

IMPORTANT OPERATIONS

1. Drilling
2. Tripping
3. Wireline Logging
4. Casing & cementing.
5. Drilling

[vedios/Oil Drilling Animation - YouTube.flv](#)

DRILLING

1-Surface hole.

The relatively **large diameter** well bore that is located immediately below the surface.

Surface holes are usually drilled more rapidly as the formations are generally soft.

2-Intermediate hole.

A smaller diameter intermediate hole is then drilled. The casing is run into the well bore and cemented.

This brings the intermediate hole under complete control and allows drilling to continue

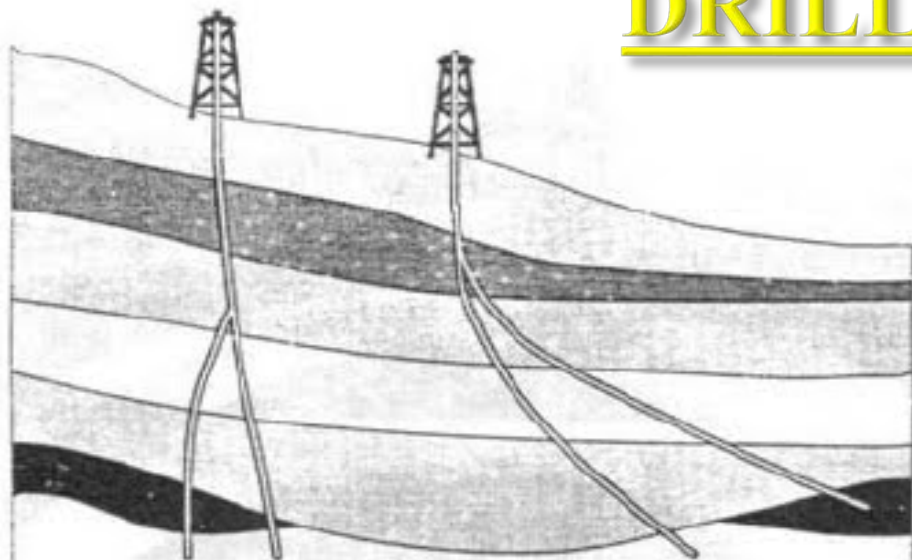
3-Production hole.

Smaller in diameter, the production hole is then drilled to the target formation.

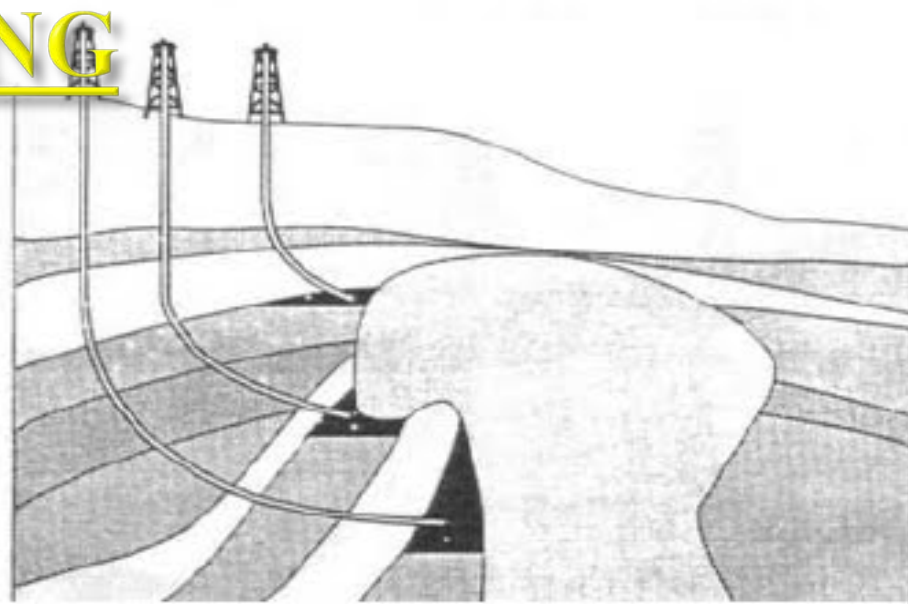
Tests are then conducted to determine if hydrocarbon presence is sufficient to justify the expense of running and cementing production casing into the hole.

If found to be “dry,” the hole is plugged and abandoned.

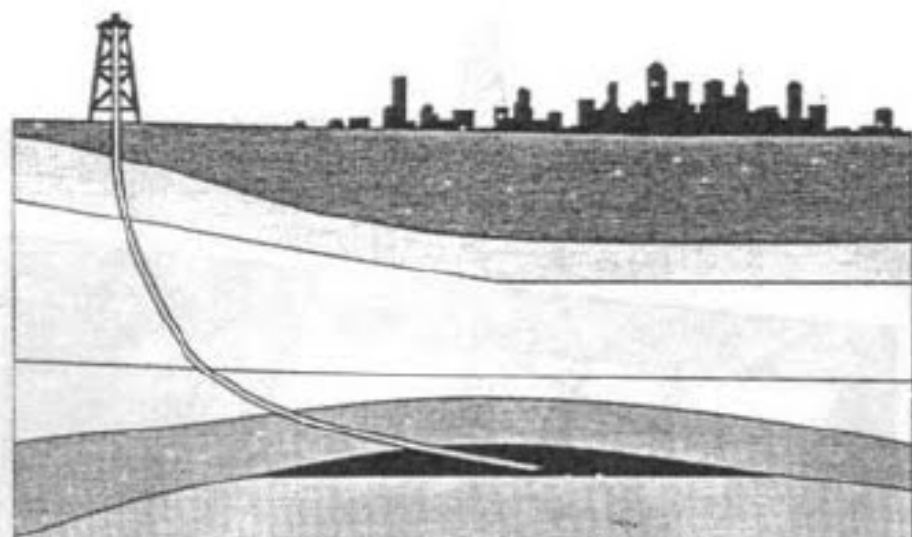
DRILLING



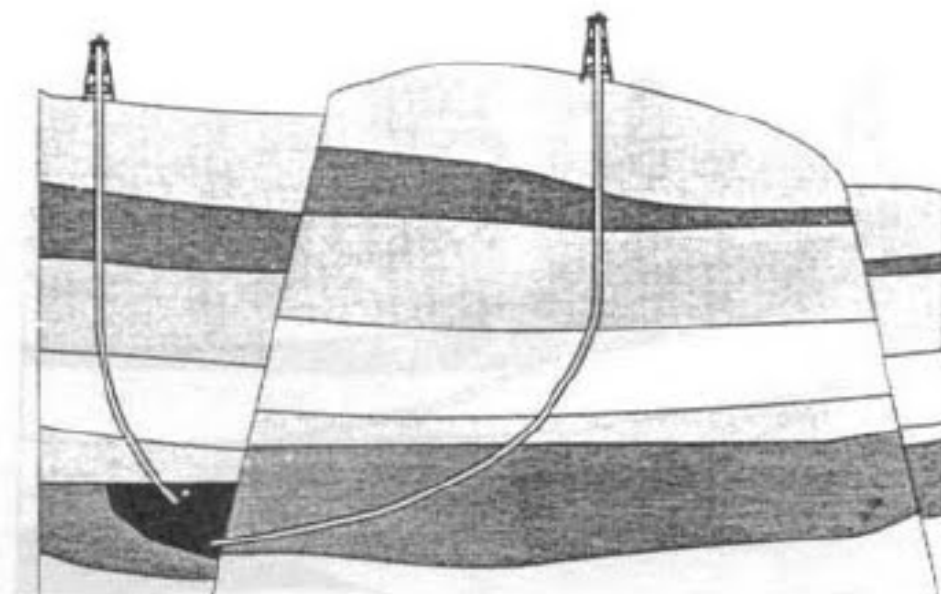
Sidetracking



Salt dome drilling



Inaccessible locations



Fault controlling

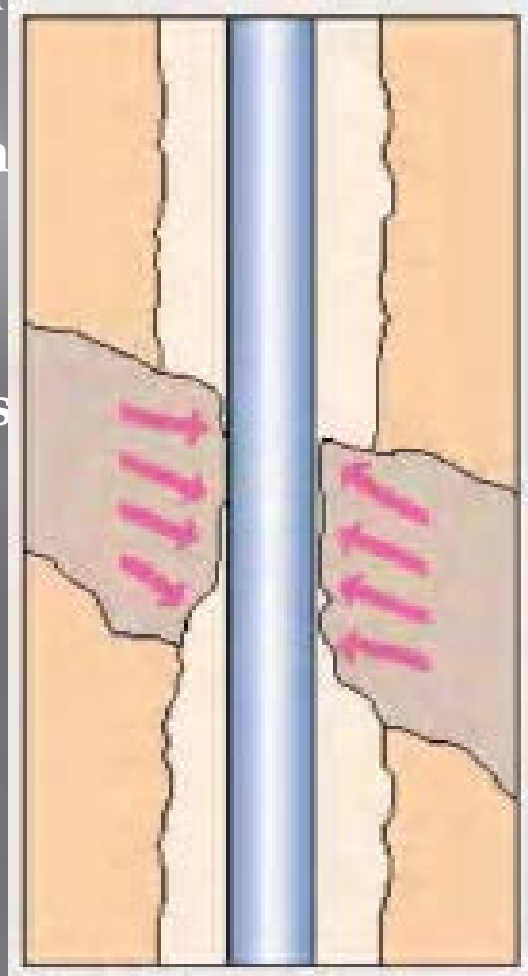
STUCK PIPE

A string is said to be stuck when no free movements possible either in terms of reciprocation or rotation

- Mechanical stuck

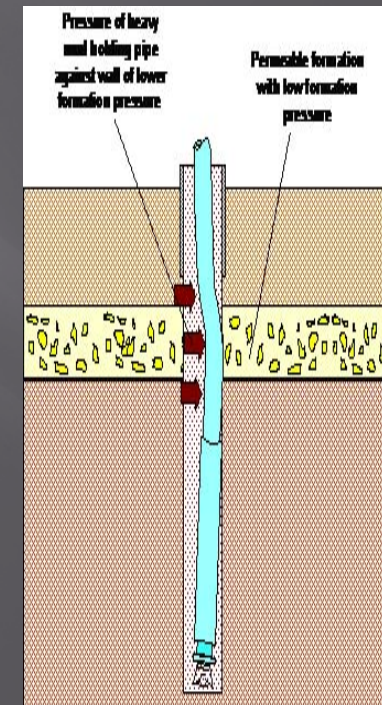
1. Inadequate Hole Cleaning
2. Under gauge hole.
3. Key seating.
4. Cement related problems
5. Shales.

[vedios\stuck types.flv](#)



- Differential stuck

- ❑ Over balance.
- ❑ Porous and permeable formations.
- ❑ Drill pipe left stationary.



KICK

- A kick is an influx of formation fluid into the wellbore that can be controlled at surface.

The causes of kick:

- The formation pressure must exceed the hydrostatic pressure. Fluids will always flow in the direction of decreasing or least pressure.
- The formation must be permeable in order for the formation fluids to flow.

Detecting Kick:

- Increased mud flow from annulus, followed by.....
- An increase in mud pit levels.
- Gas or Water Cut mud causing a reduction in the mud weight.

KICK

Dealing with a kick:

- ▣ Watching the pits levels at all times
- ▣ Watching the flow out

In case of suspected flow,

1- stop drilling 2- stop the mud pumps 3- make a flow check.

- ▣ Shut the well, close the annulus
- ▣ Close bop

What happens when we close the well

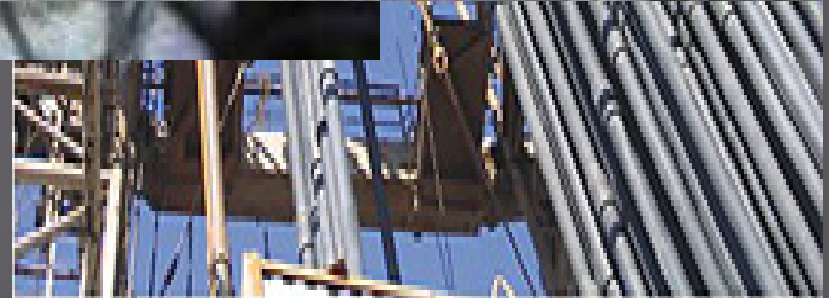
1. It will stop the flow of mud to the surface
2. It will stop the influx

TRIPPING

- The pipe work

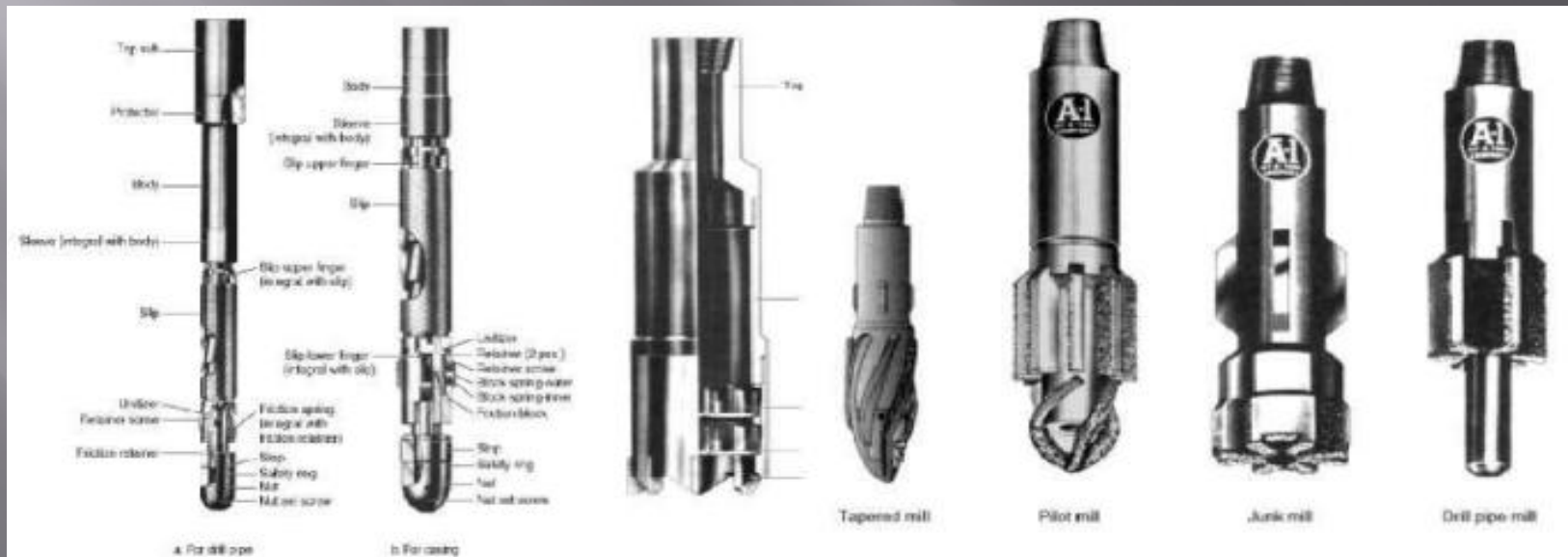


Short trip: w/ out from the hole to cover a certain section (1000 – 1500 ft). It didn't reach to the last casing.



FISHING

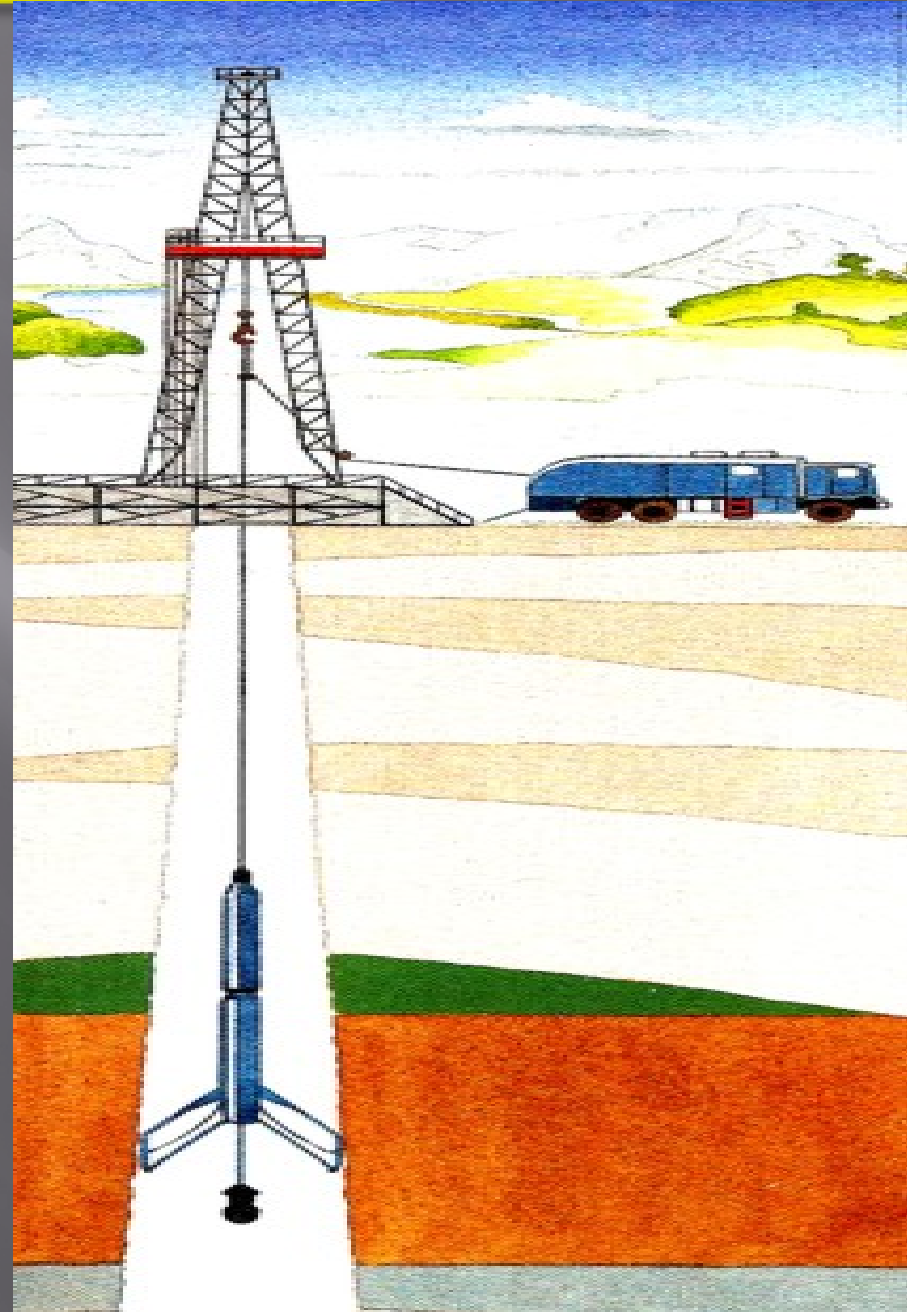
- ❑ A “fish” is a piece of equipment, a tool, a part or all of the drill string that is lost or stuck in the hole.
- ❑ Small pieces, such as a bit cone, or any other relatively small non drillable items, are called **junk** or “fish” in the hole.
- ❑ These must be removed or fished out so that drilling operations can continue.



WIRELINE LOGGING

- Types:

1. **Triple compo** (composite): (GR, SP, Caliper), (Resistivity), (Neutron & Density).
2. **Formation fluid** sampling & formation pressure measurement.
3. Dimensional measurements of the wellbore. (**Dipmeter**).
4. Wireline-conveyed **sidewall coring** tools.



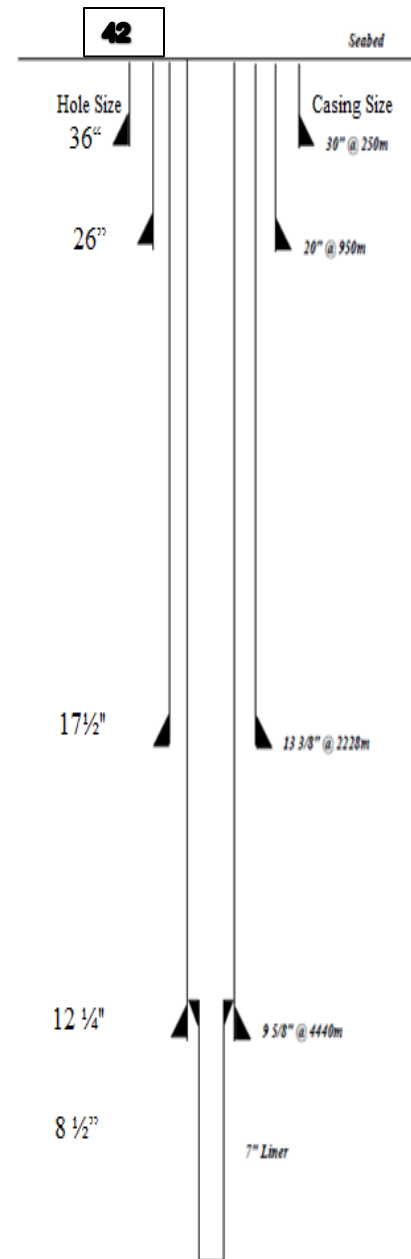
CASING & CEMENTING

- Casing is **steel pipe** placed in an oil or gas well at the **end** of every **drilled phase**, and then **cemented** in place prior to drilling the **lower smaller hole section**.
- **FUNCTIONS OF CASING:**
 1. Prevents the hole from **caving** or **collapsing**.
 2. Prevents **loss** of drilling fluids into **weak formations**.
 3. Prevents **communication** between formations.
 4. Provides means of **extracting hydrocarbons** if the well is productive.
 5. To effect a method of **control** and **safety** as depth increases.
 6. Provides a means of **support** for the **well head equipment**.

CASING & CEMENTING

Types of casing strings:

- Conductor Pipe
 - Surface Casing
 - Intermediate Casing
 - Liner String
- After the casing string is run, the next task is **cementing** the case in the place. **Cementing** is performed by **circulating** a cement slurry through the **inside** of the **casing** and out into the **annulus** through the casing shoe at the bottom of the casing string.



PERFORATION

- ❑ Since The pay zone is sealed-off by the production string and cement, **perforation** must be made in order for the **oil or gas** to **flow into the wellbore**.
- ❑ Perforations are simply **holes** that are made through the **casing and cement** and extend some distance into the **formation**.



DRILL STEM TEST (DST)

- ▣ It is made up on the **drill string** (the drill stem) and set at the **depth required**.
- ▣ It is a measurement of **pressure behavior** at the drill stem and is a valuable way to obtain important **sampling** information on the **formation fluid** and to establish the probability of **commercial production**.

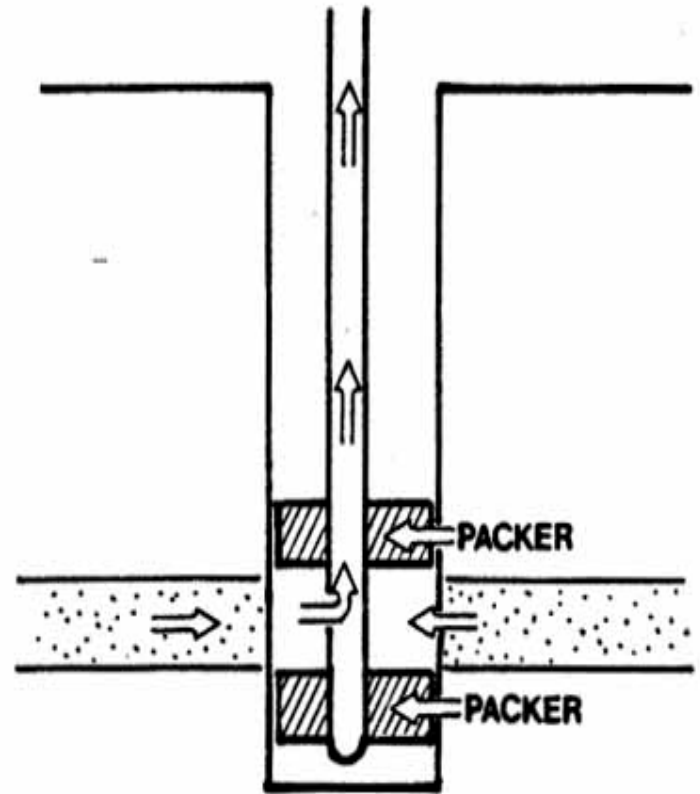


Figure 18-2 A drill stem test.

ACIDIZING & FRACTURING

- ▣ **Acidizing:** It is pumping a quantity of **acid** down the **well**. **Acid** travels down the **tubing**, enters the **perforations** and contacts the **formation**. These provide a way for the formation's **oil or gas** to enter the **well** through the perforations.
- ▣ **Fracturing:** It is used to increase permeability of the formation to a practical level. It is performed by pumping a specially blended fluid down the well and into the formation under great pressure. Pumping continues until the formation literally cracks open.

Well Completion

- It is the process of making a well **ready for production** (or injection).
- It involves **preparing the bottom** of the hole to the required specifications, running in the **production tubing** and its associated down hole tools as well as perforating and stimulating as required.



WELL COMPLETION

Well completion components:

- Wellhead:

It is a **pressure containing equipment** at the surface of the well where casing strings are suspended and the Christmas tree (oil well) is connected.

- Christmas Tree:

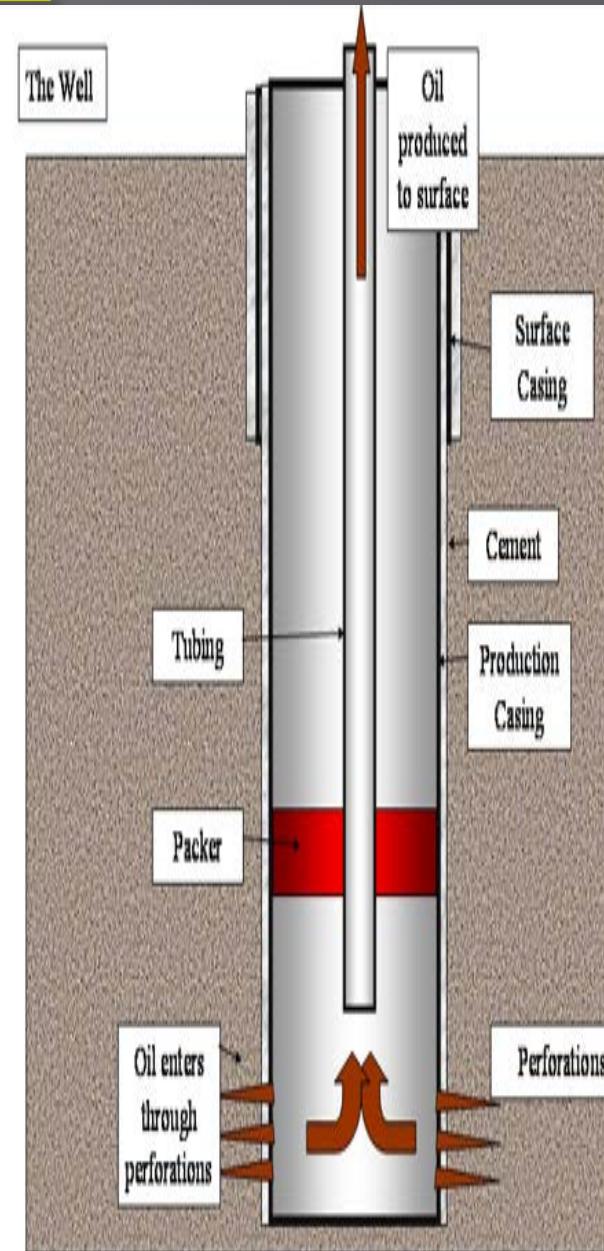
Assembly of **valves** that controls **flow from the well** to the process plant and allows access for chemical squeezes and well interventions.

- Production tubing:

Production tubing is the main conduit for transporting hydrocarbons from the reservoir to surface (or injection material the other way).

- Tubing hanger:

This is the component, which sits on top of the wellhead and serves as the main support for the production tubing.



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