Form 3160-5
(JUNE 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT --" for such proposals.

SUBMIT IN TRIPLICATE

RECEIVED
AUG 17 1998
OIL CON. DIV.
DIST. 3

5. Lease Designation and Serial No.: Jic 457

6. If Indian, Allotte or Tribe Name: Jicarill Apache Tribe

7. If Unit or CA, Agreement Designation: N/A

1. Type of Well: [ ] Oil Well [X] Gas Well [ ] Other:

2. Name of Operator: Mallon Oil Company

8. Well Name and No.: Jicarilla 457-9 No. 2

3. Address and Telephone No.: P.O. Box 3256, Carlsbad, NM 88221 (505) 884-4596

9. Well API No.: 30-039-25905

10. Field and Pool, or Exploratory Area: E. Blanco, Pictured Cliffs

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
719' FNL and 802' FWL (NW/NW) Unit D
Sec. 9, T30N-R03W

11. County or Parish, State: Rio Arriba County

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent (revised)	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[X] Altering Casing	[ ] Conversion to Injection
	[ ] Other:	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this zone.)*

Mallon Oil company proposes to change the drilling plan as follows:

Conventionally drill a 17-1/2" hole to 700' and set 13-3/8" x 48 lb/ft casing, cmt to surface. Air drill a 11" hole to 1800' to test and evaluate the San Jose formation for open hole completion. If non productive 8-5/8" csg will be set and the well will be drilled to its original target depth with a conventional mud system. For the air drilled portion of the well all requirement specified under Section III E of onshore order No. 2 will be followed.

14. I hereby certify that the foregoing is true and correct

Signed Terry Lindeman Title Operations Superintendent Date 8-3-98

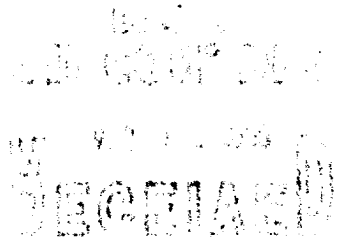
(THIS SPACE FOR FEDERAL OR STATE OFFICE USE)

Approved By Patricia M Hester Title Lands and Mineral Resources Date 8-11-98

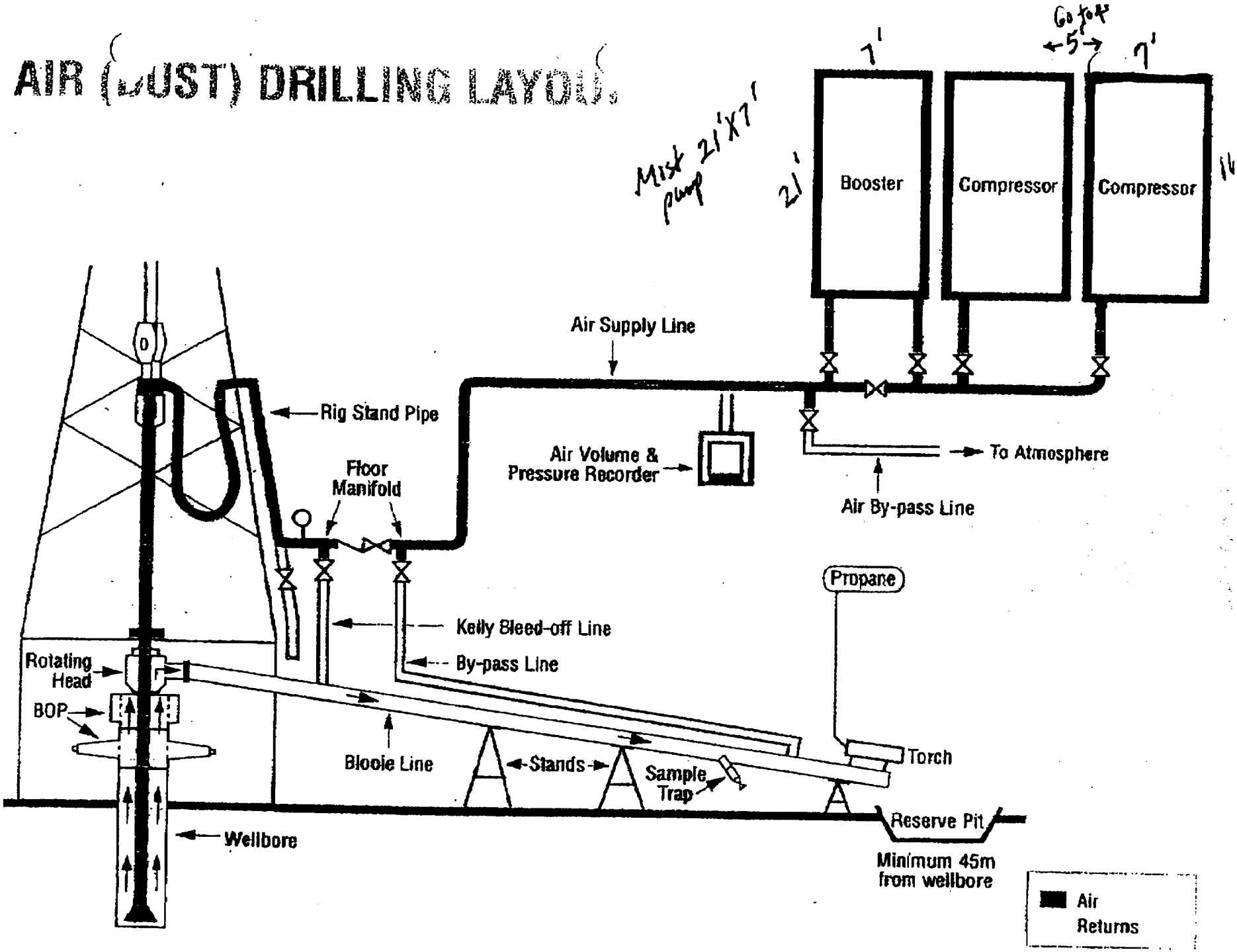
Conditions of approval, if any:

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

*See Instruction on Reverse Side



AIR (MIST) DRILLING LAYOUT



absolutely necessary, they should be gentle (no 90° turns unless targeted). The line should be securely staked down. The line should be at least 10 percent greater in cross-sectional area than the upper portion of the annulus:

$$\frac{\pi}{4}(D^2_{bl}) = 1.1\left(\frac{\pi}{4}\right)(D^2_h - D^2_p)$$

and

$$D_{bl} \geq \left[1.1\,(D^2_h - D^2_p)\right]^{0.5}$$

The end of the blooey line should be in the downwind direction from the rig.

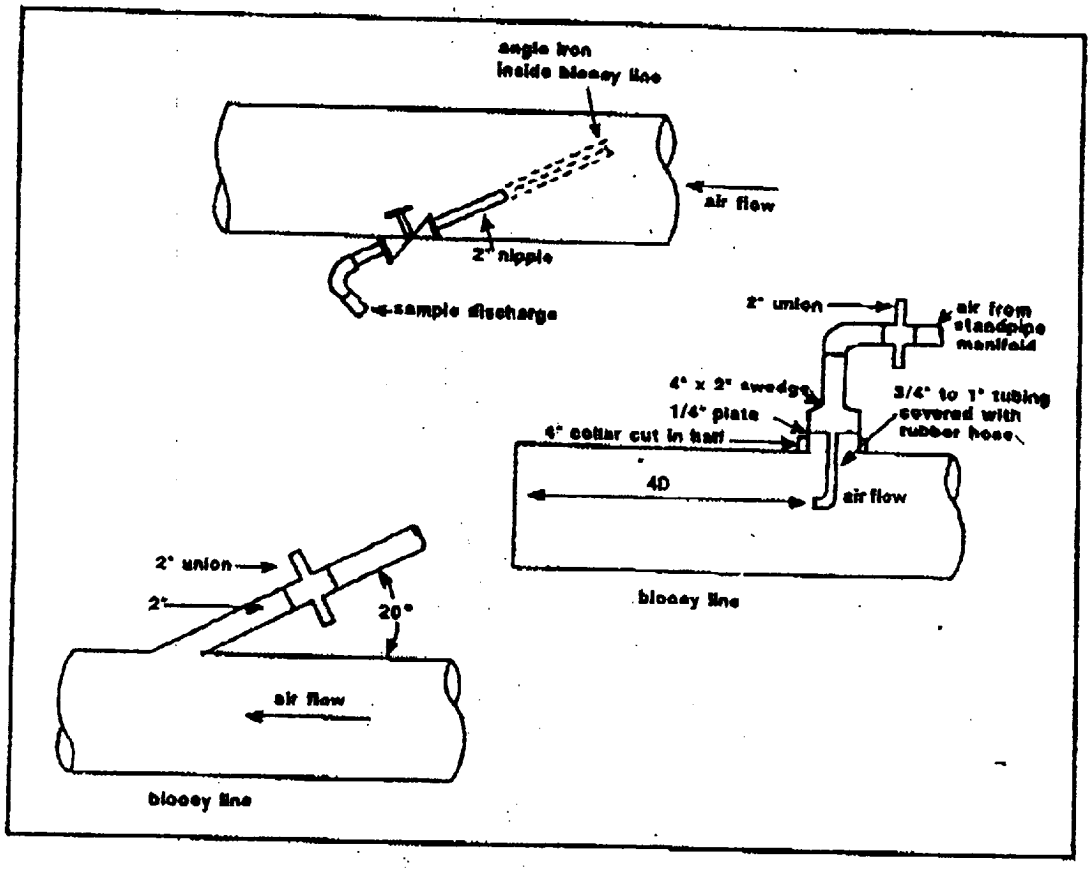


Figure 5 *Blooey line sample catcher and jets. After Hook et al.*

DOWNHOLE EQUIPMENT

String Floats, Flapper Type

String floats, flapper type (Figure 9) are placed in the upper portion of the drill string, usually in specially bored float subs, to minimize connection time. If they are not employed, time must be spent waiting for the air between the bit and the surface to bleed off prior to the connection, and again waiting to repressure this interval after the connection.

Dart-Type Float Valves

Dart-type floats are employed immediately above the bit. They are held in specially bored subs, bottomhole collars, and stabilizers (Figures 10 and 11). These floats are designed to prevent gas influx into the drill string during trips and to minimize connection time.

A point to remember with respect to floats is that wireline work cannot be done through them. This limits their use in directional drilling and would necessitate blowing them out in the event of a fishing job. Generally speaking, flapper-types are more readily blown out than dart-types.

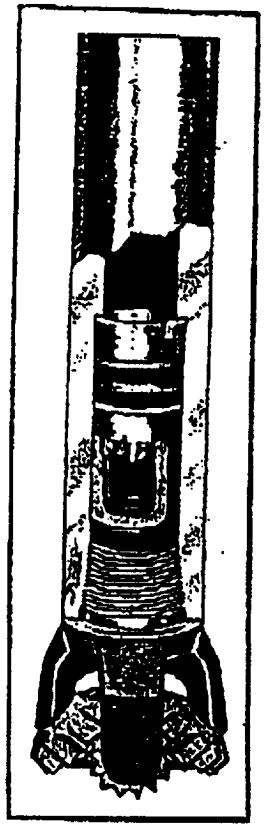
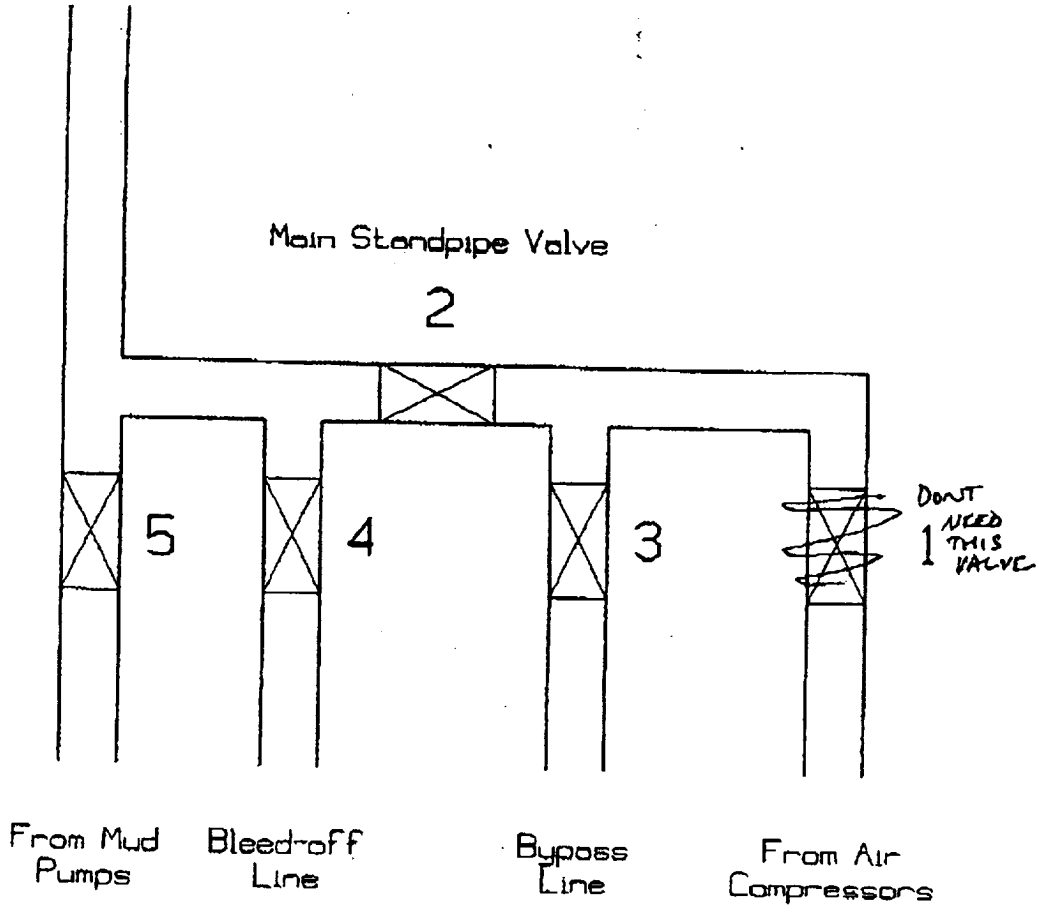


Figure 11 *Bottomhole collar bored for float. Courtesy of Baker International.*

Bottomhole Assemblies

Generally speaking the same bottomhole assemblies applicable for mud drilling are applicable for air and gas drilling. Due to the types of lithologies suitable for air drilling, however, which are often geologically old and hard, deviation control can be a problem. Over the eons, these formations were subjected to tectonic forces which caused folding and faulting. The severe bed dips associated with tectonic activity are a prime cause of deviation problems.

The fact that light bit weights can still produce reasonable rates of penetration often leads operators to drill with pendulum type assemblies (the "normal" assembly in Figure 12). This compromise cannot always be justified, and penetration rates must be analyzed.


Main Standpipe Valve
2
5
4
3
1
DONT NEED THIS VALVE
From Mud Pumps
Bleed-off Line
Bypass Line
From Air Compressors

1.3.1 Tripping Using the Primary Jet

When the gas volumes are low enough (generally less than 5 MMCFD), the primary jet can be used to keep gas off the rig floor. A pressure drop in the blooie line is caused by the venturi effect of the jet. A vacuum is pulled on the gas coming out of the annulus and gas will be pulled into the blooie line if the pressure is low enough. The jet is placed four diameters from the end of the blooie line to maximise the venturi effect because the air coming out of the jet will expand to the full diameter at the exit of the blooie line. Therefore, air is not pulled in from the exit and friction losses for the air coming out of the jet are zero. If the primary jet is placed farther up the blooie line, the pressure differential would be reduced by the value of the friction losses downstream of the jet.

If the drill string contains collars that are too large to be stripped through the rotating head rubber or if the BHA contains stabilisers, the only way to trip is with the primary jet. If the gas volume is too high for the primary jet to handle, the well will have to be killed before tripping and air drilling terminated.

Initially, the procedure is the same as making a connection except that a joint of pipe is not added to the drill string. The procedure is as follows:

1. Circulate long enough to make sure the hole is clean.
2. Open valve 3 (compressor bypass valve) in Figure 1.1.1 to allow the air to bypass the drill string. (Note: The valve will not be located on the standpipe manifold and will be located at the air compressors. In that case, the air operator will open the valve after a signal from the driller.)
3. Close valve 2 (main standpipe valve) to isolate the compressors from the drill string.
4. Open valve 4 (drill string bleed-off valve) to bleed the pressure off of the drill string. Valve 4 (drill string bleed-off valve) allows the compressed air to be vented to the blooie line through the secondary jet.
5. Once the pressure has bled off the drill string and is near zero, the kelly can be disconnected and set back in the rathole.
6. Check to assure the float valve is holding.
7. Take a wireline deviation survey if necessary. **Do not drop survey instrument.**
8. Strip two joints of drill pipe out of the hole. Pull table bushings.
9. Open valve on side of rotating head to assure a vacuum is being pulled on the blooie line by the primary jet. If there is no valve on the side of the rotating head, check at the sample catcher.
10. Disconnect the clamp on the rotating head rubber. Check to make sure no gas is escaping from the rotating head with the portable gas detector.
11. If no gas is present, pick up on the pipe and pull the rotating head rubber with the third joint of pipe. The rubber should come out on the tool joint.
12. Use the portable gas detector to make sure no gas is escaping from the rotating head. If gas is being vented through the rotating head, shut the pipe rams and open the HCR valve on the choke line. Reinstall the rotating head rubber and trip while stripping through the rotating head rubber.
13. If all the gas is being drawn down the blooie line, install table bushings and rack the stand with the rotating head rubber where it can be accessed with all the pipe out of the hole. Pull the remainder of the drill pipe.
14. When the drill collars reach the surface, check with the portable gas detector to make sure all the gas is being pulled down the blooie line. If not, lower the collars in the hole and install the rotating head rubber. Strip the BHA through the rotating head rubber.

15. If all the gas is being drawn down the blooie line, trip the BHA out of the hole and make any changes necessary.
16. Trip the drill string back in the hole. (Note: If the primary jet handles the gas while tripping out, it will also handle the gas while tripping in.) Lay down any joints necessary to ream back to bottom.
17. Install the rotating head rubber on the last stand of pipe.
18. Pick up the kelly and connect to drill string.
19. Open valve 2 (main standpipe valve) on the standpipe manifold.
20. Close valve 4 (drill string bleed-off valve) and 3 (compressor bypass valve). Do not close valve 3 (compressor bypass valve) before opening valve 2 (main standpipe valve) because the compressors will be shut in causing the pressure to increase rapidly.
21. Insure that good returns are observed at the blooie line before washing to bottom.

1.3.2 Tripping While Stripping Through the Rotating Head Rubber

The drill string can be tripped out of the hole while stripping through the rotating head rubber. There are two reasons for stripping. If gas flow rates are too high for the primary jet to handle, the rotating head rubber is left in to divert the gas down the blooie line. The pipe is also sometimes stripped to avoid running the compressors to operate the primary jet. Stripping through the rotating head rubber can be cheaper than the cost of the fuel while running the compressors through the primary jet.

If the well is being flowed through a separator to recover oil, the drill string must be stripped out through the rotating head rubber or the well killed prior to tripping. The separator creates too much back pressure on the blooie line and the primary jet will not be effective.

Sometimes just the drill pipe is stripped through the rotating head and the collars are tripped out while using the primary jet. However, if the well is making too much gas for the primary jet, the collars must be stripped out. In that case, the diameter of the collars should not substantially exceed the diameter of the tool joints on the drill pipe. Stabilisers and reamers cannot be stripped through the rotating head rubber so they should not be run. A slick BHA is best whenever possible.

The procedure for stripping through the rotating head rubber is as follows:

1. Circulate long enough to make sure the hole is clean.
2. Open valve 3 (compressor bypass valve) in Figure 1.1.1 to allow the air to bypass the drill string. (Note: The valve will not be located on the standpipe manifold and will be located at the air compressors. In that case, the air operator will open the valve after a signal from the driller.)
3. Close valve 2 (main standpipe valve) to isolate the compressors from the drill string.
4. Open valve 4 (drill string bleed-off valve) to bleed the pressure off of the drill string. Valve 4 (drill string bleed-off valve) allows the compressed air to be vented to the blooie line through the secondary jet.
5. Once the pressure has bled off the drill string and is near zero, the kelly can be disconnected and set back in the rathole.
6. Check to assure the float valve is holding.
7. Take a wireline deviation survey if necessary. Do not drop survey instrument.
8. Strip the drill pipe and drill collars out of the hole with the rotating head rubber still in the rotating head.

9. Do not pull the bit into the rotating head rubber. On the last stand of collars, pull the collars up slowly until the bit contacts the rotating head rubber.
10. Open the HCR valve to vent the well through the center of the choke manifold (not through a choke).
11. Close the blind rams and insure that the flow is out the choke line and not the blooie line. Lower the bit until it contacts the blind rams. Pull the table bushings.
12. Disconnect the clamp on the rotating head rubber. Check to make sure no gas is escaping from the rotating head with the portable gas detector.
13. If no gas is present, pick up on the collars and pull the rotating head rubber with the collars.
14. Change the bit and lower the new bit into the BOP stack.
15. Install the rotating head rubber. Install the table bushings.
16. Open the blind rams and close the HCR valve. Use the portable gas detector to insure no gas is escaping from the rotating head.
17. Strip the collars and the drill pipe back in the hole. Lay down any joints necessary to ream back to bottom. Pick up the kelly and connect to drill string.
18. Open valve 2 (main standpipe valve) on the standpipe manifold.
19. Close valve 4 (drill string bleed-off valve) and 3 (compressor bypass valve). Do not close valve 3 (compressor bypass valve) before opening valve 2 (main standpipe valve) because the compressors will be shut in causing the pressure to increase rapidly.
20. Insure that good returns are observed at the blooie line before washing to bottom.

1.4 CHANGING THE ROTATING HEAD RUBBER

At times it will be necessary to change the rotating head rubber. The pipe moving through the rubber will eventually wear it enough causing it to leak. There are two conditions under which the rotating head rubber will be changed: using the primary jet to divert the gas flow or using the blowout preventers to divert the gas flow. If the gas flow rate is too great for the primary jet to handle, the rotating head rubber will have to be changed with the preventer closed. If the well is flowing through the mud/gas separator, the rotating head rubber will have to be changed with the preventer closed.

1.4.1 Changing the Rotating Head Rubber Using the Primary Jet

1. Pull the pipe into the normal connection position. Circulate long enough to make sure the hole is clean.
2. Open valve 3 (compressor bypass valve) in Figure 1.1.1 to allow the air to bypass the drill string. (Note: The valve will not be located on the standpipe manifold and will be located at the air compressors. In that case, the air operator will open the valve after a signal from the driller.)
3. Close valve 2 (main standpipe valve) to isolate the compressors from the drill string.
4. Open valve 4 (drill string bleed-off valve) to bleed the pressure off of the drill string. Valve 4 (drill string bleed-off valve) allows the compressed air to be vented to the blooie line through the secondary jet.
5. Once the pressure has bled off the drill string and is near zero, pull part of the first joint from the hole.
6. Open valve on side of rotating head to assure a vacuum is being pulled on the blooie line by the primary jet. If there is no valve on the side of the rotating head, check at the sample catcher.

7. Unlock stripper rubber clamp. Check to make sure no gas is escaping from the rotating head with the portable gas detector. Pull table bushings.
8. If no gas is present, pull one joint of drill pipe and rotating head rubber should come with tool joint. If not, use winch line to pull stripper rubber out of rotating head.
9. Use the portable gas detector to make sure no gas is escaping from the rotating head. If gas is being vented through the rotating head, shut the pipe rams and open the HCR valve on the choke line.
10. If all the gas is being drawn down the blooie line, replace bushings, set drill pipe in slips, break out single below kelly.
11. Replace with new rubber. Stab joint of drill pipe into new rubber and make connection.
12. Pull slips and table bushings. Lower stripper rubber into rotating head and lock stripper rubber clamp. Reinstall table bushings.
13. Open valve 2 (main standpipe valve) on the standpipe manifold.
14. Close valve 4 (drill string bleed-off valve) and 3 (compressor bypass valve). Do not close valve 3 (compressor bypass valve) before opening valve 2 (main standpipe valve) because the compressors will be shut in causing the pressure to increase rapidly.
15. Insure that good returns are observed at the blooie line before resuming drilling operations.

1.4.2 Changing the Rotating Head Rubber Using the Annular Preventer

Note: This can only be done if the drill string weights enough to strip a tool joint through the annular preventer into the well. Otherwise, use the pipe ram method.

1. Pull the pipe into the normal connection position. Circulate long enough to make sure the hole is clean.
2. Open valve 3 (compressor bypass valve) in Figure 1.1.1 to allow the air to bypass the drill string. (Note: The valve will not be located on the standpipe manifold and will be located at the air compressors. In that case, the air operator will open the valve after a signal from the driller.)
3. Close valve 2 (main standpipe valve) to isolate the compressors from the drill string.
4. Open valve 4 (drill string bleed-off valve) to bleed the pressure off of the drill string. Valve 4 (drill string bleed-off valve) allows the compressed air to be vented to the blooie line through the secondary jet.
5. Once the pressure has bled off the drill string and is near zero, pull part of the first joint from the hole.
6. Open choke line and close annular preventer. Bleed the closing pressure off of the annular to about 500 psi.
7. Unlock stripper rubber clamp. Check to make sure no gas is escaping from the rotating head with the portable gas detector. Pull table bushings.
8. If no gas is present, pull one joint of drill pipe and rotating head rubber should come with tool joint. If not, use winch line to pull stripper rubber out of rotating head.
9. Replace bushings, set drill pipe in slips, break out single below kelly.
10. Replace with new rubber. Stab joint of drill pipe into new rubber and make connection.
11. Pull slips and table bushings. Lower stripper rubber into rotating head and lock stripper rubber clamp. Reinstall table bushings.
12. Open annular preventer and restore closing pressure to normal operating pressure.

13. Open valve 2 (main standpipe valve) on the standpipe manifold.
14. Close valve 4 (drill string bleed-off valve) and 3 (compressor bypass valve). Do not close valve 3 (compressor bypass valve) before opening valve 2 (main standpipe valve) because the compressors will be shut in causing the pressure to increase rapidly.
15. Insure that good returns are observed at the blooie line before resuming drilling operations.

1.4.3 Changing the Rotating Head Rubber Using the Pipe Rams

1. Pull the pipe into the normal connection position. Circulate long enough to make sure the hole is clean.
2. Open valve 3 (compressor bypass valve) in Figure 1.1.1 to allow the air to bypass the drill string. (Note: The valve will not be located on the standpipe manifold and will be located at the air compressors. In that case, the air operator will open the valve after a signal from the driller.)
3. Close valve 2 (main standpipe valve) to isolate the compressors from the drill string.
4. Open valve 4 (drill string bleed-off valve) to bleed the pressure off of the drill string. Valve 4 (drill string bleed-off valve) allows the compressed air to be vented to the blooie line through the secondary jet.
5. Once the pressure has bled off the drill string and is near zero, pull first single drill pipe above rotary table.
6. Break connection between first and second joints of drill pipe but do not back out.
7. Open choke line and close pipe rams. Lock pipe rams in place.
8. Set top tool joint of second single on pipe rams (connection that has been loosened).
9. Back off connection on bottom of first single and unlock stripper rubber clamp. Check to make sure no gas is escaping from the rotating head with the portable gas detector. Pull table bushings.
10. Pull single and the rubber should come on the tool joint. If not, pull stripper rubber with winch line.
11. Replace with new rubber, stab joint on bottom of kelly into new rubber
12. Run joint into hole and install stripper rubber in rotating head. Lock stripper rubber clamp.
13. Screw into connection above pipe rams and pick up string weight. Open pipe rams and close choke line.
14. Reinstall table bushings. Pull connection to floor and set slips. Tighten connection with rig tongs.
15. Open valve 2 (main standpipe valve) on the standpipe manifold.
16. Close valve 4 (drill string bleed-off valve) and 3 (compressor bypass valve). Do not close valve 3 (compressor bypass valve) before opening valve 2 (main standpipe valve) because the compressors will be shut in causing the pressure to increase rapidly.
17. Insure that good returns are observed at the blooie line before resuming drilling operations.

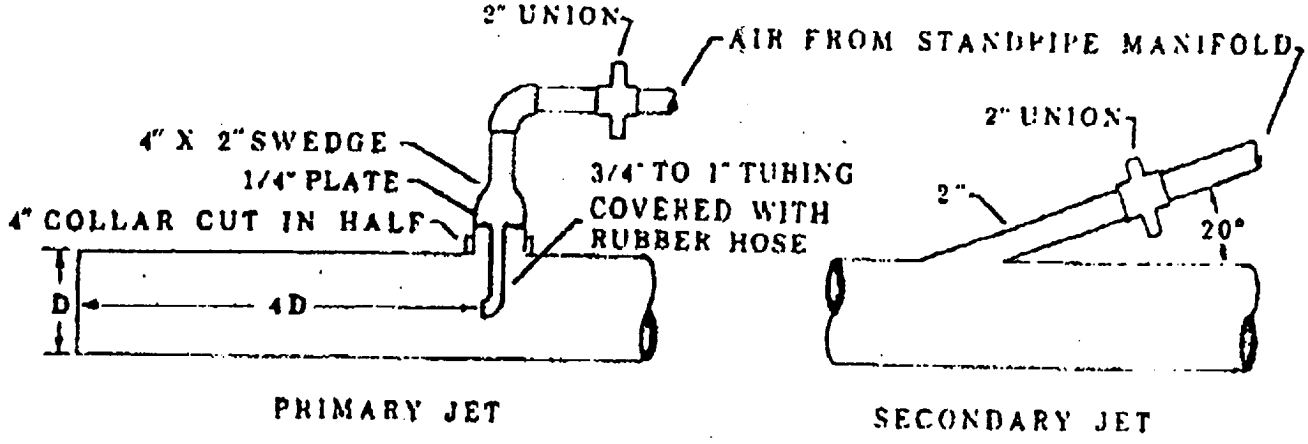
1.5 UNLOADING THE HOLE

There are several reason the hole would have to be unloaded. After running and cementing casing, the cement is displaced with water. The water must be blown out of the well before air drilling can begin.

Though rare, the well can be killed before tripping. If the well is killed, the mud must be blown out of the hole after tripping back to bottom. With the hole unloaded, air drilling can continue.

[illegible] Drilling

Downhole fires and explosions cause extensive damage to the downhole equipment. Drill collars and pipe are melted and slag has been blown up-hole several hundred feet. Even though downhole equipment is damaged or destroyed, there is no damage to surface equipment. Most of the time all that is known at the surface is that the drill string is stuck, and a surface recording temperature survey may have to be run through drill string to determine if a fire occurred.



Because of damages incurred to downhole equipment after a burn-off, fishing operations are difficult and sidetrack operations are necessary in order to drill deeper. This type operation is expensive and time consuming. Therefore, the prevention of a downhole fire or explosion is of primary importance.

There are two positive methods to prevent downhole fires while drilling. The first is to drill with fluid. This method is much too expensive and slow for marginal gas plays. The second method is to drill potential pay zones with gas, also expensive at today's gas prices.

From a practical standpoint, a well could be air drilled to top of potential gas pay zones, then gas drilled through the pay. However, gas is not always available and drilling every potential gas pay with gas can be expensive and will be more so as the price of natural gas goes up. At present, mist drilling is the most common method used in preventing a burn-off when gas is encountered.

There may be no absolute method to prevent a downhole fire while drilling with air; however, certain measures can be taken to lessen the chance of a burn-off. Constant supervision is an absolute necessity in any air drilling operation. This is especially true when air drilling a potential gas pay. Pressure recorders with high pressure alarms able to sense 5 to 10 psig increases in standpipe pressure are necessary. The pressure recorder denotes the formation of a mud ring or back pressure from gas entry through pressure increase on the standpipe.