



COMPANY PROFILE

ABOUT US

North Side provides innovative solutions for well and reservoir performance evaluation through “tailored to clients’ needs” cased hole wireline technologies and downhole tools.

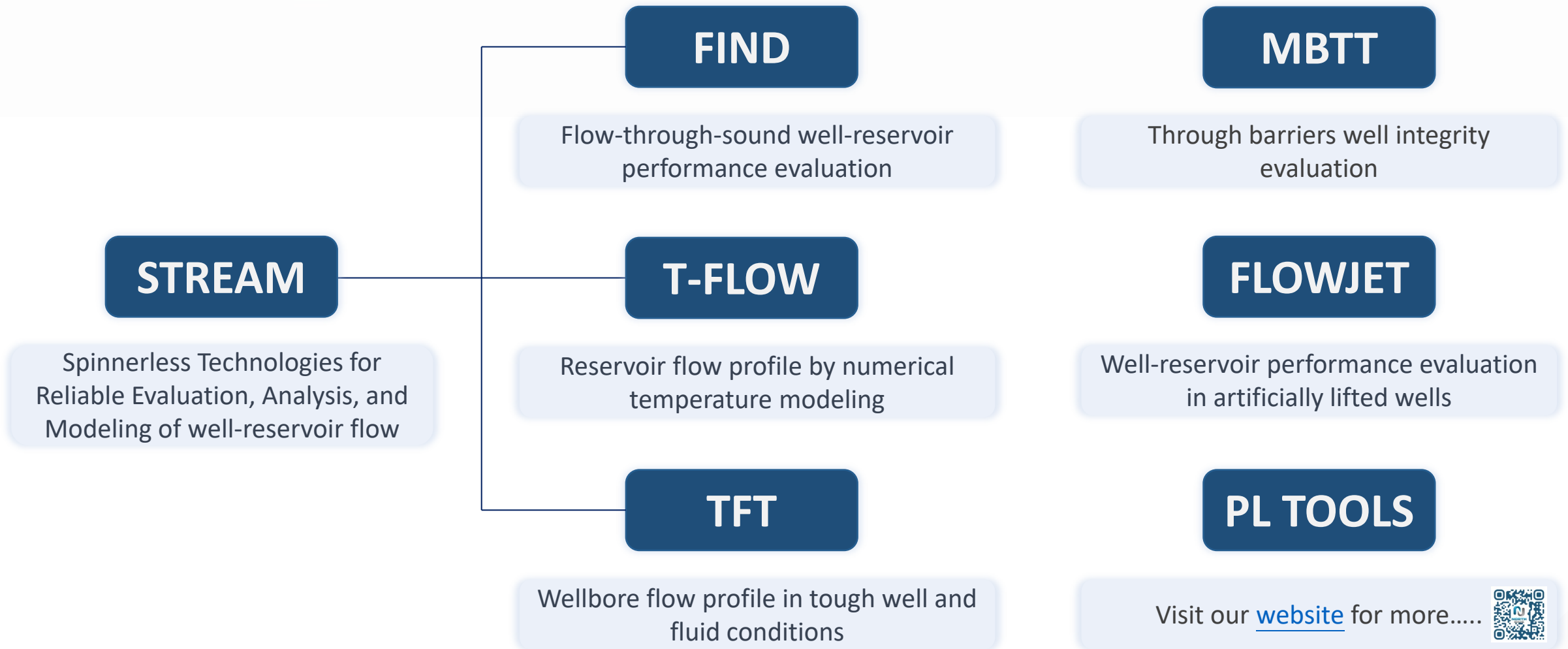
With a Team of highly skilled experts, we bring a wealth of experience and technical knowledge to every project we undertake. Our commitment to excellence is reflected in our outstanding track record, having successfully performed logging operations in hundreds of production and injection wells.

We take pride in our over-decade industry experience, which has enabled us to establish ourselves as a trusted and reliable partner. As a customer-centric organization, we strive to exceed expectations, delivering practical cased hole logging solutions and exceptional service.

Contact us for STREAM (FIND, TFT, T-FLOW), FLOWJET, MBTT technologies, and cased hole logging tools to unlock your well potential or resolve integrity challenges.



TECHNOLOGIES, TOOLS AND SOLUTIONS

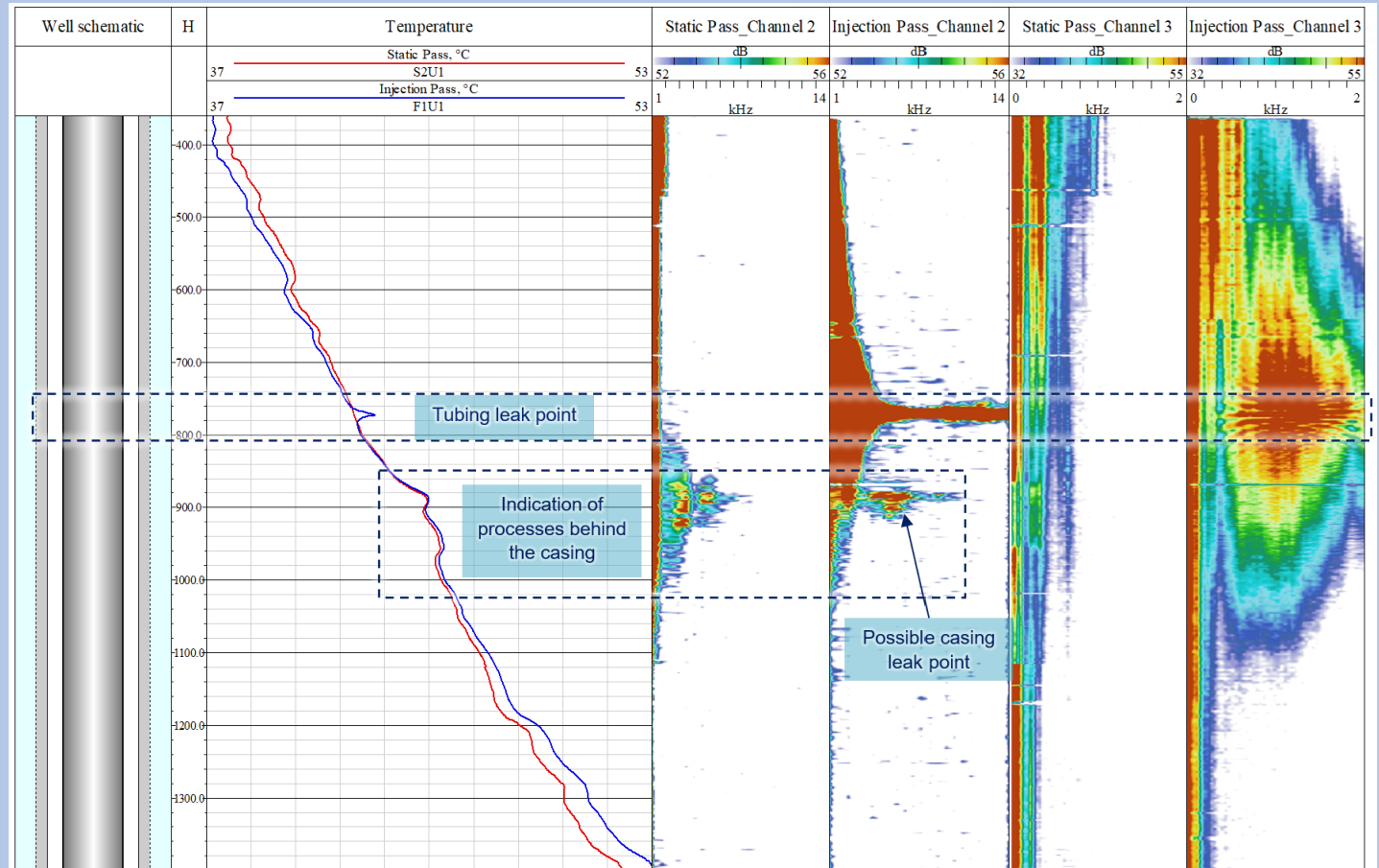


FLOW IDENTIFYING NOISE DETECTOR (FIND)

Flow Identifying Noise Detector (FIND) is a complex technology solution comprised of the high-fidelity multi-sensor split channels spectral noise logging tool with the most advanced algorithms in data processing and analysis software. FIND is developed to assess well integrity and provide detailed profiles of well-reservoir flow.

- ✓ Response from active leak interval at various frequencies and amplitude against well completion
- ✓ Processes behind casing/liner
- ✓ Reservoir performance evaluation

FIND CASE (LEAK DETECTION)

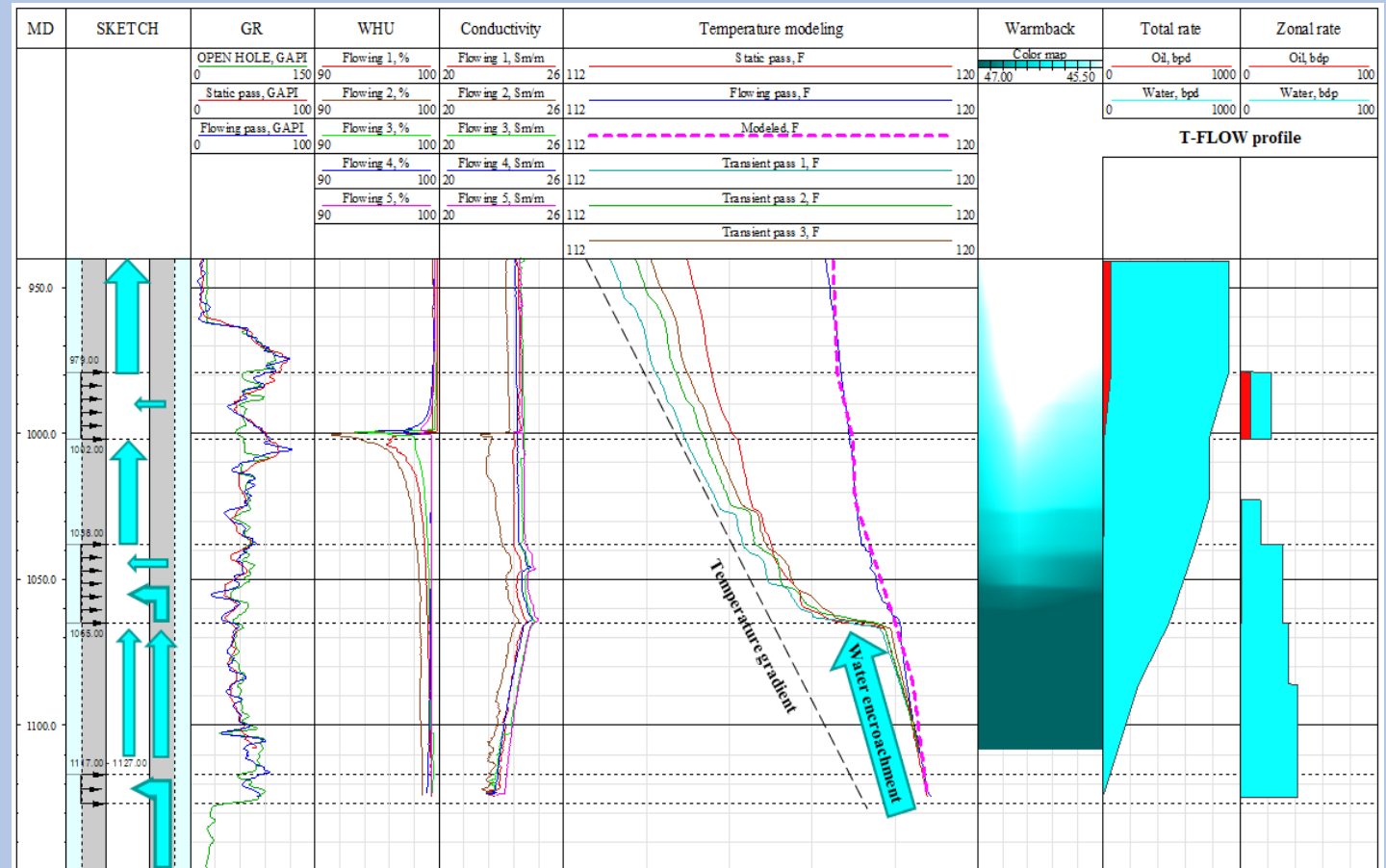


HIGH RESOLUTION TEMPERATURE MODELING (T-FLOW)

T-FLOW is an advanced numerical temperature simulation technology enabling comprehensive evaluation of reservoir flow profile behind the casing and open-hole wells. The technology is based on high-resolution temperature data acquisition and subsequent processing in in-house software.

- ✓ Quantitative reservoir performance evaluation
- ✓ Through-casing technology
- ✓ 100% data acquisition assurance

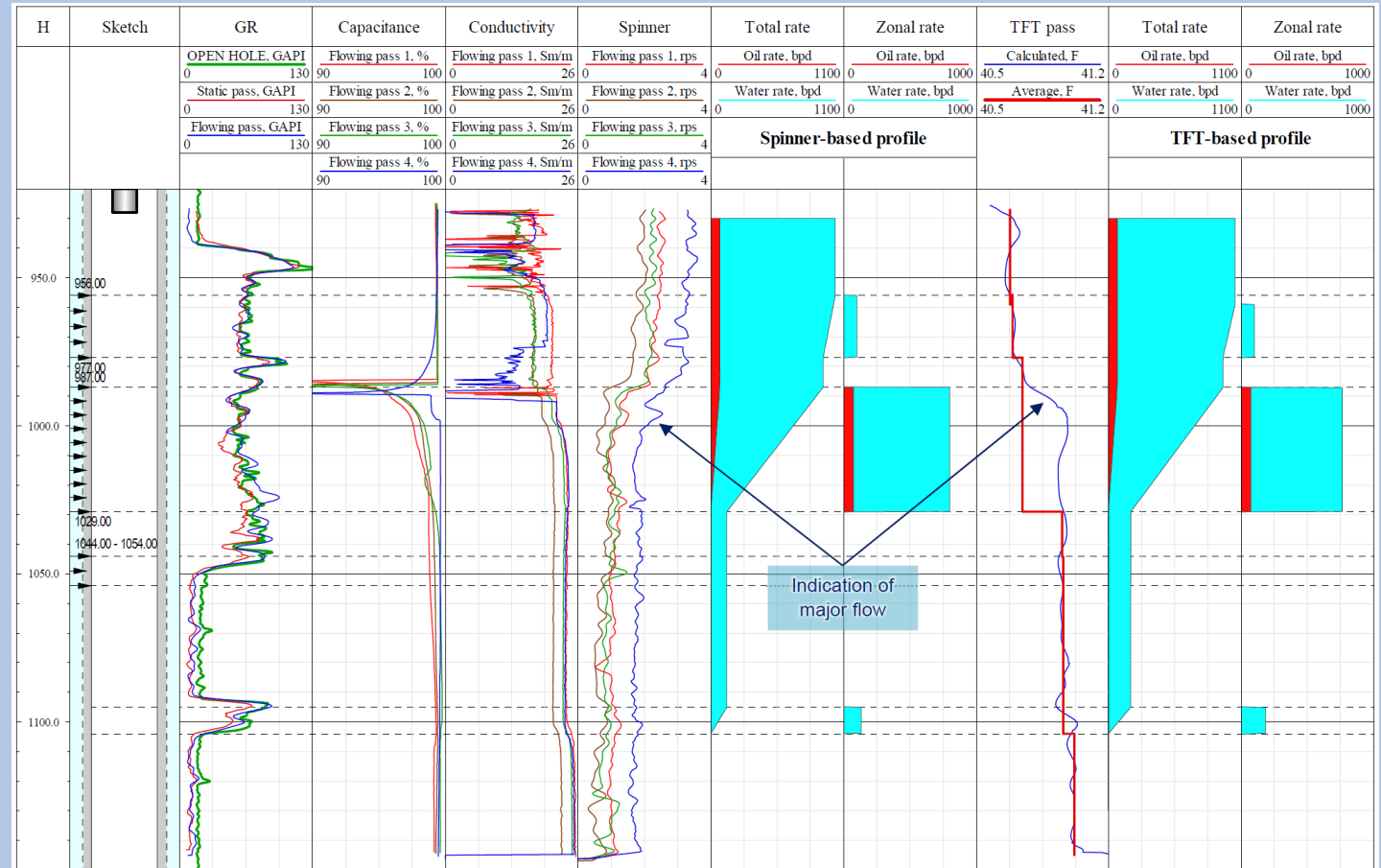
T-FLOW CASE (HIGHLY DEVIATED OIL PRODUCER)



THERMAL FLOW TECHNOLOGY (TFT)

Thermal Flow Technology (TFT) is an advanced solution for the accurate assessment of wellbore flow profile. This comprehensive system combines a high-sensitivity and wide-range flow logging tool with cutting-edge data processing software. The Thermal Flow Technology (TFT) offers the unique advantage of determining fluid velocity without the need for spinners, even in challenging logging conditions typically encountered in horizontal oil producers and polymer injectors.

TFT vs SPINNER CASE (HIGHLY DEVIATED OIL PRODUCER)

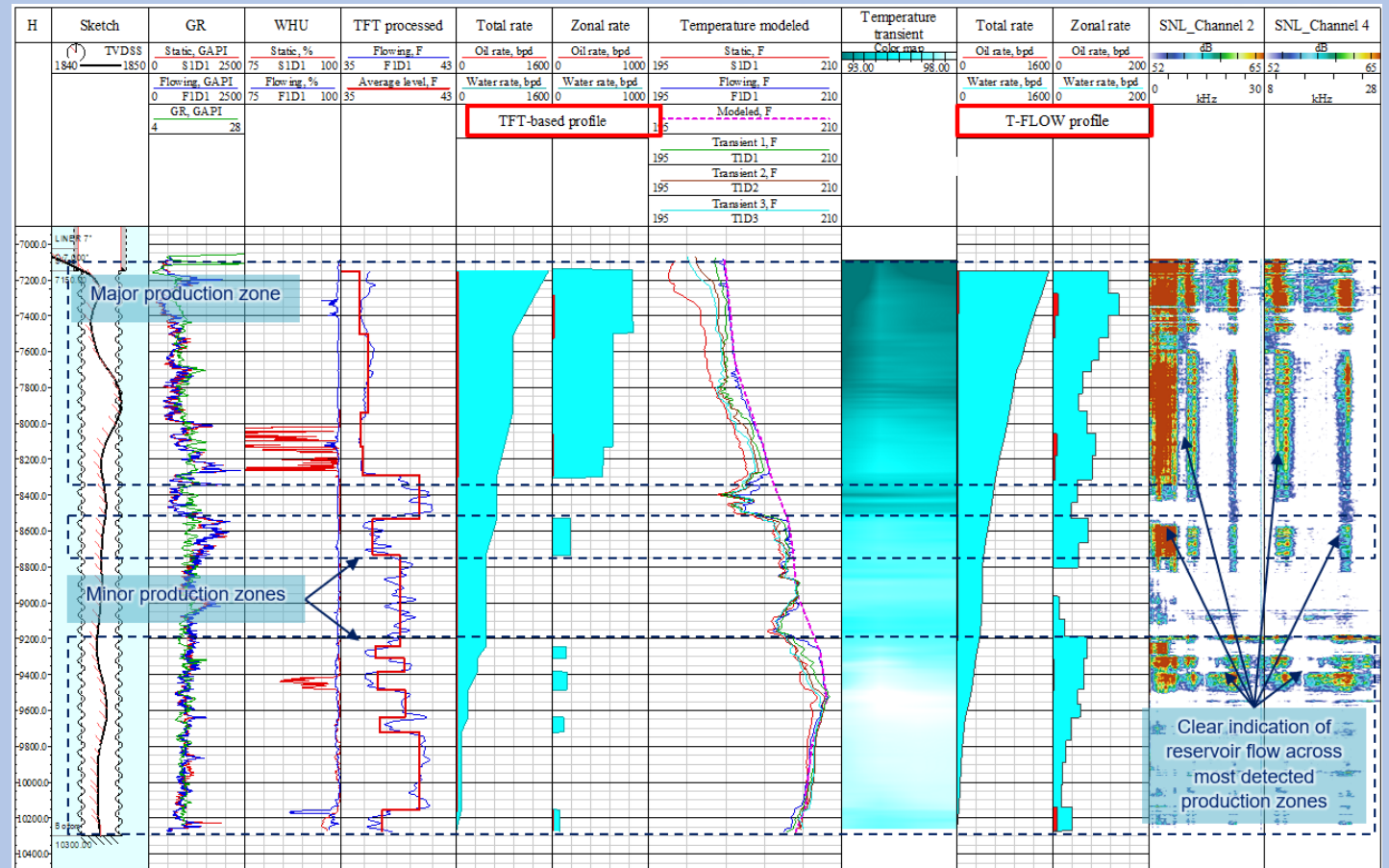


STREAM

Spinnerless Technologies for Reliable Evaluation, Analysis and Modeling of well-reservoir flow (**STREAM**) is a powerful suite of tools and technologies that provide high-resolution and accurate logging capabilities. STREAM is an integration of FIND, TFT AND T-FLOW technologies, working in perfect harmony to unlock unparalleled insights into the processes occurring inside and beyond the wellbore.

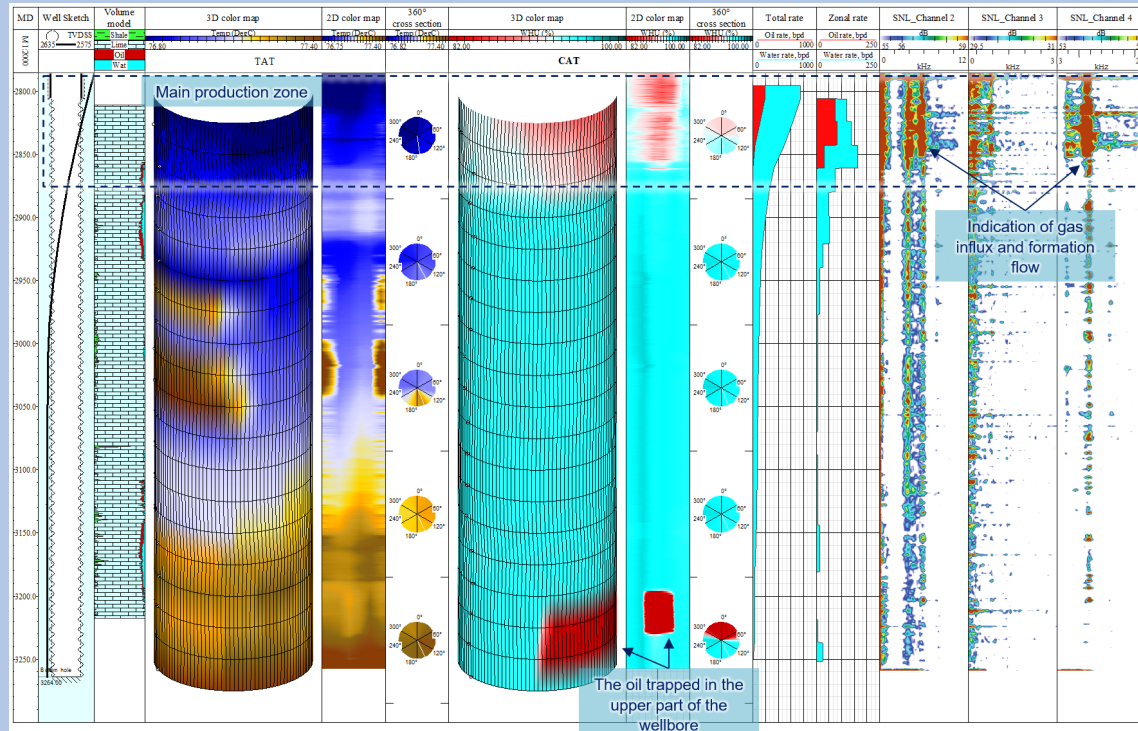
- ✓ FIND
- ✓ T-FLOW
- ✓ TFT

STREAM CASE (HORIZONTAL OIL PRODUCER)

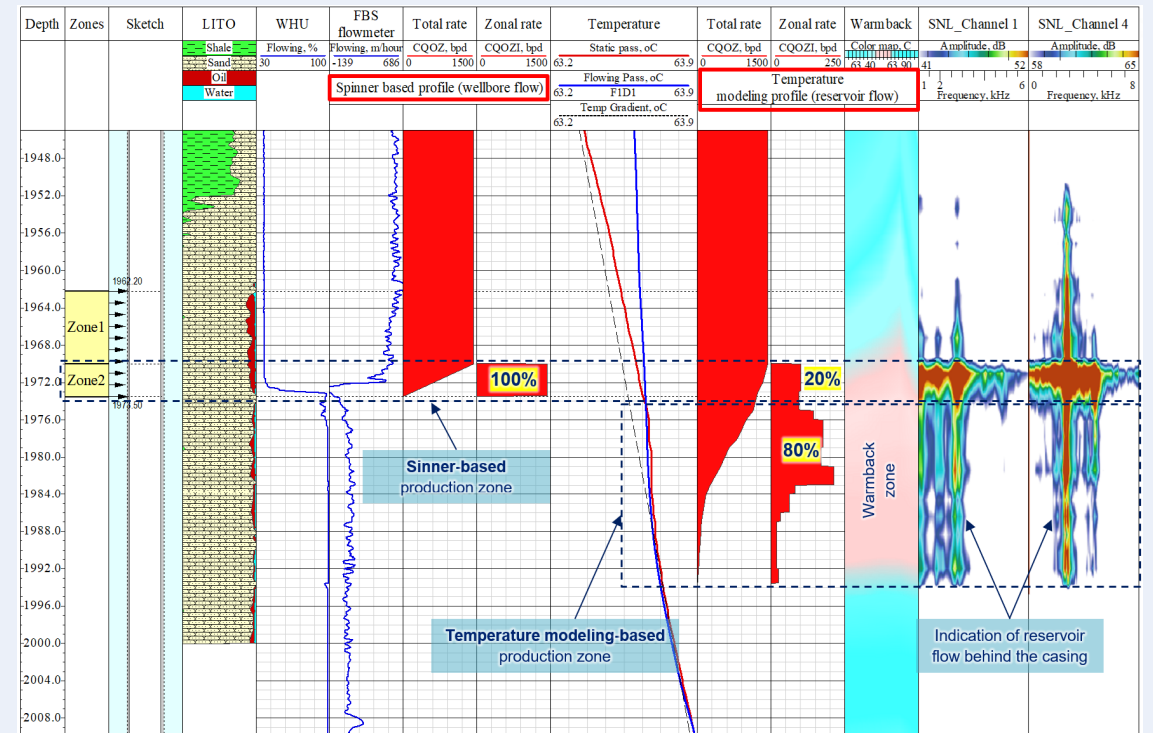


STREAM CASE STUDIES

ARRAY STREAM CASE HORIZONTAL OIL PRODUCER

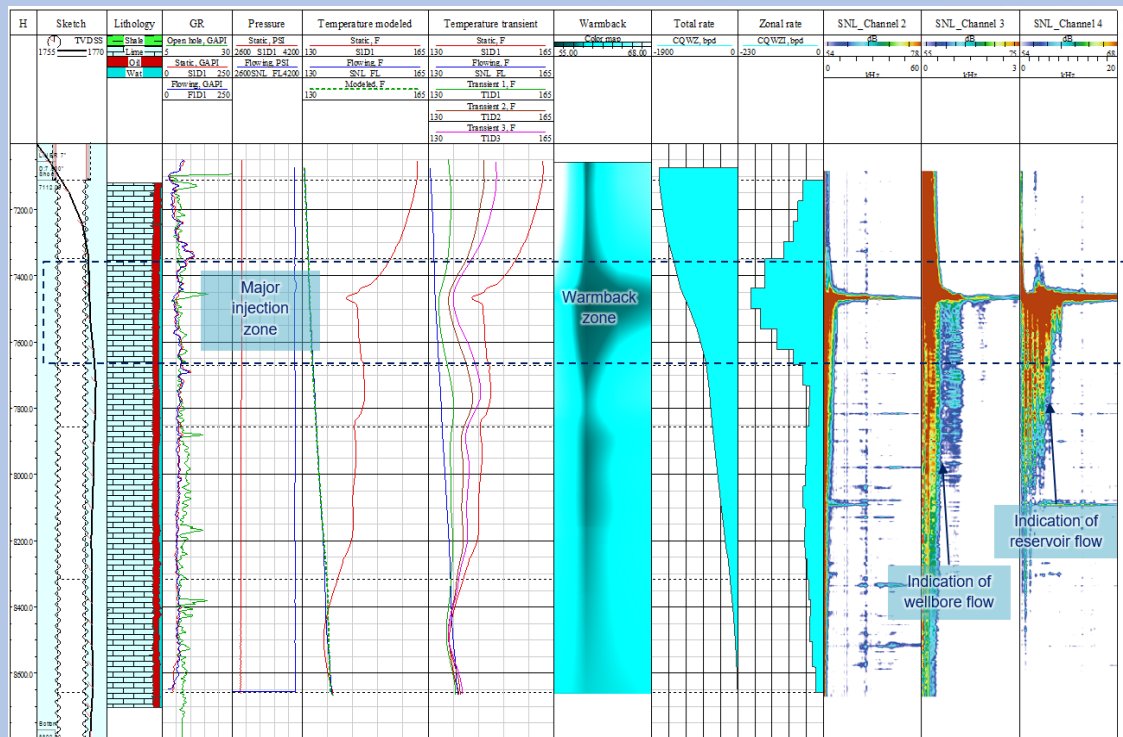


CONVENTIONAL MPLT vs STREAM VERTICAL OIL PRODUCER

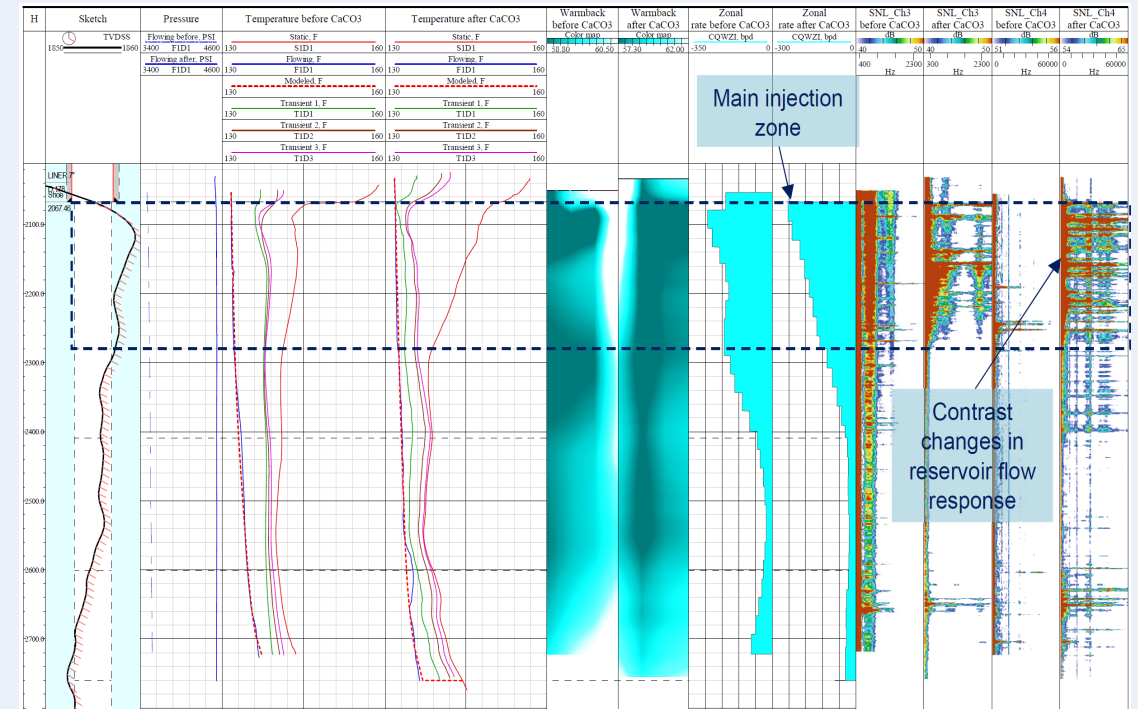


STREAM CASE STUDIES

FRACTURE INJECTION HORIZONTAL WATER INJECTOR



BEFORE AND AFTER CaCO₃ TREATMENT HORIZONTAL WATER INJECTOR

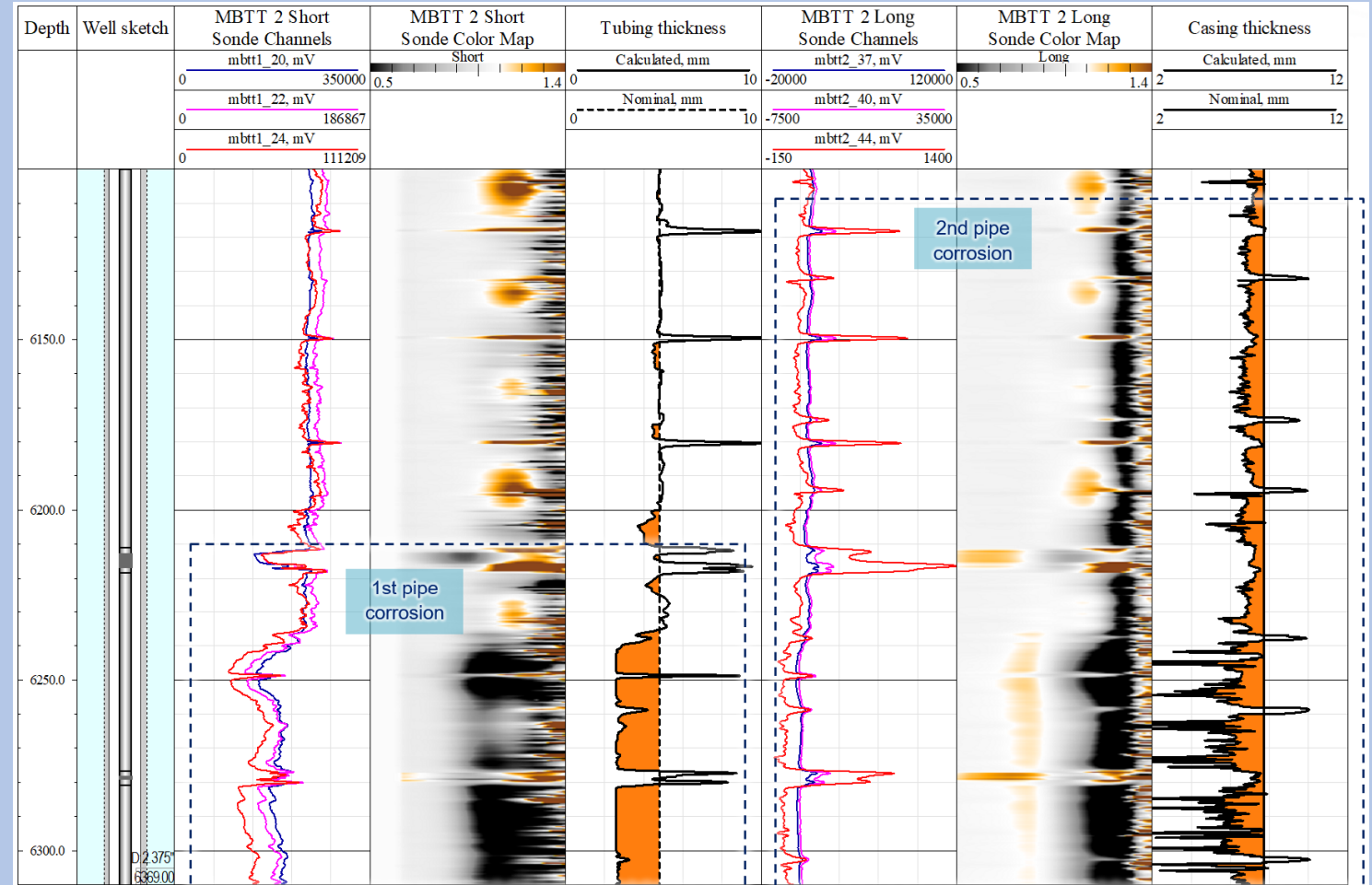


MULTIBARRIER THICKNESS TECHNOLOGY (MBTT)

Multi Barrier Thickness Technology (MBTT), an EM-based solution for accurate evaluation of metal loss of the well tubulars, pipe-by-pipe, up to 4 barriers even with scale deposition. MBTT technology utilizes autonomous corrosion logging tools and specialized in-house software for processing and analysis ofquired data.

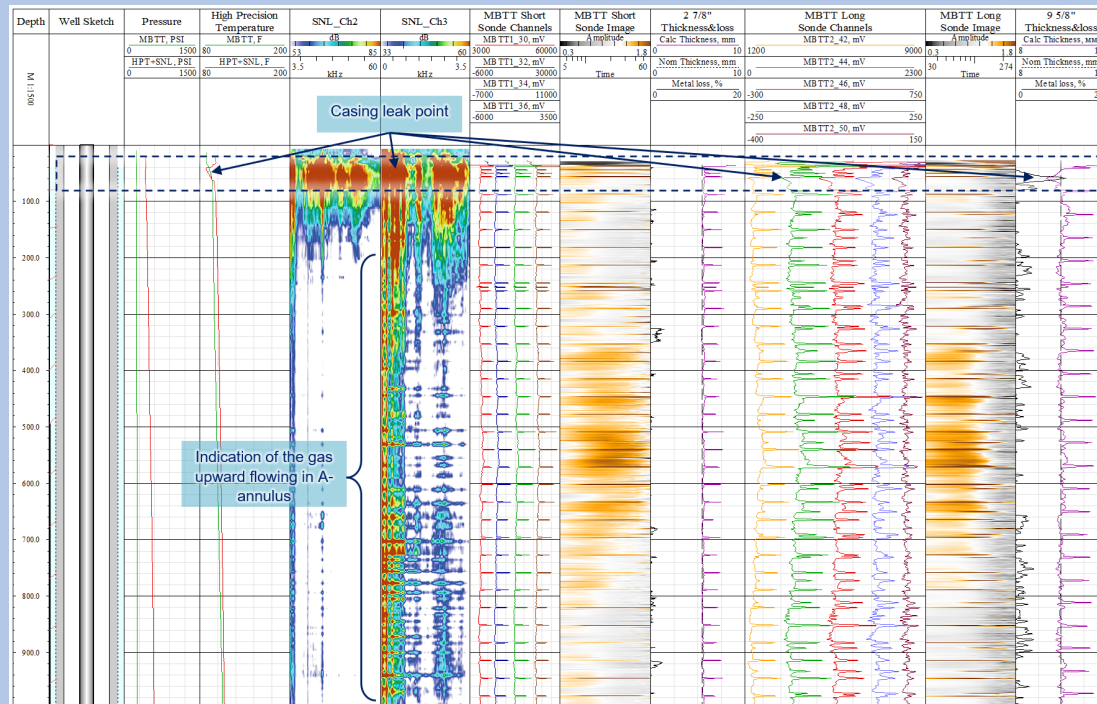
- ✓ Slickline conveyed
- ✓ 4-barrier memory mode tool
- ✓ Azimuthal distribution of EM sensors
- ✓ Accurate depth control (GR)
- ✓ T and P additional sensors in the tool

MBTT CASE (2 PIPES CORROSION)

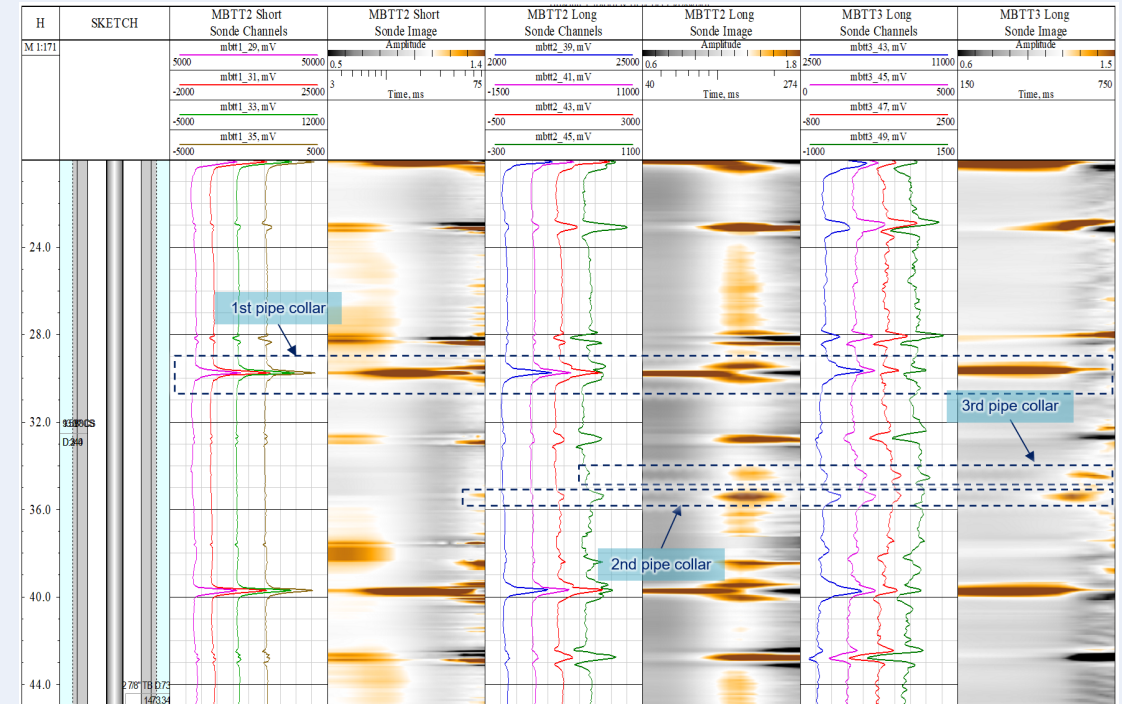


MBTT CASE STUDIES

LEAK DETECTION CASE MBTT-FIND TECHNOLOGY



MBTT CASE 3 PIPES RESPONSE

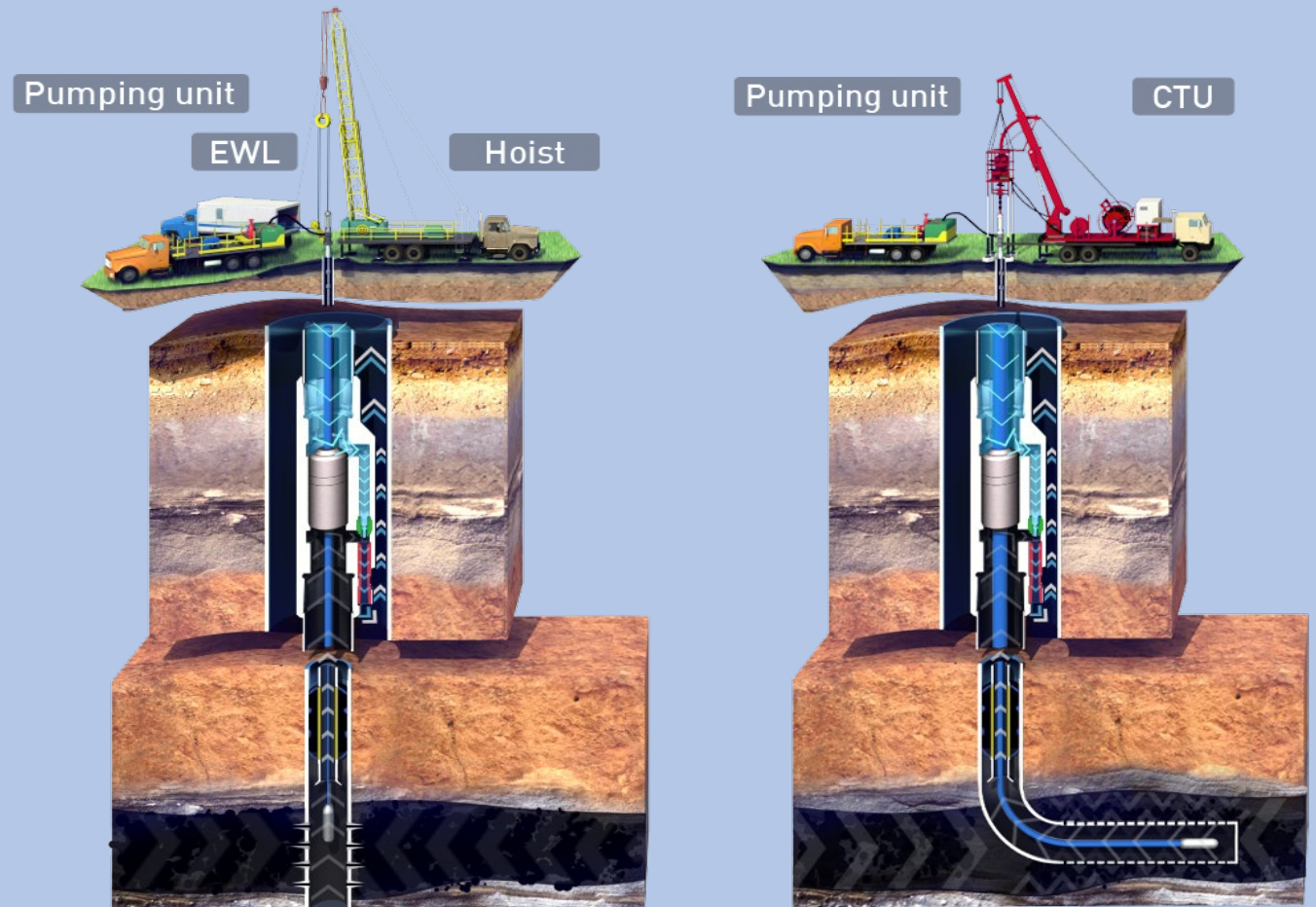


FLOWJET

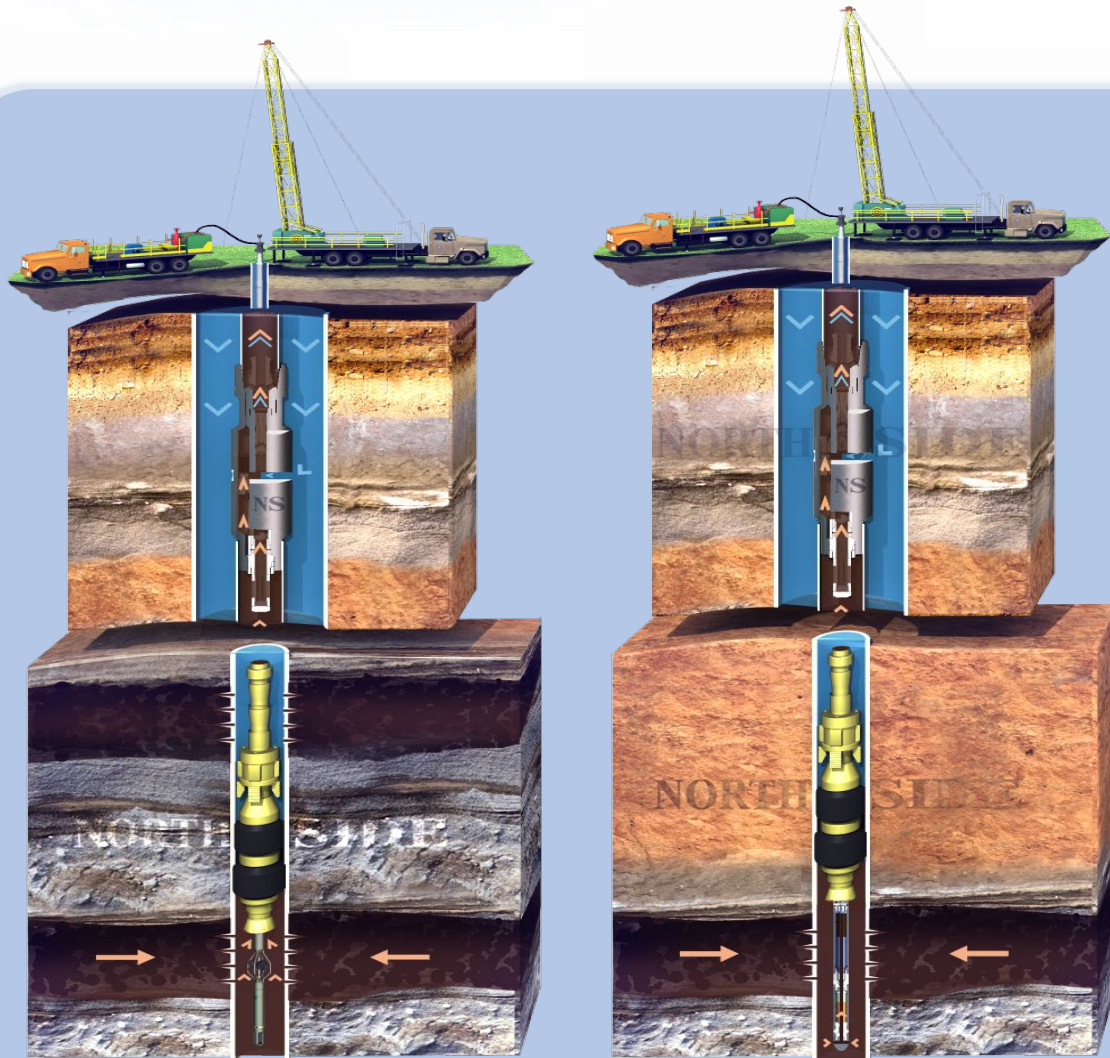
FlowJet® is a cutting-edge technology engineered to efficiently lift the sub-hydrostatic oil wells during Production Logging Survey. This technology provides a seamless solution for PCP, BP, and ESP wells eliminating the need for a Y-tool or Dual string in their completion. FlowJet simplifies the PLT survey, ensuring smooth operations and accurate data acquisition.

- ✓ PLT in artificially lifted wells
- ✓ No Y-tool required
- ✓ Variable rate
- ✓ Logging on an opportunity basis at failed AL replacement WO
- ✓ Immediate result for workover continuation
- ✓ Cost-effective solution

MPLT IN ARTIFICIALLY LIFTED WELLS



FLOWJET FOR DST



Drill Stem Test with FlowJet® is the best way to test multilayered formations zone by zone creating variable drawdown to the reservoir to evaluate its performance at different flow regimes. MEFM tool helps to measure gross rate, water cut, pressure and temperature during production test downhole with unlimited test duration, perform PBUS.

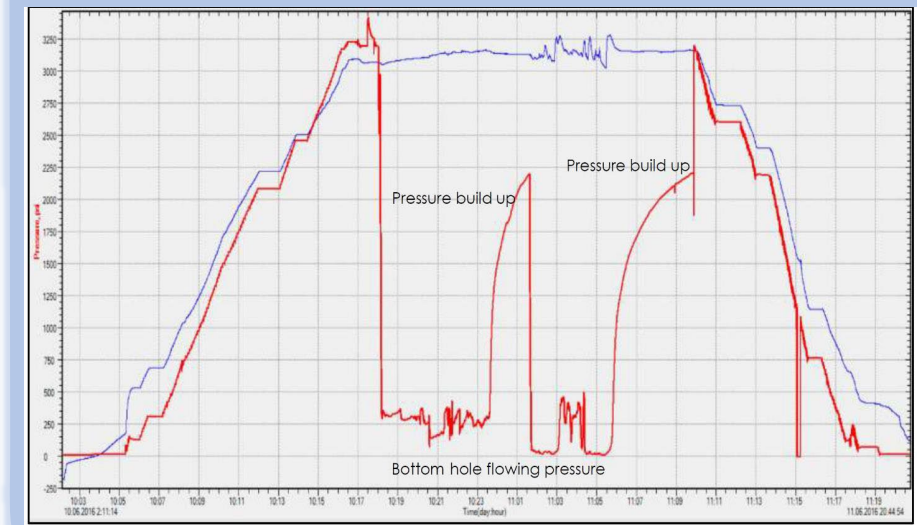
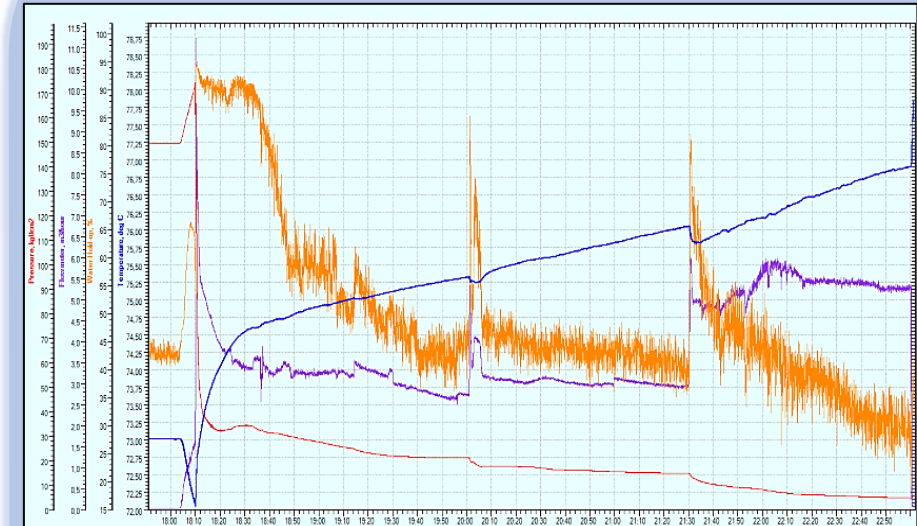
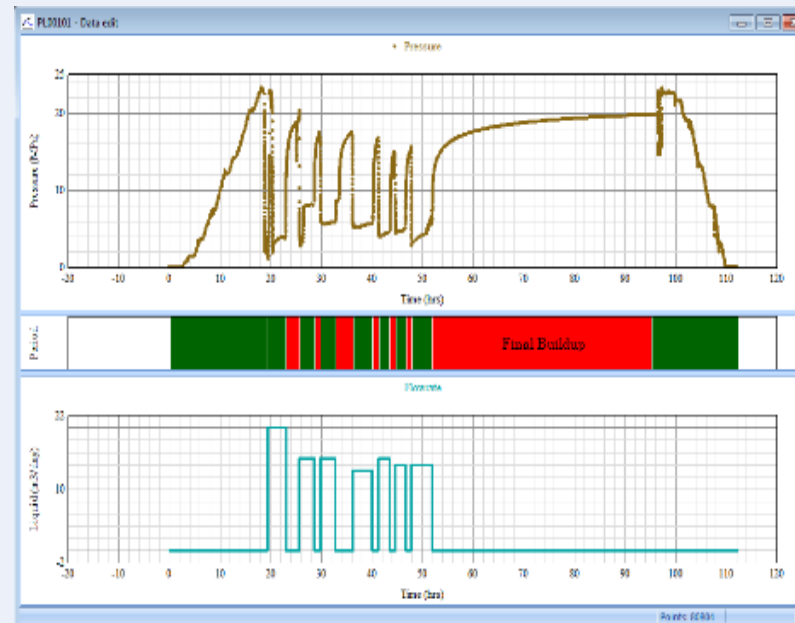
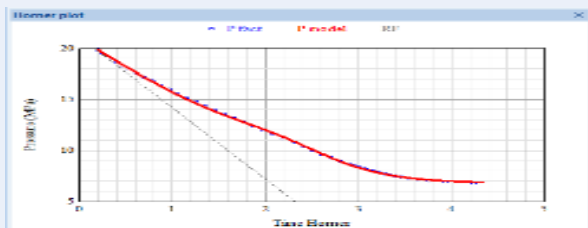
- ✓ During production and testing MEFM tool records all stated above parameters to its internal memory at a sampling rate of 0.25 - 60 seconds.
- ✓ The well test insert with the MEFM tool can be retrieved from the hole using slickline, along with the assistance of a supplied fishing tool.
- ✓ There is no set time limit for the production, allowing it to continue without any restrictions on duration.
- ✓ PVT sampling can also be conducted during stationary well flow conditions.
- ✓ The collection of PVT samples enables obtaining clean and uncontaminated reservoir fluid samples from remote zones of the formation, devoid of any remnants of drilling mud. The PVT chamber, utilized for this purpose, consists of two 500cc containers equipped with a timer and pressure triggers.

FLOWJET AND DST INTERPRETATION

RESULTS AND ADVANTAGES:

- ✓ The series of Zonal DST have been successfully performed in a low permeability ($\sim 1\text{mD}$) reservoir.
- ✓ The FlowJet pump and DST assembly enable achieving maximum drawdown, with bottom hole pressure (BHP) reaching nearly zero, in order to induce flow in a non-naturally flowing well.
- ✓ Wellbore isolation with pump inset helps to eliminate wellbore storage effect and obtain valuable reservoir information.

| Parameter | Unit | Value |
|----------------------------|--------------------|---------|
| Initial Reservoir Pressure | MPa | 21.0 |
| Reservoir Temperature | $^{\circ}\text{C}$ | 113.0 |
| Bottom Hole Pressure | Map | 4.6 |
| Flow rate | m ³ /d | 14.0 |
| Permeability-Thickness | mD*m | 4.6 |
| Infinitesimal Skin | | 0.6-1.0 |
| Radius of Investigation | meter | 86 |





ADIPEC 2018/2019/2022

North Side successfully participated in ADIPEC 2018, ADIPEC 2019 and ADIPEC 2022 where presented its latest achievements and case studies.



NAPEC 2019

North Side presented the paper about MPLT in Artificially produced wells and well-reservoir management through Company's Performance Evaluation Package.



MEOS GEO 2023

North Side participated in Middle East Oil, Gas and Geoscience Show in 2023 in Bahrain.

OUR TEAM ONSITE



Our team of field engineers works on different locations around the world.



OUR INTERPRETATION TEAM

North Side Company provides 24/7 availability of interpreters who deliver interpretation results within 14 hours. This enables clients to make timely decisions and perform optimization workover on-site based on the results.



NORTH SIDE ACROSS THE WORLD





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WITH US**

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