

ABSTRACT: In the oil industry, different recovery methods are applied to produce a percentage of the hydrocarbon storage in a reservoir. These methods are classified into three principal categories: primary, secondary, and tertiary recovery. Their selection and implementation depend on the reservoir and fluids properties. According to the recovery method selected, it is possible to recover different quantities of hydrocarbon.

INTRODUCTION

The recovery factor (RF) in the world is 35% (Fragoso, Selvan, & Aguilera, 2018). Increasing the RF by 5% allow the extraction of 86,695 million barrels of oil; this volume represents 2.5 years of global supply with the current oil demand (British Petroleum, 2019).

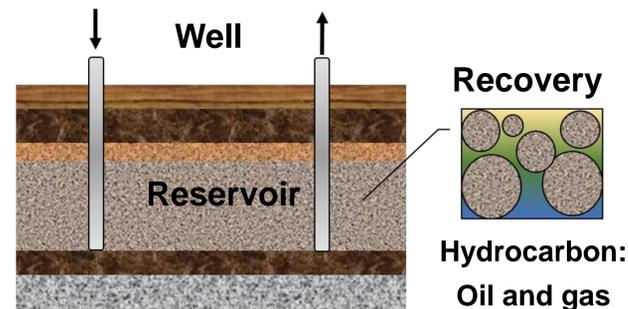


Figure 1. Reservoir structure. From Author

The oil recovery methods are classified into three principal groups: Primary, Secondary and Tertiary Recovery.

PRIMARY RECOVERY

It uses the natural reservoir energy to produce the hydrocarbon.

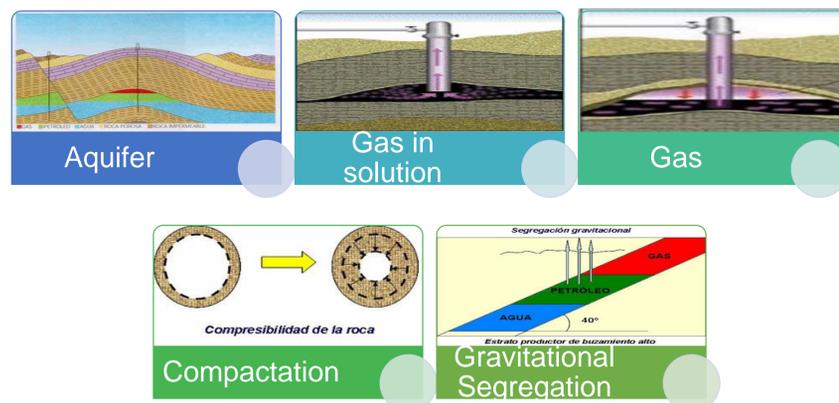


Figure 2. Primary Recovery Process. Modified from (Green & Willhite, 1998)

SECONDARY RECOVERY

The main objective of this kind of recovery is increase the reservoir pressure, injecting another fluid into the reservoir. Waterflooding is the most common method.

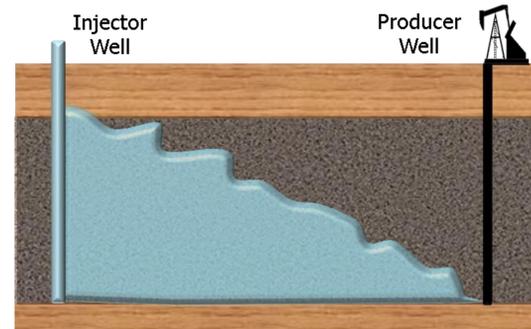


Figure 3. Waterflooding. Modified from (De Ferrer, 2001)

TERTIARY RECOVERY

These methods inject other fluids into the reservoir with the purpose of changing the rocks or fluids properties.

Chemical Injection: Increase water viscosity and change the fluid preference.

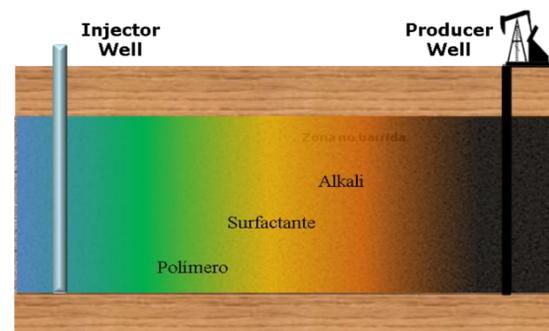


Figure 4. Chemical Injection. Modified from (Green & Willhite, 1998)

Steam Injection: Reduce oil viscosity

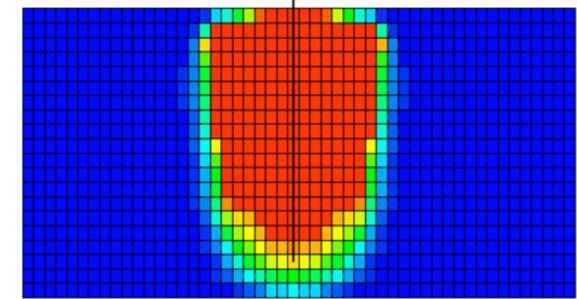


Figure 5. Steam Injection. Modified from (Rodriguez, Munoz, & Palma, 2016)

CONCLUSIONS

Oil recovery methods are the different processes that the oil industry implements in an oilfield to extract the hydrocarbon storage from a reservoir.

These methods are classified into primary, secondary and tertiary recovery. Their selection and implementation depends on the reservoir and fluids properties.

Secondary and tertiary recovery are implemented when there is not enough oil pressure to push the oil in the reservoir to the surface. Although their names have a numerical sequence, their applications are not necessarily in order.

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