CYCLIC MICROBIAL RECOVERY

(A well-stimulation method)

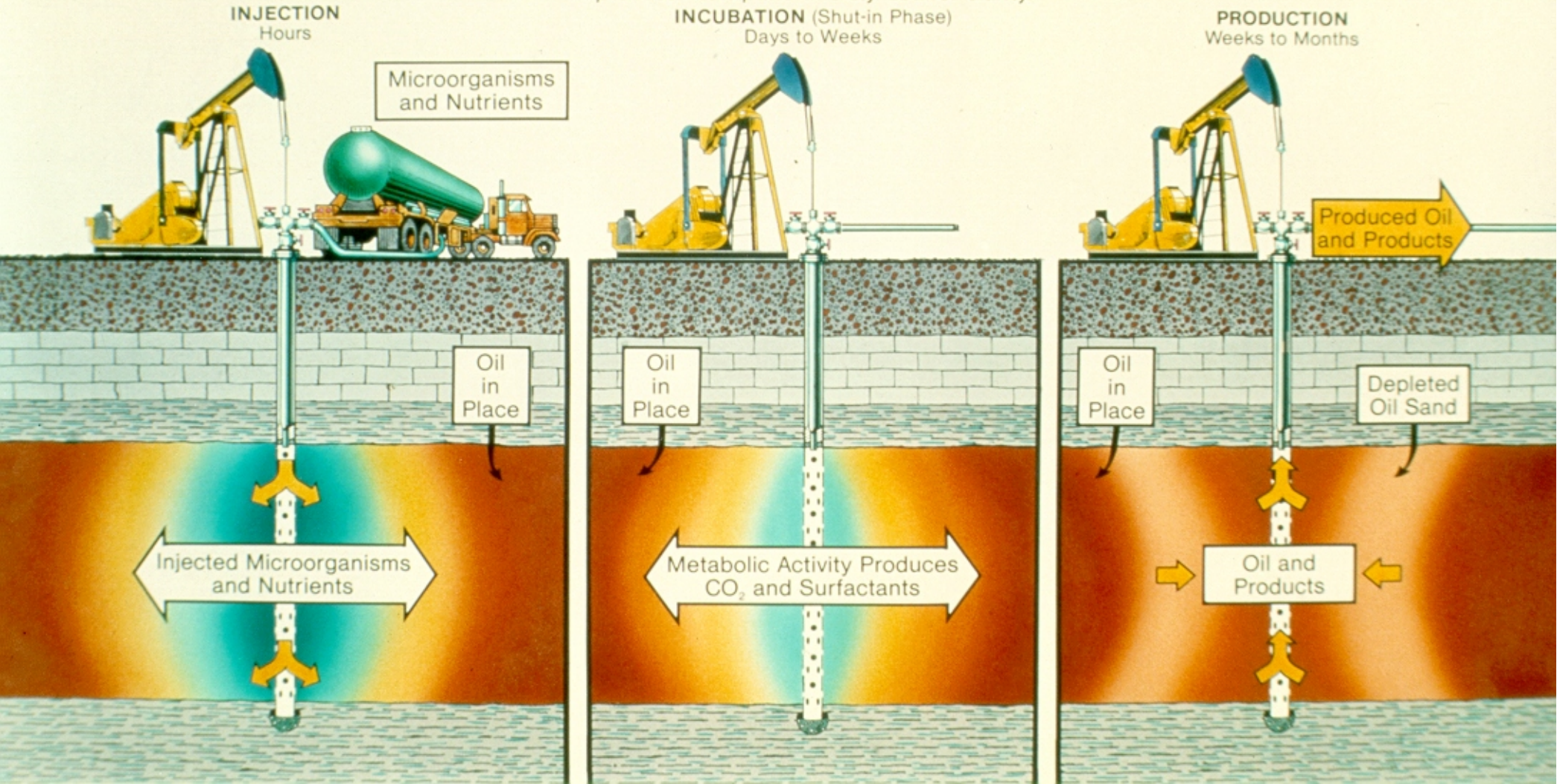
Microbial methods of flooding to enhance oil production include microbial flooding and *cyclic microbial recovery*.

Cyclic microbial recovery, one of the newest EOR methods, requires the injection of a solution of microorganisms and nutrients down a well into an oil reservoir. This injection can usually be performed in a matter of hours, depending on the depth and permeability of the oil-bearing formation. Once injection is accomplished, the injection well is shut in for days to weeks. During this time, known as an incubation or soak period, the microorganisms feed on the nutrients provided and multiply in number. These microorganisms produce substances metabolically that affect the oil in place in ways that facilitate its flow, making it easier to produce. Depending on the microorganisms used, these products may be acids, surfactants, and certain gases, most notably hydrogen and carbon dioxide.

At the end of this period, the well is opened, and the oil and products resulting from this process are produced.

This method eliminates the need for continual injection, but after the production phase is completed a new supply of microorganisms and nutrients must be injected if the process is to be repeated.

CYCLIC MICROBIAL RECOVERY

A solution of microorganisms and nutrients is introduced into an oil reservoir during injection. The injection well is then shut in for an incubation period allowing the microorganisms to produce carbon dioxide gas and surfactants that help to mobilize the oil. The well is then opened and oil and products resulting from the treatment are produced. This process may be repeated.

Schematic portrays one well during the 3 phases of this process. Flow pattern is stylized for clarity.