Petroleum and Mining Engineering College
Department of Petroleum & Refining Engineering
Third stage
Petroleum Product Engineering
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29/9/2024
10:30 Am

Petroleum product Engineering •

reference

Production Engineering . Herish N. Hamarash

Introduction to Production Technology

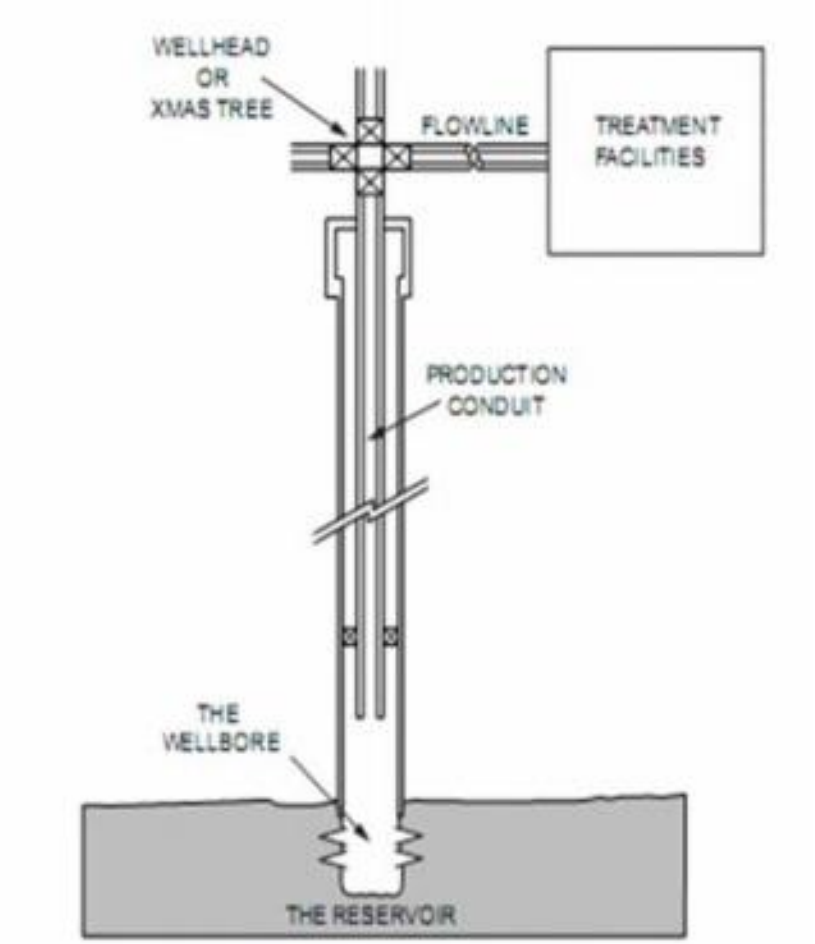
The role of the Production Technologist is extremely broad. Currently within the operating companies in the petroleum industry, the role and responsibility does vary between companies but can be broadly said to be responsible for the production system.

The production system is a composite term describing the entire production process and includes the following principal components:-

1- The reservoir - it productive capacity and dynamic production characteristics over the envisaged life of the development.
2- The wellbore - the production interval, the sump and the fluids in the wellbor
3- Production Conduit - comprising the tubing and the tubing components
4- Wellhead, Xmas Tree and Flow Lines
5- Treatment Facilities.

In simple terms, the term "well completion" refers to the methods by which a newly drilled well can be finalized so that reservoir fluids can be produced to surface production facilities efficiently and safely. In general, the process of completing a well includes the following:

- A method of providing satisfactory communication between the reservoir and the borehole.
- The design of the tubulars (casing and tubing) which will be installed in the well.
- An appropriate method of raising reservoir fluids to the surface.
- The design and the installation in the well of various components used to allow efficient production, pressure integrity testing, emergency containment of reservoir fluids, reservoir monitoring, barrier placement, well maintenance and well kill.
- The installation of safety devises and equipment, which will automatically shut a well in the event of a disaster.



Elements of the production technology system

Before knowing the classification of completion, must know the main objective from wells drilling as following:

- Exploration and evaluation wells: This type of wells is drill for exploration and evaluation.
- Production wells: The wells are drilled and completed for produce oil, gas and sometime water produce.
- Injection wells: The wells are drilled and completed for inject water or gas or chemical material and sometimes petroleum products.
- Measurement and observation wells: The wells are drilled and completed for observation the reservoir (reservoir fluid behavior, reservoir pressure, etc...).
- Special operation wells: The wells are drilled and completed for special operation such as to kill the below out well.

I. Fluid flow
II. Reservoir dynamics
III. Equipment design, installation, operation and fault diagnosis

Reservoir Drive Mechanisms

Ideally the hydrocarbons are recovered from the reservoir porous media by the assistance of the drive mechanisms weather it was natural or artificial. Drive mechanisms have two classifications:

Internal drive: Using the internal energy of the reservoir configuration.

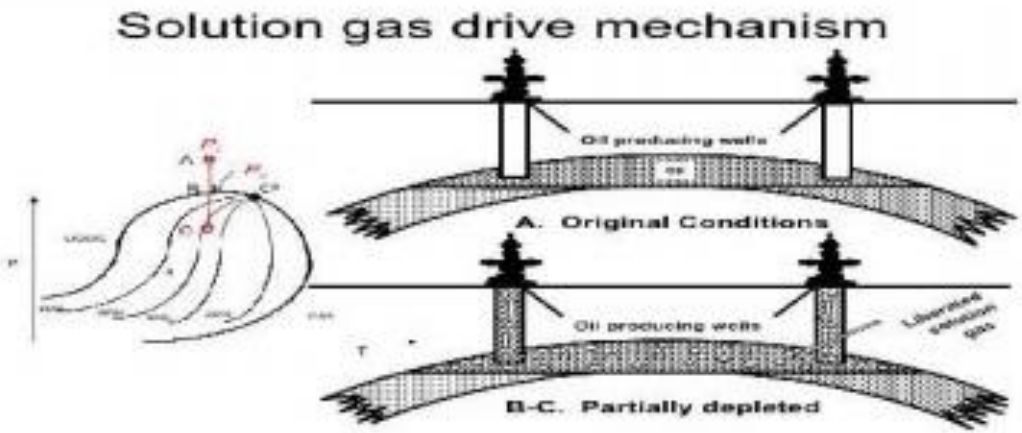
External drive: Which involves the invasion of the pore spaces by a replacement fluid, this type of drive called "Secondary recovery or Enhanced oil recovery".

Internal drive:

This is known as primary recovery, which includes three drive mechanisms:

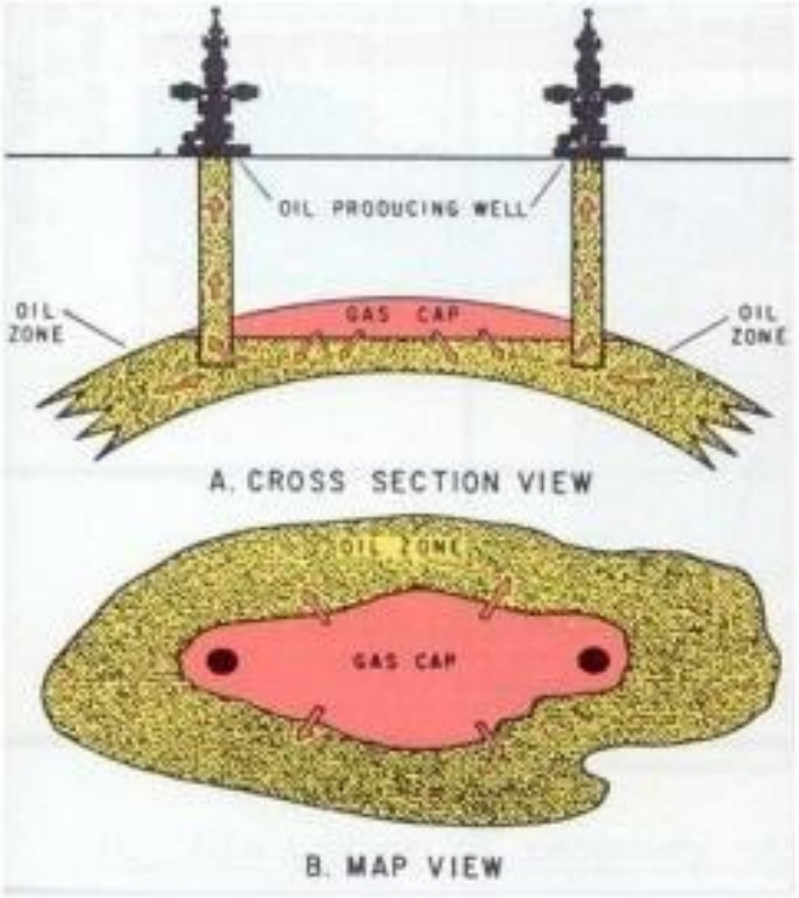
A. Depletion or internal gas drive
B. External gas cap drive
C. Water drive

A- Depletion or internal gas drive:



Internal Gas Drive

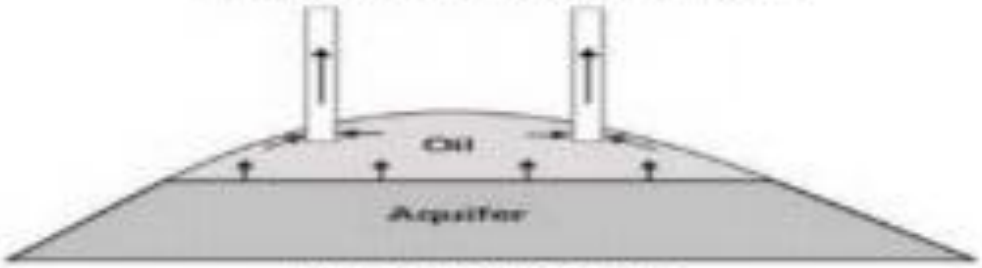
B- External gas cap drive



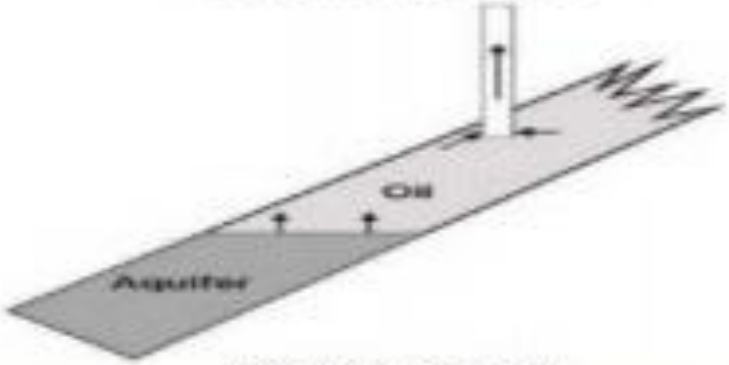
Gas Cap Drive

C- Water Drive

Figure 3.5 Water Drive

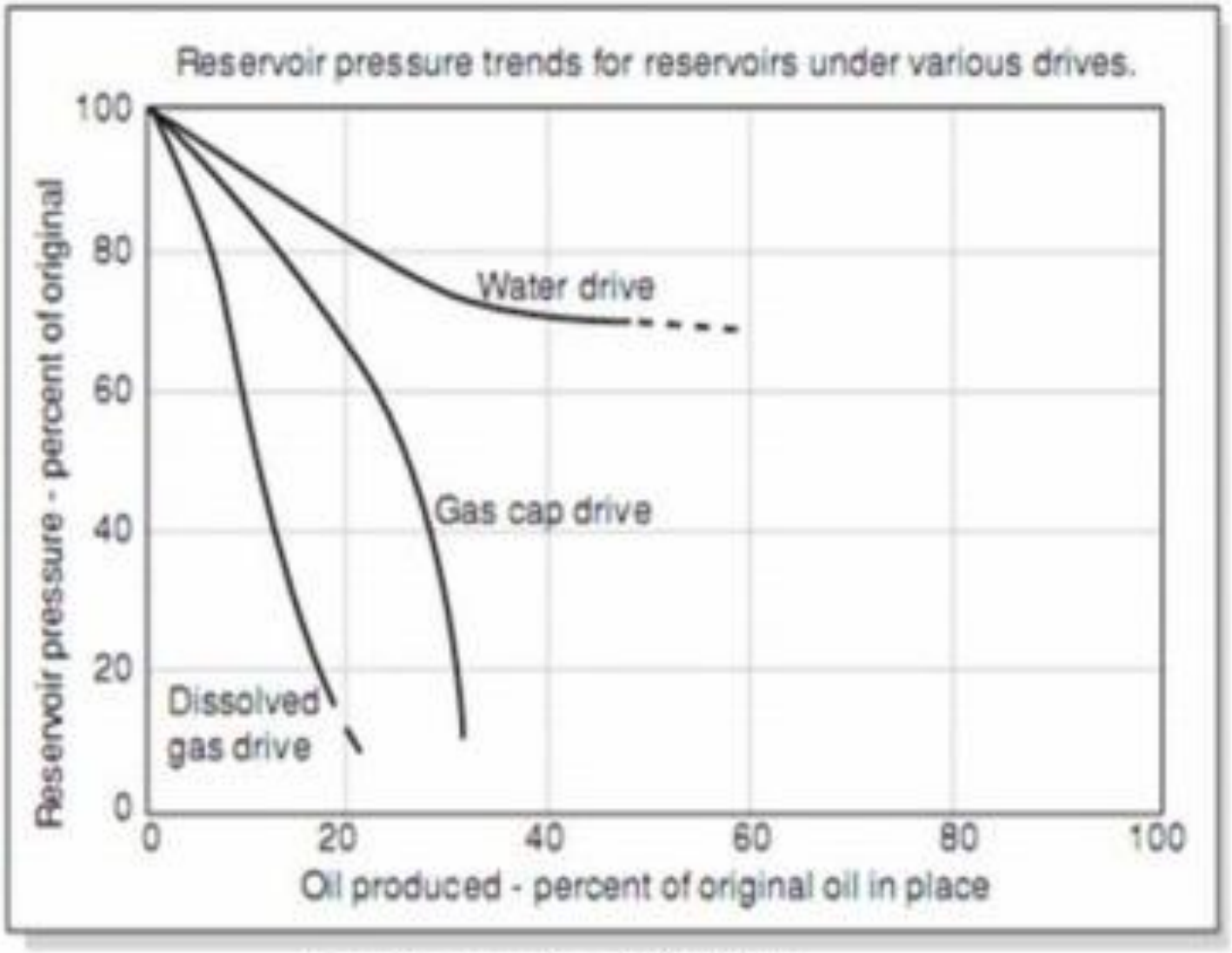


Bottom Water Drive



Edge Water Drive

Water Drive



Expected recovery from different drives