

INCREASED PRODUCTION THROUGH EMULSION VISCOSITY REDUCERS

EVR More:
Emulsion Viscosity Reducers → More Oil Recovery



NALCO Champion

An Ecolab Company

GOAL: MORE OIL RECOVERY

The goal of all oil producers is to be able to produce more oil more efficiently from their reservoirs. While this is often through focus on large scale tertiary recovery projects, sometimes it is possible to identify a solution to improve the challenges of secondary production. One such challenge is production restrictions, due highly viscous emulsions.

Nalco Champion has developed a treatment programme that meets this challenge. The program combines the ability to select suitable candidate wells and to select a suitable chemical treatment. This targeted approach optimises the additional production revenue for operators, and delivers significant return on investment.

VISCOUS EMULSIONS CAUSE GREATER BACK PRESSURE

The driving force for a producing well is the reservoir pressure. The pressure supports the lifting of the fluid column from the wellbore to the production and processing facility. It is well known that during the lifetime of an oil well the fluid column becomes heavier and it is harder to lift fluids. This is because the water cut naturally increases with the depletion of the reservoir. Most of the time, an artificial lifting system, such as gas lift and ESP, is aiding production.

When the well reaches WC>40%, the productivity can be impacted by a dramatic increase in the viscosity of the fluids: this can lead to severe slugging, premature field abandonment and in general a loss in well productivity.

THE IMPACT OF SLUGGING:

A typical solution to slug flow mitigation is to choke back the slugging wells, cycle them, or in the worst-case scenario shutting them in. All of which leave precious resources in the ground.

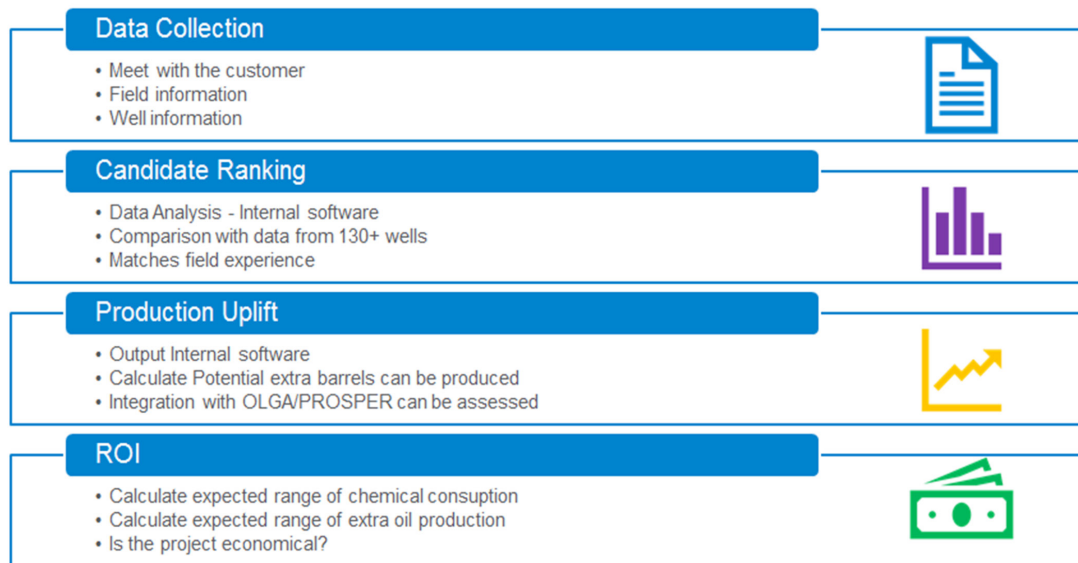
HOW CAN WE CONTROL VISCOSITY?:

The viscosity of the fluids depends on:

- Oil density (API)
- Water Cut
- Temperature
- Emulsion Stability

Temperature, oil density and water cut are all properties of the reservoir or depend on the lifetime of a well. We cannot easily control them. The only parameter we are left with is the emulsion stability.

THE PROCESS



SIGNIFICANT PRODUCTION INCREASES CAN BE OBSERVED

PRIMARY BENEFITS:

The primary benefits of EVR's help the work of the Operations Managers. The application of EVRs results in slugging mitigation, increased production, and uptime. An increase between 1% to 15% of the field production can be expected. The gain potential increases dramatically for wells that are choked back to prevent slugging. Our model will help you simulate the field condition and the expected return of investment.

The model also allows targeting wells which are most likely to give the greatest returns. Increasing the chances of a successful application.

SECONDARY BENEFITS:

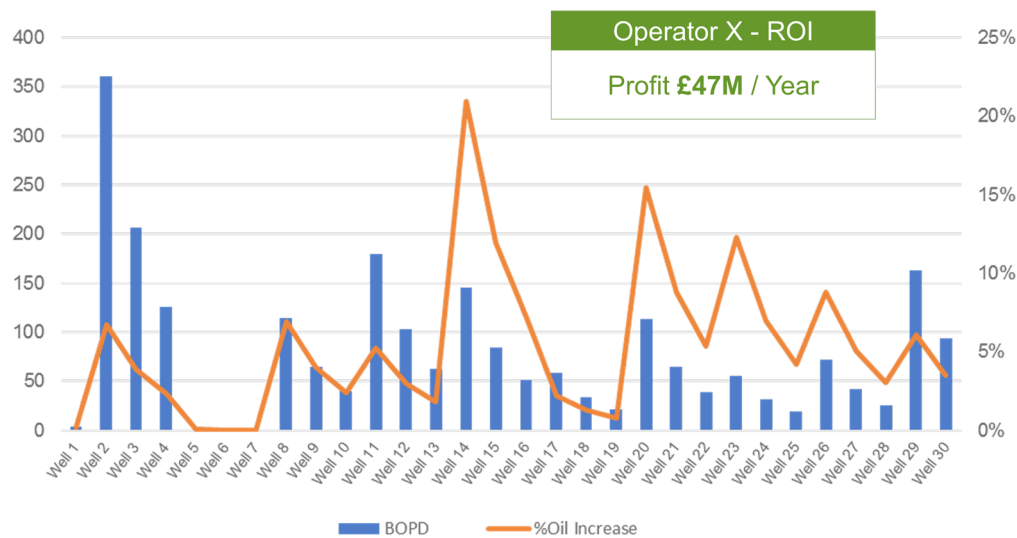
The secondary benefits of EVR's help the work of the Production Engineers: with this newly enhanced well chokes can be opened further, and one can reoptimize the lifting strategy based on new conditions. Most of the time this means more gas lift available to lift lower water cut wells. More over, downtime due to slugging is removed and startup time is shortened. The combination leads to an overall increase in the oil production from a field.

TERTIARY BENEFITS:

Tertiary benefits of EVR's help the work of the Process Engineers: fluid production is more stable (less slugging), flowline capacity can be maximized, and separator efficiency is increased. The net result of these impacts are drier oil and cleaner water.

REVIEW AND ANALYSIS

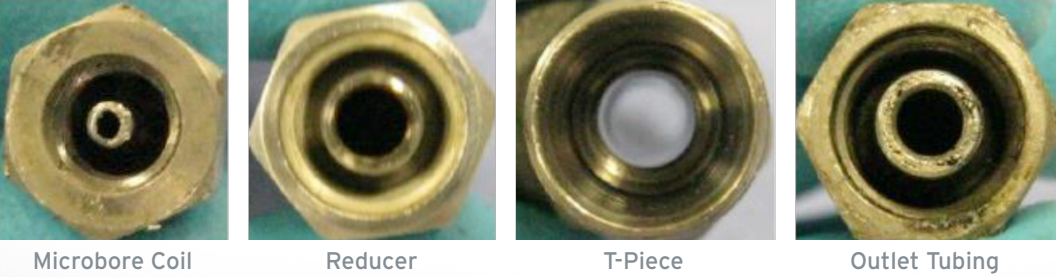
MODELLING TO IDENTIFY CANDIDATE WELLS:



PRODUCT DEVELOPMENT THROUGH BESPOKE TESTING:



PRODUCT QUALIFICATION FOR INJECTION METHOD:



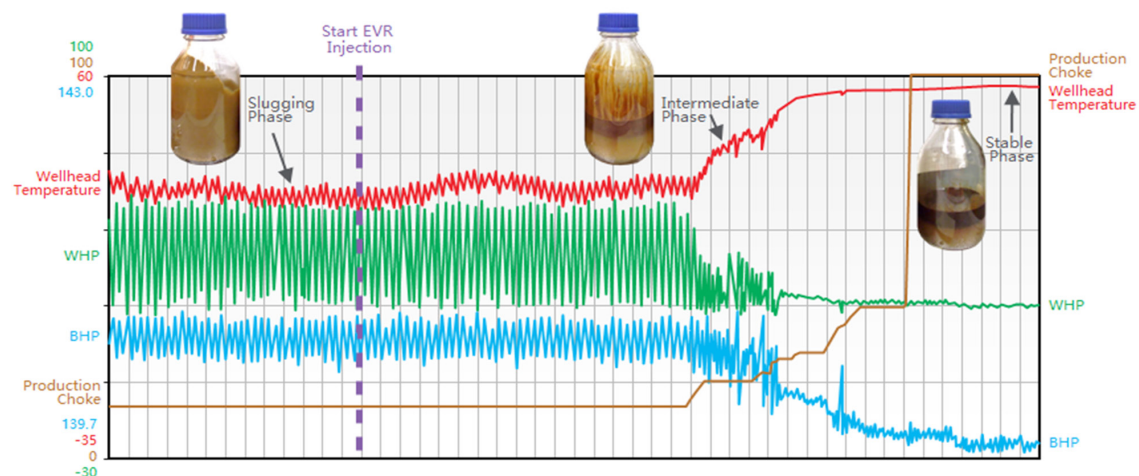
THE SOLUTION

Nalco Champion has developed a solution. Emulsion Viscosity Reducers (EVR's) can eliminate the detrimental impacts of increased emulsion viscosity on production, leading to more production.

Injected downhole by gas lift or capillary strings, EVR's will act upon contact with fluids to prevent emulsion formation or remove already formed emulsion. The effect of applying EVR's is an immediate reduction of the fluid viscosity. Because of the reduced fluid viscosity, slugging is reduced/eliminated, the flowing bottomhole pressure stabilizes at a lower level, and the drawdown is increased leading to increased fluid production. This is a low risk method of potentially significantly increasing production.

Candidate wells can be identified through modelling and the project can go from concept to the field in weeks, leading to high ROI, improved process stability and potentially extended field lifetime.

Reduction in viscosity results in reduction in back pressure, which results in increased production. If wells are slugging this can be significantly reduced, enabling the choke to be opened more fully and further production gains obtained.



The Nalco Champion programme is a field proven answer to viscosity constrained production. After careful selection of candidate wells and products it is simple and low risk to deploy. It is even simpler to demonstrate value delivery through increased oil flow.

Taking Energy Further™

Nalco Champion, an Ecolab company, offers a singular focus on providing speciality chemistry programmes and related services for upstream, midstream, and downstream oil and gas operations. Through on site problem solving and the application of innovative technologies, we deliver sustainable solutions to overcome complex challenges in the world's toughest energy frontiers. Together, we're taking energy further.

Contact EVR@ecolab.com, or visit nalcochampion.com to learn more.

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