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EOR Thermal Dynamic Technology

This patented environmentally safe biodegradable chemical composition (Composition's components are used in the food industry) is injected into the well to clean perforated zones and stimulates the oil productive formations around the wells. The technology is subdivided into **Thermal Gas Dynamic** and **Thermo Gas Chemical** EOR methods.

Thermal Gas Dynamic EOR Method

After analyzing the specifics of each bedrock formation and each oil well, the specific compositions are injected into well's perforated zone area, creating the specific temperature and dynamic pressure designed for each particular well.

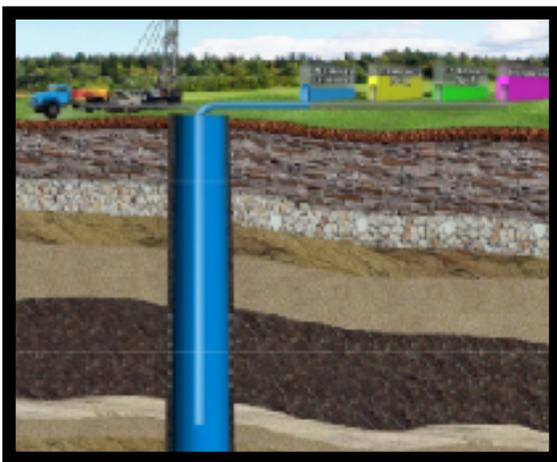
The reaction between injected compositions will start slowly and will last 20 – 30 minutes, depending on specifics of well and total volume of compositions injected into well.

This reaction will create the high pressure up to 1832 degree of Fahrenheit and high pressure up to 1000 MPA. The temperature and pressure is controllable by volumes and specifics of patented compositions that are designed for the specific characteristics of this particular well.

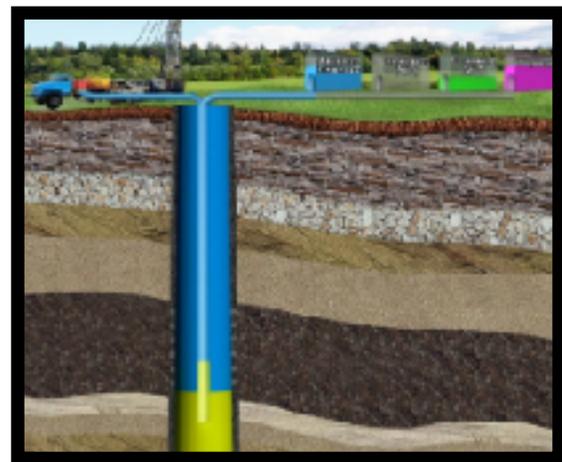
The high pressure creates the micro fractures in oil producing bedrock formations with radius up to 10 meters (33 feet) around perforated zone and cleans this area from clogging (inside and outside of well).

The high temperature and high pressure creates very chemically active positive hydrogen ions, and as a result, melting heavy oil components and breaking long chain hydrocarbons into more short chains (partial oil pyrolysis).

It increases the oil liquidity, oil API and the well's productivity. The results of treatment last up to one year, gradually fading with time.

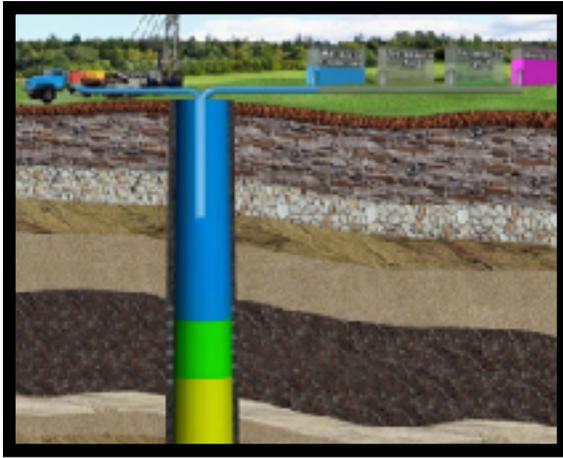


First, well is killed by salt composition injection;

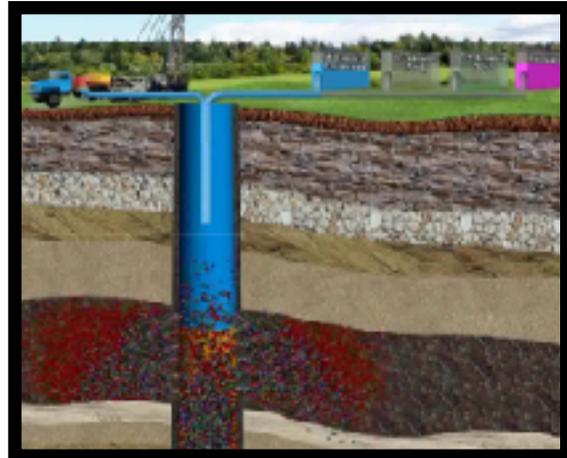


Next, first chemical composition injected into well

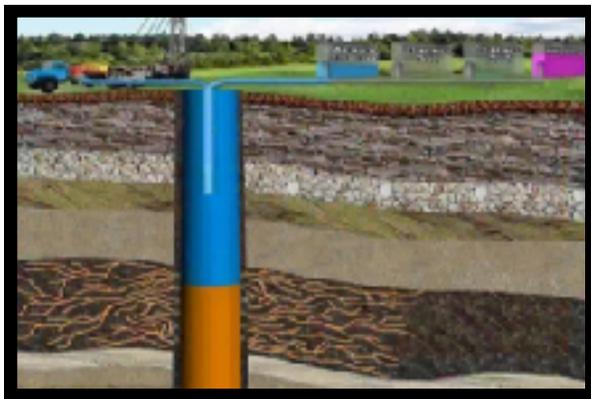
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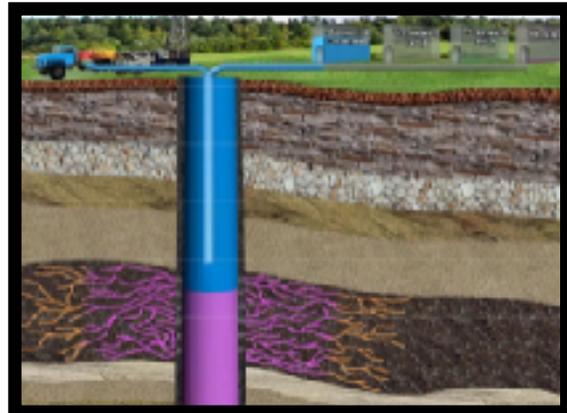
Second chemical composition injected into well;



Thermo chemical reaction of injected compositions;



Micro gaps created in the productive oil layer;



Third chemical is injected to neutralize all chemicals, washing the well and preventing chemicals into it

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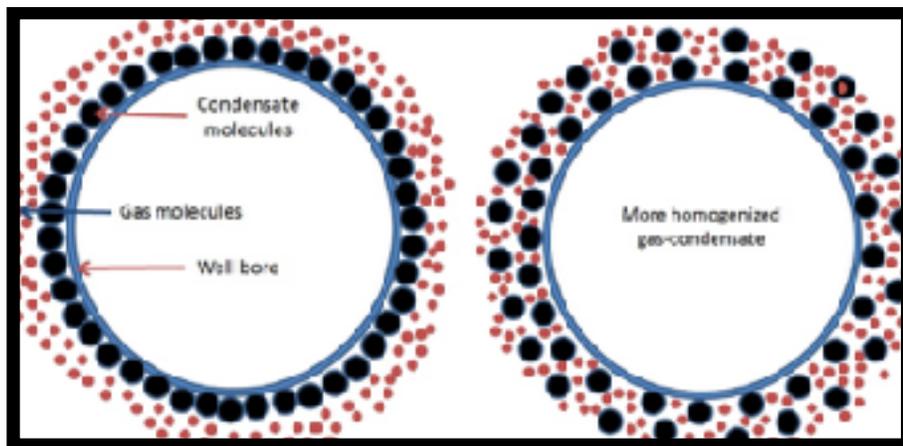
Thermal Gas Chemical EOR Method

This method is mostly used in Gas wells, where the exothermal reaction takes place in the reservoir. This reaction lasts about 20 minutes and in well's perforated zone the temperature increases up to 200C – 600 Celsius (392 -1112 Fahrenheit) and the pressure increases up to 140% of previous pressure level.

Produced heat and pressure exert the shock to the conical gas condensate layer around the perforated zone and the physical and chemical structure of conical gas condensate around well is changed greatly.

Resulting uniform conical gas condensate layer around well opens capillaries in bedrock formation and increases the production of condensate – gas mixture.

The produced heat and energy in this reaction is just enough for changing the conical structure of condensate in the well, so it can't raise the temperature of condensates and gas in the reservoir, and the resultant extracted mixtures has normal temperature. Therefore there is no need to use a cooling process after extraction.



Before thermo gas chemical effect

After thermo gas chemical effect

Another advantage of this method is that by mixing the condensate and gas together, the weight and density of resultant mixture become lower and the gas pressure helps to recover condensate, so the efficiency of condensate recovery is better by using this process.

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Table below shows the efficiency of our oil and gas recovery compared with conventional acid treatment of wells.

Technology	Increased productivity after treatment
Conventional (HCl) acid treatment	-200% - +200%
Thermo Gasification technology	+150% - +500%
Thermo Dynamic gas technology	+500% - +1000%