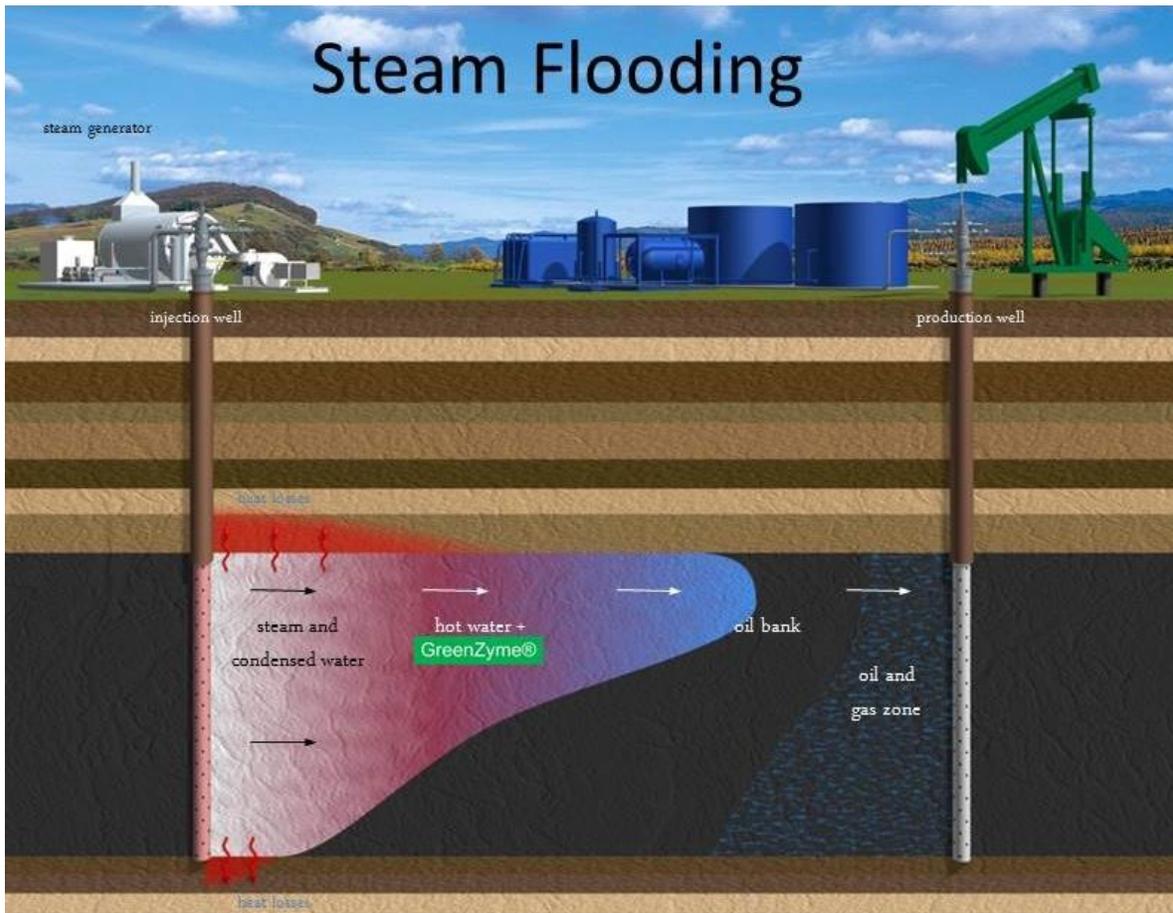


STEAM CYCLIC WITH GreenZyme®

The cyclic steam and enzyme system is comprised of four (4) stages.

1. Pre-treatment
2. Steam injection
3. Soak stage
4. Recovery stage

This cyclic steam and enzyme system is sequential and repeated whenever recovery volumes diminish to a calculated economic break-even point.



In the stage of pre-treatment **GreenZyme®** is diluted and sent to a heater to have the temperature increased to between 80 to 90 degrees Celsius. A sufficient volume of the heated diluted enzymatic fluid is then pumped through an injection

pipe through the downhole well bore and into the oil well formation so as to contact a desirable amount of residual oil particles. The stage of pre-treatment may last from 0-4 weeks stage depending on the type and size of the oil well formation before commencing the steam injection stage. During the stage of pre-treatment the diluted **GreenZyme®** fluid acts to release the oil from solid surfaces, increase the mobility of the oil by reducing surface tension, decreasing contact angles, preventing crude oil that has become less viscous by heating or other means, from re-adhering to itself as it cools and acts catalytically in contacting and releasing oil from solid surfaces. Blockages in the oil well formation may be reduced or eliminated as well.

In the steam injection stage the steam acts to disperse the diluted enzymatic fluid further into the oil well formation to further contact oil particles thereby increasing contact volume.

The heat available to be transferred to the oil well formation and oil particles reacts over a period of time while the well sits idle. The soak stage as it is known, allows the heat to permeate the oil well formation and **GreenZyme®** to reach maximum oil releasing efficiency. **GreenZyme®** remains active in water or hot water included condensed steam and acts catalytically in contacting and releasing oil from solid surfaces. It is not restricted by variations in the American Petroleum Institute (API) specific gravity ratings of the crude oil. The soak stage is depending on the type and size of the oil well formation.

Following the soak stage is the recovery stage the extraction pump is activated.

- **GREENZYME® STEAM STIMULATION AT SHENGLI OILFIELD,, WELL #826. SHENGLI, CHINA.**

Abstract: Showing significantly improved production from a first steam cycle without enzyme fluid (<3,000 bbls oil) to the second steam cycle which **reduced the steam load used by 20%, but injected diluted enzyme fluid as a pre-cursor** (>21,000 bbls oil produced). Both daily production and production for the second steam cycle rose significantly, despite the reduction in steam. The depth of the well indicated (1,700 meters) makes it likely the steam injected reached the intended zone as hot water rather than steam. Well produced a heavy crude with density =1.03. Viscosity 025-30 MPa's. The addition of **Greenzyme®** enhanced production
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