

Figure 3. Underlying aquifer contributing water to perforation interval via cement channels⁵

pens after the fluid leaves the perforation tunnels is not realized. Under shut-in conditions SNL identified cross flow occurring behind casing, and under flowing conditions identified behind pipe (reservoir) injection profile. This behind pipe injection profile was then quantified by temperature simulation.

Producer Wells

Optimal production is achieved when reservoir productivity index and completion component (cement sheath, ISO-packer) isolation performance is strong. Under-producing pay zones result in delayed, and often uneven, layer production. Completion component isolation failure allows for out of target interval reservoir and/or aquifer fluid contribution. For smart completions this means a total loss of production / injection control. In this case SNL has identified contribution of layers out-with the perforation interval, and provided evaluation of the pay zone interval performance. Assessing wells with this measure-

ment allows for effective work over planning with respect to water shut-off strategy and reservoir stimulation well candidates.

Conclusion

Assessing reservoir and completion performance is critical for effective reservoir management; sustaining optimal productivity and maximising recovery. Spectral noise logging captures and distinguishes between noise generated from flow occurring within the completion itself (leaking pipes and packers, cement channels, etc.) and flow happening 3 – 5 meters into the formation itself (matrix and fractures).

Spectral Noise Logging For Injectors:

- Locate and constrain limits of injection into layers behind pipe (within and out with perforation interval)
- Detect and differentiate between wellbore and behind casing cross-flows

- Identify leaks occurring across any completion components (tubing, casings, packers, completion jewellery, cement)

Spectral Noise Logging For Producers:

- Locate and constrain limits of producing layers behind pipe (within and out with perforation interval)
- Detect and differentiate between wellbore and behind casing cross-flows
- Identify leaks occurring across any completion components (tubing, casings, packers, completion jewellery, cement)

Continuous solids removal assures continuous production

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There are a number of aging oil and gas wells in production globally in addition to an increasing number of HPHT wells being drilled and set in production. Both aging wells and HPHT wells have significant challenges related to solids control while at the same time maintaining optimal well flow.

With these challenges present the Oil & Gas Industry must focus on working smarter and more efficiently. There has never been a greater need to apply new technology and implement innovative solutions. It is a fact that solids removal technology plays a major role in materially reducing costs and improving production efficiency in solids producing wells.

Solids removal technology enables Operators to increase the flow rate from producing wells while at the same time staying within the acceptable sand rate (ASR) criteria. This results in improved oil recovery at a lower cost per barrel. Solids removal technology provides a proven solution to maximising profit from each barrel of oil and/or gas. While the oil price is not something Opera-

tors can directly affect – increased production rates can compensate for loss of revenue while the oil price stays low. Further, solids removal technology reduces all direct and indirect costs related to reactive sand management:

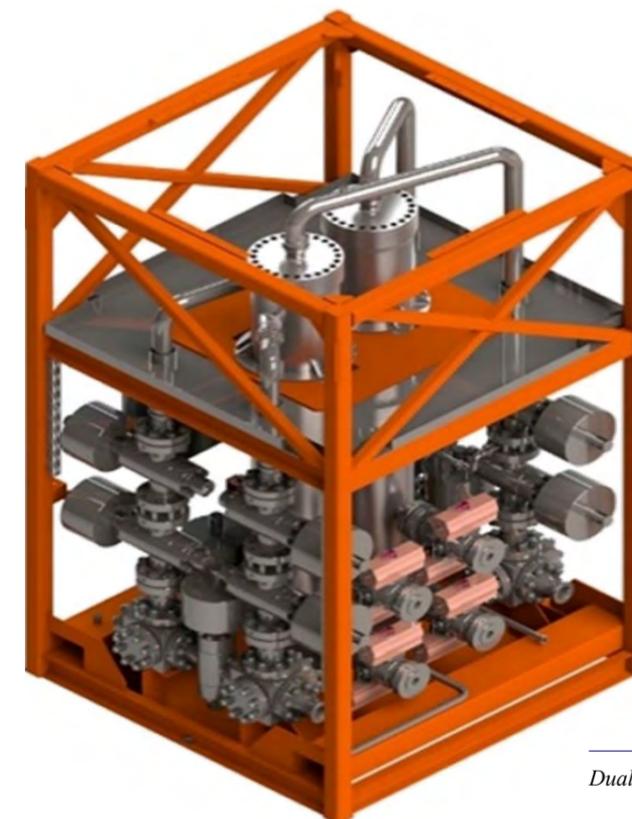
- Well intervention activities such as coiled tubing (CT) and snubbing clean-outs
- Separator cleaning and sand handling
- Heavy lifting
- Erosion of process plant
- POB necessary for doing maintenance on equipment suffering from sand production

Gullfakcs C, Statoil has been among the pioneers in implementing FourPhase’s continuous production unit – DualFlow. In the paper presented by Statoil at SPE Sand Management Forum in 2014*, Statoil highlighted the benefits achieved by installing the DualFlow unit for continuous solids removal. According to the presentation, FourPhase’s technology resulted in operational benefits (less jetting work, reduced sand problems in process plant, only one rig-up), cost savings (sand handling done offshore by reinjection, less need for CT sand clean out, more time for alternative CT operations) and improved oil recovery (higher flow rates without exceeding ASR, less down time for wells, optimised well performance).

FourPhase has proven to highly reduce and, in some cases, eliminate the need for costly intervention operations. In addition, providing uninterrupted continuous production.

Contact us to learn more about how FourPhase can revolutionize sand management on your installation.

*Optimization of well performance by use of a semi-permanent dynamic desander – SPE SMN European Sand Management Forum 26-27 March 2014



DualFlow – dual non-motorized desander

⁵R. Bhagavatula, M.F. Al-Ajmi, et al Kuwait Oil Company, F.Y. Shnaib, I. Aslanyan, et al, TGT Oilfield Services, An Integrated Downhole Production Logging Suite for Locating Water Sources in Oil Production Wells, 2015, SPE-178112-MS, paper was presented at the SPE Oil and