

CASE STUDY

EVALUATION OF AN INJECTION DISTRIBUTION BY **STREAM[™]** IN HORIZONTAL WATER INJECTOR ENABLED THE OPERATOR TO ASSESS THE EFFICIENCY OF THE CaCO₃ TREATMENT

Location: Middle East

Well type: horizontal water injector

Average injection rate: 1500 bpd

Challenge: to evaluate CaCO₃ treatment efficiency of the horizontal open hoe water injection well.

Objective: to assess changes in water injection distribution before and after the $CaCO_3$ treatment.

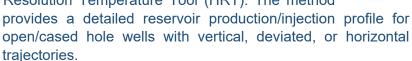
Solution: the injection profile evaluation was proposed to be done by the STREAM™ including T-FLOW FIND and technologies. Such а combination of technologies enables construction of detailed injection profiles water the horizontal across section of the well expected addressing redistribution of injection after CaCO₃ treatment.

STREAM[™] (SPINNERLESS TECHNOLOGIES for RELIABLE EVALUATION, ANALYSIS, and MODELING of well-reservoir flow)

A powerful suite of tools and technologies that provide highresolution and accurate logging capabilities. STREAM is an integration of FIND, TFT, and T-FLOW technologies, working in harmony perfect to unlock unparalleled insights into the processes occurring inside and beyond the wellbore.



The math solver allows predicting the heat exchange between the wellbore and the reservoir based on hydro/ thermo-dynamic theory and highresolution temperature data acquired by the High-Resolution Temperature Tool (HRT). The method



FIND (Flow Identifying Noise Detector)

A new-generation spectral noise logging tool records data by four channels with different frequency ranges and amplification to signal. It allows to provide detailed full-spectrum acoustic profile without distortion, including wellbore/reservoir flow intervals detailing, fractures localization, leak detection, and flow behind the casing determination.

FIND

HRT



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Results

According to the T-FLOW profiling, which was done before the CaCO₃ treatment, a detailed injection profile revealed a nonuniform distribution of injection and localized the main injection zone across the first half of the open hole section. The FIND's Channel 4 data confirms the T-FLOW profile indicating the major high-frequency horizontal anomalies across the main injection zone related to reservoir fractured flow.

The T-FLOW profiling conducted after the CaCO₃ treatment shows explicit changes of profile and more uniform distribution of water injection (refer to the chart below). The FIND's Channel 4 data presents drastic changes in reservoir flow response by the spiky type of horizontal noise anomalies across the middle section of the logging interval confirming injection distribution changes.

Major outcomes

- detailed injection profiles before and after the treatment
- confirmed redistribution of the injection after the treatment
- STREAM[™] as a reliable suite to evaluate the efficiency of the CaCO₃ treatment

