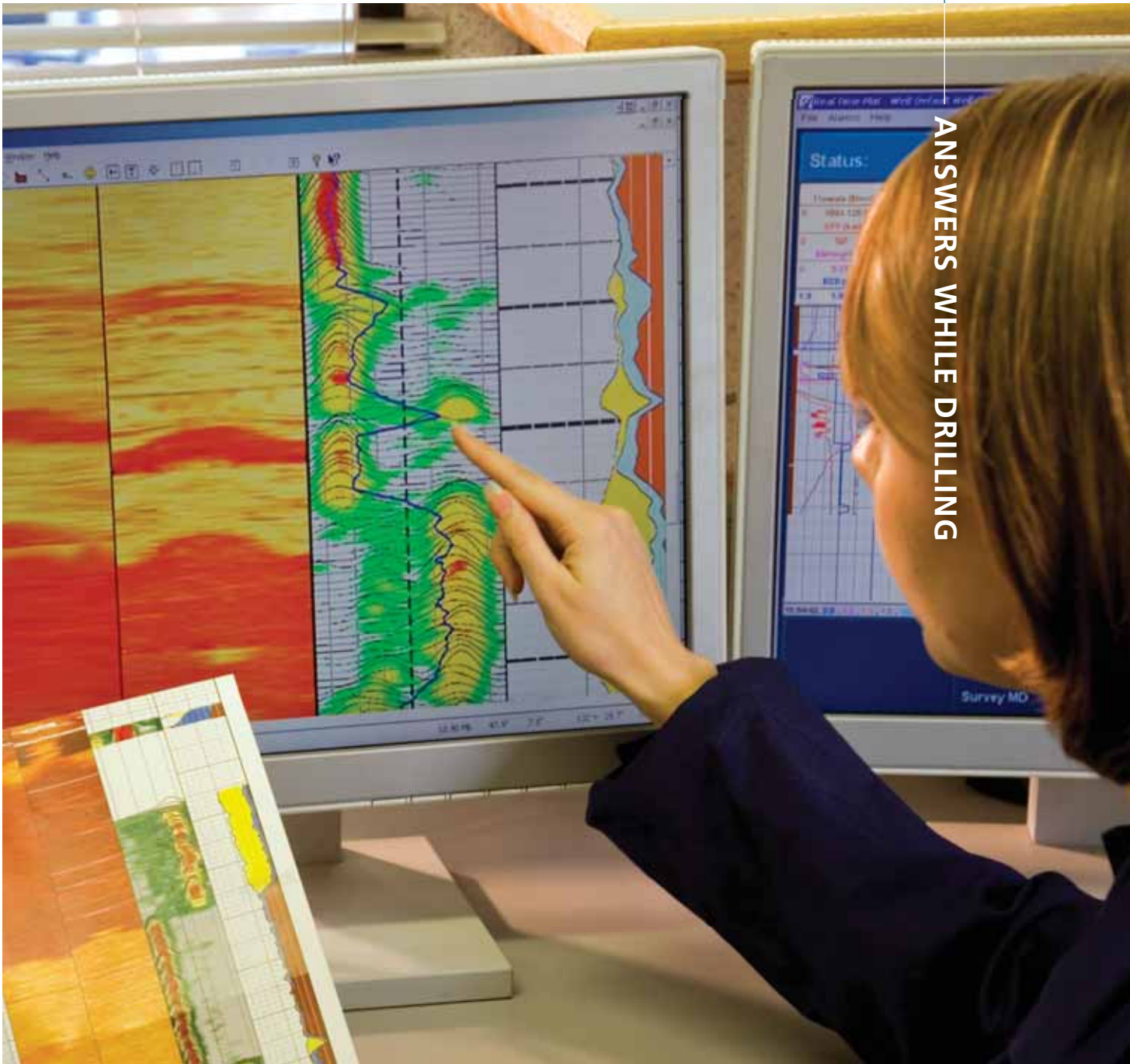
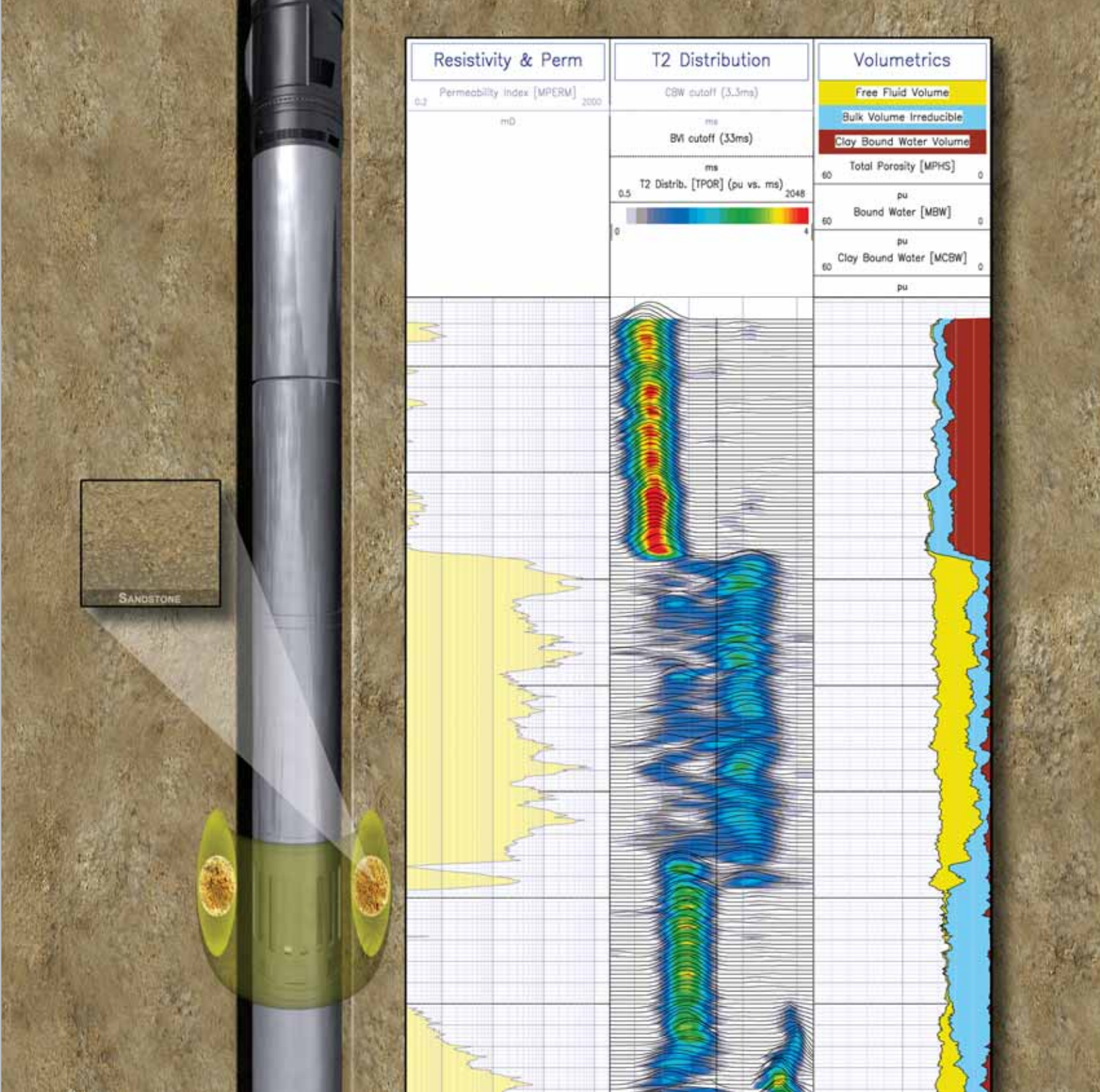


MagTrak
Advanced LWD Magnetic Resonance

ANSWERS WHILE DRILLING





With the introduction of MagTrak advanced LWD magnetic resonance services, INTEQ is the first in the industry to deploy real-time T_2 distribution, capturing the full potential of the measurements while drilling. The log above reveals a variety of information delivered at the well site, including porosity for reservoir storage potential, identification of zones with producible fluid, as well as enhanced rock and fluid properties from the T_2 spectra.





ACCURATE ANSWERS. WHEN AND WHERE YOU NEED THEM.

approaching a water contact? How rapidly identify hydrocarbon zones in high-pressure formations? Are there any flow barriers present in this reservoir? Do I have the data I need to identify optimal fluid
What is the potential for water production in this reservoir? Should we be adjusting downhole parameters to avoid potential borehole problems? Do I need to adjust the placement of the wellbore within the
the optimal completion program for my well? Am I getting the measurements I need for reliable net-to-gross calculations? What is the true value of my reservoir? Are there moveable hydrocarbons present? A
a water contact? How can I rapidly identify hydrocarbon zones in high-pressure formations? Are there any flow barriers present in this reservoir? Do I have the data I need to identify optimal fluid sampling
the potential for water production in this reservoir? Should we be adjusting downhole parameters to avoid potential borehole problems? Do I need to adjust the placement of the wellbore within the reservoir?

DEPENDABLE ANSWERS FOR MULTIPLE APPLICATIONS.

INTEQ's MagTrak service, the industry's most dependable while-drilling porosity measurements, delivers critical answers throughout the well's life cycle; from drilling and evaluation through post-well analysis, well completion and production optimization programs.

IMPROVED PLACEMENT. While drilling, MagTrak logs provide simple, "quick look" formation evaluation—permitting real-time identification of reservoir-quality rock, gas zones and water contacts. The service's ability to quickly identify problem shales can be critical to proactively adjusting drilling parameters to avoid potential borehole problems and minimize lost-in-hole risks.

WELLSITE EFFICIENCY. The service also delivers improved logging while drilling (LWD) efficiency by providing a reliable means of obtaining high-quality formation evaluation data in high-angle holes without interrupting the drilling process to run wireline. Or, when a wireline run is planned, the high-resolution MagTrak measurements can be used to optimize the logging program and identify optimal fluid sampling points.

FAST ACCURATE ANSWERS. In addition to being able to rapidly identify hydrocarbon zones, geoscientists can employ the real-time MagTrak data to get the valuable answers they need regarding a variety of critical reservoir questions, including permeability profiles, net-to-gross calculations, storage capacity and grain size distribution.

By obtaining these measurements while drilling, the operator's completion design team can review the MagTrak data in a timely manner, facilitating the design of optimal completion programs while reducing the risk of completing non-productive zones.

DETAILED ANALYSIS. MagTrak LWD data proves invaluable for handling detailed post-well analysis, offering operators critical measurements for evaluating their reservoir. The answers provided by MagTrak in relation to reservoir valuation include:

- Reservoir volume
- Reservoir rock quality
- Producibility
- Flow barriers
- Flow units and more.





ACCURATE, REAL-TIME T₂ MAGNETIC RESONANCE.

At INTEQ, our design engineers never forget the challenges facing formation evaluation technology in the drilling environment. As a result, our MagTrak service and other Answers While Drilling technologies have been specially designed to obtain accurate and reliable measurements without negatively impacting the drilling process or requiring operators to artificially restrict penetration rates.

And, unique in the industry's offering of magnetic resonance while drilling technologies, MagTrak is designed to eliminate motion effects on the measurements induced by drilling vibration. The combination of a low magnetic field gradient, integrated low-motion stabilizers and a short inter-echo spacing, is all designed to deliver accurate T₂ magnetic resonance in challenging drilling environments.

The results:

- Direct measurements of fluid-filled porosity independent of lithology or radioactive sources for environmentally sensitive reservoir characterization
- Dependable estimates of moveable fluids in shaley sands and other complex lithologies for optimized reservoir drainage strategies
- Intrinsic T₂ magnetic resonance data from the low magnetic field gradient design for reliable measurements.

An Integrated Approach to Answers While Drilling.

We designed and engineered the MagTrak service for full integration with INTEQ's other advanced technologies and products in our Answers While Drilling suite of services. These include the AutoTrak™ rotary steerable system to ensure that well placement decisions based on MagTrak answers are executed with unmatched precision and accuracy.

And MagTrak data can further enhance wellsite efficiency by quickly identifying potential testing areas for our TesTrak™ formation pressure while drilling service.

In addition to providing experienced wellsite personnel and support, INTEQ's Answers While Drilling services offer immediate, around-the-clock access to a team of experts in drilling, geology and petrophysical disciplines.

Access to this real-time interpretation and advice is delivered via INTEQ's secure internet data transmission service and a network of worldwide collaboration centers.

When you need timely magnetic resonance answers about your reservoir, you can count on INTEQ's MagTrak service to deliver the best answers time and time again.

> To learn more about the MagTrak service—including third-party papers and detailed case studies—visit www.AnswersWhileDrilling.com, contact INTEQ at 713.625.4200 or e-mail MagTrakAnswers@INTEQ.com



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INTEQ, a division of Baker Hughes, is the industry leader in innovative, automated directional drilling and real-time formation evaluation services. These services form the basis of INTEQ's Answers While Drilling, offering new solutions at the farthest reaches of drilling depth, complexity and range. Answers While Drilling integrates advanced drilling and evaluation services, designed to deliver real-time answers from accurate and reliable while drilling information. These answers allow operators, geoscientists and drilling personnel to make informed drilling decisions on the spot, leading to fast and accurate well placement, enhanced drilling efficiency and maximum recovery.