

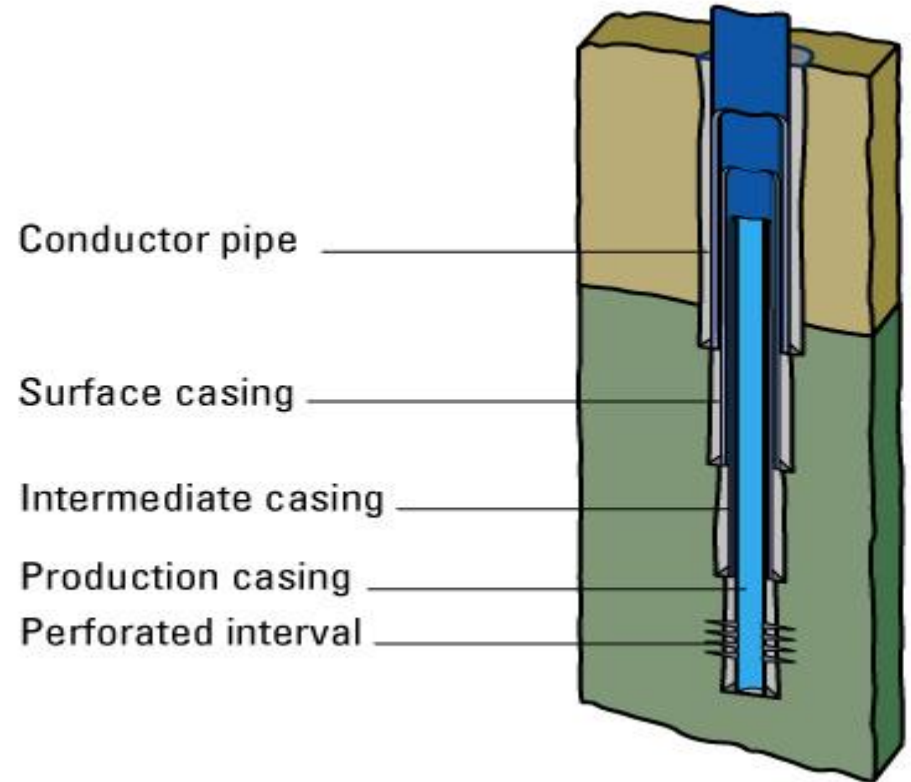
Well completion steps

(Source: http://www.rigzone.com/training/insight.asp?i_id=326)

- Casing
- Cementing
- Open hole completion
- Closed hole completion(Perforating)
- Gravel packing
- Production tree

Casing has 3 different sections

- Conductor pipe
- Surface casing (High diameter)
- Intermediate casing
- Production casing (Low diameter)



Source:

http://www.rigzone.com/training/insight.asp?i_id=326

Question

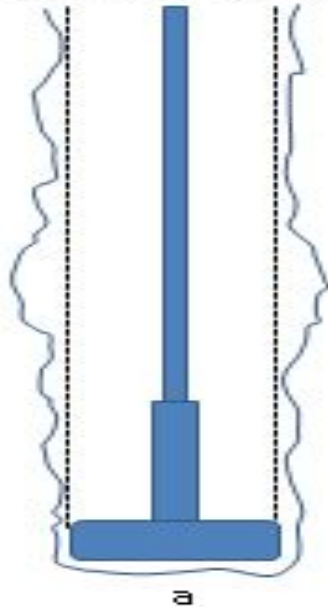
- List common problems during casing

Answer

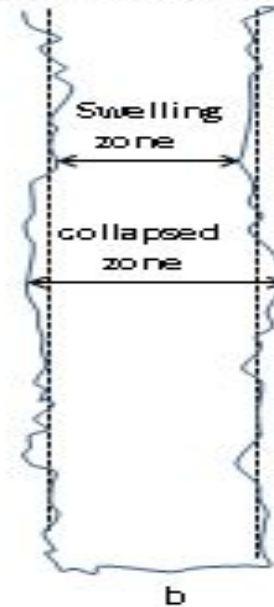
- Hole instability (Bore hole collapse & Well swelling)
- Formation kick

Effect of rock expansion on the hole size

1-case during drilling



2-case after drilling

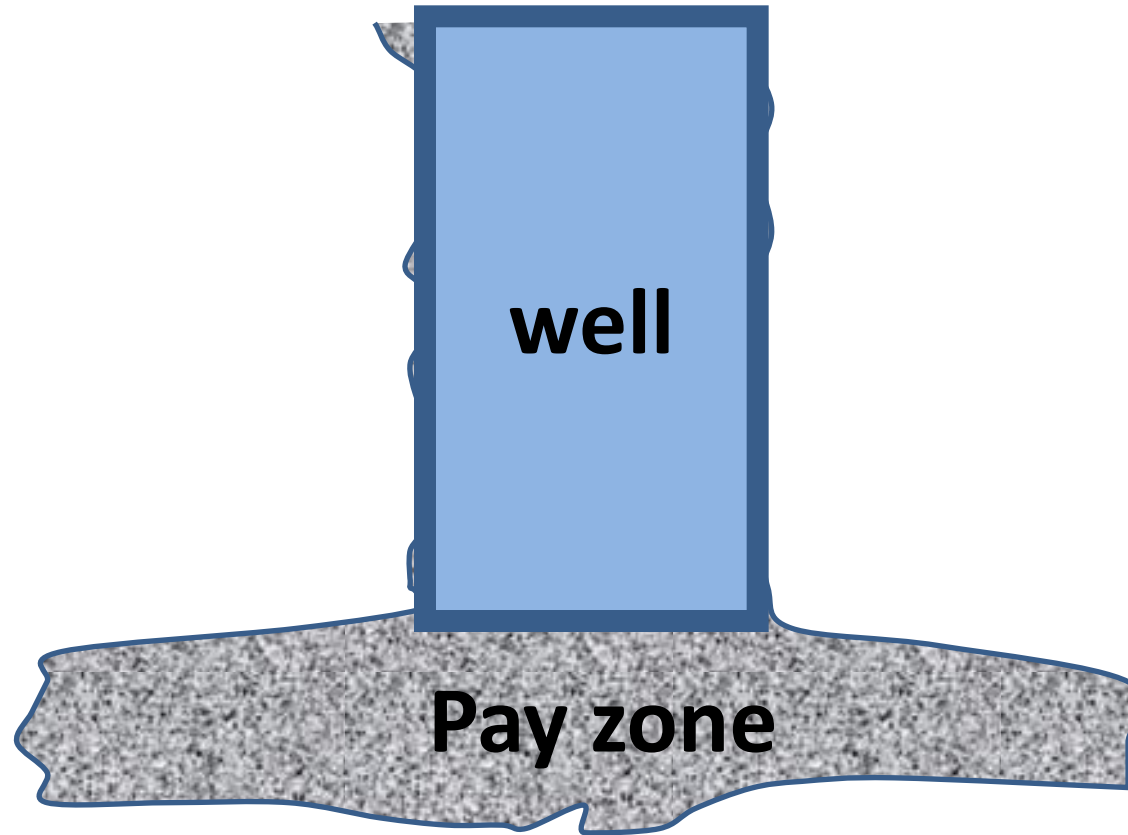


Cementing

- Casings are cemented with the formation in order to be tight
- If cementing is incomplete, the well could have problems.
- Usually cement slurry is used

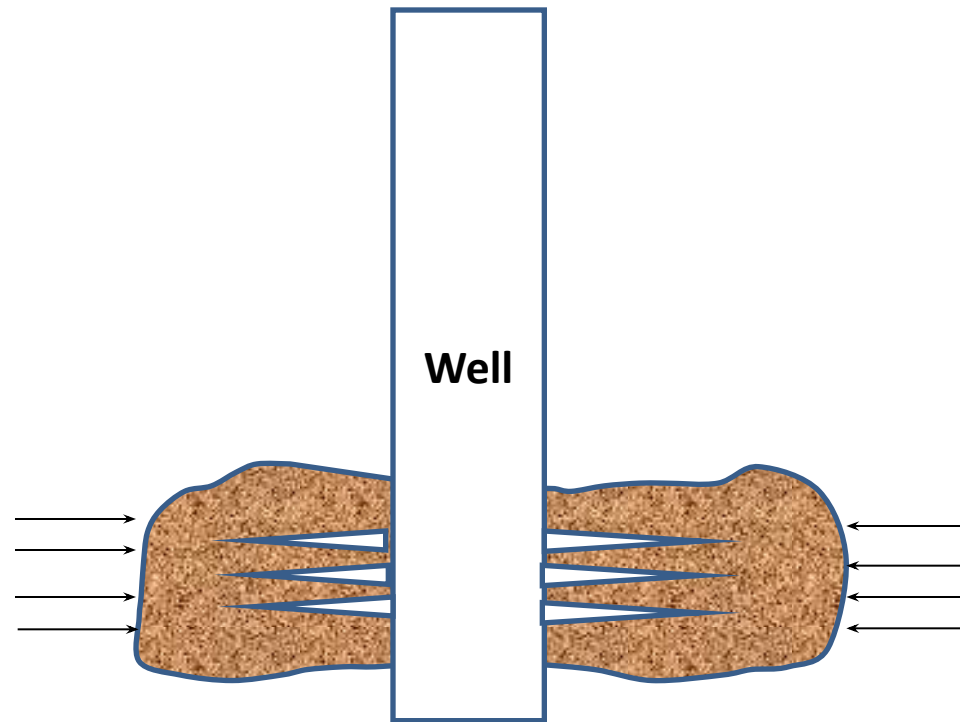
Open hole completion

- Well is cemented above the pay zone
- Saves the cost of casing
- Perforation is not performed



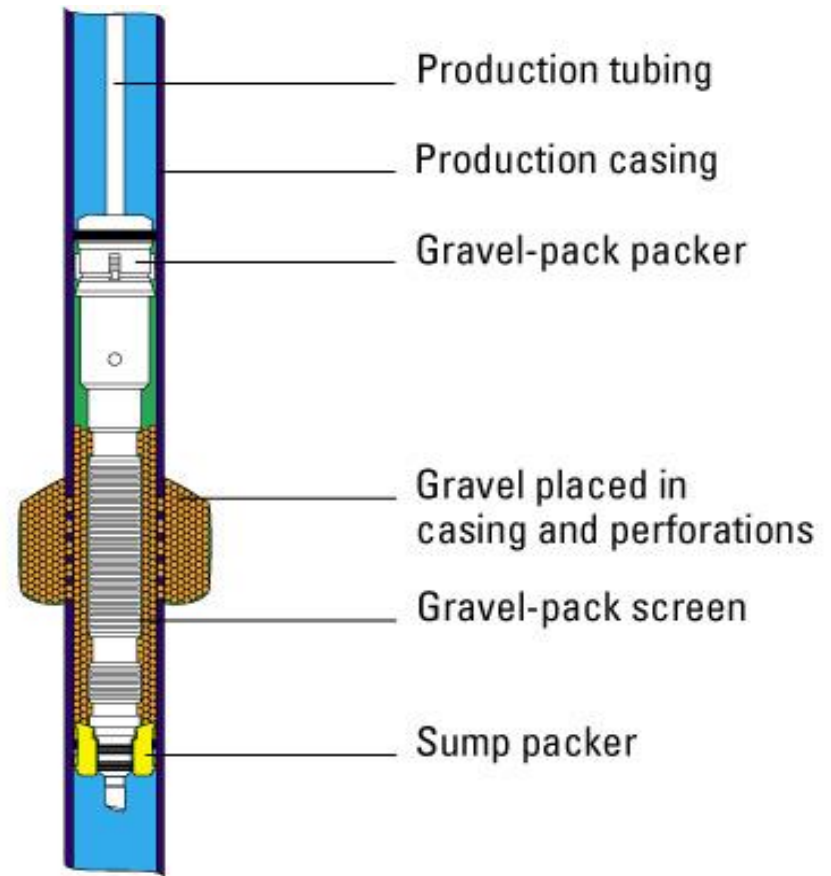
Closed hole completion (perforating)

- The well reaches to the bottom of the pay zone.
- Perforation is used to make sure that oil comes into the well directly.



Gravel packing

- Prevents from the production of sand
- It is allowed to use at the perforated zone
- The reason is that sand may cause the metallic corrosion
- Sand increases oil salinity

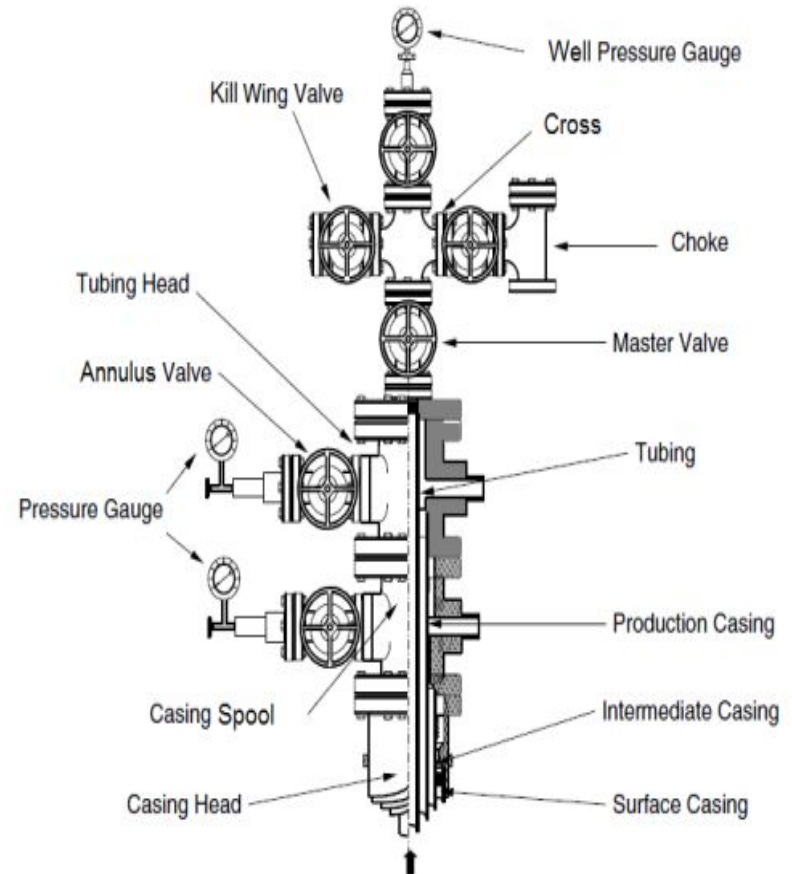


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Production tree

- The production tree is the last step of well completion.
- It is installed at the top of the well
- The production tree controls the production of oil and gas.
- The production tree prevents from the formation kick as soon as the preventors are present



Source:
<https://oilandgastechologies.wordpress.com/page/6/>

Formation damage

Causes of skin (M. Čikeš, 2008)

- 1 Shale reservoir**
- 2. Well completion**
- 3 Solid particles**

Causes of skin (M. Čikeš, 2008)

1 Shale reservoir

- Low permeability
($k=10^{(-8)} \text{ md} \sim 10^{(-2)} \text{ md}$)
- Swelled smectite does not allow the fluid movement



Figure 1. Shale [14]

Causes of skin (M. Čikeš, 2008)

2 Well completion

- Trapped cement particles near well bore
- Cement particles become solid depending on time

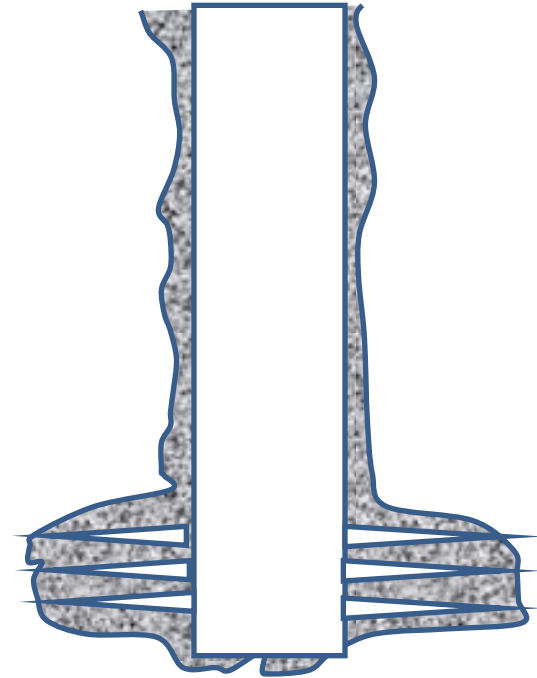


Figure 2.

Causes of skin (M. Čikeš, 2008)

3 Solid particles from reservoir

- Wax and parafines are collected in a diameter of 1-1.5m near well bore
- High reservoir pressure

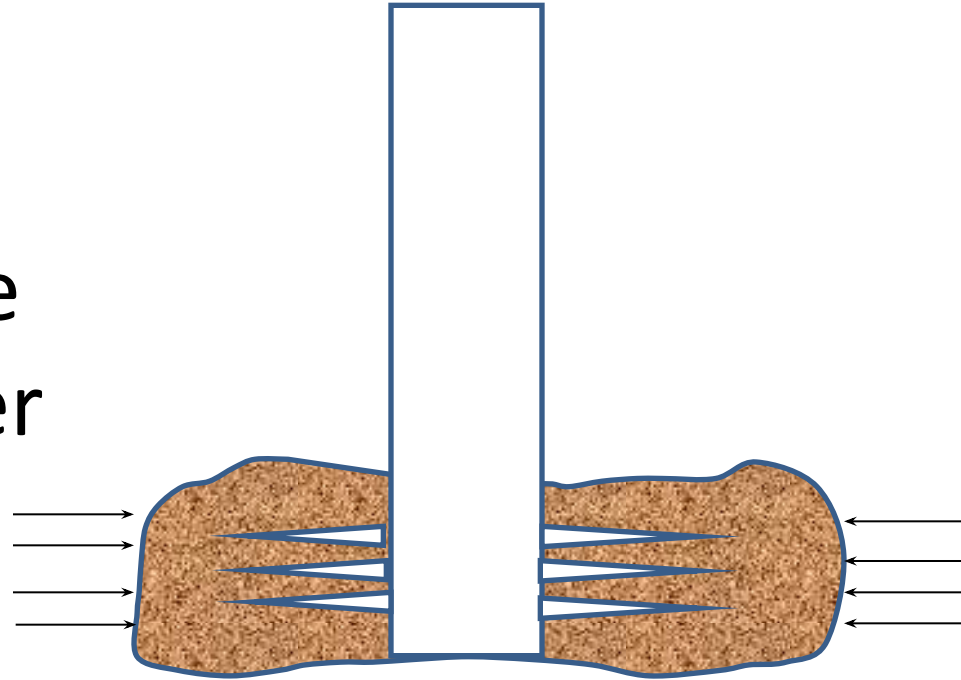


Figure 3.