.48	1,264.88	1,169.73	141.38	13.293
12,300.00	8,949.07	-3,573.91	225.21	68.22	13,468.35	9,938.77	-3,565.73	-564.36	68.19	1,264.61	1,167.02	141.37	12.959
12,400.00	8,950.82	-3,673.89	225.92	69.97	13,568.35	9,940.17	-3,665.71	-563.64	69.91	1,264.33	1,164.31	141.36	12.641
12,500.00	8,952.57	-3,773.87	226.64	71.73	13,668.35	9,941.57	-3,765.70	-562.93	71.63	1,264.06	1,161.59	141.35	12.336
12,600.00	8,954.32	-3,873.86	227.35	73.49	13,768.35	9,942.96	-3,865.69	-562.22	73.36	1,263.79	1,158.87	141.34	12.045
12,700.00	8,956.07	-3,973.84	228.07	75.26	13,868.35	9,944.36	-3,965.68	-561.51	75.09	1,263.52	1,156.13	141.33	11.766
12,800.00	8,957.82	-4,073.82	228.78	77.03	13,968.35	9,945.76	-4,065.66	-560.80	76.83	1,263.24	1,153.39	141.32	11.500
12,900.00	8,959.57	-4,173.80	229.50	78.80	14,068.35	9,947.15	-4,165.65	-560.09	78.57	1,262.97	1,150.65	141.31	11.244
13,000.00	8,961.32	-4,273.78	230.22	80.57	14,168.35	9,948.55	-4,265.64	-559.38	80.32	1,262.70	1,147.90	141.30	10.999
13,100.00	8,963.07	-4,373.77	230.93	82.35	14,268.35	9,949.94	-4,365.62	-558.67	82.07	1,262.42	1,145.14	141.29	10.764
13,200.00	8,964.82	-4,473.75	231.65	84.13	14,368.35	9,951.34	-4,465.61	-557.96	83.83	1,262.15	1,142.38	141.28	10.538
13,300.00	8,966.57	-4,573.73	232.36	85.91	14,468.35	9,952.74	-4,565.60	-557.25	85.58	1,261.88	1,139.62	141.27	10.321
13,400.00	8,968.32	-4,673.71	233.08	87.69	14,568.35	9,954.13	-4,665.58	-556.54	87.34	1,261.61	1,136.85	141.26	10.112
13,500.00	8,970.07	-4,773.70	233.80	89.48	14,668.35	9,955.53	-4,765.57	-555.83	89.11	1,261.33	1,134.07	141.25	9.911
13,600.00	8,971.82	-4,873.68	234.51	91.27	14,768.34	9,956.93	-4,865.56	-555.12	90.87	1,261.06	1,131.29	141.24	9.718
13,700.00	8,973.57	-4,973.66	235.23	93.05	14,868.34	9,958.32	-4,965.55	-554.41	92.64	1,260.79	1,128.51	141.23	9.532
13,800.00	8,975.32	-5,073.64	235.94	94.85	14,968.34	9,959.72	-5,065.53	-553.70	94.41	1,260.52	1,125.73	141.22	9.352
13,900.00	8,977.07	-5,173.62	236.66	96.64	15,068.34	9,961.12	-5,165.52	-552.98	96.19	1,260.24	1,122.94	141.21	9.178
14,000.00	8,978.82	-5,273.61	237.37	98.43	15,168.34	9,962.51	-5,265.51	-552.27	97.96	1,259.97	1,120.15	141.20	9.011
14,100.00	8,980.57	-5,373.59	238.09	100.23	15,268.34	9,963.91	-5,365.49	-551.56	99.74	1,259.70	1,117.35	141.19	8.850
14,200.00	8,982.32	-5,473.57	238.81	102.02	15,368.34	9,965.30	-5,465.48	-550.85	101.52	1,259.43	1,114.56	141.18	8.693
14,300.00	8,984.07	-5,573.55	239.52	103.82	15,468.34	9,966.70	-5,565.47	-550.14	103.30	1,259.15	1,111.75	141.17	8.542
14,400.00	8,985.82	-5,673.53	240.24	105.62	15,568.34	9,968.10	-5,665.46	-549.43	105.09	1,258.88	1,108.95	141.15	8.396
14,500.00	8,987.57	-5,773.52	240.95	107.42	15,668.34	9,969.49	-5,765.44	-548.72	106.87	1,258.61	1,106.14	141.14	8.255
14,600.00	8,989.32	-5,873.50	241.67	109.22	15,768.34	9,970.89	-5,865.43	-548.01	108.66	1,258.34	1,103.34	141.13	8.118
14,700.00	8,991.07	-5,973.48	242.39	111.02	15,868.34	9,972.29	-5,965.42	-547.30	110.45	1,258.07	1,100.52	141.12	7.986

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
14,800.00	8,992.82	-6,073.46	243.10	112.83	15,968.34	9,973.68	-6,065.40	-546.59	112.24	1,257.79	1,097.71	141.11	7.857
14,900.00	8,994.57	-6,173.45	243.82	114.63	16,068.34	9,975.08	-6,165.39	-545.88	114.03	1,257.52	1,094.89	141.10	7.732
15,000.00	8,996.32	-6,273.43	244.53	116.44	16,168.34	9,976.48	-6,265.38	-545.17	115.82	1,257.25	1,092.08	141.09	7.612
15,100.00	8,998.07	-6,373.41	245.25	118.24	16,268.34	9,977.87	-6,365.37	-544.46	117.61	1,256.98	1,089.25	141.08	7.494
15,200.00	8,999.82	-6,473.39	245.97	120.05	16,368.33	9,979.27	-6,465.35	-543.75	119.41	1,256.71	1,086.43	141.07	7.380
15,300.00	9,001.57	-6,573.37	246.68	121.86	16,468.33	9,980.66	-6,565.34	-543.04	121.20	1,256.43	1,083.61	141.06	7.270
15,400.00	9,003.32	-6,673.36	247.40	123.67	16,568.33	9,982.06	-6,665.33	-542.32	123.00	1,256.16	1,080.78	141.05	7.162
15,500.00	9,005.07	-6,773.34	248.11	125.48	16,668.33	9,983.46	-6,765.31	-541.61	124.80	1,255.89	1,077.95	141.04	7.058
15,600.00	9,006.82	-6,873.32	248.83	127.29	16,768.33	9,984.85	-6,865.30	-540.90	126.60	1,255.62	1,075.12	141.03	6.956
15,700.00	9,008.57	-6,973.30	249.54	129.10	16,868.33	9,986.25	-6,965.29	-540.19	128.40	1,255.35	1,072.29	141.02	6.858
15,800.00	9,010.32	-7,073.28	250.26	130.91	16,968.33	9,987.65	-7,065.28	-539.48	130.20	1,255.08	1,069.45	141.01	6.761
15,900.00	9,012.07	-7,173.27	250.98	132.72	17,068.33	9,989.04	-7,165.26	-538.77	132.00	1,254.80	1,066.62	141.00	6.668
16,000.00	9,013.82	-7,273.25	251.69	134.53	17,168.33	9,990.44	-7,265.25	-538.06	133.81	1,254.53	1,063.78	140.99	6.577
16,100.00	9,015.57	-7,373.23	252.41	136.34	17,268.33	9,991.84	-7,365.24	-537.35	135.61	1,254.26	1,060.94	140.98	6.488
16,200.00	9,017.32	-7,473.21	253.12	138.16	17,368.33	9,993.23	-7,465.22	-536.64	137.41	1,253.99	1,058.10	140.97	6.401
16,300.00	9,019.07	-7,573.19	253.84	139.97	17,468.33	9,994.63	-7,565.21	-535.93	139.22	1,253.72	1,055.25	140.96	6.317
16,400.00	9,020.82	-7,673.18	254.56	141.78	17,568.33	9,996.02	-7,665.20	-535.22	141.03	1,253.45	1,052.41	140.95	6.235
16,500.00	9,022.57	-7,773.16	255.27	143.60	17,668.33	9,997.42	-7,765.18	-534.51	142.83	1,253.18	1,049.56	140.94	6.155
16,600.00	9,024.32	-7,873.14	255.99	145.41	17,768.33	9,998.82	-7,865.17	-533.80	144.64	1,252.90	1,046.72	140.93	6.077
16,700.00	9,026.07	-7,973.12	256.70	147.23	17,868.33	10,000.21	-7,965.16	-533.09	146.45	1,252.63	1,043.87	140.92	6.000
16,800.00	9,027.82	-8,073.11	257.42	149.05	17,968.32	10,001.61	-8,065.15	-532.38	148.26	1,252.36	1,041.02	140.91	5.926
16,900.00	9,029.57	-8,173.09	258.13	150.86	18,068.32	10,003.01	-8,165.13	-531.66	150.06	1,252.09	1,038.16	140.90	5.853
17,000.00	9,031.32	-8,273.07	258.85	152.68	18,168.32	10,004.40	-8,265.12	-530.95	151.87	1,251.82	1,035.31	140.89	5.782
17,100.00	9,033.07	-8,373.05	259.57	154.50	18,268.32	10,005.80	-8,365.11	-530.24	153.68	1,251.55	1,032.46	140.88	5.712
17,200.00	9,034.82	-8,473.03	260.28	156.32	18,368.32	10,007.20	-8,465.09	-529.53	155.50	1,251.28	1,029.60	140.87	5.645
17,300.00	9,036.57	-8,573.02	261.00	158.13	18,468.32	10,008.59	-8,565.08	-528.82	157.31	1,251.01	1,026.74	140.85	5.578
17,400.00	9,038.32	-8,673.00	261.71	159.95	18,568.32	10,009.99	-8,665.07	-528.11	159.12	1,250.73	1,023.88	140.84	5.513
17,500.00	9,040.07	-8,772.98	262.43	161.77	18,668.32	10,011.38	-8,765.06	-527.40	160.93	1,250.46	1,021.02	140.83	5.450
17,600.00	9,041.82	-8,872.96	263.15	163.59	18,768.32	10,012.78	-8,865.04	-526.69	162.74	1,250.19	1,018.16	140.82	5.388

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 2H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
17,700.00	9,043.57	-8,972.94	263.86	165.41	18,868.32	10,014.18	-8,965.03	-525.98	164.56	1,249.92	1,015.30	140.81	5.327
17,800.00	9,045.32	-9,072.93	264.58	167.23	18,968.32	10,015.57	-9,065.02	-525.27	166.37	1,249.65	1,012.43	140.80	5.268
17,900.00	9,047.07	-9,172.91	265.29	169.05	19,068.32	10,016.97	-9,165.00	-524.56	168.19	1,249.38	1,009.57	140.79	5.210
18,000.00	9,048.82	-9,272.89	266.01	170.87	19,168.32	10,018.37	-9,264.99	-523.85	170.00	1,249.11	1,006.70	140.78	5.153
18,100.00	9,050.57	-9,372.87	266.72	172.69	19,268.32	10,019.76	-9,364.98	-523.14	171.81	1,248.84	1,003.83	140.77	5.097
18,200.00	9,052.32	-9,472.86	267.44	174.51	19,368.32	10,021.16	-9,464.97	-522.43	173.63	1,248.57	1,000.96	140.76	5.043
18,300.00	9,054.07	-9,572.84	268.16	176.33	19,468.32	10,022.56	-9,564.95	-521.72	175.45	1,248.30	998.09	140.75	4.989
18,400.00	9,055.82	-9,672.82	268.87	178.15	19,568.31	10,023.95	-9,664.94	-521.01	177.26	1,248.03	995.22	140.74	4.937
18,500.00	9,057.57	-9,772.80	269.59	179.97	19,668.31	10,025.35	-9,764.93	-520.29	179.08	1,247.76	992.35	140.73	4.885
18,600.00	9,059.32	-9,872.78	270.30	181.79	19,768.31	10,026.74	-9,864.91	-519.58	180.89	1,247.49	989.48	140.72	4.835
18,700.00	9,061.07	-9,972.77	271.02	183.62	19,868.31	10,028.14	-9,964.90	-518.87	182.71	1,247.22	986.60	140.71	4.786
18,800.00	9,062.82	-10,072.75	271.74	185.44	19,968.31	10,029.54	-10,064.89	-518.16	184.53	1,246.95	983.73	140.70	4.737
18,838.28	9,063.49	-10,111.02	272.01	186.14	20,006.59	10,030.07	-10,103.16	-517.89	185.22	1,246.84	982.62	140.69	4.719

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
100.00	100.00	0.00	0.00	0.51	100.20	100.20	-0.41	-119.95	0.51	119.95	117.02	-90.20	40.911
200.00	200.00	0.00	0.00	0.59	200.20	200.20	-0.41	-119.95	0.59	119.95	116.85	-90.20	38.743
300.00	300.00	0.00	0.00	0.73	300.20	300.20	-0.41	-119.95	0.73	119.95	116.57	-90.20	35.439
400.00	400.00	0.00	0.00	0.91	400.20	400.20	-0.41	-119.95	0.91	119.95	116.21	-90.20	32.074
500.00	500.00	0.00	0.00	1.11	500.20	500.20	-0.41	-119.95	1.11	119.95	115.82	-90.20	29.048
600.00	600.00	0.00	0.00	1.31	600.20	600.20	-0.41	-119.95	1.31	119.95	115.41	-90.20	26.431
700.00	700.00	0.00	0.00	1.52	700.20	700.20	-0.41	-119.95	1.52	119.95	114.99	-90.20	24.190
800.00	800.00	0.00	0.00	1.73	800.20	800.20	-0.41	-119.95	1.74	119.95	114.56	-90.20	22.269
900.00	900.00	0.00	0.00	1.95	900.20	900.20	-0.41	-119.95	1.95	119.95	114.13	-90.20	20.614
1,000.00	1,000.00	0.00	0.00	2.17	1,000.20	1,000.20	-0.41	-119.95	2.17	119.95	113.70	-90.20	19.177
1,100.00	1,100.00	0.00	0.00	2.39	1,100.20	1,100.20	-0.41	-119.95	2.39	119.95	113.26	-90.20	17.920
1,200.00	1,200.00	0.00	0.00	2.61	1,200.20	1,200.20	-0.41	-119.95	2.61	119.95	112.82	-90.20	16.814
1,300.00	1,300.00	0.00	0.00	2.83	1,300.20	1,300.20	-0.41	-119.95	2.83	119.95	112.37	-90.20	15.833
1,400.00	1,400.00	0.00	0.00	3.05	1,400.20	1,400.20	-0.41	-119.95	3.05	119.95	111.93	-90.20	14.959
1,500.00	1,500.00	0.00	0.00	3.27	1,500.20	1,500.20	-0.41	-119.95	3.27	119.95	111.49	-90.20	14.174
1,600.00	1,600.00	0.00	0.00	3.50	1,600.20	1,600.20	-0.41	-119.95	3.50	119.95	111.04	-90.20	13.467
1,700.00	1,700.00	0.00	0.00	3.72	1,700.20	1,700.20	-0.41	-119.95	3.72	119.95	110.60	-90.20	12.826
1,800.00	1,800.00	0.00	0.00	3.94	1,800.20	1,800.20	-0.41	-119.95	3.94	119.95	110.15	-90.20	12.242
1,900.00	1,900.00	0.00	0.00	4.16	1,900.20	1,900.20	-0.41	-119.95	4.16	119.95	109.71	-90.20	11.709
1,916.60	1,916.60	0.00	0.00	4.20	1,916.80	1,916.80	-0.41	-119.95	4.20	119.95	109.63	-90.20	11.625
2,000.00	2,000.00	0.00	0.00	4.39	2,000.00	2,000.00	-0.41	-119.95	4.39	119.95	109.26	-90.20	11.221
2,100.00	2,100.00	0.00	0.00	4.61	2,098.14	2,098.13	-0.41	-120.79	4.59	120.81	109.69	-90.19	10.866
2,200.00	2,200.00	0.00	0.00	4.83	2,196.02	2,195.98	-0.41	-123.30	4.79	123.38	111.84	-90.19	10.699
2,300.00	2,300.00	0.00	0.00	5.06	2,293.79	2,293.66	-0.41	-127.48	4.98	127.65	115.71	-90.18	10.688
2,400.00	2,400.00	0.00	0.00	5.28	2,391.38	2,391.08	-0.41	-133.31	5.19	133.62	121.27	-90.18	10.815
2,500.00	2,500.00	0.00	0.00	5.50	2,488.75	2,488.16	-0.41	-140.78	5.39	141.30	128.53	-90.17	11.069
2,600.00	2,600.00	0.00	0.00	5.73	2,588.10	2,587.13	-0.41	-149.43	5.61	150.00	136.81	-90.16	11.372
2,700.00	2,700.00	0.00	0.00	5.95	2,687.72	2,686.37	-0.41	-158.11	5.84	158.72	145.10	-90.15	11.653
2,800.00	2,800.00	0.00	0.00	6.18	2,787.34	2,785.61	-0.41	-166.80	6.06	167.43	153.38	-90.14	11.915
2,900.00	2,900.00	0.00	0.00	6.40	2,886.95	2,884.85	-0.41	-175.48	6.29	176.15	161.66	-90.13	12.160

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
3,000.00	3,000.00	0.00	0.00	6.62	2,986.57	2,984.09	-0.41	-184.16	6.53	184.86	169.94	-90.13	12.390
3,100.00	3,100.00	0.00	0.00	6.85	3,086.19	3,083.33	-0.41	-192.84	6.77	193.58	178.22	-90.12	12.605
3,200.00	3,200.00	0.00	0.00	7.07	3,185.81	3,182.57	-0.41	-201.53	7.01	202.30	186.50	-90.12	12.808
3,300.00	3,300.00	0.00	0.00	7.30	3,285.43	3,281.81	-0.41	-210.21	7.25	211.01	194.78	-90.11	12.998
3,400.00	3,400.00	0.00	0.00	7.52	3,385.05	3,381.05	-0.41	-218.89	7.49	219.73	203.05	-90.11	13.178
3,500.00	3,500.00	0.00	0.00	7.75	3,484.67	3,480.29	-0.41	-227.57	7.74	228.44	211.33	-90.10	13.348
3,600.00	3,600.00	0.00	0.00	7.97	3,584.29	3,579.53	-0.41	-236.25	7.99	237.16	219.60	-90.10	13.508
3,700.00	3,700.00	0.00	0.00	8.19	3,683.91	3,678.77	-0.41	-244.94	8.24	245.87	227.87	-90.10	13.660
3,800.00	3,800.00	0.00	0.00	8.42	3,783.53	3,778.01	-0.41	-253.62	8.49	254.59	236.15	-90.09	13.804
3,900.00	3,900.00	0.00	0.00	8.64	3,883.15	3,877.25	-0.41	-262.30	8.75	263.30	244.42	-90.09	13.941
4,000.00	4,000.00	0.00	0.00	8.87	3,982.77	3,976.49	-0.41	-270.98	9.00	272.02	252.69	-90.09	14.071
4,100.00	4,100.00	0.00	0.00	9.09	4,082.39	4,075.73	-0.41	-279.67	9.25	280.74	260.96	-90.08	14.195
4,200.00	4,200.00	0.00	0.00	9.32	4,182.01	4,174.97	-0.41	-288.35	9.51	289.45	269.23	-90.08	14.313
4,300.00	4,300.00	0.00	0.00	9.54	4,281.63	4,274.21	-0.41	-297.03	9.77	298.17	277.50	-90.08	14.425
4,400.00	4,400.00	0.00	0.00	9.77	4,381.25	4,373.45	-0.41	-305.71	10.03	306.88	285.77	-90.08	14.532
4,500.00	4,500.00	0.00	0.00	9.99	4,480.87	4,472.69	-0.41	-314.40	10.29	315.60	294.03	-90.07	14.635
4,600.00	4,600.00	0.00	0.00	10.21	4,580.49	4,571.93	-0.41	-323.08	10.55	324.31	302.30	-90.07	14.733
4,700.00	4,700.00	0.00	0.00	10.44	4,680.10	4,671.17	-0.41	-331.76	10.81	333.03	310.57	-90.07	14.827
4,800.00	4,800.00	0.00	0.00	10.66	4,779.72	4,770.42	-0.41	-340.44	11.07	341.74	318.84	-90.07	14.917
4,900.00	4,900.00	0.00	0.00	10.89	4,879.34	4,869.66	-0.41	-349.13	11.33	350.46	327.10	-90.07	15.004
5,000.00	5,000.00	0.00	0.00	11.11	4,978.96	4,968.90	-0.41	-357.81	11.59	359.18	335.37	-90.07	15.087
5,100.00	5,100.00	0.00	0.00	11.34	5,078.58	5,068.14	-0.41	-366.49	11.86	367.89	343.63	-90.06	15.166
5,200.00	5,200.00	0.00	0.00	11.56	5,178.20	5,167.38	-0.41	-375.17	12.12	376.61	351.90	-90.06	15.243
5,300.00	5,300.00	0.00	0.00	11.79	5,277.82	5,266.62	-0.41	-383.86	12.38	385.32	360.17	-90.06	15.317
5,400.00	5,400.00	0.00	0.00	12.01	5,377.44	5,365.86	-0.41	-392.54	12.65	394.04	368.43	-90.06	15.388
5,500.00	5,500.00	0.00	0.00	12.24	5,477.06	5,465.10	-0.41	-401.22	12.91	402.75	376.70	-90.06	15.456
5,600.00	5,600.00	0.00	0.00	12.46	5,576.68	5,564.34	-0.41	-409.90	13.18	411.47	384.96	-90.06	15.522
5,700.00	5,700.00	0.00	0.00	12.68	5,676.30	5,663.58	-0.41	-418.59	13.44	420.18	393.22	-90.06	15.585
5,800.00	5,800.00	0.00	0.00	12.91	5,775.92	5,762.82	-0.41	-427.27	13.71	428.90	401.49	-90.05	15.647

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
5,900.00	5,900.00	0.00	0.00	13.13	5,875.54	5,862.06	-0.41	-435.95	13.97	437.62	409.75	-90.05	15.706
6,000.00	6,000.00	0.00	0.00	13.36	5,975.16	5,961.30	-0.41	-444.63	14.24	446.33	418.02	-90.05	15.763
6,100.00	6,100.00	0.00	0.00	13.58	6,074.78	6,060.54	-0.41	-453.32	14.51	455.05	426.28	-90.05	15.819
6,200.00	6,200.00	0.00	0.00	13.81	6,174.40	6,159.78	-0.41	-462.00	14.78	463.76	434.54	-90.05	15.872
6,300.00	6,300.00	0.00	0.00	14.03	6,274.02	6,259.02	-0.41	-470.68	15.04	472.48	442.81	-90.05	15.924
6,400.00	6,400.00	0.00	0.00	14.26	6,373.64	6,358.26	-0.41	-479.36	15.31	481.19	451.07	-90.05	15.974
6,500.00	6,500.00	0.00	0.00	14.48	6,473.26	6,457.50	-0.41	-488.04	15.58	489.91	459.33	-90.05	16.023
6,600.00	6,600.00	0.00	0.00	14.71	6,572.87	6,556.74	-0.41	-496.73	15.85	498.62	467.60	-90.05	16.070
6,700.00	6,700.00	0.00	0.00	14.93	6,672.49	6,655.98	-0.41	-505.41	16.11	507.34	475.86	-90.05	16.116
6,800.00	6,800.00	0.00	0.00	15.16	6,772.11	6,755.22	-0.41	-514.09	16.38	516.06	484.12	-90.05	16.160
6,900.00	6,900.00	0.00	0.00	15.38	6,871.73	6,854.46	-0.41	-522.77	16.65	524.77	492.38	-90.04	16.203
7,000.00	7,000.00	0.00	0.00	15.60	6,971.35	6,953.70	-0.41	-531.46	16.92	533.49	500.65	-90.04	16.245
7,100.00	7,100.00	0.00	0.00	15.83	7,070.97	7,052.94	-0.41	-540.14	17.19	542.20	508.91	-90.04	16.286
7,200.00	7,200.00	0.00	0.00	16.05	7,170.59	7,152.18	-0.41	-548.82	17.46	550.92	517.17	-90.04	16.325
7,300.00	7,300.00	0.00	0.00	16.28	7,270.21	7,251.42	-0.41	-557.50	17.73	559.63	525.43	-90.04	16.364
7,400.00	7,400.00	0.00	0.00	16.50	7,369.83	7,350.67	-0.41	-566.19	18.00	568.35	533.70	-90.04	16.401
7,500.00	7,500.00	0.00	0.00	16.73	7,469.45	7,449.91	-0.41	-574.87	18.27	577.06	541.96	-90.04	16.437
7,600.00	7,600.00	0.00	0.00	16.95	7,569.07	7,549.15	-0.41	-583.55	18.54	585.78	550.22	-90.04	16.473
7,700.00	7,700.00	0.00	0.00	17.18	7,668.69	7,648.39	-0.41	-592.23	18.81	594.50	558.48	-90.04	16.507
7,800.00	7,800.00	0.00	0.00	17.40	7,768.31	7,747.63	-0.41	-600.92	19.08	603.21	566.74	-90.04	16.541
7,900.00	7,900.00	0.00	0.00	17.63	7,867.93	7,846.87	-0.41	-609.60	19.35	611.93	575.00	-90.04	16.573
8,000.00	8,000.00	0.00	0.00	17.85	7,967.55	7,946.11	-0.41	-618.28	19.62	620.64	583.27	-90.04	16.605
8,100.00	8,100.00	0.00	0.00	18.08	8,067.17	8,045.35	-0.41	-626.96	19.89	629.36	591.53	-90.04	16.636
8,200.00	8,200.00	0.00	0.00	18.30	8,166.79	8,144.59	-0.41	-635.65	20.16	638.07	599.79	-90.04	16.666
8,300.00	8,299.99	0.00	0.51	18.52	8,266.35	8,243.78	-0.41	-644.32	20.43	647.29	608.56	179.96	16.710
8,400.00	8,398.68	0.00	15.50	18.72	8,363.36	8,340.41	-0.41	-652.78	20.69	670.83	631.67	179.96	17.129
8,500.00	8,492.92	-2.31	48.53	18.93	8,454.36	8,431.06	-0.41	-660.71	20.94	711.95	672.40	163.07	18.000
8,600.00	8,584.18	-22.45	83.57	19.14	8,542.22	8,518.60	-0.41	-668.37	21.18	755.13	715.23	135.06	18.923
8,700.00	8,669.54	-62.48	116.36	19.37	8,624.40	8,600.46	-0.41	-675.53	21.40	797.33	757.06	118.42	19.801
8,800.00	8,745.27	-120.64	145.45	19.64	8,697.30	8,673.09	-0.41	-681.88	21.60	839.15	798.49	108.51	20.637

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
8,900.00	8,808.05	-194.40	169.58	20.00	8,757.74	8,733.29	-0.41	-687.15	21.76	881.61	840.51	101.78	21.447
9,000.00	8,855.13	-280.53	187.70	20.46	8,803.07	8,778.45	-0.41	-691.10	21.89	925.56	883.96	96.23	22.252
9,100.00	8,884.47	-375.26	199.00	21.04	8,831.31	8,806.58	-0.41	-693.56	21.96	971.23	929.12	90.81	23.066
9,200.00	8,894.82	-474.46	203.01	21.72	8,841.27	8,816.50	-0.41	-694.43	21.99	1,017.99	975.39	85.52	23.899
9,300.00	8,896.57	-574.45	203.73	22.49	8,842.95	8,818.18	-0.41	-694.58	21.99	1,068.95	1,025.89	85.62	24.826
9,400.00	8,898.32	-674.43	204.45	23.38	8,844.63	8,819.85	-0.41	-694.72	22.00	1,126.50	1,082.99	85.73	25.894
9,500.00	8,900.07	-774.41	205.16	24.38	8,846.31	8,821.52	-0.41	-694.87	22.00	1,189.68	1,145.75	85.84	27.085
9,600.00	8,901.82	-874.39	205.88	25.46	8,847.99	8,823.20	-0.41	-695.02	22.01	1,257.64	1,213.34	85.95	28.385
9,700.00	8,903.57	-974.37	206.59	26.63	8,849.67	8,824.87	-0.41	-695.16	22.01	1,329.66	1,285.01	86.05	29.778
9,800.00	8,905.32	-1,074.36	207.31	27.88	8,851.35	8,826.55	-0.41	-695.31	22.02	1,405.10	1,360.14	86.16	31.251
9,900.00	8,907.07	-1,174.34	208.02	29.18	8,853.03	8,828.22	-0.41	-695.46	22.02	1,483.45	1,438.22	86.27	32.793
10,000.00	8,908.82	-1,274.32	208.74	30.54	8,854.71	8,829.90	-0.41	-695.60	22.03	1,564.27	1,518.79	86.38	34.393
10,100.00	8,910.57	-1,374.30	209.46	31.95	8,856.39	8,831.57	-0.41	-695.75	22.03	1,647.20	1,601.49	86.48	36.043
10,200.00	8,912.32	-1,474.29	210.17	33.39	8,858.08	8,833.25	-0.41	-695.90	22.04	1,731.92	1,686.02	86.59	37.735
10,300.00	8,914.07	-1,574.27	210.89	34.88	8,859.76	8,834.92	-0.41	-696.04	22.04	1,818.20	1,772.12	86.70	39.462
10,400.00	8,915.82	-1,674.25	211.60	36.39	8,861.44	8,836.60	-0.41	-696.19	22.04	1,905.82	1,859.58	86.81	41.221
10,500.00	8,917.57	-1,774.23	212.32	37.94	11,757.46	9,746.84	-1,775.33	-1,566.97	46.43	1,962.96	1,891.67	114.99	27.533
10,600.00	8,919.32	-1,874.21	213.04	39.50	11,857.46	9,748.24	-1,875.31	-1,566.25	47.56	1,962.82	1,888.71	114.98	26.487
10,700.00	8,921.07	-1,974.20	213.75	41.10	11,957.46	9,749.63	-1,975.30	-1,565.54	48.74	1,962.67	1,885.71	114.97	25.502
10,800.00	8,922.82	-2,074.18	214.47	42.71	12,057.46	9,751.03	-2,075.29	-1,564.83	49.96	1,962.53	1,882.66	114.96	24.574
10,900.00	8,924.57	-2,174.16	215.18	44.33	12,157.46	9,752.43	-2,175.27	-1,564.12	51.22	1,962.38	1,879.58	114.95	23.701
11,000.00	8,926.32	-2,274.14	215.90	45.97	12,257.46	9,753.82	-2,275.26	-1,563.41	52.51	1,962.23	1,876.46	114.94	22.878
11,100.00	8,928.07	-2,374.12	216.61	47.63	12,357.45	9,755.22	-2,375.25	-1,562.70	53.84	1,962.09	1,873.31	114.93	22.102
11,200.00	8,929.82	-2,474.11	217.33	49.30	12,457.45	9,756.61	-2,475.24	-1,561.98	55.21	1,961.94	1,870.14	114.92	21.371
11,300.00	8,931.57	-2,574.09	218.05	50.98	12,557.45	9,758.01	-2,575.22	-1,561.27	56.60	1,961.80	1,866.94	114.91	20.681
11,400.00	8,933.32	-2,674.07	218.76	52.67	12,657.45	9,759.40	-2,675.21	-1,560.56	58.02	1,961.65	1,863.71	114.90	20.029
11,500.00	8,935.07	-2,774.05	219.48	54.37	12,757.45	9,760.80	-2,775.20	-1,559.85	59.46	1,961.51	1,860.47	114.89	19.414
11,600.00	8,936.82	-2,874.04	220.19	56.08	12,857.45	9,762.19	-2,875.18	-1,559.14	60.93	1,961.36	1,857.21	114.88	18.831
11,700.00	8,938.57	-2,974.02	220.91	57.80	12,957.45	9,763.59	-2,975.17	-1,558.42	62.42	1,961.21	1,853.93	114.87	18.280

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
11,800.00	8,940.32	-3,074.00	221.63	59.52	13,057.45	9,764.98	-3,075.16	-1,557.71	63.93	1,961.07	1,850.63	114.86	17.757
11,900.00	8,942.07	-3,173.98	222.34	61.25	13,157.45	9,766.38	-3,175.15	-1,557.00	65.46	1,960.92	1,847.32	114.85	17.261
12,000.00	8,943.82	-3,273.96	223.06	62.98	13,257.45	9,767.77	-3,275.13	-1,556.29	67.00	1,960.78	1,844.00	114.84	16.790
12,100.00	8,945.57	-3,373.95	223.77	64.72	13,357.45	9,769.17	-3,375.12	-1,555.58	68.56	1,960.63	1,840.66	114.84	16.342
12,200.00	8,947.32	-3,473.93	224.49	66.47	13,457.45	9,770.57	-3,475.11	-1,554.87	70.14	1,960.49	1,837.31	114.83	15.916
12,300.00	8,949.07	-3,573.91	225.21	68.22	13,557.45	9,771.96	-3,575.09	-1,554.15	71.72	1,960.34	1,833.96	114.82	15.511
12,400.00	8,950.82	-3,673.89	225.92	69.97	13,657.45	9,773.36	-3,675.08	-1,553.44	73.32	1,960.20	1,830.59	114.81	15.124
12,500.00	8,952.57	-3,773.87	226.64	71.73	13,757.45	9,774.75	-3,775.07	-1,552.73	74.94	1,960.05	1,827.21	114.80	14.755
12,600.00	8,954.32	-3,873.86	227.35	73.49	13,857.45	9,776.15	-3,875.06	-1,552.02	76.56	1,959.91	1,823.83	114.79	14.403
12,700.00	8,956.07	-3,973.84	228.07	75.26	13,957.44	9,777.54	-3,975.04	-1,551.31	78.20	1,959.76	1,820.44	114.78	14.066
12,800.00	8,957.82	-4,073.82	228.78	77.03	14,057.44	9,778.94	-4,075.03	-1,550.60	79.84	1,959.62	1,817.04	114.77	13.744
12,900.00	8,959.57	-4,173.80	229.50	78.80	14,157.44	9,780.33	-4,175.02	-1,549.88	81.49	1,959.47	1,813.63	114.76	13.436
13,000.00	8,961.32	-4,273.78	230.22	80.57	14,257.44	9,781.73	-4,275.00	-1,549.17	83.15	1,959.33	1,810.22	114.75	13.140
13,100.00	8,963.07	-4,373.77	230.93	82.35	14,357.44	9,783.12	-4,374.99	-1,548.46	84.82	1,959.19	1,806.80	114.74	12.857
13,200.00	8,964.82	-4,473.75	231.65	84.13	14,457.44	9,784.52	-4,474.98	-1,547.75	86.49	1,959.04	1,803.38	114.73	12.585
13,300.00	8,966.57	-4,573.73	232.36	85.91	14,557.44	9,785.92	-4,574.96	-1,547.04	88.18	1,958.90	1,799.95	114.72	12.324
13,400.00	8,968.32	-4,673.71	233.08	87.69	14,657.44	9,787.31	-4,674.95	-1,546.33	89.87	1,958.75	1,796.51	114.71	12.073
13,500.00	8,970.07	-4,773.70	233.80	89.48	14,757.44	9,788.71	-4,774.94	-1,545.61	91.56	1,958.61	1,793.07	114.70	11.832
13,600.00	8,971.82	-4,873.68	234.51	91.27	14,857.44	9,790.10	-4,874.93	-1,544.90	93.26	1,958.46	1,789.63	114.69	11.600
13,700.00	8,973.57	-4,973.66	235.23	93.05	14,957.44	9,791.50	-4,974.91	-1,544.19	94.97	1,958.32	1,786.18	114.68	11.377
13,800.00	8,975.32	-5,073.64	235.94	94.85	15,057.44	9,792.89	-5,074.90	-1,543.48	96.68	1,958.17	1,782.73	114.67	11.161
13,900.00	8,977.07	-5,173.62	236.66	96.64	15,157.44	9,794.29	-5,174.89	-1,542.77	98.39	1,958.03	1,779.28	114.66	10.954
14,000.00	8,978.82	-5,273.61	237.37	98.43	15,257.44	9,795.68	-5,274.87	-1,542.06	100.11	1,957.89	1,775.82	114.66	10.754
14,100.00	8,980.57	-5,373.59	238.09	100.23	15,357.44	9,797.08	-5,374.86	-1,541.34	101.84	1,957.74	1,772.35	114.65	10.560
14,200.00	8,982.32	-5,473.57	238.81	102.02	15,457.44	9,798.47	-5,474.85	-1,540.63	103.56	1,957.60	1,768.89	114.64	10.374
14,300.00	8,984.07	-5,573.55	239.52	103.82	15,557.43	9,799.87	-5,574.84	-1,539.92	105.30	1,957.45	1,765.42	114.63	10.193
14,400.00	8,985.82	-5,673.53	240.24	105.62	15,657.43	9,801.26	-5,674.82	-1,539.21	107.03	1,957.31	1,761.95	114.62	10.019
14,500.00	8,987.57	-5,773.52	240.95	107.42	15,757.43	9,802.66	-5,774.81	-1,538.50	108.77	1,957.17	1,758.47	114.61	9.850
14,600.00	8,989.32	-5,873.50	241.67	109.22	15,857.43	9,804.06	-5,874.80	-1,537.79	110.51	1,957.02	1,755.00	114.60	9.687
14,700.00	8,991.07	-5,973.48	242.39	111.02	15,957.43	9,805.45	-5,974.78	-1,537.07	112.26	1,956.88	1,751.52	114.59	9.529

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
14,800.00	8,992.82	-6,073.46	243.10	112.83	16,057.43	9,806.85	-6,074.77	-1,536.36	114.00	1,956.73	1,748.03	114.58	9.376
14,900.00	8,994.57	-6,173.45	243.82	114.63	16,157.43	9,808.24	-6,174.76	-1,535.65	115.76	1,956.59	1,744.55	114.57	9.227
15,000.00	8,996.32	-6,273.43	244.53	116.44	16,257.43	9,809.64	-6,274.75	-1,534.94	117.51	1,956.45	1,741.06	114.56	9.083
15,100.00	8,998.07	-6,373.41	245.25	118.24	16,357.43	9,811.03	-6,374.73	-1,534.23	119.26	1,956.30	1,737.57	114.55	8.944
15,200.00	8,999.82	-6,473.39	245.97	120.05	16,457.43	9,812.43	-6,474.72	-1,533.52	121.02	1,956.16	1,734.08	114.54	8.808
15,300.00	9,001.57	-6,573.37	246.68	121.86	16,557.43	9,813.82	-6,574.71	-1,532.80	122.78	1,956.02	1,730.59	114.53	8.677
15,400.00	9,003.32	-6,673.36	247.40	123.67	16,657.43	9,815.22	-6,674.69	-1,532.09	124.55	1,955.87	1,727.09	114.52	8.549
15,500.00	9,005.07	-6,773.34	248.11	125.48	16,757.43	9,816.61	-6,774.68	-1,531.38	126.31	1,955.73	1,723.59	114.51	8.425
15,600.00	9,006.82	-6,873.32	248.83	127.29	16,857.43	9,818.01	-6,874.67	-1,530.67	128.08	1,955.59	1,720.09	114.50	8.304
15,700.00	9,008.57	-6,973.30	249.54	129.10	16,957.43	9,819.40	-6,974.66	-1,529.96	129.85	1,955.44	1,716.59	114.49	8.187
15,800.00	9,010.32	-7,073.28	250.26	130.91	17,057.43	9,820.80	-7,074.64	-1,529.25	131.62	1,955.30	1,713.09	114.48	8.073
15,900.00	9,012.07	-7,173.27	250.98	132.72	17,157.42	9,822.20	-7,174.63	-1,528.53	133.39	1,955.16	1,709.59	114.47	7.962
16,000.00	9,013.82	-7,273.25	251.69	134.53	17,257.42	9,823.59	-7,274.62	-1,527.82	135.17	1,955.01	1,706.08	114.47	7.854
16,100.00	9,015.57	-7,373.23	252.41	136.34	17,357.42	9,824.99	-7,374.60	-1,527.11	136.94	1,954.87	1,702.57	114.46	7.748
16,200.00	9,017.32	-7,473.21	253.12	138.16	17,457.42	9,826.38	-7,474.59	-1,526.40	138.72	1,954.73	1,699.06	114.45	7.646
16,300.00	9,019.07	-7,573.19	253.84	139.97	17,557.42	9,827.78	-7,574.58	-1,525.69	140.50	1,954.58	1,695.55	114.44	7.546
16,400.00	9,020.82	-7,673.18	254.56	141.78	17,657.42	9,829.17	-7,674.57	-1,524.98	142.28	1,954.44	1,692.04	114.43	7.448
16,500.00	9,022.57	-7,773.16	255.27	143.60	17,757.42	9,830.57	-7,774.55	-1,524.26	144.06	1,954.30	1,688.53	114.42	7.353
16,600.00	9,024.32	-7,873.14	255.99	145.41	17,857.42	9,831.96	-7,874.54	-1,523.55	145.84	1,954.16	1,685.01	114.41	7.261
16,700.00	9,026.07	-7,973.12	256.70	147.23	17,957.42	9,833.36	-7,974.53	-1,522.84	147.63	1,954.01	1,681.50	114.40	7.170
16,800.00	9,027.82	-8,073.11	257.42	149.05	18,057.42	9,834.75	-8,074.51	-1,522.13	149.41	1,953.87	1,677.98	114.39	7.082
16,900.00	9,029.57	-8,173.09	258.13	150.86	18,157.42	9,836.15	-8,174.50	-1,521.42	151.20	1,953.73	1,674.46	114.38	6.996
17,000.00	9,031.32	-8,273.07	258.85	152.68	18,257.42	9,837.55	-8,274.49	-1,520.71	152.99	1,953.59	1,670.94	114.37	6.912
17,100.00	9,033.07	-8,373.05	259.57	154.50	18,357.42	9,838.94	-8,374.47	-1,519.99	154.78	1,953.44	1,667.42	114.36	6.830
17,200.00	9,034.82	-8,473.03	260.28	156.32	18,457.42	9,840.34	-8,474.46	-1,519.28	156.57	1,953.30	1,663.90	114.35	6.749
17,300.00	9,036.57	-8,573.02	261.00	158.13	18,557.42	9,841.73	-8,574.45	-1,518.57	158.36	1,953.16	1,660.38	114.34	6.671
17,400.00	9,038.32	-8,673.00	261.71	159.95	18,657.42	9,843.13	-8,674.44	-1,517.86	160.15	1,953.02	1,656.85	114.33	6.594
17,500.00	9,040.07	-8,772.98	262.43	161.77	18,757.41	9,844.52	-8,774.42	-1,517.15	161.94	1,952.87	1,653.33	114.32	6.519
17,600.00	9,041.82	-8,872.96	263.15	163.59	18,857.41	9,845.92	-8,874.41	-1,516.43	163.74	1,952.73	1,649.80	114.31	6.446

Anticollision Report for 3H - Plan 2

Offset Design: Diamondback 24 Federal 2BS - 1H - Wellbore #1 - Plan 2
0-MWD
Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)
Scan Range: 0.00 to 18,838.28 usft. Measured Depth.
Scan Radius is 2,209.98 usft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Uncertainty Data for Reference Well					Uncertainty Data for Comparison Well					Separation (Ref. > Comp.)			
Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Measured Depth (usft)	Vertical Depth (usft)	Ellipse Centre +N/-S (usft)	Ellipse Centre +E/-W (usft)	Ellipse Major Axis/2	Between Centres (usft)	Between Ellipsoids (usft)	Relative Highside Bearing	Clearance Factor
17,700.00	9,043.57	-8,972.94	263.86	165.41	18,957.41	9,847.31	-8,974.40	-1,515.72	165.53	1,952.59	1,646.27	114.30	6.374
17,800.00	9,045.32	-9,072.93	264.58	167.23	19,057.41	9,848.71	-9,074.38	-1,515.01	167.33	1,952.45	1,642.75	114.29	6.304
17,900.00	9,047.07	-9,172.91	265.29	169.05	19,157.41	9,850.10	-9,174.37	-1,514.30	169.12	1,952.31	1,639.22	114.28	6.236
18,000.00	9,048.82	-9,272.89	266.01	170.87	19,257.41	9,851.50	-9,274.36	-1,513.59	170.92	1,952.16	1,635.69	114.27	6.168
18,100.00	9,050.57	-9,372.87	266.72	172.69	19,357.41	9,852.89	-9,374.35	-1,512.88	172.72	1,952.02	1,632.16	114.27	6.103
18,200.00	9,052.32	-9,472.86	267.44	174.51	19,457.41	9,854.29	-9,474.33	-1,512.16	174.52	1,951.88	1,628.62	114.26	6.038
18,300.00	9,054.07	-9,572.84	268.16	176.33	19,557.41	9,855.69	-9,574.32	-1,511.45	176.32	1,951.74	1,625.09	114.25	5.975
18,400.00	9,055.82	-9,672.82	268.87	178.15	19,657.41	9,857.08	-9,674.31	-1,510.74	178.12	1,951.60	1,621.56	114.24	5.913
18,500.00	9,057.57	-9,772.80	269.59	179.97	19,757.41	9,858.48	-9,774.29	-1,510.03	179.92	1,951.45	1,618.02	114.23	5.853
18,600.00	9,059.32	-9,872.78	270.30	181.79	19,857.41	9,859.87	-9,874.28	-1,509.32	181.72	1,951.31	1,614.49	114.22	5.793
18,700.00	9,061.07	-9,972.77	271.02	183.62	19,957.41	9,861.27	-9,974.27	-1,508.61	183.52	1,951.17	1,610.95	114.21	5.735
18,800.00	9,062.82	-10,072.75	271.74	185.44	20,057.41	9,862.66	-10,074.26	-1,507.89	185.33	1,951.03	1,607.41	114.20	5.678
18,838.28	9,063.49	-10,111.02	272.01	186.14	20,095.68	9,863.20	-10,112.53	-1,507.62	186.02	1,950.98	1,606.06	114.19	5.656

Anticollision Report for 3H - Plan 2

Reference Well Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	18,838.28	Plan 2	MWD

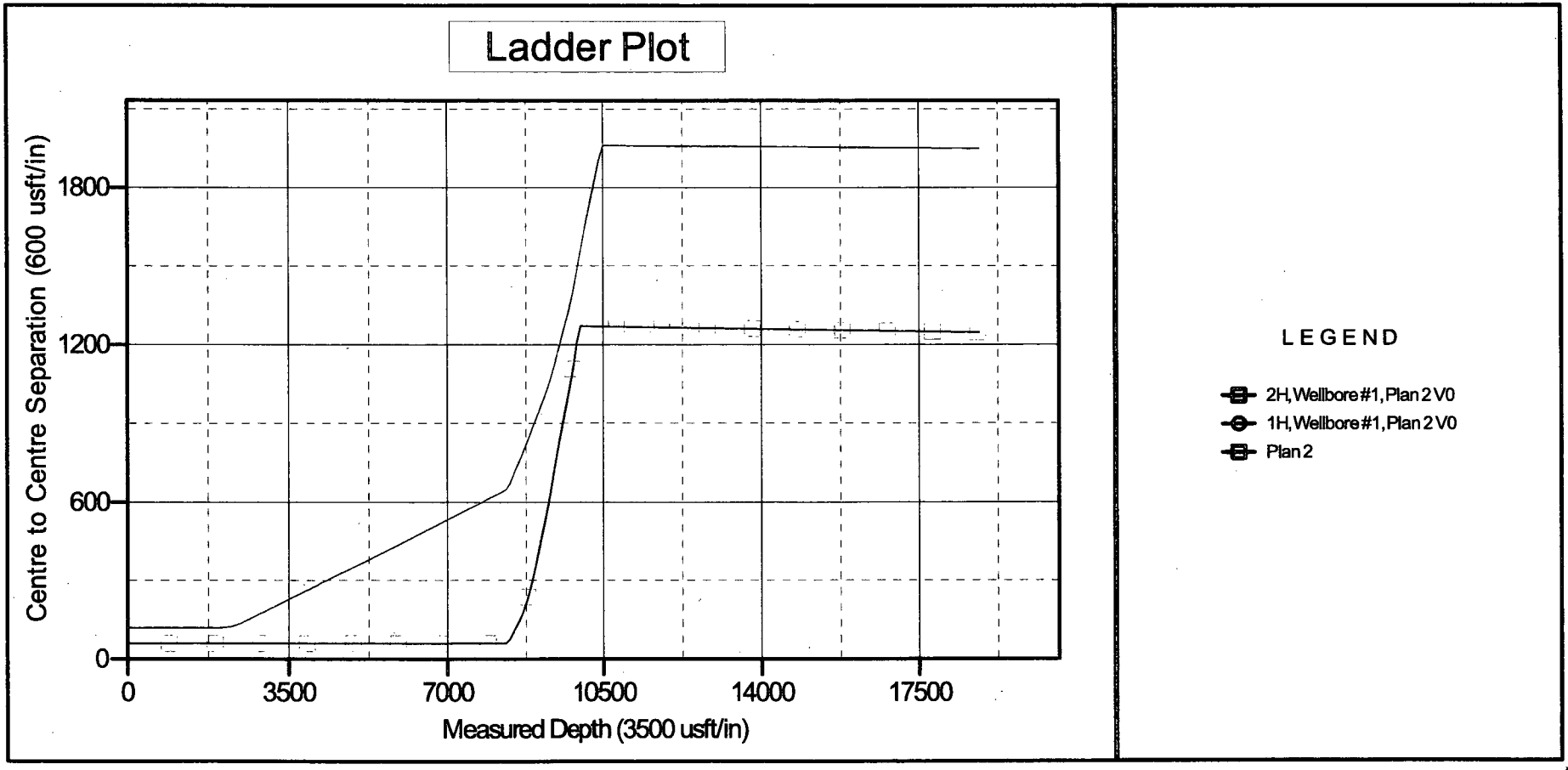
Anticollision Info

Error Model: ISCWSA
Scan Method: Closest Approach 3D
Output errors are at 2.00 sigma

Ellipse error terms are correlated across survey tool tie-on points.
Calculated ellipses incorporate surface errors.
Separation is the actual distance between ellipsoids.
Distance Between centres is the straight line distance between wellbore centres.
Clearance Factor = Distance Between Profiles / (Distance Between Profiles - Ellipse Separation).
All station coordinates were calculated using the Minimum Curvature method.

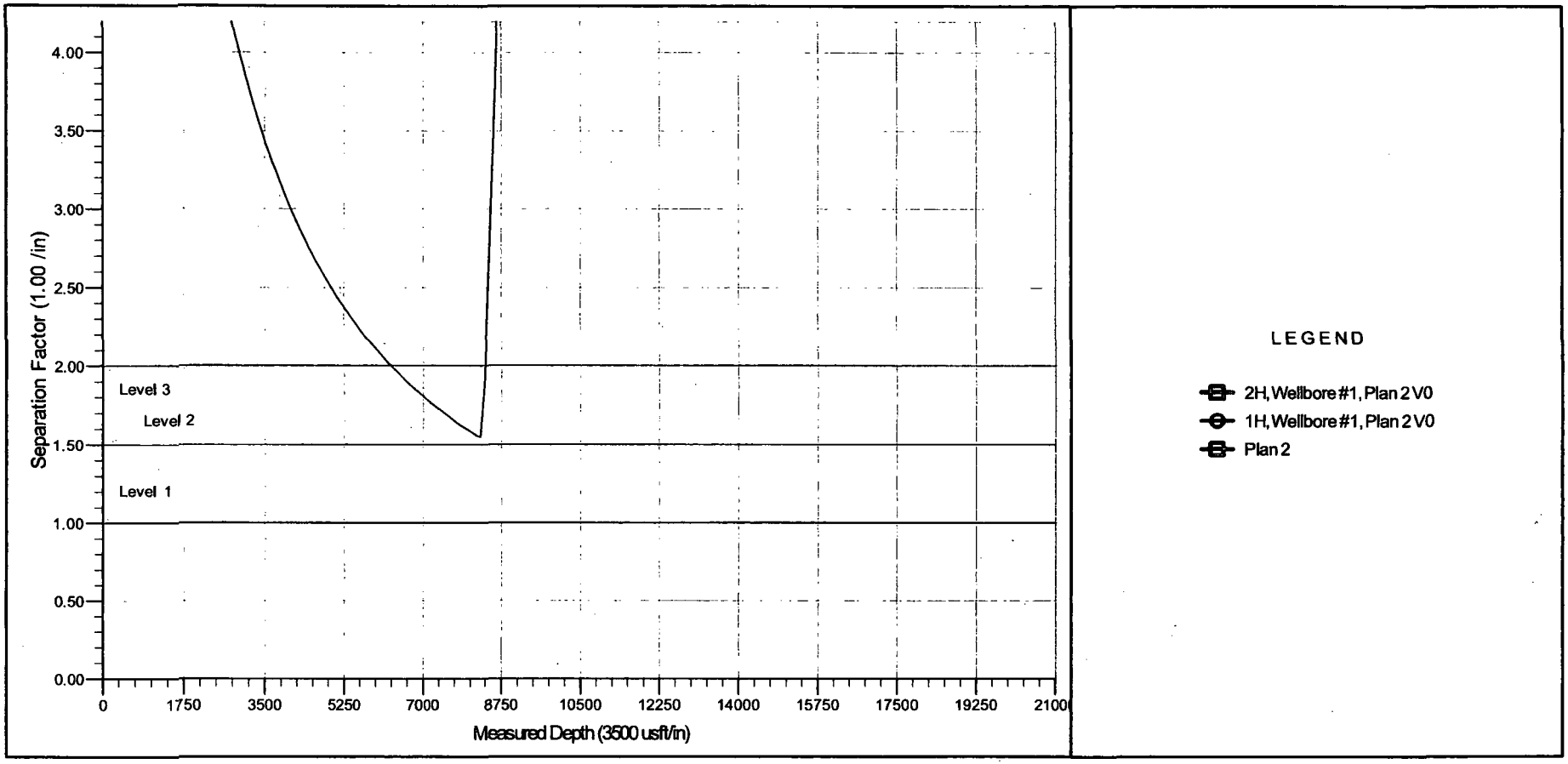
Anticollision Report for 3H - Plan 2

Direction and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to GL+KB 22' @ 3641.60usft (Nabors M55). Northing and Easting are relative to 3H.
Coordinate System is US State Plane 1983, New Mexico Eastern Zone.
Central Meridian is -104.00°, Grid Convergence at Surface is: 0.33 °.
Summary is based on Minimum Centre Distance



Anticollision Report for 3H - Plan 2

Clearance Factor Plot: Measured Depth versus Separation(Clearance) Factor



CHISHOLM ENERGY

Chisholm Energy Holdings

GL+KB 22' @ 3641.60usft (Nabors M55)

Ground Level: 3619.60

Project: Lea County, NM (NAD 83)
Site: Diamondback 24 Federal 2BS
Well: 3H
Wellbore: Wellbore #1
Design: Plan 2
Rig: Nabors M55

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

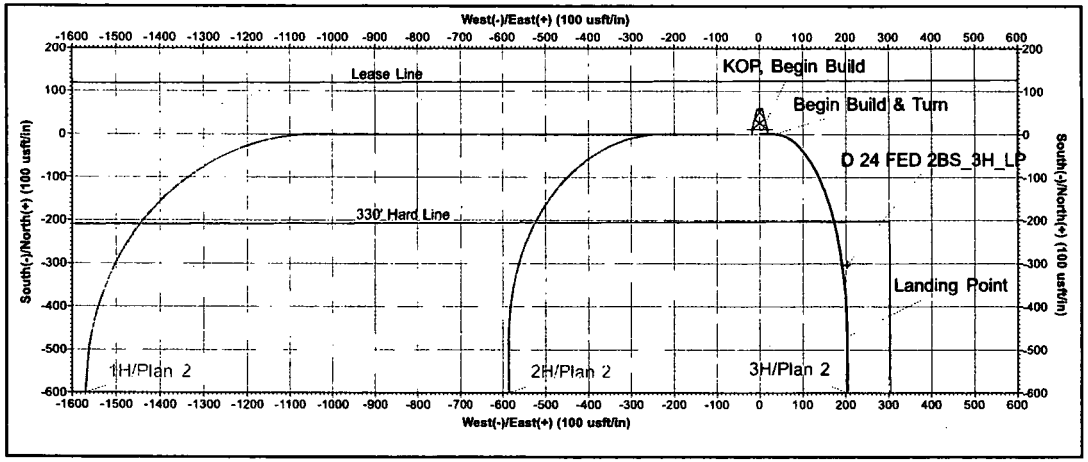
Azimuths to Grid North
True North: -0.34°
Magnetic North: 6.65°

Magnetic Field
Strength: 48130.4snT
Dip Angle: 60.40°
Date: 6/19/2018
Model: BGGM2018

WELL DETAILS

Ground Level: 3619.60

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	601744.85	732196.45	32.65271193	-103.71320741



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8278.00	0.00	0.00	8278.00	0.00	0.00	0.00	0.00	0.00	KOP, Begin Build
8453.00	21.00	90.00	8449.11	0.00	31.71	12.00	90.00	0.00	Begin Build & Turn
9193.97	89.00	179.59	8894.71	-468.44	202.97	12.00	89.98	468.44	Landing Point
18838.28	89.00	179.59	9063.49	-10111.02	272.01	0.00	0.00	10111.02	TD at 18838.28' MD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
D 24 FED 2BS_3H_BHL	0.00	-10111.02	272.01	591633.83	732468.46	32.62491678	-103.71251564
D 24 FED 2BS_3H_LP	0.00	-304.14	202.10	601440.71	732398.55	32.65187274	-103.71255657

HALLIBURTON | Sperry Drilling

Nabors M55

Chisholm Energy Holdings

Lea County, NM (NAD 83) Diamondback 24 Federal 2BS
API#
3H

Wellbore #1
Plan: Plan 2

Sperry Drilling Services

Combo Report

30 May, 2018

Well Coordinates:	32° 39' 09.76" N 103° 42' 47.55" W	North American Datum 1983 New Mexico Eastern Zone 601,744.85 N 732,196.45 E

Ground Level: 3,619.60 usft

Local Coordinate Origin:	Centered on Well 3H
Viewing Datum:	GL+KB 22' @ 3641.60usft (Nabors M55)
TVDs to System:	N
North Reference:	**Grid**
Unit System:	Midcon (2 decimal)

Version: 5000.1 Build: 81E

Report Version: Midcon Combo v1.12

HALLIBURTON

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
0.00	0.00	0.00	0.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,700.00	0.00	0.00	1,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,800.00	0.00	0.00	1,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
1,900.00	0.00	0.00	1,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,100.00	0.00	0.00	2,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,300.00	0.00	0.00	2,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,600.00	0.00	0.00	2,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
3,600.00	0.00	0.00	3,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,000.00	0.00	0.00	4,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,100.00	0.00	0.00	4,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,200.00	0.00	0.00	4,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,400.00	0.00	0.00	4,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,600.00	0.00	0.00	4,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,700.00	0.00	0.00	4,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,800.00	0.00	0.00	4,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
4,900.00	0.00	0.00	4,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,000.00	0.00	0.00	5,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,100.00	0.00	0.00	5,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,200.00	0.00	0.00	5,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,000.00	0.00	0.00	6,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,000.00	0.00	0.00	7,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
7,300.00	0.00	0.00	7,300.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,400.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,500.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,600.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,700.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,800.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,900.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
8,000.00	0.00	0.00	8,000.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,100.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,200.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	
8,278.00	0.00	0.00	8,278.00	0.00 N	0.00 E	601,744.85	732,196.45	0.00	0.00	0.00	KOP, Begin Build
8,300.00	2.64	90.00	8,299.99	0.00 S	0.51 E	601,744.85	732,196.96	12.00	0.00	90.00	
8,325.00	5.64	90.00	8,324.92	0.00 S	2.31 E	601,744.85	732,198.76	12.00	0.00	0.00	
8,350.00	8.64	90.00	8,349.73	0.00 S	5.42 E	601,744.85	732,201.87	12.00	0.00	0.00	
8,375.00	11.64	90.00	8,374.33	0.00 S	9.82 E	601,744.85	732,206.27	12.00	0.00	0.00	
8,400.00	14.64	90.00	8,398.68	0.00 S	15.50 E	601,744.85	732,211.95	12.00	0.00	0.00	
8,425.00	17.64	90.00	8,422.69	0.00 S	22.45 E	601,744.85	732,218.90	12.00	0.00	0.00	
8,450.00	20.64	90.00	8,446.30	0.00 S	30.65 E	601,744.85	732,227.10	12.00	0.00	0.00	
8,453.00	21.00	90.00	8,449.11	0.00 S	31.71 E	601,744.85	732,228.16	12.00	0.00	0.00	Begin Build & Turn
8,475.00	21.16	97.33	8,469.64	0.51 S	39.59 E	601,744.34	732,236.04	12.00	0.51	89.98	
8,500.00	21.71	105.41	8,492.92	2.31 S	48.53 E	601,742.54	732,244.98	12.00	2.31	83.13	
8,525.00	22.64	112.97	8,516.07	5.42 S	57.42 E	601,739.43	732,253.87	12.00	5.42	75.62	
8,550.00	23.89	119.89	8,539.04	9.82 S	66.24 E	601,735.03	732,262.69	12.00	9.82	68.61	
8,575.00	25.41	126.08	8,561.77	15.50 S	74.97 E	601,729.35	732,271.42	12.00	15.50	62.26	
8,600.00	27.17	131.57	8,584.18	22.45 S	83.57 E	601,722.40	732,280.02	12.00	22.45	56.62	
8,625.00	29.12	136.41	8,606.23	30.65 S	92.04 E	601,714.20	732,288.49	12.00	30.65	51.70	
8,650.00	31.22	140.68	8,627.84	40.07 S	100.34 E	601,704.78	732,296.79	12.00	40.07	47.43	
8,675.00	33.45	144.44	8,648.97	50.69 S	108.45 E	601,694.16	732,304.90	12.00	50.69	43.74	
8,700.00	35.77	147.78	8,669.54	62.48 S	116.36 E	601,682.37	732,312.81	12.00	62.48	40.56	
8,725.00	38.18	150.76	8,689.52	75.40 S	124.03 E	601,669.45	732,320.48	12.00	75.40	37.81	
8,750.00	40.66	153.43	8,708.83	89.43 S	131.45 E	601,655.42	732,327.90	12.00	89.43	35.43	
8,775.00	43.19	155.84	8,727.43	104.52 S	138.60 E	601,640.33	732,335.05	12.00	104.52	33.37	
8,800.00	45.77	158.03	8,745.27	120.64 S	145.45 E	601,624.21	732,341.90	12.00	120.64	31.58	
8,825.00	48.38	160.03	8,762.30	137.73 S	152.00 E	601,607.12	732,348.45	12.00	137.73	30.01	
8,850.00	51.03	161.88	8,778.46	155.76 S	158.21 E	601,589.09	732,354.66	12.00	155.76	28.64	
8,875.00	53.70	163.60	8,793.73	174.66 S	164.08 E	601,570.19	732,360.53	12.00	174.66	27.45	
8,900.00	56.40	165.20	8,808.05	194.40 S	169.58 E	601,550.45	732,366.03	12.00	194.40	26.40	

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
8,925.00	59.12	166.70	8,821.38	214.91 S	174.71 E	601,529.94	732,371.16	12.00	214.91	25.48	
8,950.00	61.85	168.12	8,833.70	236.14 S	179.45 E	601,508.71	732,375.90	12.00	236.14	24.68	
8,975.00	64.60	169.47	8,844.96	258.03 S	183.78 E	601,486.82	732,380.23	12.00	258.03	23.98	
9,000.00	67.36	170.76	8,855.13	280.53 S	187.70 E	601,464.32	732,384.15	12.00	280.53	23.37	
9,025.00	70.13	172.00	8,864.20	303.56 S	191.18 E	601,441.29	732,387.63	12.00	303.56	22.85	
9,050.00	72.91	173.20	8,872.12	327.07 S	194.24 E	601,417.78	732,390.69	12.00	327.07	22.40	
9,075.00	75.69	174.36	8,878.89	350.99 S	196.84 E	601,393.86	732,393.29	12.00	350.99	22.02	
9,100.00	78.48	175.49	8,884.47	375.26 S	199.00 E	601,369.59	732,395.45	12.00	375.26	21.71	
9,125.00	81.28	176.60	8,888.87	399.81 S	200.70 E	601,345.04	732,397.15	12.00	399.81	21.45	
9,150.00	84.07	177.69	8,892.05	424.57 S	201.93 E	601,320.28	732,398.38	12.00	424.57	21.26	
9,175.00	86.87	178.77	8,894.03	449.48 S	202.70 E	601,295.37	732,399.15	12.00	449.48	21.12	
9,193.97	89.00	179.59	8,894.71	468.44 S	202.97 E	601,276.41	732,399.42	12.00	468.44	21.03	Landing Point
9,200.00	89.00	179.59	8,894.82	474.46 S	203.01 E	601,270.39	732,399.46	0.00	474.46	0.00	
9,300.00	89.00	179.59	8,896.57	574.45 S	203.73 E	601,170.40	732,400.18	0.00	574.45	0.00	
9,400.00	89.00	179.59	8,898.32	674.43 S	204.45 E	601,070.42	732,400.90	0.00	674.43	0.00	
9,500.00	89.00	179.59	8,900.07	774.41 S	205.16 E	600,970.44	732,401.61	0.00	774.41	0.00	
9,600.00	89.00	179.59	8,901.82	874.39 S	205.88 E	600,870.46	732,402.33	0.00	874.39	0.00	
9,700.00	89.00	179.59	8,903.57	974.37 S	206.59 E	600,770.48	732,403.04	0.00	974.37	0.00	
9,800.00	89.00	179.59	8,905.32	1,074.36 S	207.31 E	600,670.49	732,403.76	0.00	1,074.36	0.00	
9,900.00	89.00	179.59	8,907.07	1,174.34 S	208.02 E	600,570.51	732,404.47	0.00	1,174.34	0.00	
10,000.00	89.00	179.59	8,908.82	1,274.32 S	208.74 E	600,470.53	732,405.19	0.00	1,274.32	0.00	
10,100.00	89.00	179.59	8,910.57	1,374.30 S	209.46 E	600,370.55	732,405.91	0.00	1,374.30	0.00	
10,200.00	89.00	179.59	8,912.32	1,474.29 S	210.17 E	600,270.56	732,406.62	0.00	1,474.29	0.00	
10,300.00	89.00	179.59	8,914.07	1,574.27 S	210.89 E	600,170.58	732,407.34	0.00	1,574.27	0.00	
10,400.00	89.00	179.59	8,915.82	1,674.25 S	211.60 E	600,070.60	732,408.05	0.00	1,674.25	0.00	
10,500.00	89.00	179.59	8,917.57	1,774.23 S	212.32 E	599,970.62	732,408.77	0.00	1,774.23	0.00	
10,600.00	89.00	179.59	8,919.32	1,874.21 S	213.04 E	599,870.64	732,409.49	0.00	1,874.21	0.00	
10,700.00	89.00	179.59	8,921.07	1,974.20 S	213.75 E	599,770.65	732,410.20	0.00	1,974.20	0.00	
10,800.00	89.00	179.59	8,922.82	2,074.18 S	214.47 E	599,670.67	732,410.92	0.00	2,074.18	0.00	
10,900.00	89.00	179.59	8,924.57	2,174.16 S	215.18 E	599,570.69	732,411.63	0.00	2,174.16	0.00	
11,000.00	89.00	179.59	8,926.32	2,274.14 S	215.90 E	599,470.71	732,412.35	0.00	2,274.14	0.00	
11,100.00	89.00	179.59	8,928.07	2,374.12 S	216.61 E	599,370.73	732,413.06	0.00	2,374.12	0.00	
11,200.00	89.00	179.59	8,929.82	2,474.11 S	217.33 E	599,270.74	732,413.78	0.00	2,474.11	0.00	
11,300.00	89.00	179.59	8,931.57	2,574.09 S	218.05 E	599,170.76	732,414.50	0.00	2,574.09	0.00	
11,400.00	89.00	179.59	8,933.32	2,674.07 S	218.76 E	599,070.78	732,415.21	0.00	2,674.07	0.00	
11,500.00	89.00	179.59	8,935.07	2,774.05 S	219.48 E	598,970.80	732,415.93	0.00	2,774.05	0.00	

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
11,600.00	89.00	179.59	8,936.82	2,874.04 S	220.19 E	598,870.81	732,416.64	0.00	2,874.04	0.00	
11,700.00	89.00	179.59	8,938.57	2,974.02 S	220.91 E	598,770.83	732,417.36	0.00	2,974.02	0.00	
11,800.00	89.00	179.59	8,940.32	3,074.00 S	221.63 E	598,670.85	732,418.08	0.00	3,074.00	0.00	
11,900.00	89.00	179.59	8,942.07	3,173.98 S	222.34 E	598,570.87	732,418.79	0.00	3,173.98	0.00	
12,000.00	89.00	179.59	8,943.82	3,273.96 S	223.06 E	598,470.89	732,419.51	0.00	3,273.96	0.00	
12,100.00	89.00	179.59	8,945.57	3,373.95 S	223.77 E	598,370.90	732,420.22	0.00	3,373.95	0.00	
12,200.00	89.00	179.59	8,947.32	3,473.93 S	224.49 E	598,270.92	732,420.94	0.00	3,473.93	0.00	
12,300.00	89.00	179.59	8,949.07	3,573.91 S	225.21 E	598,170.94	732,421.66	0.00	3,573.91	0.00	
12,400.00	89.00	179.59	8,950.82	3,673.89 S	225.92 E	598,070.96	732,422.37	0.00	3,673.89	0.00	
12,500.00	89.00	179.59	8,952.57	3,773.87 S	226.64 E	597,970.98	732,423.09	0.00	3,773.87	0.00	
12,600.00	89.00	179.59	8,954.32	3,873.86 S	227.35 E	597,870.99	732,423.80	0.00	3,873.86	0.00	
12,700.00	89.00	179.59	8,956.07	3,973.84 S	228.07 E	597,771.01	732,424.52	0.00	3,973.84	0.00	
12,800.00	89.00	179.59	8,957.82	4,073.82 S	228.78 E	597,671.03	732,425.23	0.00	4,073.82	0.00	
12,900.00	89.00	179.59	8,959.57	4,173.80 S	229.50 E	597,571.05	732,425.95	0.00	4,173.80	0.00	
13,000.00	89.00	179.59	8,961.32	4,273.78 S	230.22 E	597,471.07	732,426.67	0.00	4,273.78	0.00	
13,100.00	89.00	179.59	8,963.07	4,373.77 S	230.93 E	597,371.08	732,427.38	0.00	4,373.77	0.00	
13,200.00	89.00	179.59	8,964.82	4,473.75 S	231.65 E	597,271.10	732,428.10	0.00	4,473.75	0.00	
13,300.00	89.00	179.59	8,966.57	4,573.73 S	232.36 E	597,171.12	732,428.81	0.00	4,573.73	0.00	
13,400.00	89.00	179.59	8,968.32	4,673.71 S	233.08 E	597,071.14	732,429.53	0.00	4,673.71	0.00	
13,500.00	89.00	179.59	8,970.07	4,773.70 S	233.80 E	596,971.15	732,430.25	0.00	4,773.70	0.00	
13,600.00	89.00	179.59	8,971.82	4,873.68 S	234.51 E	596,871.17	732,430.96	0.00	4,873.68	0.00	
13,700.00	89.00	179.59	8,973.57	4,973.66 S	235.23 E	596,771.19	732,431.68	0.00	4,973.66	0.00	
13,800.00	89.00	179.59	8,975.32	5,073.64 S	235.94 E	596,671.21	732,432.39	0.00	5,073.64	0.00	
13,900.00	89.00	179.59	8,977.07	5,173.62 S	236.66 E	596,571.23	732,433.11	0.00	5,173.62	0.00	
14,000.00	89.00	179.59	8,978.82	5,273.61 S	237.37 E	596,471.24	732,433.82	0.00	5,273.61	0.00	
14,100.00	89.00	179.59	8,980.57	5,373.59 S	238.09 E	596,371.26	732,434.54	0.00	5,373.59	0.00	
14,200.00	89.00	179.59	8,982.32	5,473.57 S	238.81 E	596,271.28	732,435.26	0.00	5,473.57	0.00	
14,300.00	89.00	179.59	8,984.07	5,573.55 S	239.52 E	596,171.30	732,435.97	0.00	5,573.55	0.00	
14,400.00	89.00	179.59	8,985.82	5,673.53 S	240.24 E	596,071.32	732,436.69	0.00	5,673.53	0.00	
14,500.00	89.00	179.59	8,987.57	5,773.52 S	240.95 E	595,971.33	732,437.40	0.00	5,773.52	0.00	
14,600.00	89.00	179.59	8,989.32	5,873.50 S	241.67 E	595,871.35	732,438.12	0.00	5,873.50	0.00	
14,700.00	89.00	179.59	8,991.07	5,973.48 S	242.39 E	595,771.37	732,438.84	0.00	5,973.48	0.00	
14,800.00	89.00	179.59	8,992.82	6,073.46 S	243.10 E	595,671.39	732,439.55	0.00	6,073.46	0.00	
14,900.00	89.00	179.59	8,994.57	6,173.45 S	243.82 E	595,571.40	732,440.27	0.00	6,173.45	0.00	
15,000.00	89.00	179.59	8,996.32	6,273.43 S	244.53 E	595,471.42	732,440.98	0.00	6,273.43	0.00	
15,100.00	89.00	179.59	8,998.07	6,373.41 S	245.25 E	595,371.44	732,441.70	0.00	6,373.41	0.00	
15,200.00	89.00	179.59	8,999.82	6,473.39 S	245.97 E	595,271.46	732,442.42	0.00	6,473.39	0.00	

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
15,300.00	89.00	179.59	9,001.57	6,573.37 S	246.68 E	595,171.48	732,443.13	0.00	6,573.37	0.00	
15,400.00	89.00	179.59	9,003.32	6,673.36 S	247.40 E	595,071.49	732,443.85	0.00	6,673.36	0.00	
15,500.00	89.00	179.59	9,005.07	6,773.34 S	248.11 E	594,971.51	732,444.56	0.00	6,773.34	0.00	
15,600.00	89.00	179.59	9,006.82	6,873.32 S	248.83 E	594,871.53	732,445.28	0.00	6,873.32	0.00	
15,700.00	89.00	179.59	9,008.57	6,973.30 S	249.54 E	594,771.55	732,445.99	0.00	6,973.30	0.00	
15,800.00	89.00	179.59	9,010.32	7,073.28 S	250.26 E	594,671.57	732,446.71	0.00	7,073.28	0.00	
15,900.00	89.00	179.59	9,012.07	7,173.27 S	250.98 E	594,571.58	732,447.43	0.00	7,173.27	0.00	
16,000.00	89.00	179.59	9,013.82	7,273.25 S	251.69 E	594,471.60	732,448.14	0.00	7,273.25	0.00	
16,100.00	89.00	179.59	9,015.57	7,373.23 S	252.41 E	594,371.62	732,448.86	0.00	7,373.23	0.00	
16,200.00	89.00	179.59	9,017.32	7,473.21 S	253.12 E	594,271.64	732,449.57	0.00	7,473.21	0.00	
16,300.00	89.00	179.59	9,019.07	7,573.19 S	253.84 E	594,171.66	732,450.29	0.00	7,573.19	0.00	
16,400.00	89.00	179.59	9,020.82	7,673.18 S	254.56 E	594,071.67	732,451.01	0.00	7,673.18	0.00	
16,500.00	89.00	179.59	9,022.57	7,773.16 S	255.27 E	593,971.69	732,451.72	0.00	7,773.16	0.00	
16,600.00	89.00	179.59	9,024.32	7,873.14 S	255.99 E	593,871.71	732,452.44	0.00	7,873.14	0.00	
16,700.00	89.00	179.59	9,026.07	7,973.12 S	256.70 E	593,771.73	732,453.15	0.00	7,973.12	0.00	
16,800.00	89.00	179.59	9,027.82	8,073.11 S	257.42 E	593,671.74	732,453.87	0.00	8,073.11	0.00	
16,900.00	89.00	179.59	9,029.57	8,173.09 S	258.13 E	593,571.76	732,454.58	0.00	8,173.09	0.00	
17,000.00	89.00	179.59	9,031.32	8,273.07 S	258.85 E	593,471.78	732,455.30	0.00	8,273.07	0.00	
17,100.00	89.00	179.59	9,033.07	8,373.05 S	259.57 E	593,371.80	732,456.02	0.00	8,373.05	0.00	
17,200.00	89.00	179.59	9,034.82	8,473.03 S	260.28 E	593,271.82	732,456.73	0.00	8,473.03	0.00	
17,300.00	89.00	179.59	9,036.57	8,573.02 S	261.00 E	593,171.83	732,457.45	0.00	8,573.02	0.00	
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17,900.00	89.00	179.59	9,047.07	9,172.91 S	265.29 E	592,571.94	732,461.74	0.00	9,172.91	0.00	
18,000.00	89.00	179.59	9,048.82	9,272.89 S	266.01 E	592,471.96	732,462.46	0.00	9,272.89	0.00	
18,100.00	89.00	179.59	9,050.57	9,372.87 S	266.72 E	592,371.98	732,463.17	0.00	9,372.87	0.00	
18,200.00	89.00	179.59	9,052.32	9,472.86 S	267.44 E	592,271.99	732,463.89	0.00	9,472.86	0.00	
18,300.00	89.00	179.59	9,054.07	9,572.84 S	268.16 E	592,172.01	732,464.61	0.00	9,572.84	0.00	
18,400.00	89.00	179.59	9,055.82	9,672.82 S	268.87 E	592,072.03	732,465.32	0.00	9,672.82	0.00	
18,500.00	89.00	179.59	9,057.57	9,772.80 S	269.59 E	591,972.05	732,466.04	0.00	9,772.80	0.00	
18,600.00	89.00	179.59	9,059.32	9,872.78 S	270.30 E	591,872.07	732,466.75	0.00	9,872.78	0.00	
18,700.00	89.00	179.59	9,061.07	9,972.77 S	271.02 E	591,772.08	732,467.47	0.00	9,972.77	0.00	
18,800.00	89.00	179.59	9,062.82	10,072.75 S	271.74 E	591,672.10	732,468.19	0.00	10,072.75	0.00	
18,838.28	89.00	179.59	9,063.49	10,111.02 S	272.01 E	591,633.83	732,468.46	0.00	10,111.02	0.00	TD at 18838.28' MD

Plan Report for 3H - Plan 2

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,278.00	8,278.00	0.00	0.00	KOP, Begin Build
8,453.00	8,449.11	0.00	31.71	Begin Build & Turn
9,193.97	8,894.71	-468.44	202.97	Landing Point
18,838.28	9,063.49	-10,111.02	272.01	TD at 18838.28' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	18,838.28	Plan 2	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
100.00	100.00	20"	20	26

Plan Report for 3H - Plan 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
D 24 FED 2BS_3H_BHL ()									
	0.00	0.00	0.00	-10,111.02	272.01	591,633.83	732,468.46	32.62491678	-103.71251564
- plan misses target center by 9062.10usft at 18679.66usft MD (9060.71 TVD, -9952.43 N, 270.87 E)									
- Point									
D 24 FED 2BS_3H_LP ()									
	0.00	0.00	0.00	-304.14	202.10	601,440.71	732,398.55	32.65187274	-103.71255657
- plan misses target center by 365.17usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	0.58 °/100usft	Maximum Dogleg over Survey:	12.00 °/100usft at 8,453.00 usft
Net Tortousity applicable to Plans:	0.58 °/100usft	Directional Difficulty Index:	6.506

Audit Info

North Reference Sheet for Diamondback 24 Federal 2BS - 3H - Wellbore #1

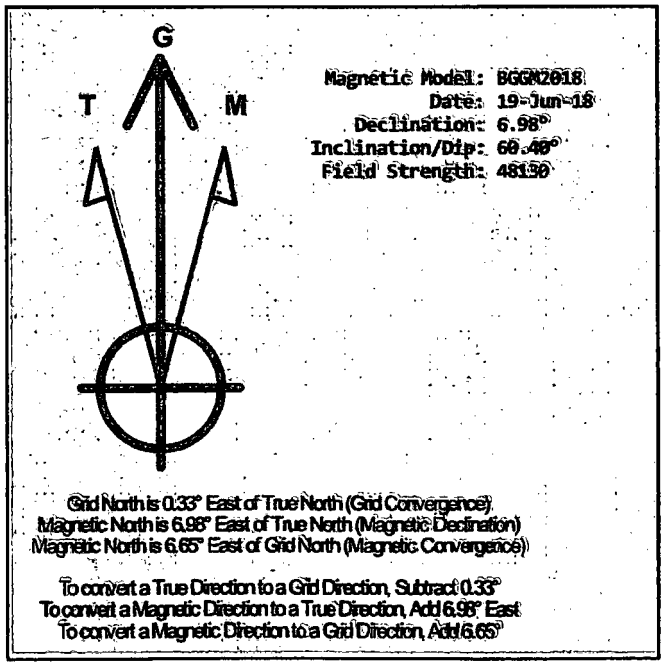
All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to GL+KB 22' @ 3641.60usft (Nabors M55). Northing and Easting are relative to 3H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980
Projection method is Transverse Mercator (Gauss-Kruger)
Central Meridian is -104.33333333°, Longitude Origin:0.00000000°, Latitude Origin:0.00000000°
False Easting: 541,337.50usft, False Northing: 0.00usft, Scale Reduction: 0.99995081

Grid Coordinates of Well: 601,744.85 usft N, 732,196.45 usft E
Geographical Coordinates of Well: 32° 39' 09.76" N, 103° 42' 47.55" W
Grid Convergence at Surface is: 0.33°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,838.28usft
the Bottom Hole Displacement is 10,114.68usft in the Direction of 178.46° (Grid).

Magnetic Convergence at surface is: -6.65° (19 June 2018, , BGGM2018)



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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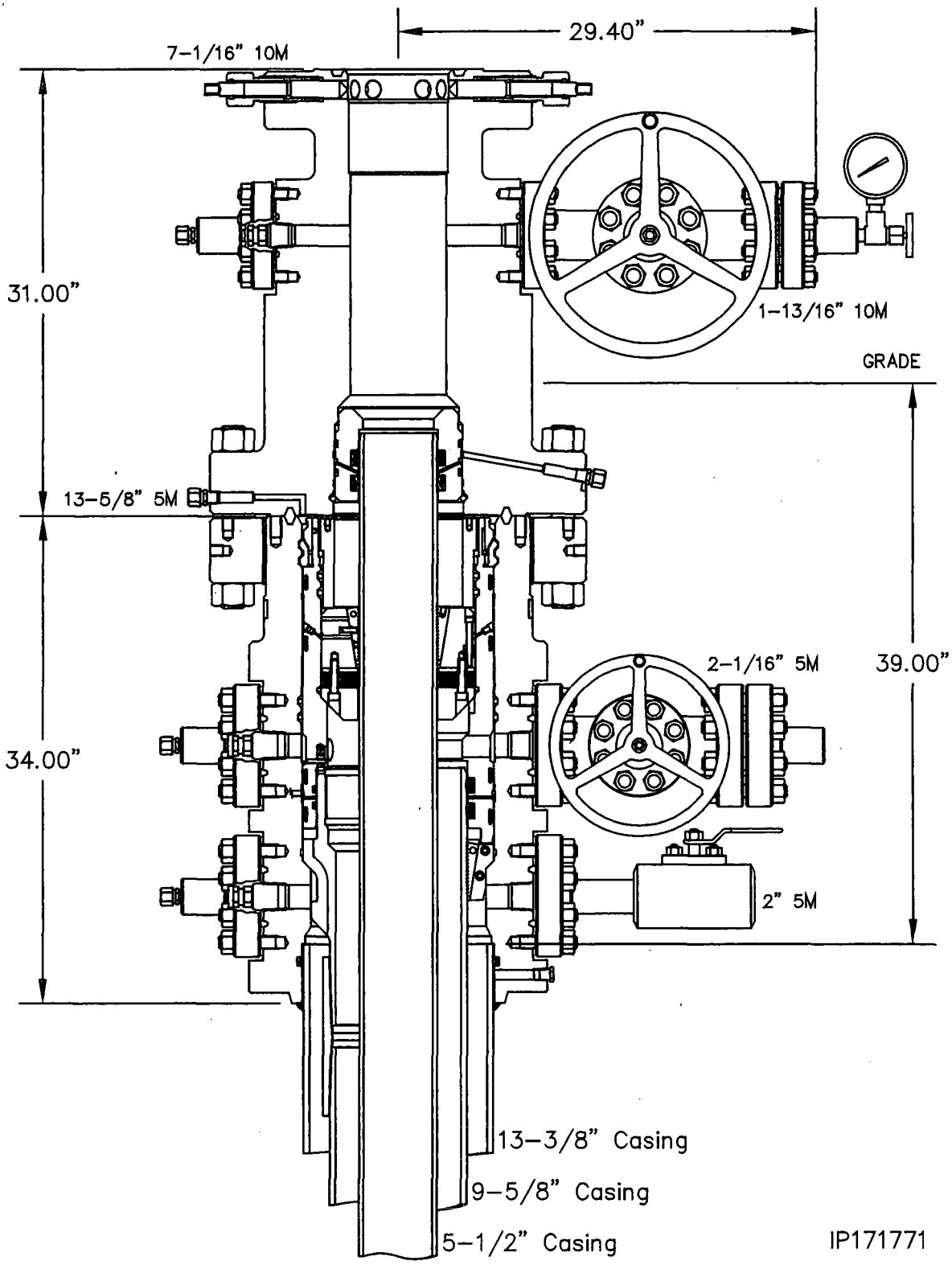
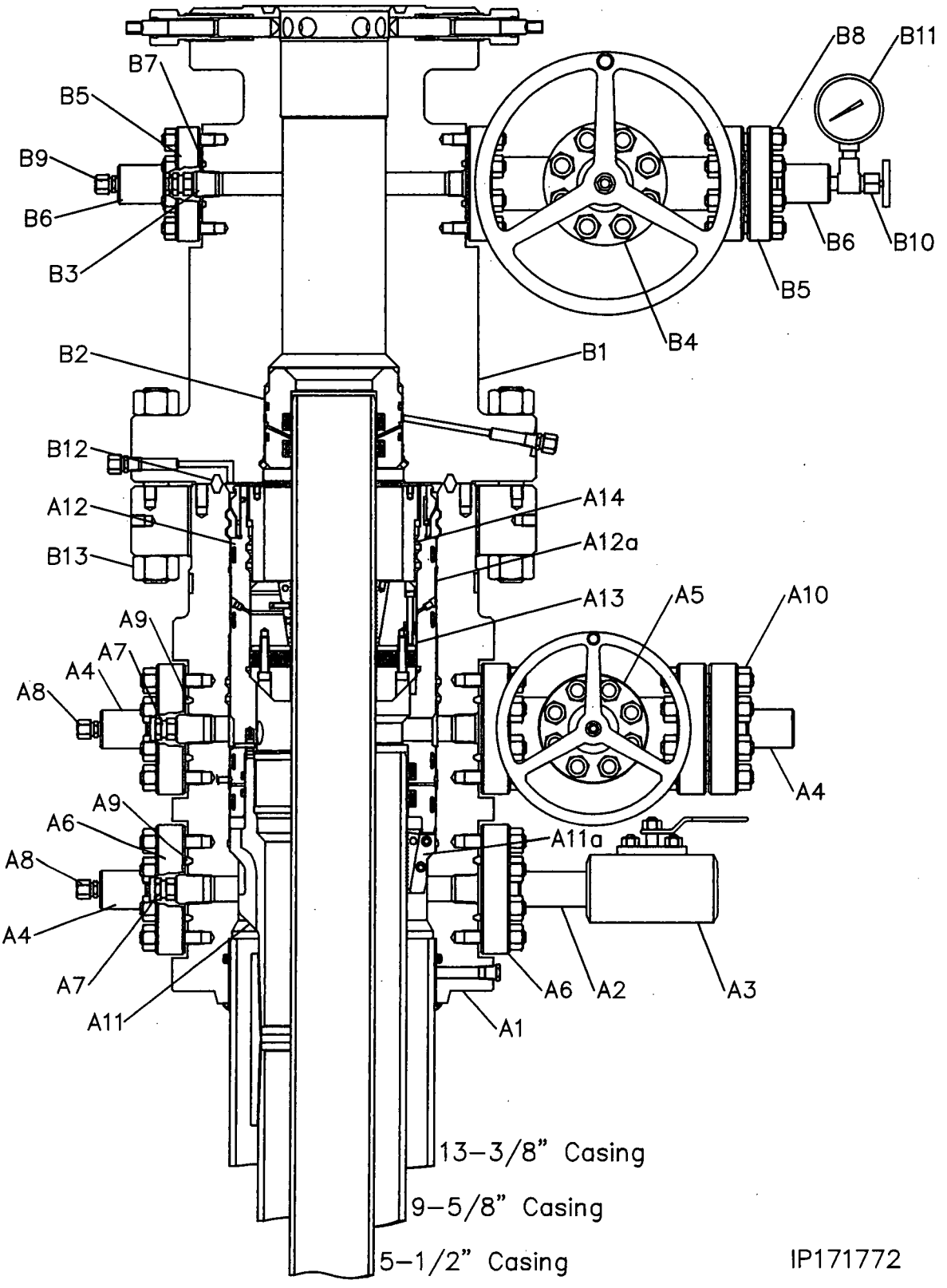
System Drawing



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

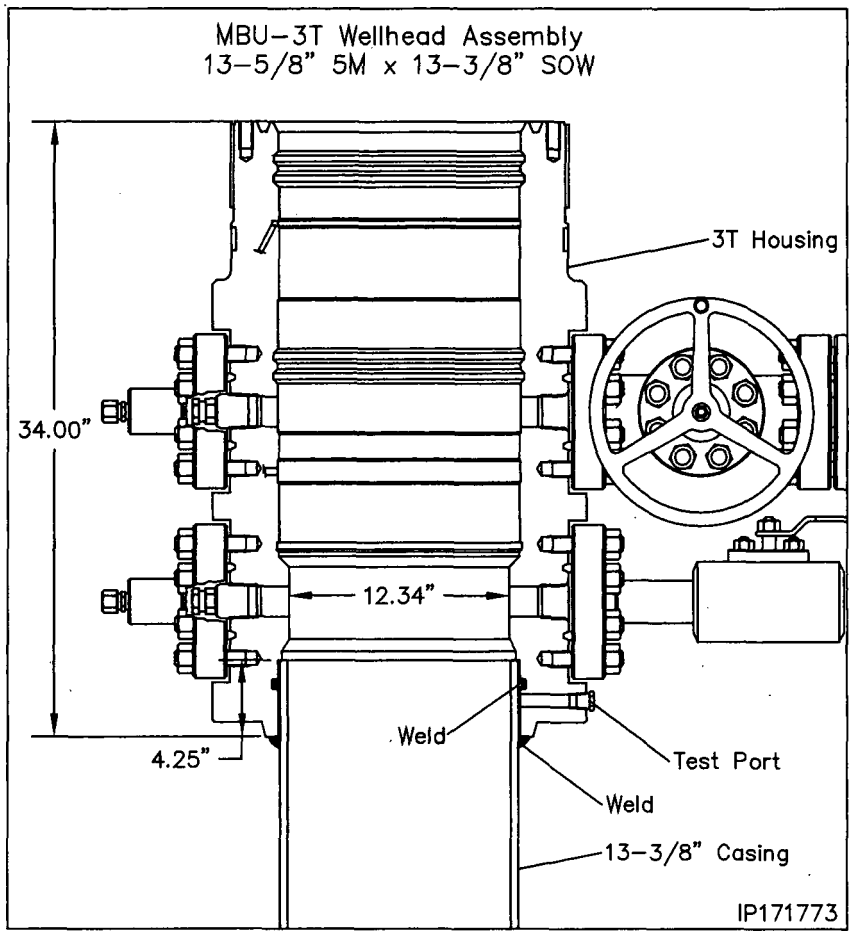
Stage 1 — Install the MBU-3T Housing

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.

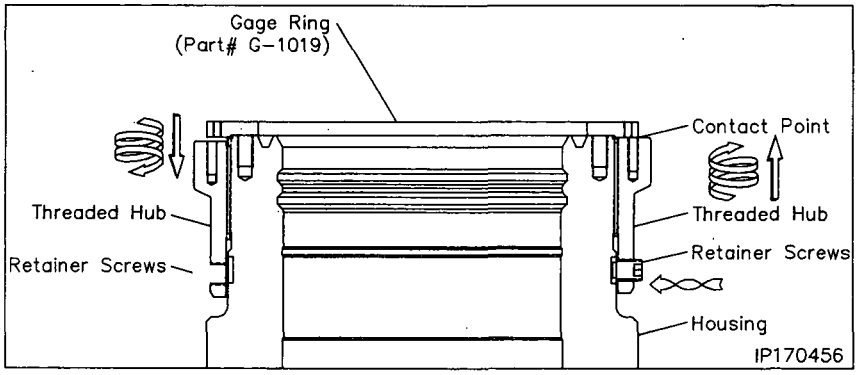
Refer to the back of this publication for the **Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal** and for field testing of the weld connection.

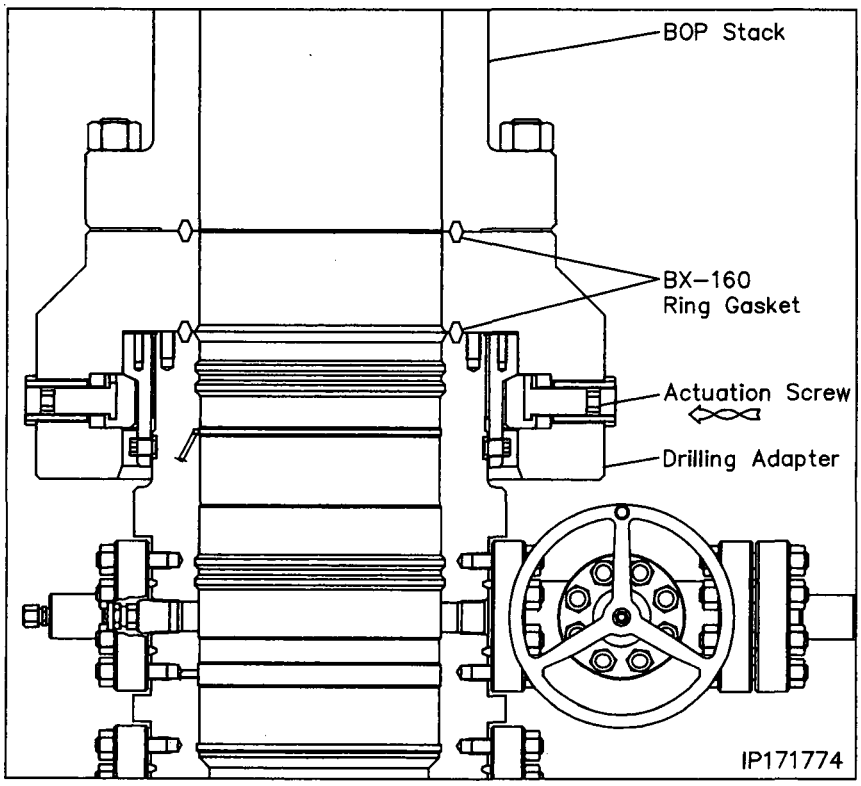
Stage 2 — Nipple Up The BOP Stack

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.

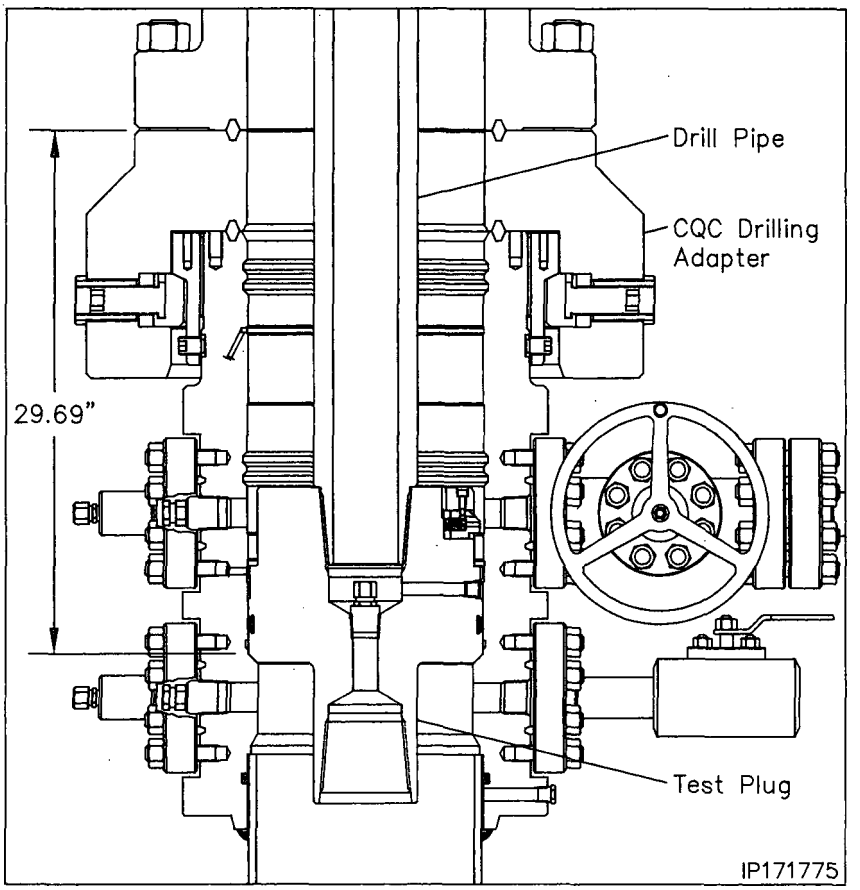
5. Lightly lubricate the test plug seal with oil or light grease.

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

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.

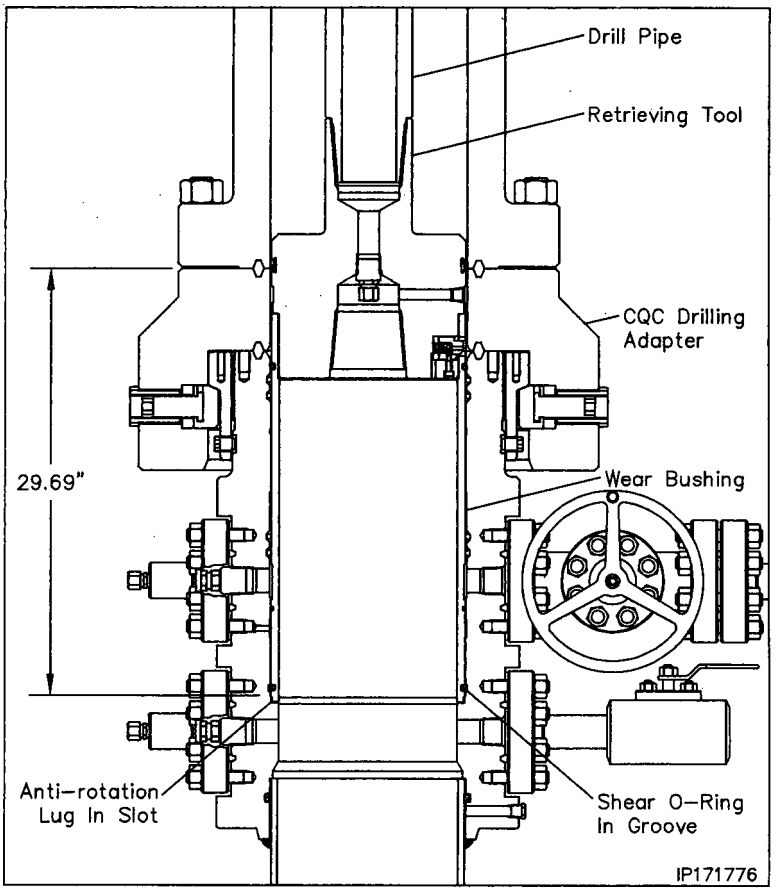
5. **Apply a heavy coat of grease, not dope, to the OD of the bushing.**

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.

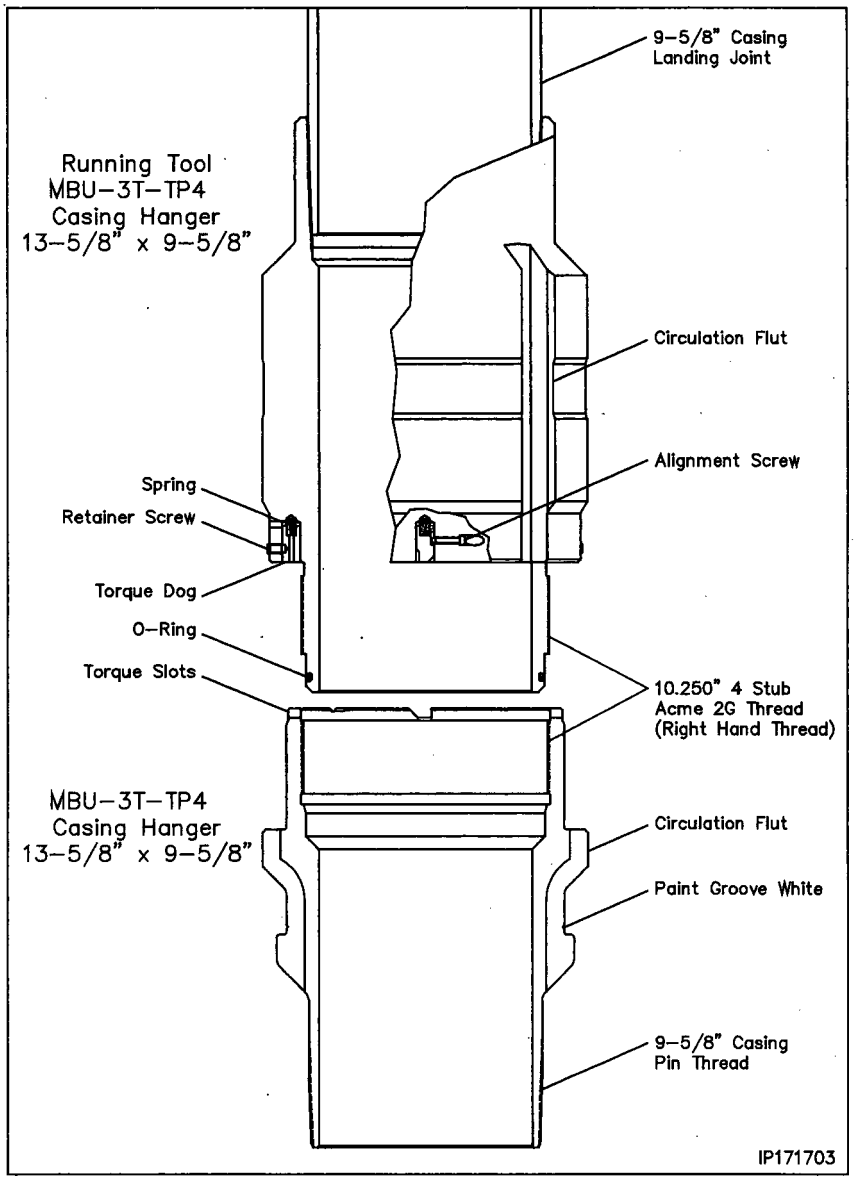
4. On the pipe rack, examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Mandrel Casing Hanger (Item A11).*** Verify the following:
   - internal bore and threads are clean and in good condition
   - neck seal area is clean and undamaged
   - torque slots are clean and in good condition
   - pin threads are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



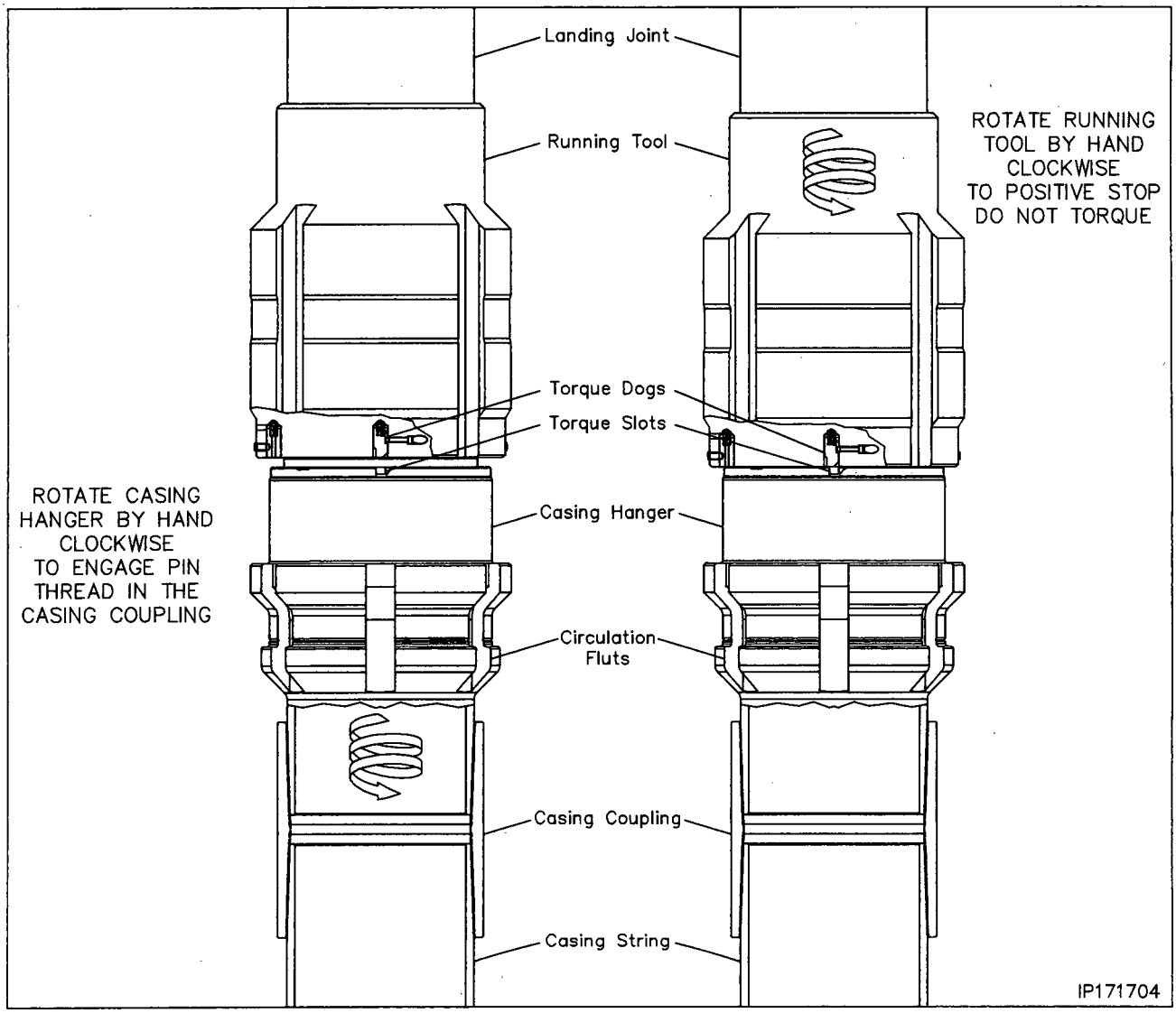
7. Calculate the total landing dimension by adding the previously determined RKB dimension and 29.69", the depth of the wellhead.

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

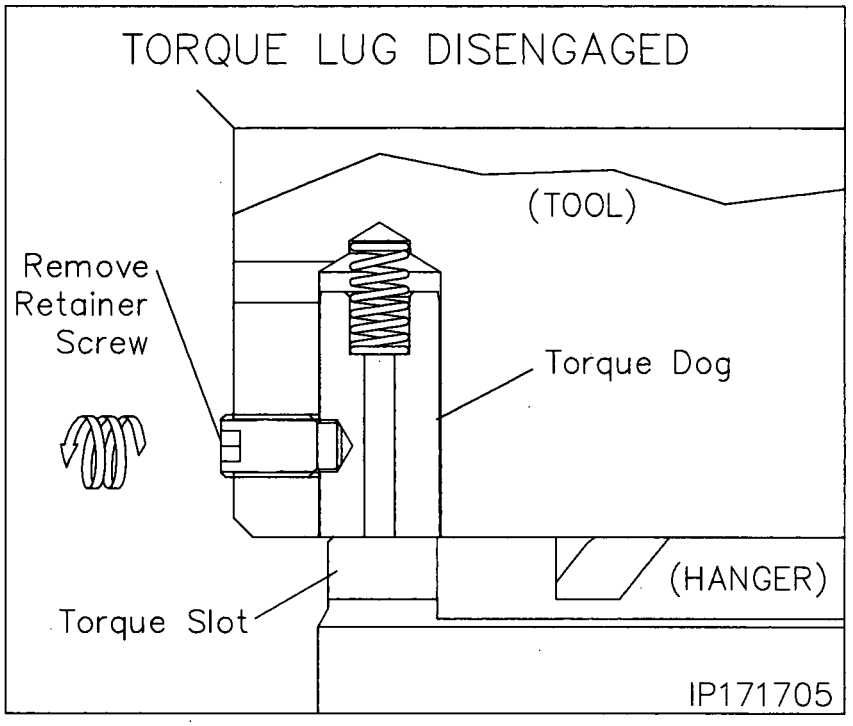
14. Locate the (4) 3/8" socket head set screws in the side of the hanger running tool and remove the screws.

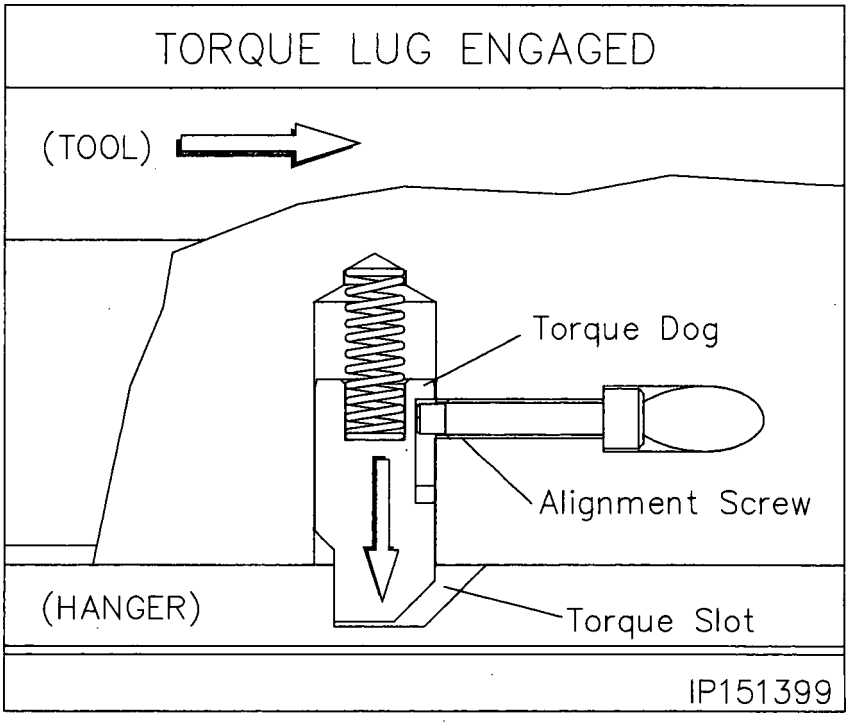
WARNING: Place the screws in a safe place to reinstall in the tool when the job is completed.

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.

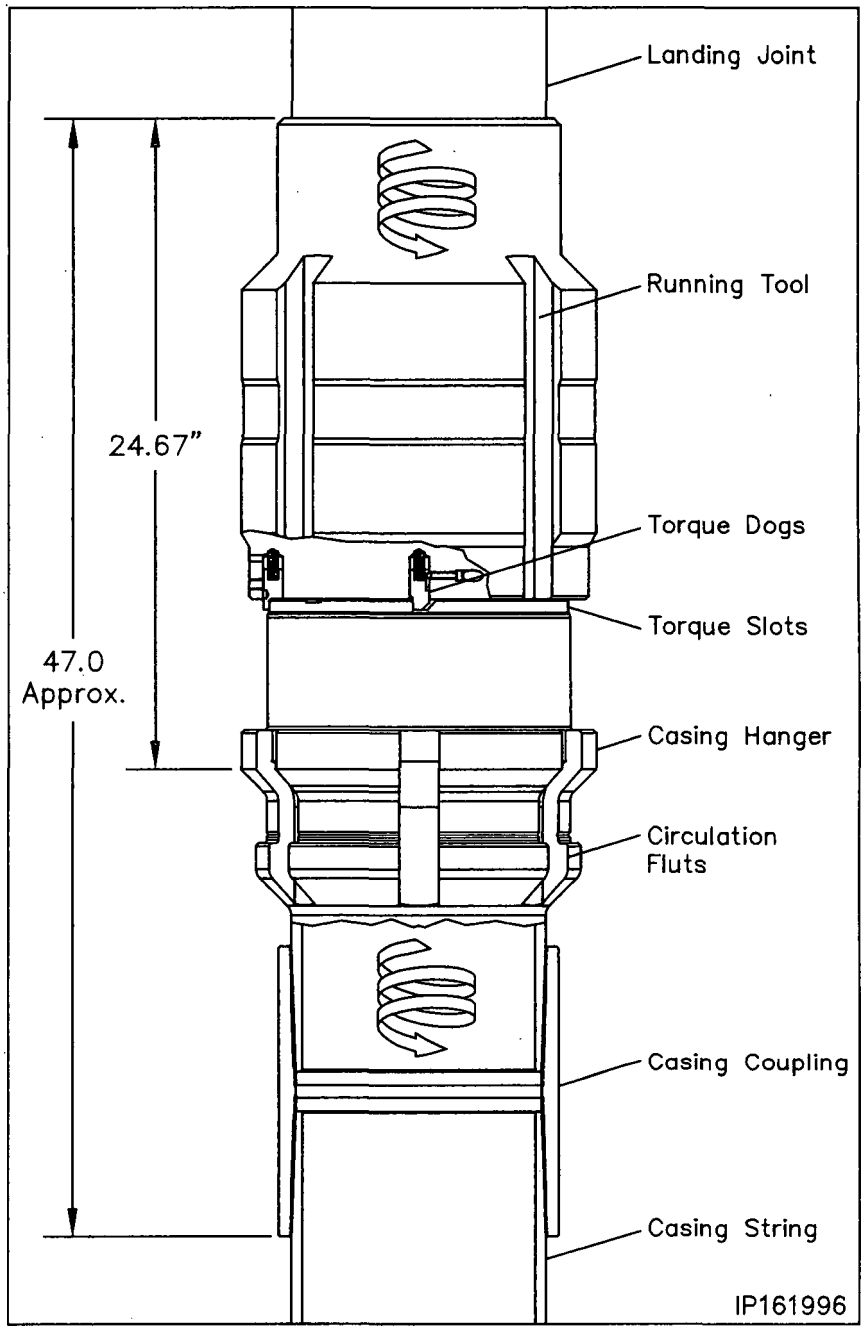
WARNING: Do not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement





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.



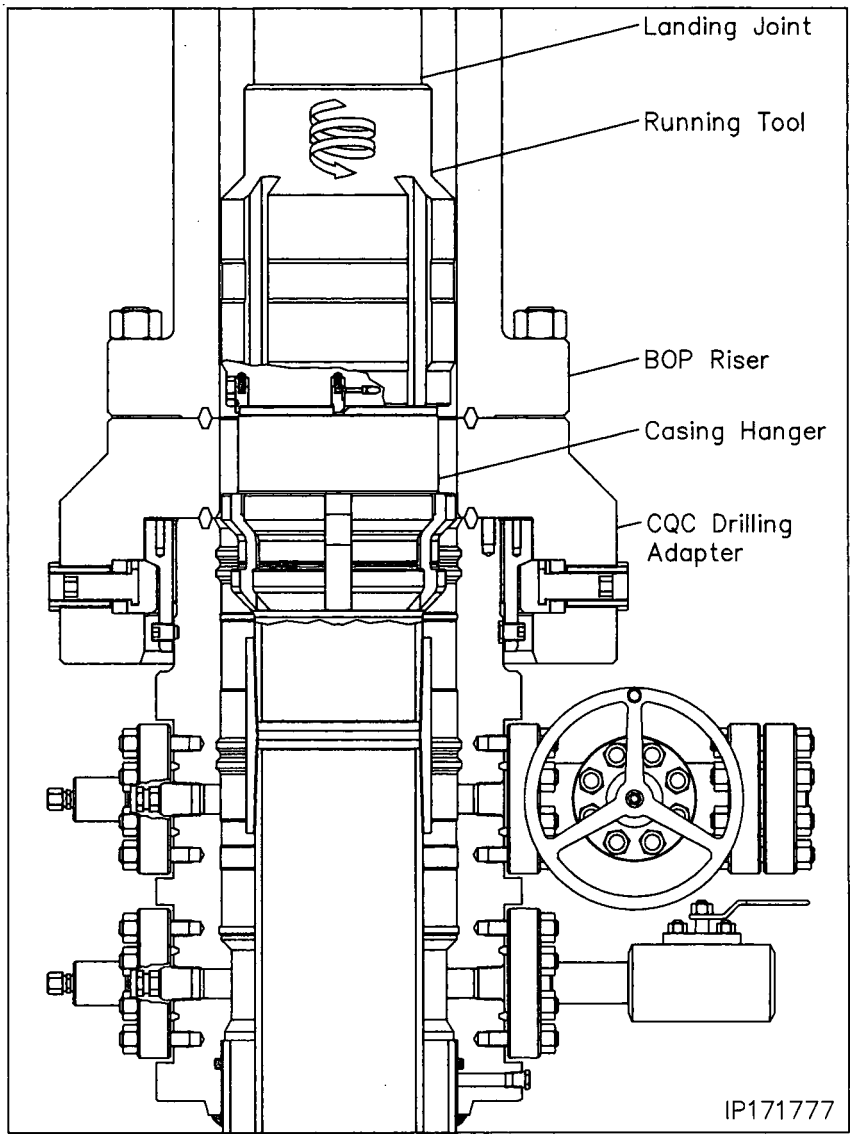
Stage 5 — Hang Off the 9-5/8" Casing

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.

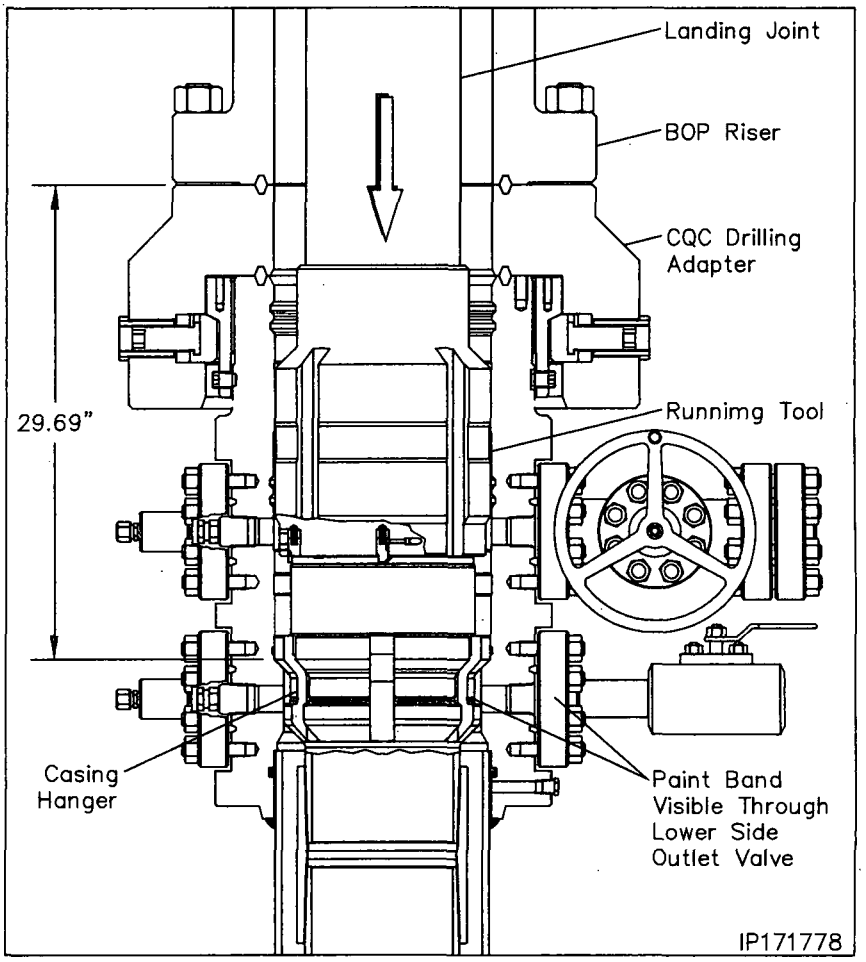
25. Cement the casing as required.

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.

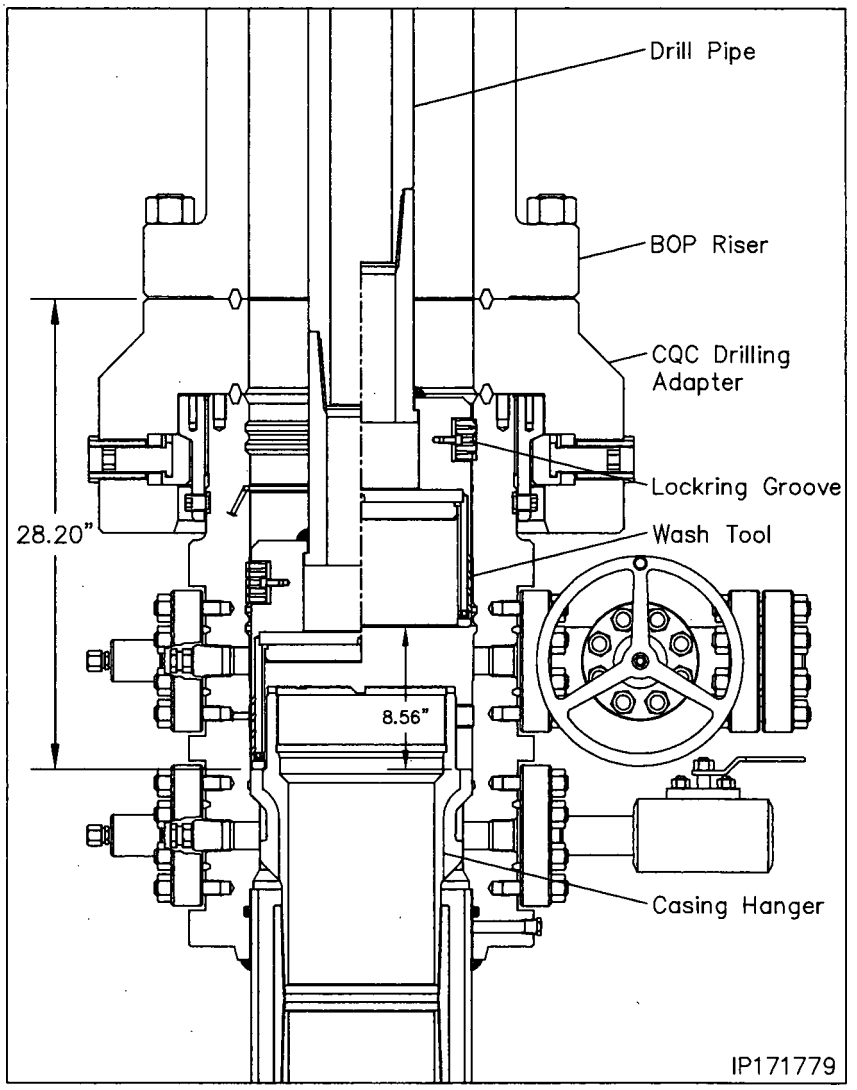
WARNING: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



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.

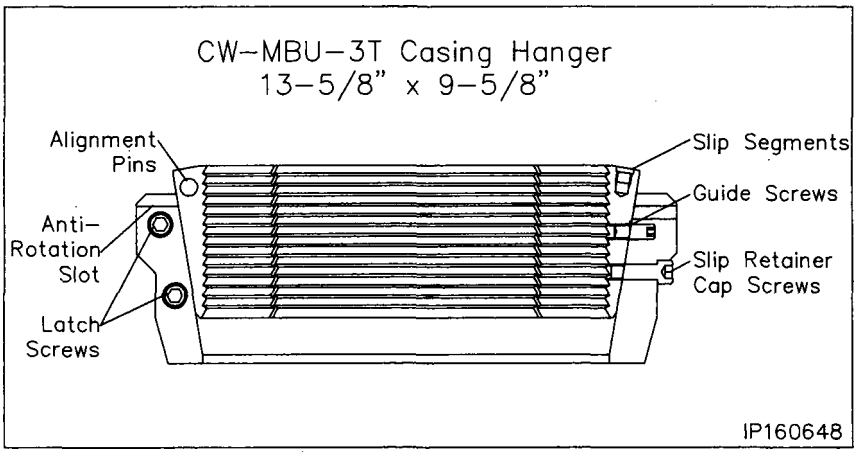
Note: Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.

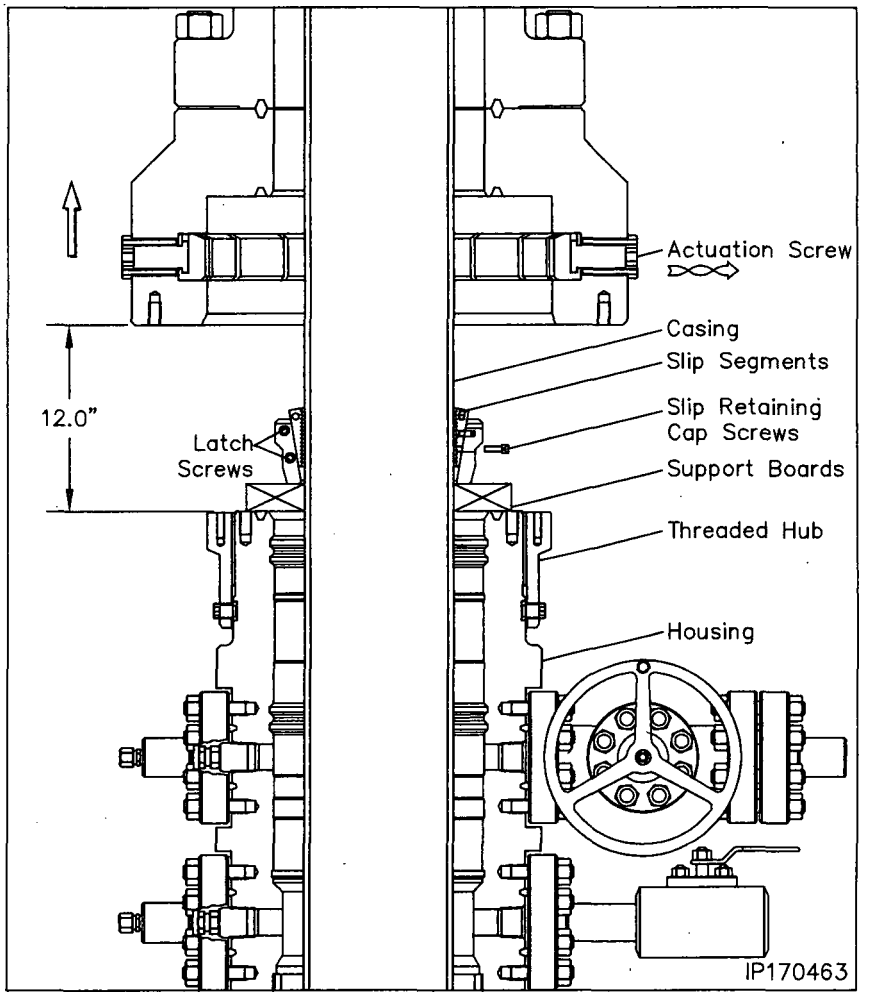
12. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
13. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure that there are no dark areas on top of the flutes of the hanger.

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.

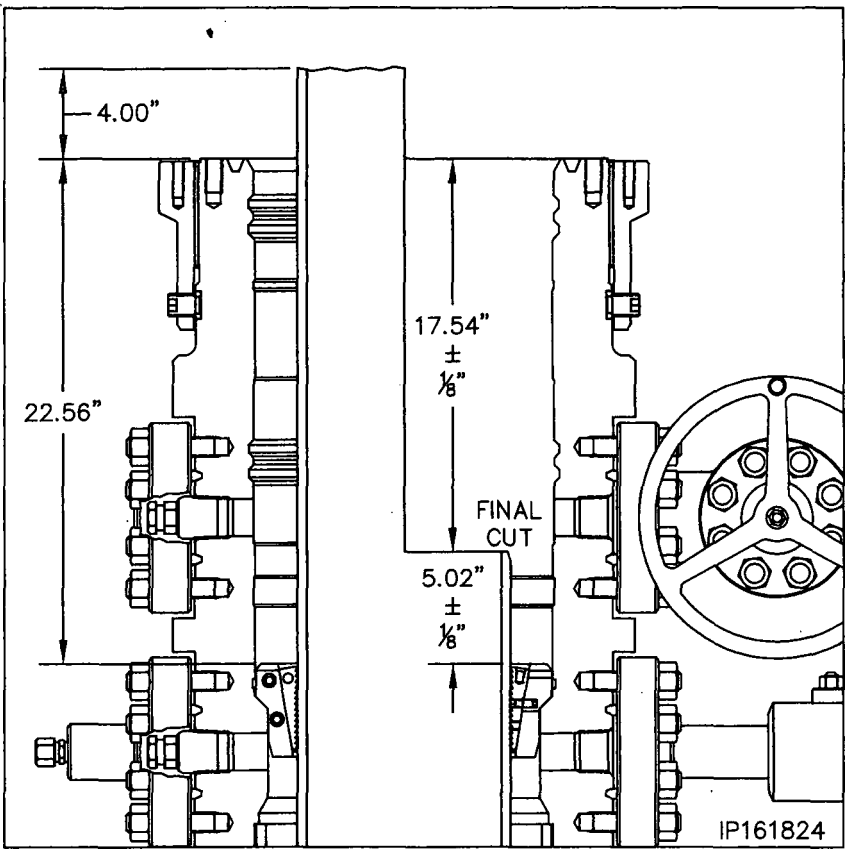
Note: A sharp decrease on the weight indicator will signify that the hanger has taken weight and at what point, If this does not occur, pull tension again and slack off once more.

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.

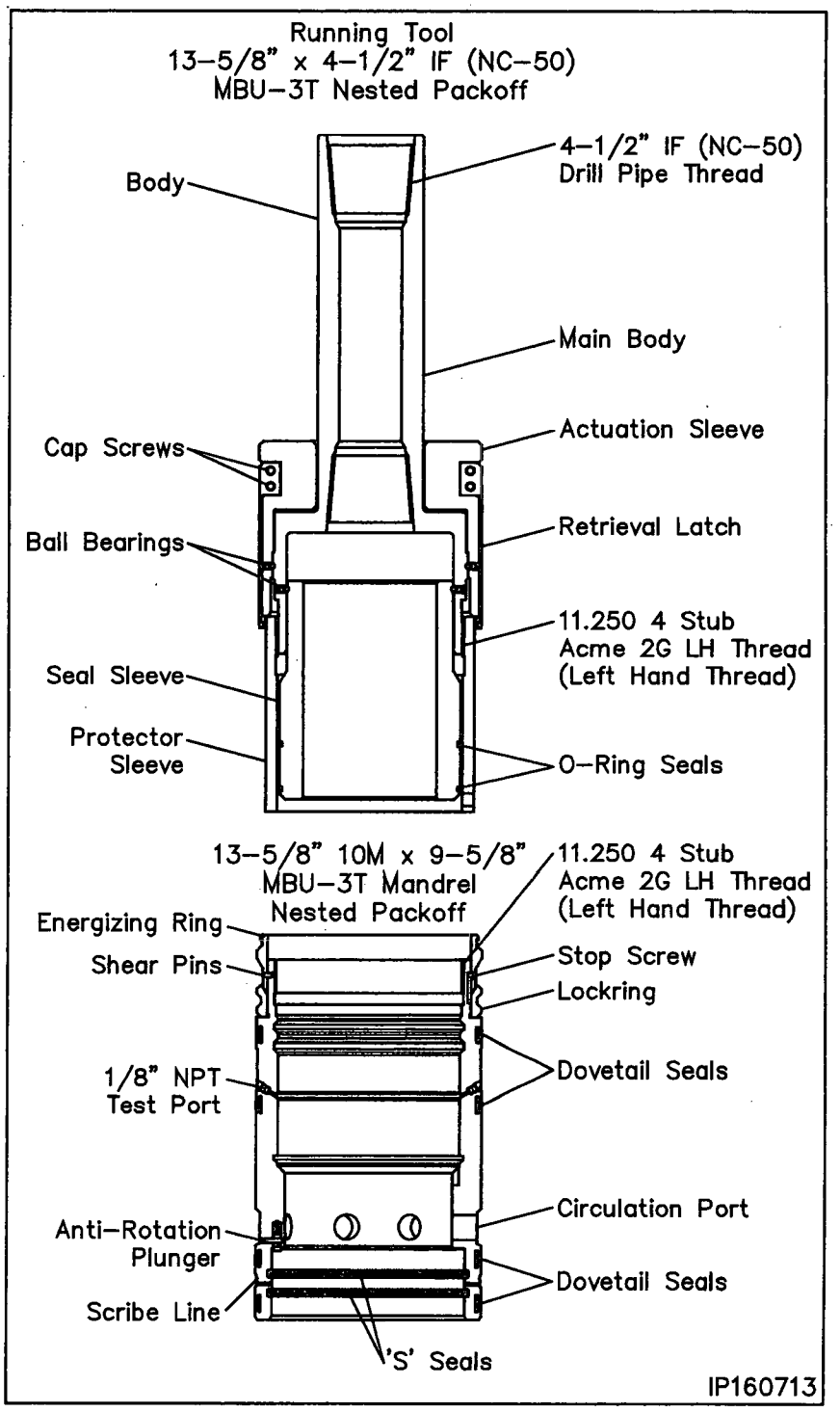
23. Place a straight edge on top of the slip bowl and in line with the center of one of the notches.

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.

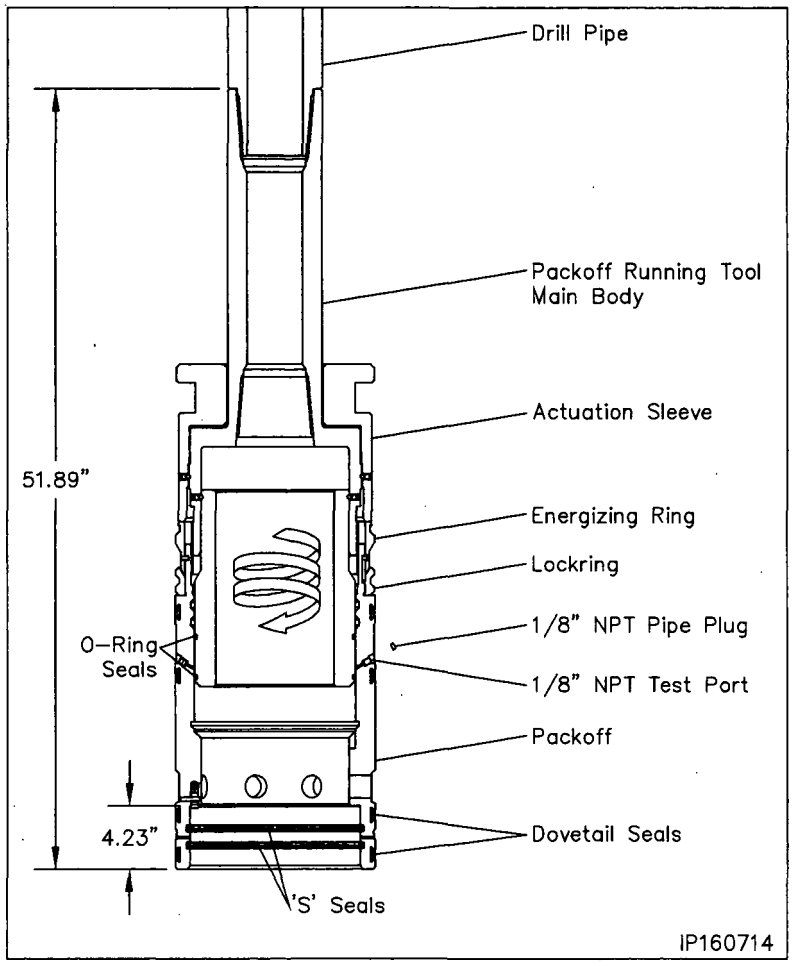


Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

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

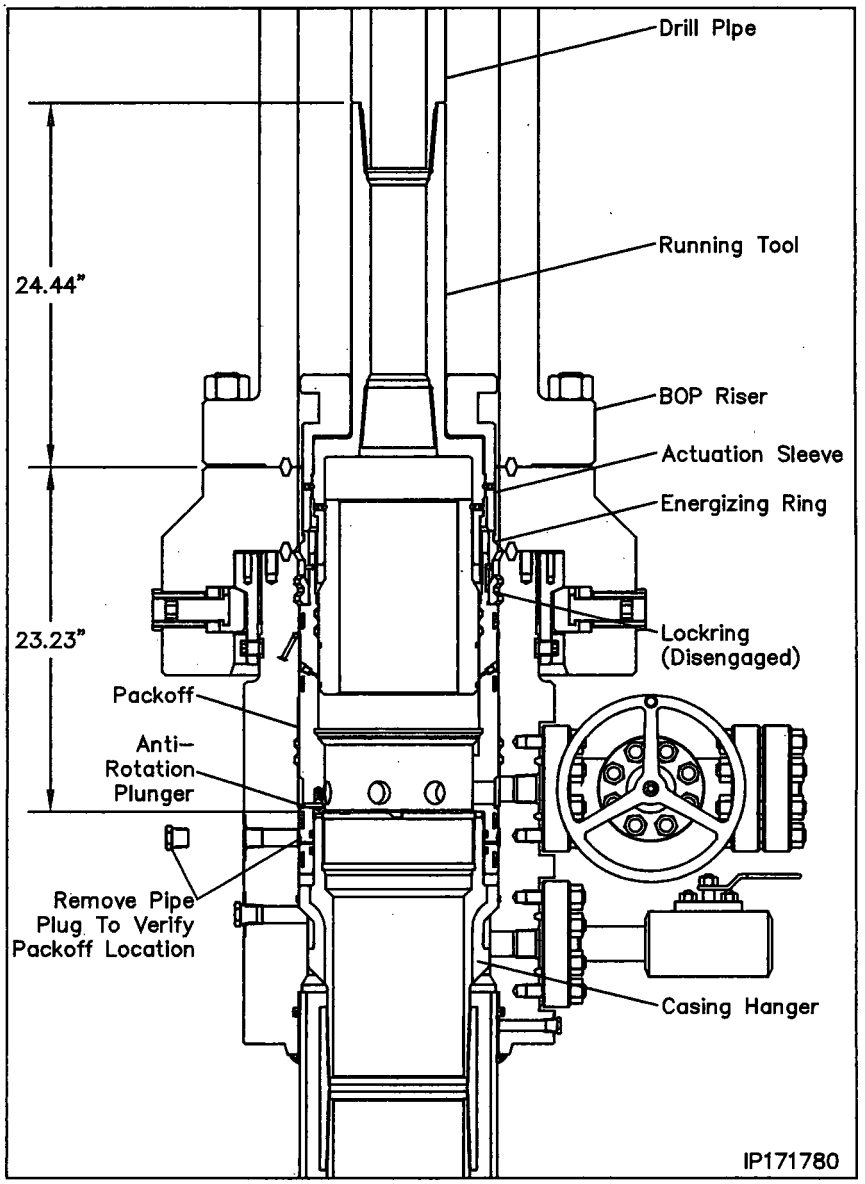
15. Pick up the assembly and thoroughly clean and lightly lubricate the packoff ID 'S' seals and the OD dovetail seals with oil or light grease.



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.

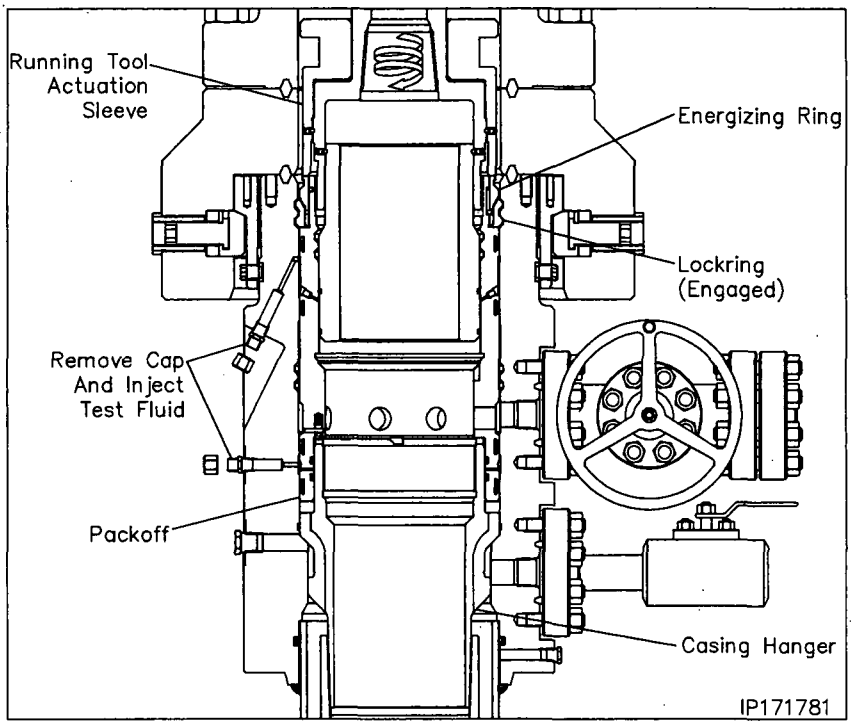
29. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.

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

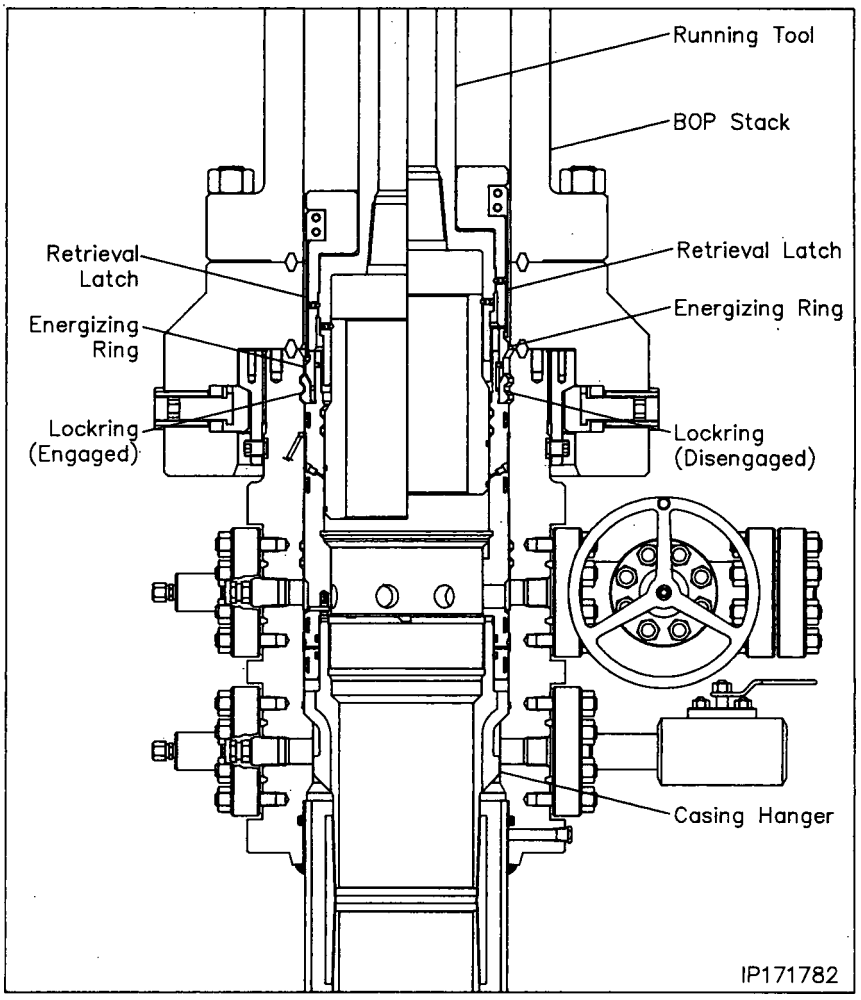
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.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

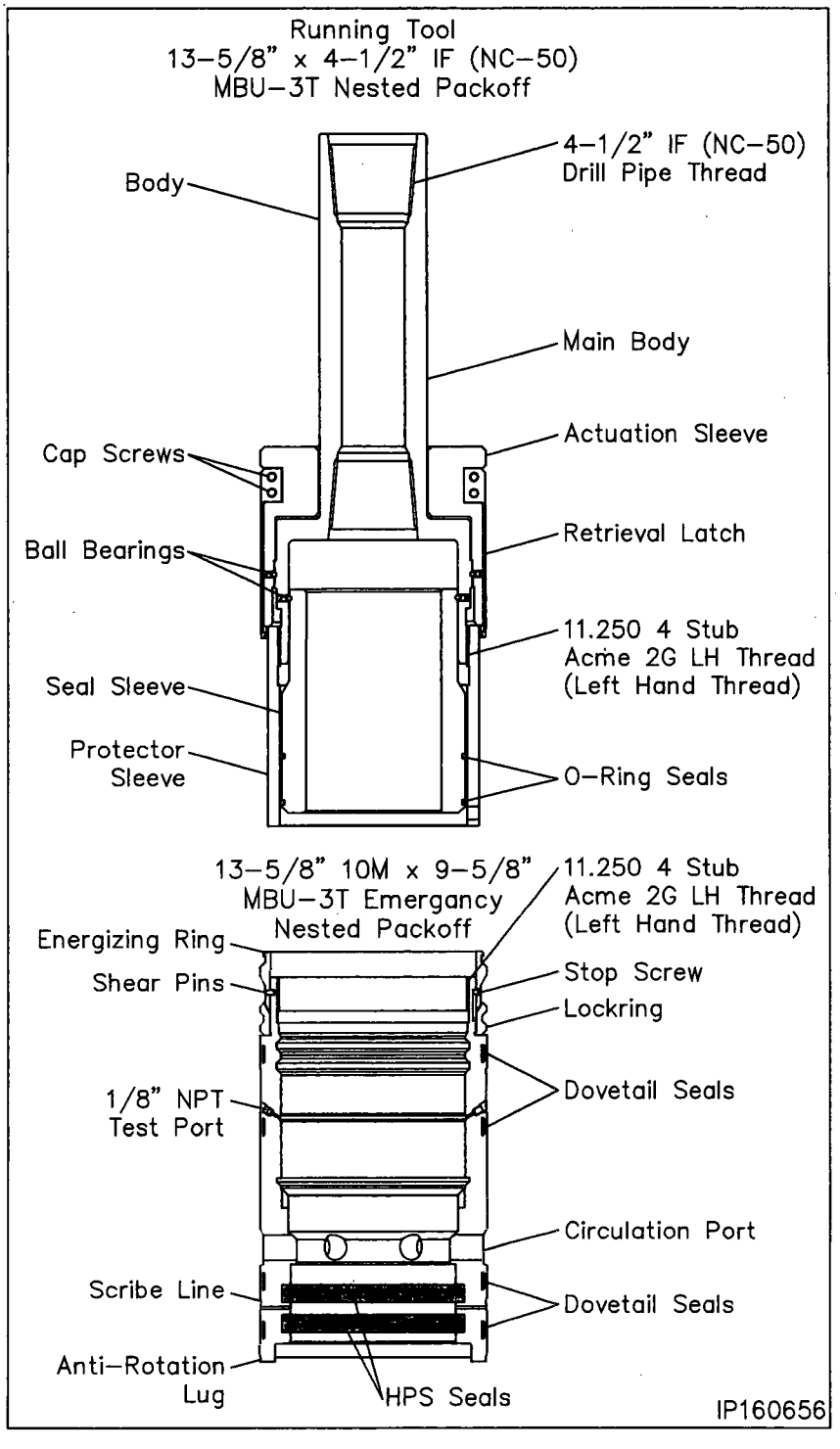
1. Examine the ***13-5/8" 10M x 9-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Emergency Nested Packoff Assembly (Item A12a).*** Verify the following:
   - all elastomer seals are in place and undamaged
   - internal bore, and ports, are clean and in good condition
   - lockring is fully retracted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

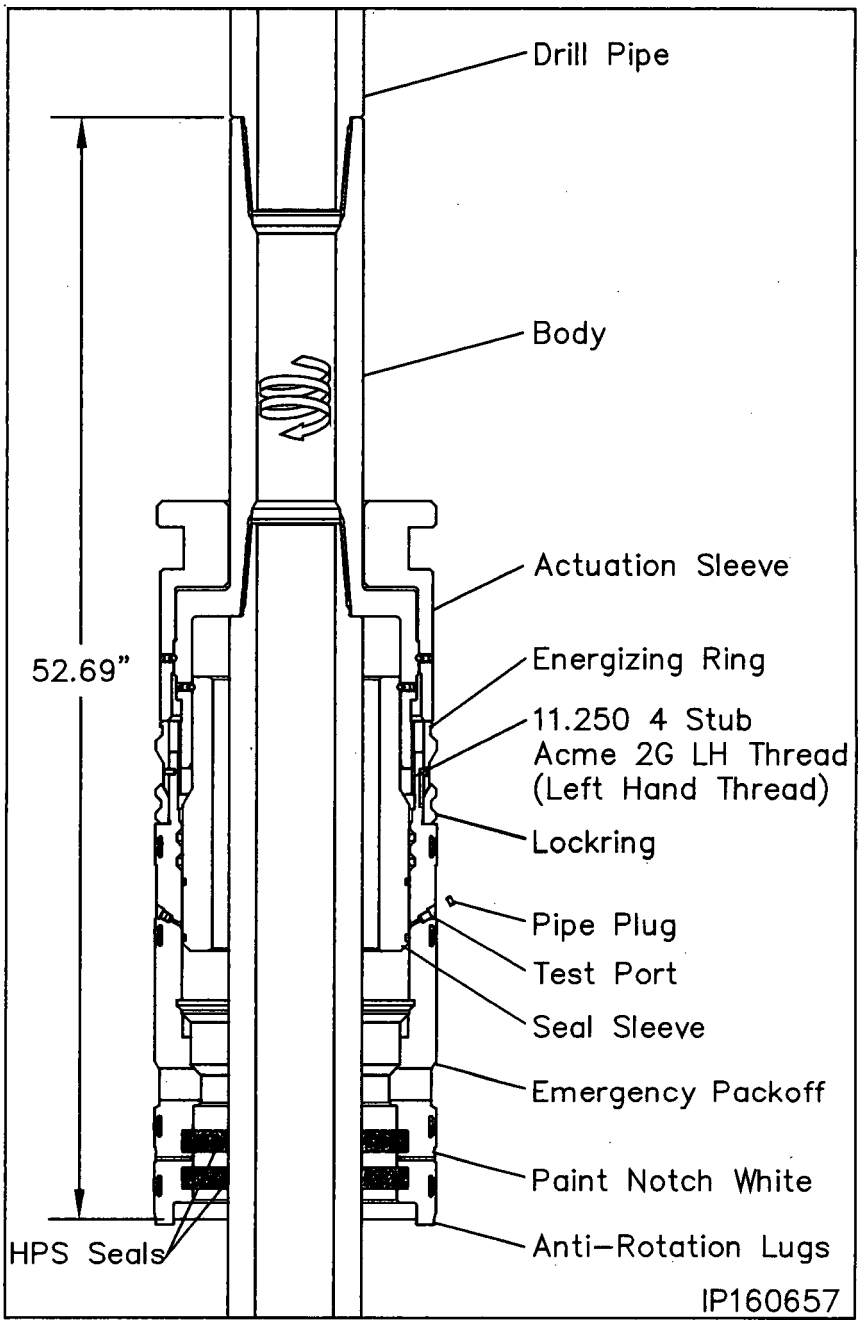
13. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5,000 psi is achieved.

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

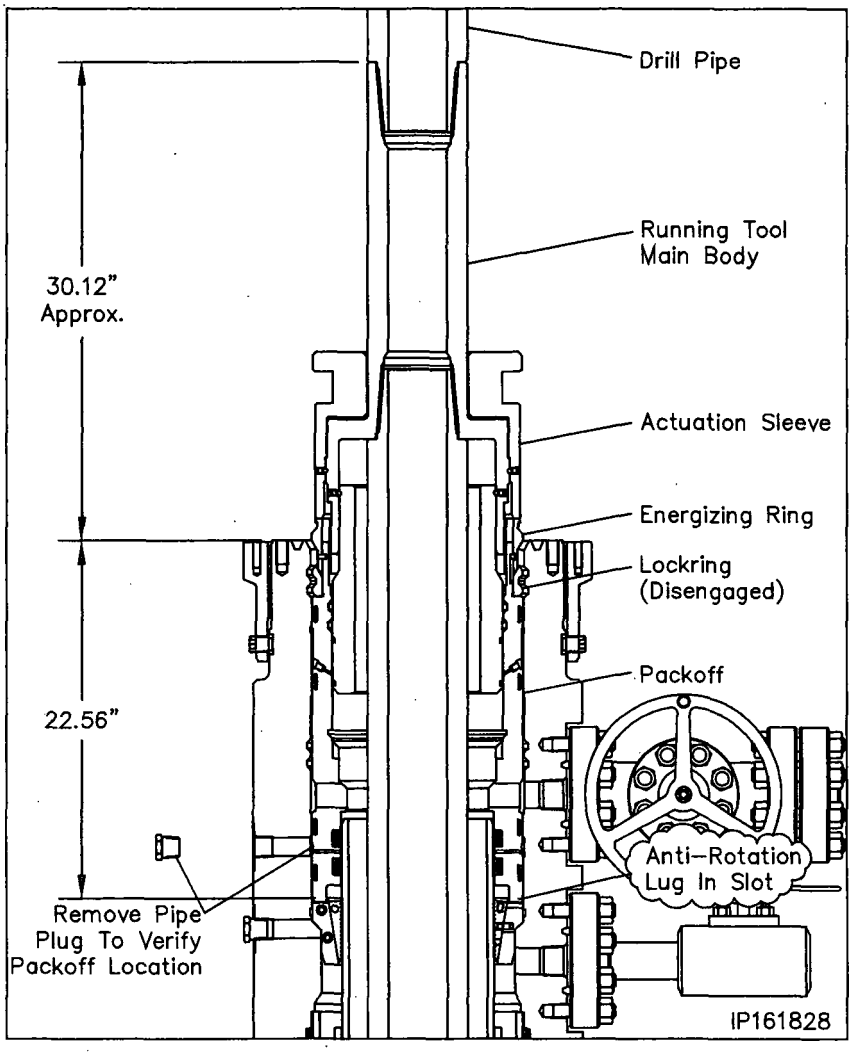
Landing the Packoff

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

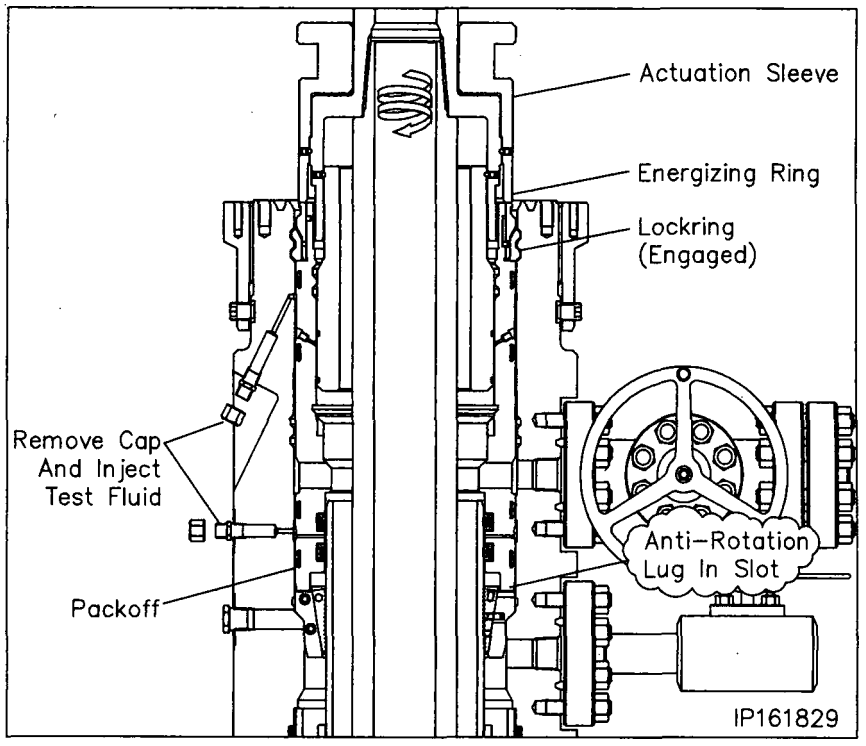
Seal Test

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

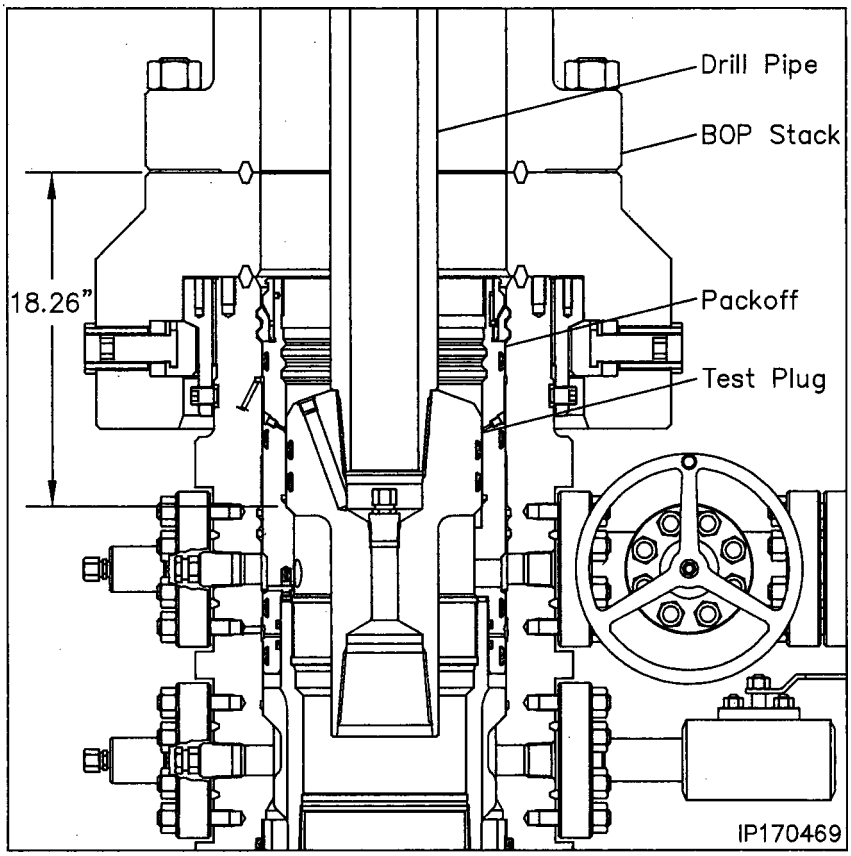
3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

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.

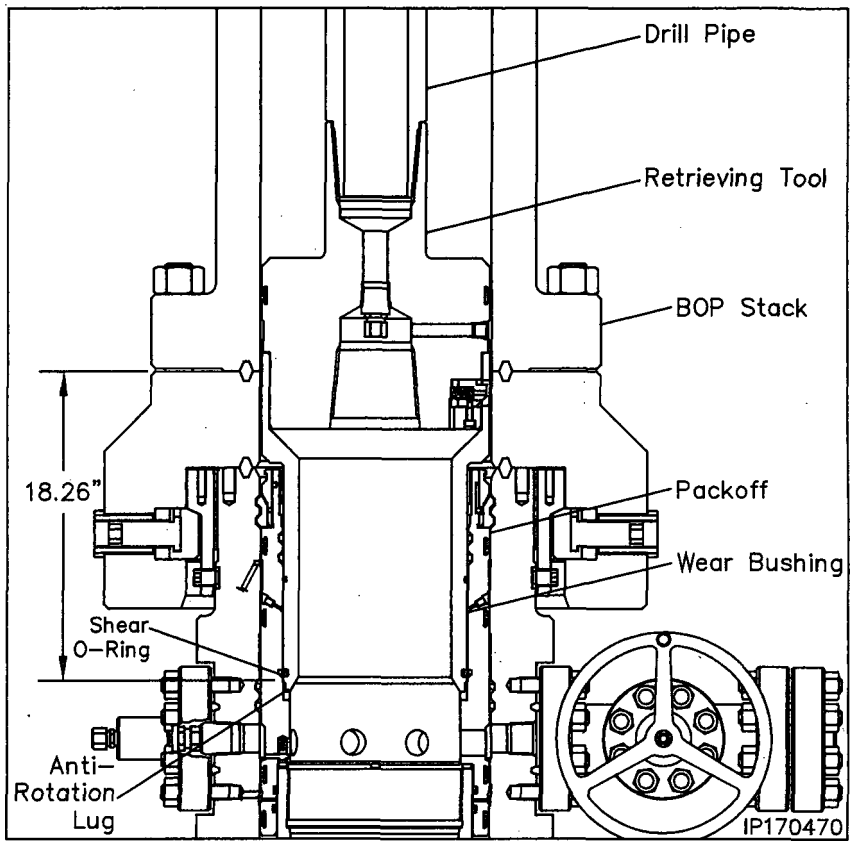
Note: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

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

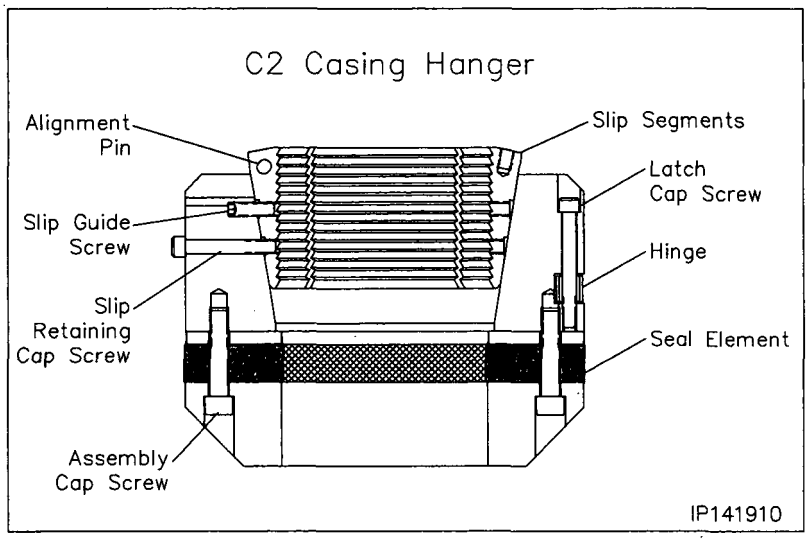
1. Run and cement the 5-1/2" casing string as required.
2. Open the housing upper side outlet valve to drain the BOP stack.
3. Clean the ID of the BOP stack and OD of the casing with a high pressure water hose until returns through the open side outlet valve are clean and free of debris.
4. Thoroughly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

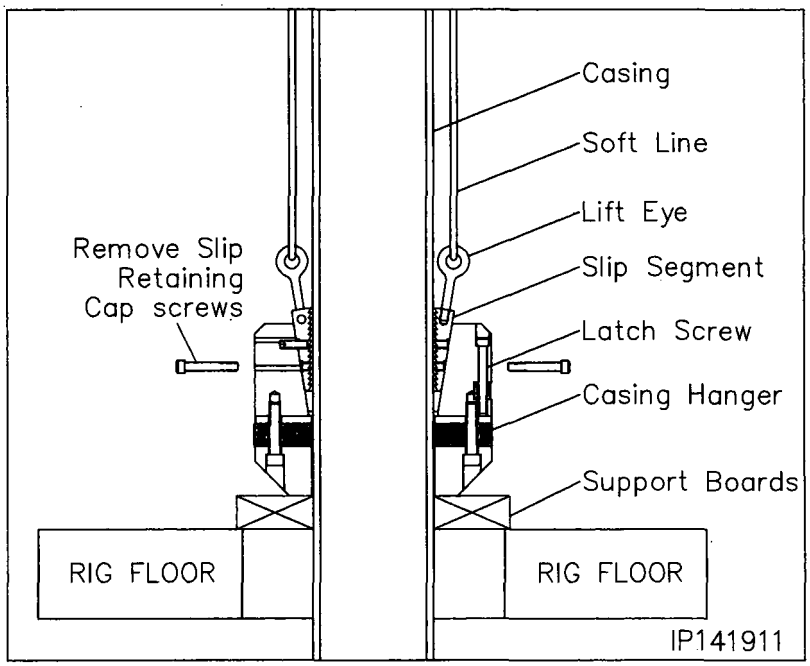
Note: Side outlet valve to remain open while setting the casing hanger.

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.

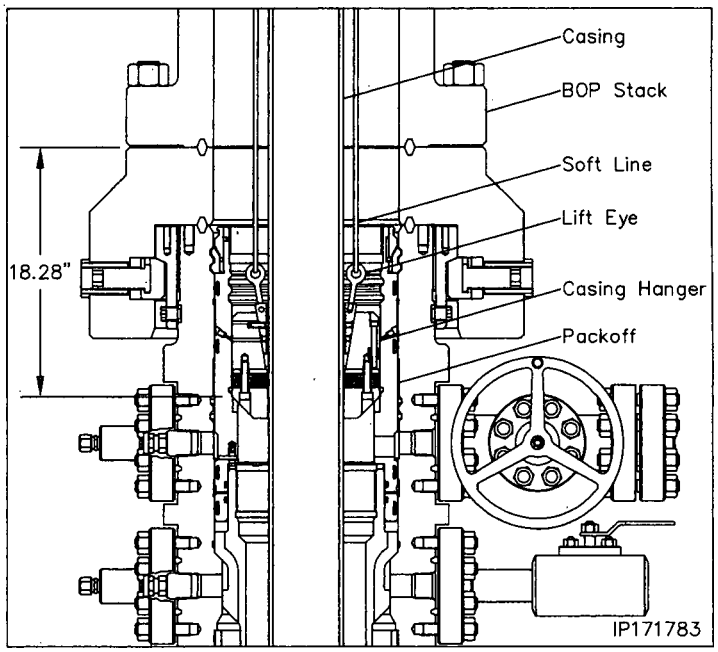
24. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.

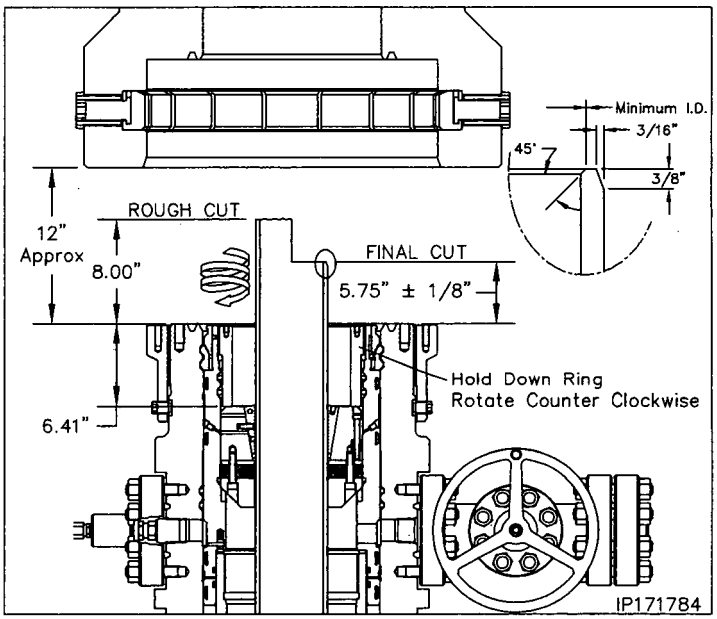
25. Remove the four lift eyes.

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.

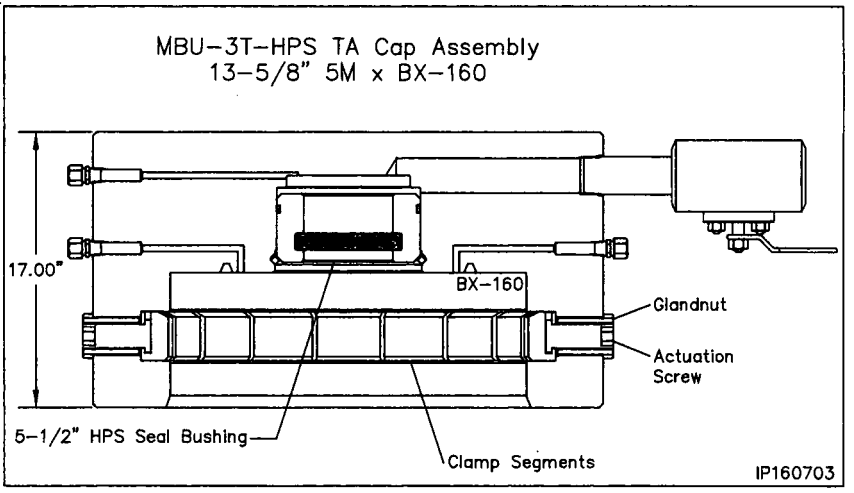
30. Thoroughly clean and lightly lubricate the mating acme threads of the MBU-3T packoff and the slip ***Hold Down Ring (Item A14)***.

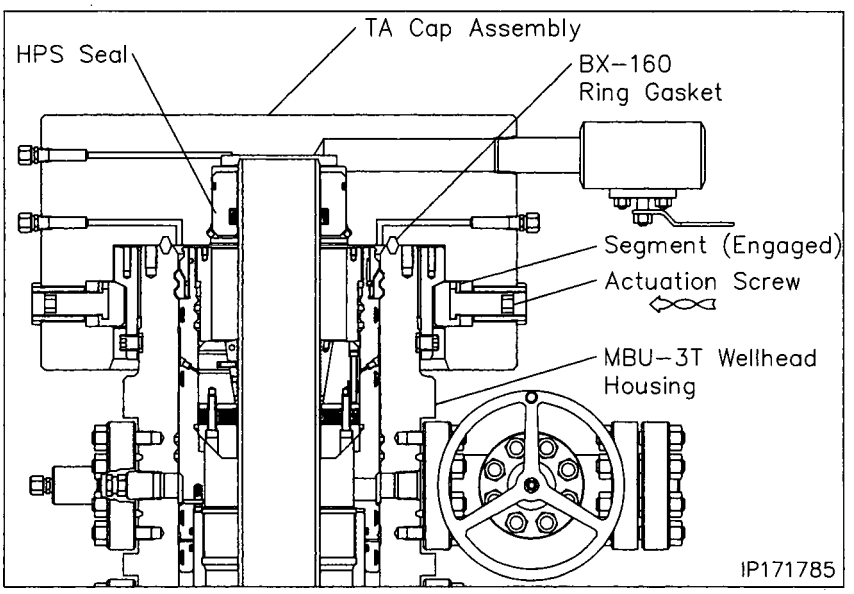
31. Thread the ring into the packoff with counter clockwise rotation to a positive stop on top of the slip hanger.

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.

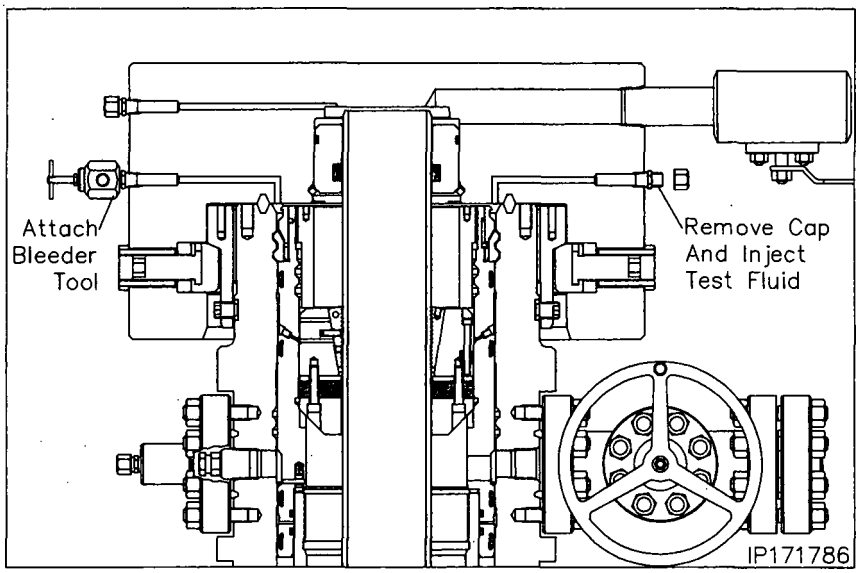




Stage 10 — Install the 'Quick Connect' TA Cap Assembly

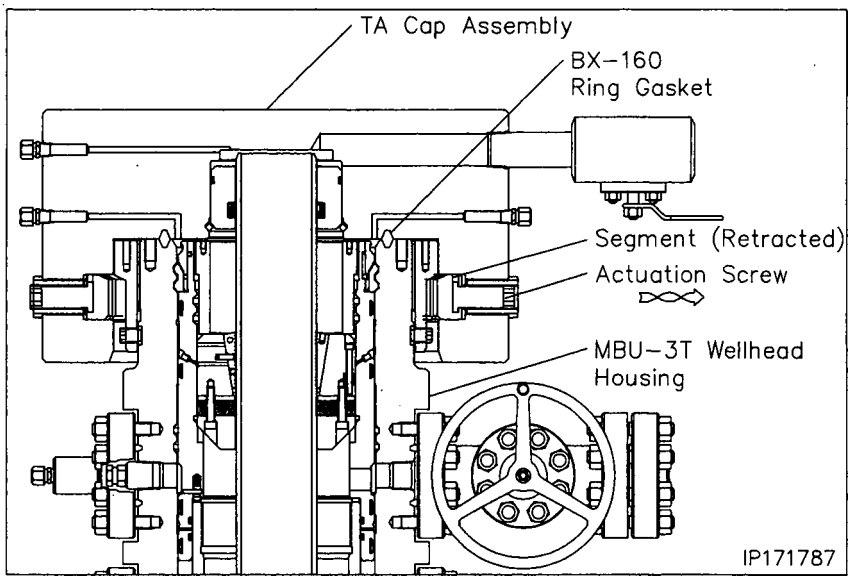
Connection Test

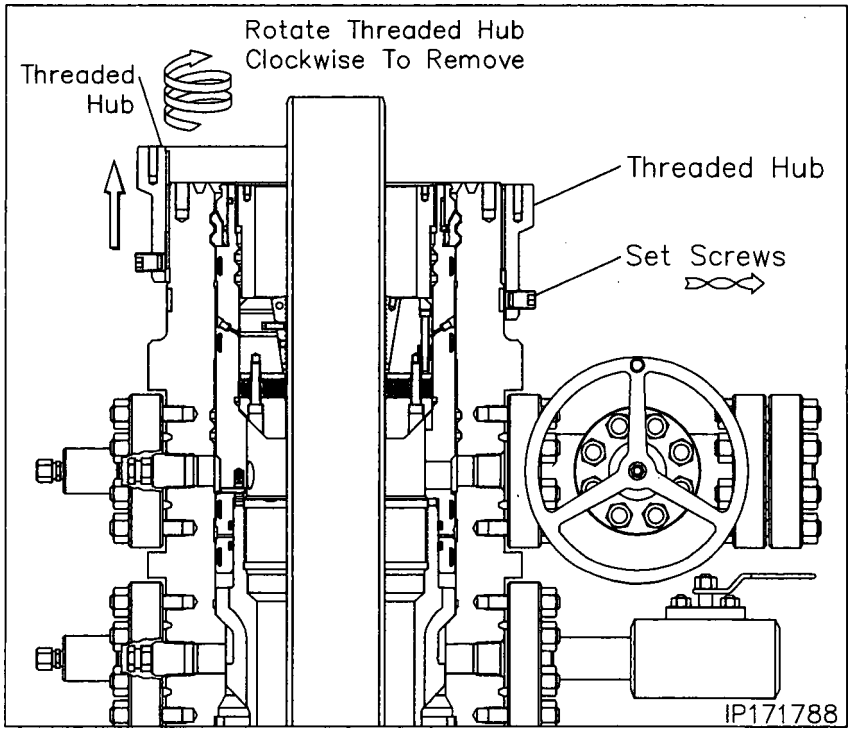
1. Open the TA Cap ball valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked flange test and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fitting and open the tool.
4. Attach a test pump to the remaining open fitting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

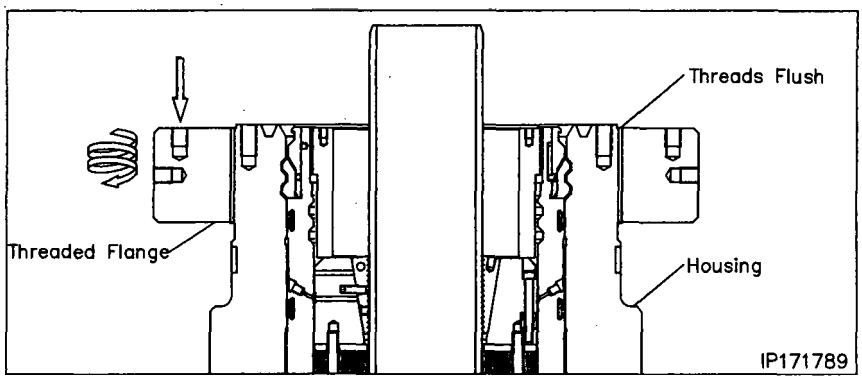
1. Open the ball valve on the TA cap to check for trapped pressure above the casing hanger.
2. Locate the actuation screws on the OD of the TA Cap Assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
4. Install a lift eye with pick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



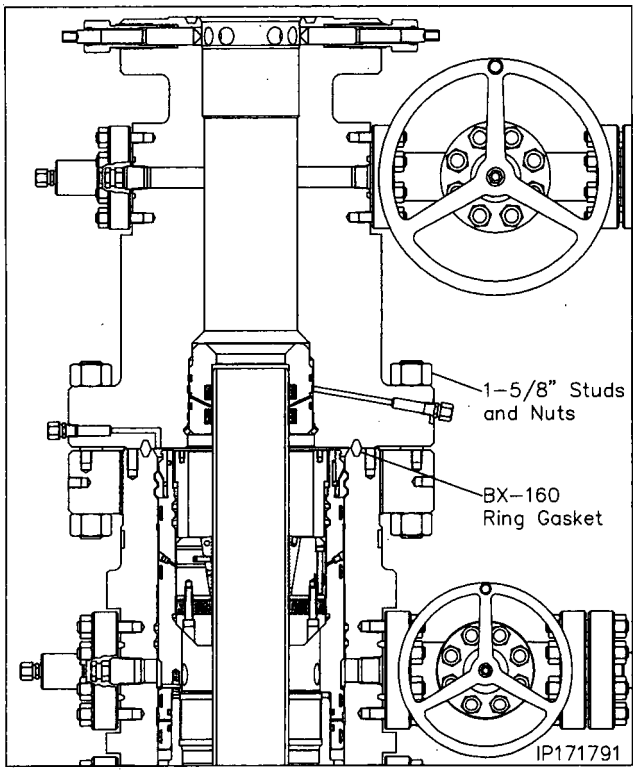
Stage 12 — Install the Tubing Head

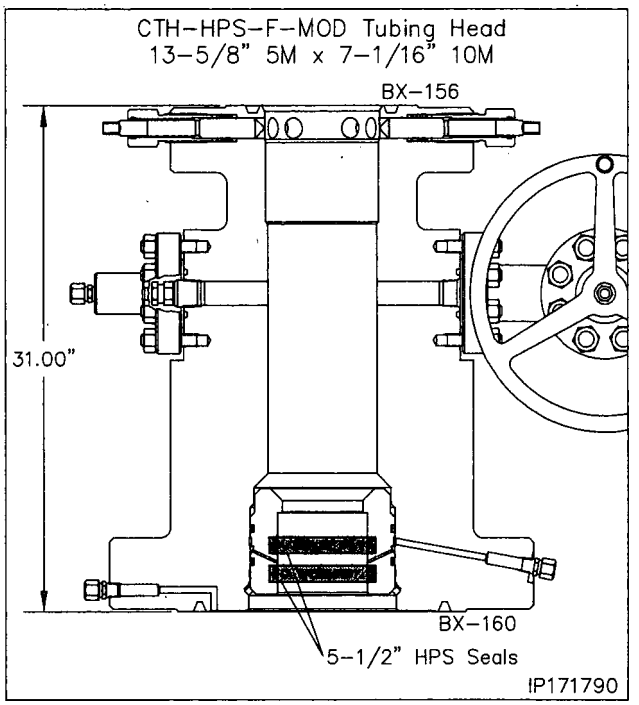
Note: The tubing head may be shipped to location with the lower frac valve pre installed and tested.

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.

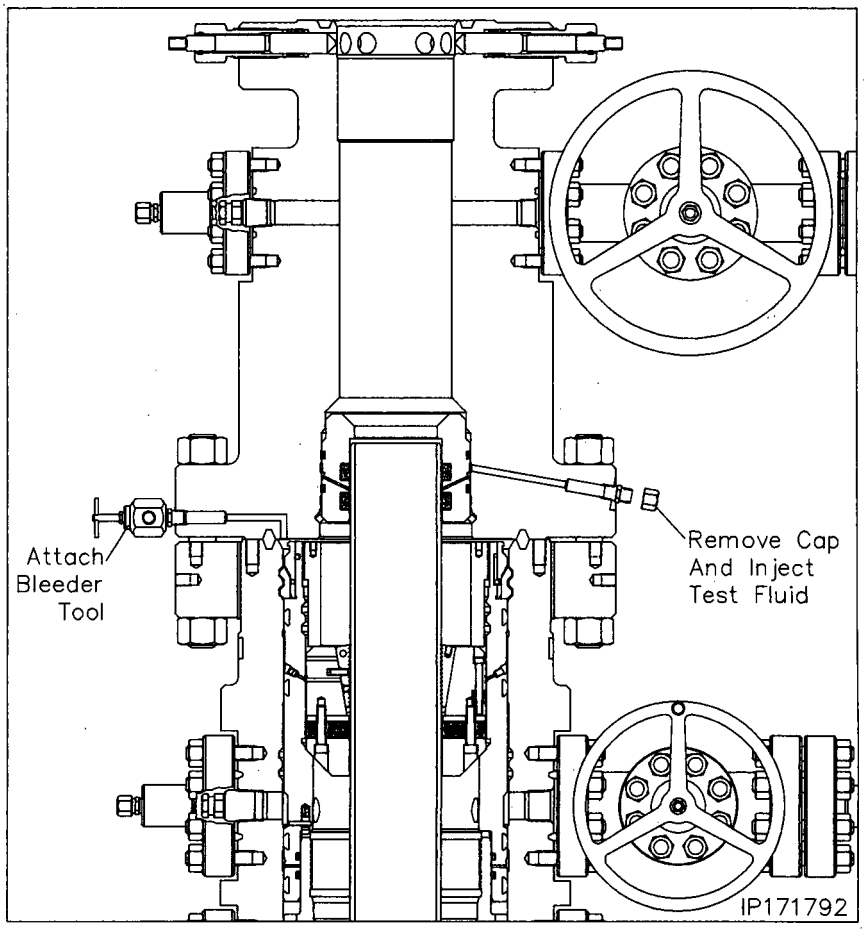
Warning: Do Not damage the 'HPS' seals or their sealing ability will be impaired!

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.

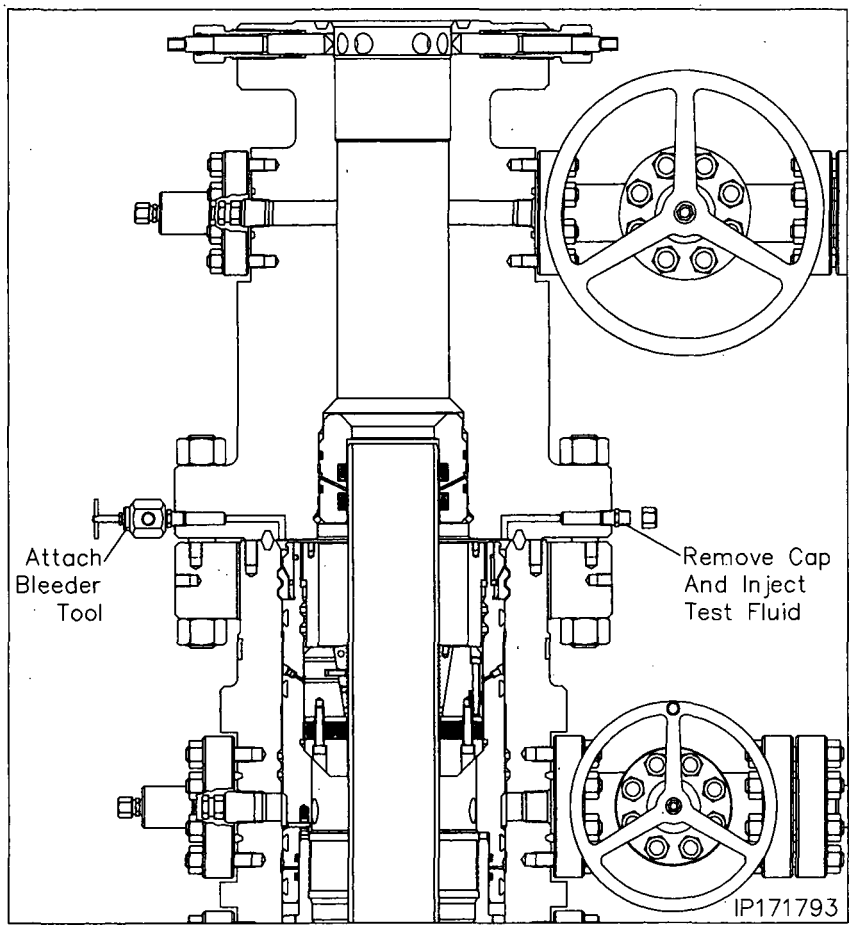


Seal Test	
Leak Location	**Appropriate Action**
Open bleeder tool - Lower HPS seal is leaking	Remove Tubing Head and replace leaking seals. Re land and retest seals
Into the tubing head bore - Upper HPS seal is leaking	

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.

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   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.

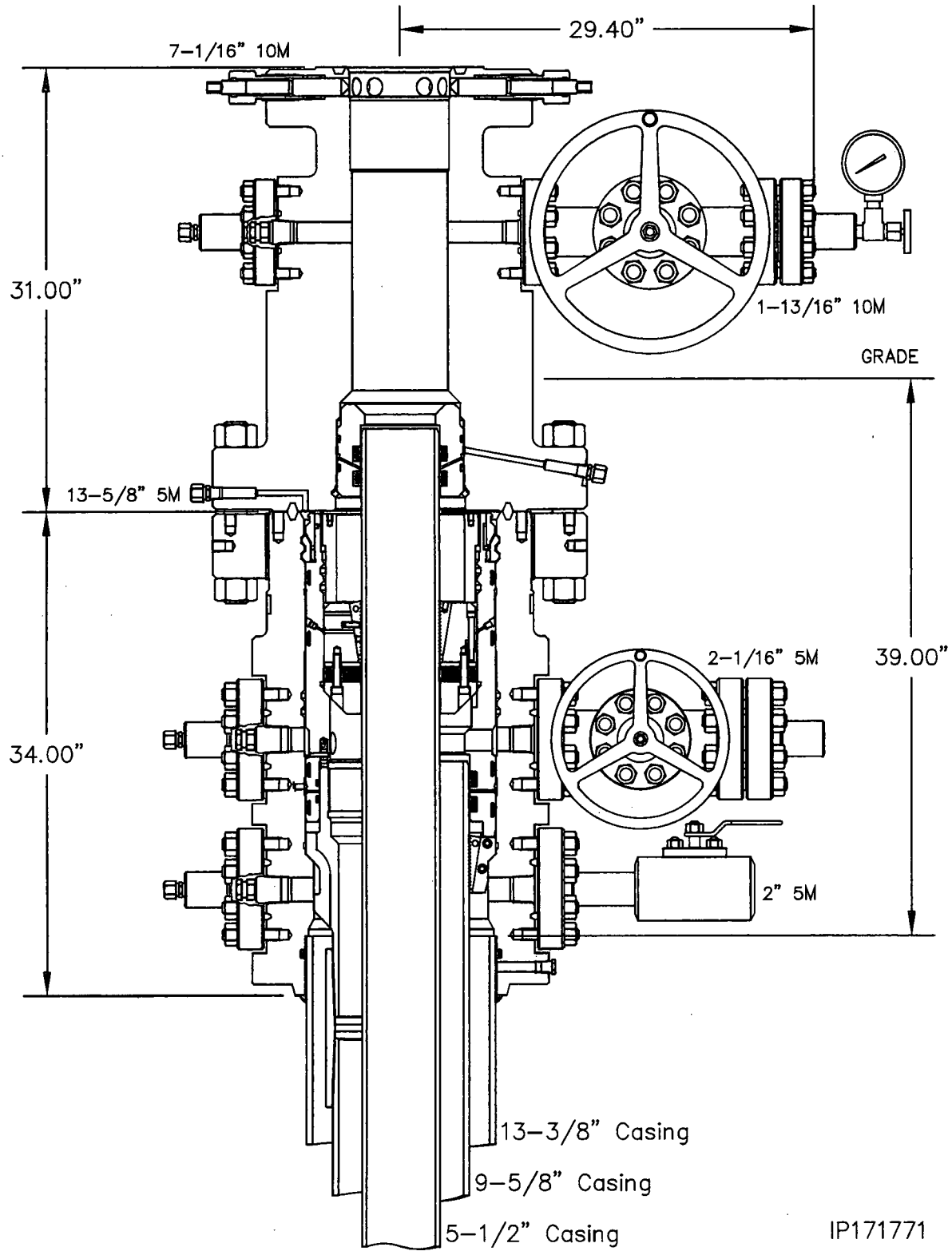
11. **Cooling.** ***Rapid cooling must be avoided.*** To assure slow cooling, welds should be protected from extreme weather conditions (cold, rain, high winds, etc.) by the use of suitable insulating material. (Specially designed insulating blankets are available at many welding supply stores.) Particular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



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"**

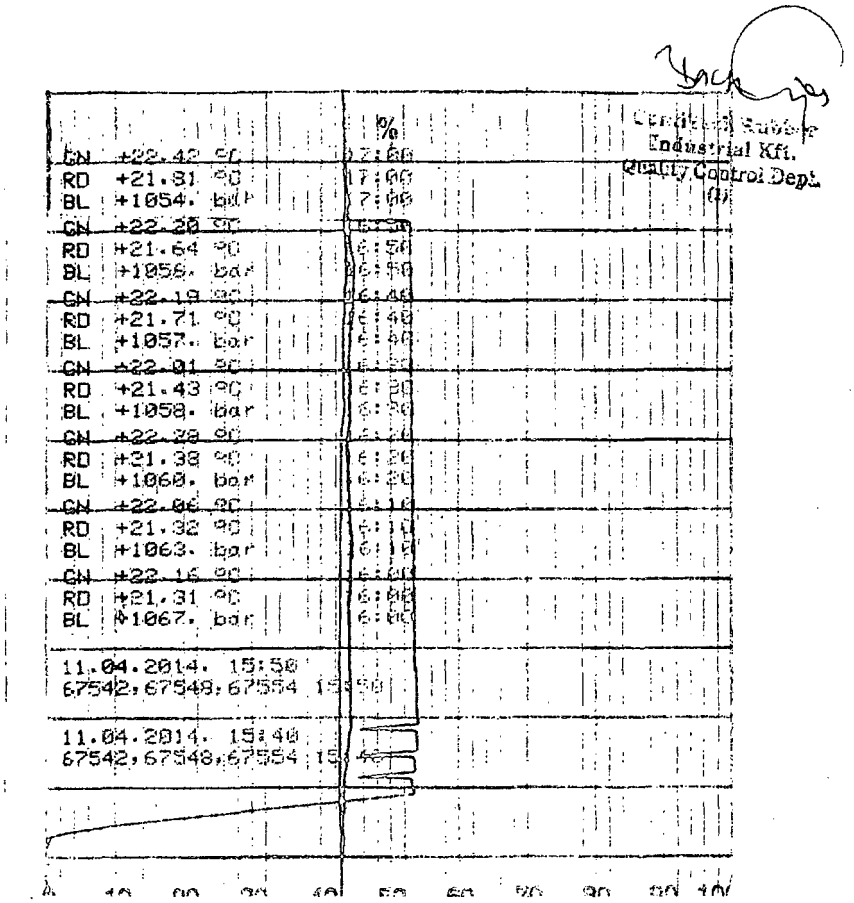
All metal parts are flawless

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 (1)

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



Industrial Kft.
Quality Control Dept.

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