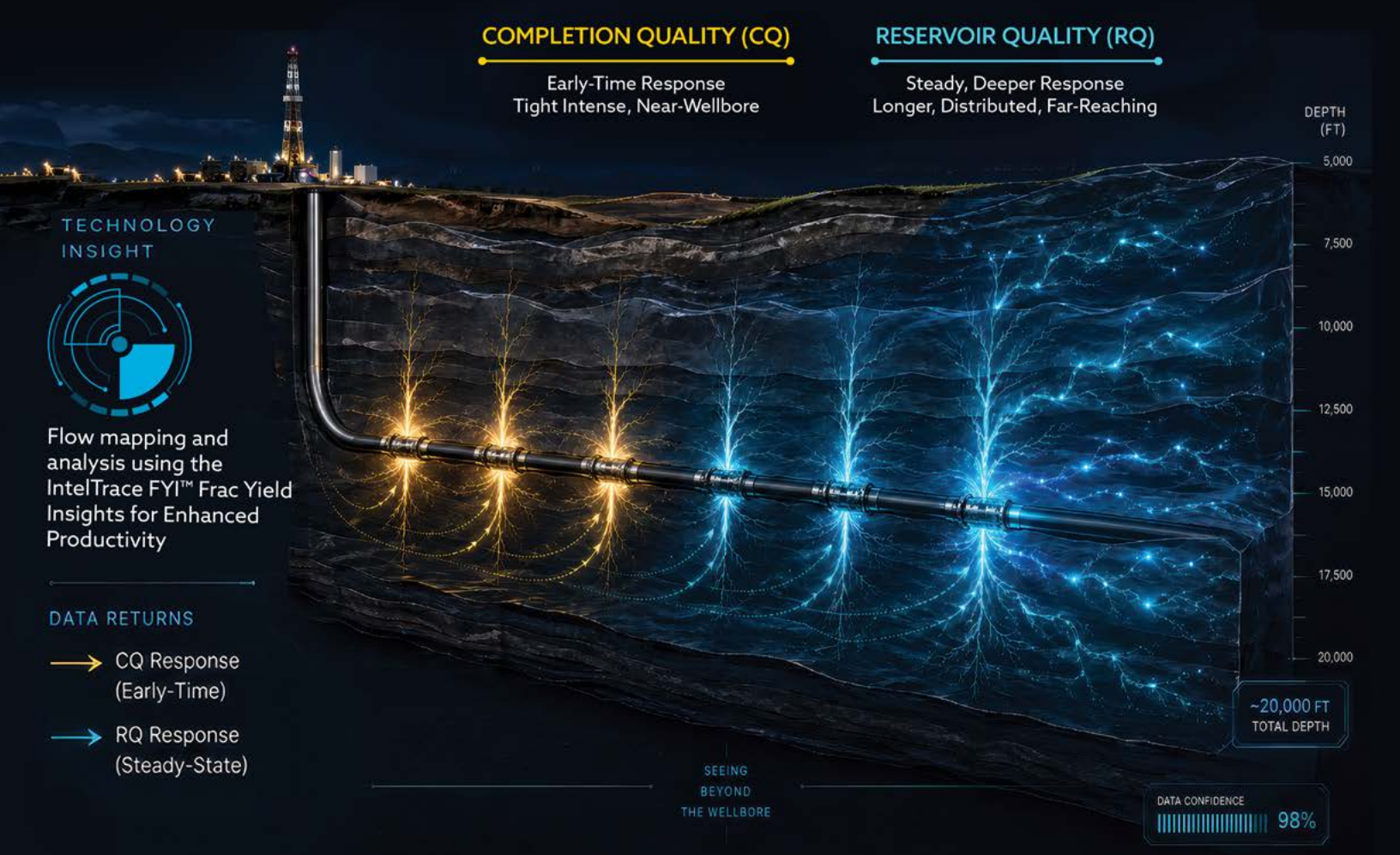
QuantumPro, Inc.

IntelTrace FYI™

Frac Yield Insights for Enhanced Productivity



The Enabler: Ultra-High-Resolution, Inert Nanoparticle Tracers

The High Cost of Uncertainty

Multi-stage completions account for **up to 70% of total well costs.** Yet studies across North America indicate that up to **50% of stages** and clusters do not meet production expectations. To maximize capital investment, operators must differentiate between reservoir-driven limitations and completion-quality inefficiencies.

Cost-driven Decisions vs. Cost-effective Decisions

Operators often resort to inefficient geometric completion approaches simply because traditional diagnostics like fiber-optics are cost-prohibitive (adding up to $1 million/well) and production logging tools (PLT) offer only short snapshots requiring costly and risky intervention. Furthermore, conventional liquid chemical tracers are prone to "false positives" during inter-well communication events and wash out quickly, limiting long-term insight. **Our mission is to change that,** with a game-changing diagnostics solution, **IntelTrace FYI™ Frac Yield Insights for Enhanced Productivity.**

The Enabler: Ultra-High-Resolution, Inert Nanoparticle Tracers

QuantumPro, Inc's award-winning, ultra-high-resolution and ultrahigh-temperature nanoparticle tracer technology provides a robust, non-radioactive, and non-hazardous solution for precise flow and subsurface diagnostics.

Unlike liquid tracers that dissolve and disperse in days, our **solid, inert, non-hazardous, and non-radioactive nanoparticle tracers** are engineered to remain intact within the conductive fracture network.

The nanoparticle tracers can be injected with the proppant pack at the stage level or embedded at the perforation level. The nanoparticle tracers release gradually over months, providing a continuous, high-resolution, long-term, and high-fidelity data stream.







The Next Frontier: Completion Quality (CQ) and Reservoir Quality (RQ) Delivered

QuantumPro, Inc. IntelTrace FYI™ Frac Yield Insights for Enhanced Productivity Solution is a field-proven solution that delivers both short- and long-term analysis for production-based CQ and RQ diagnostics.

Time Matters: Decoding CQ vs. RQ with IntelTrace FYI™

Monitoring production over extended periods allows operators to distinguish between how efficiently the well was stimulated and how good the reservoir rock is.

Completion Quality (CQ) – The Short Game (Days 1–30)

- **What it tells you:** Did the frac work? CQ measures the effectiveness of the hydraulic fracture treatment, the conductivity of the proppant pack, and the connection to the wellbore.
- **The Diagnostic:** High early-time tracer recovery analysis confirms a successful mechanical connection. Low recovery warns of over flushing, screen-outs, poor proppant placement, frac conductivity damage, or mechanical failure.

Reservoir Quality (RQ) – The Long Game (Days 90–180+)

- **What it tells you:** Is the rock a high-quality producer? RQ evaluates the geologic reality—permeability, porosity, reservoir quality, and total organic content.
- **The Diagnostic:** Sustained late-time tracer recovery indicates a rich, productive zone. A sharp drop-off suggests that while the frac (CQ) was good, the rock (RQ) itself is depleted or of poor quality.



QuantumPro, Inc. – Nanotechnology for Subsurface Intelligence

Your Strategic Advantage: Stop Guessing and Start Optimizing

With expert implementation, monitoring, and advanced diagnostics, we help you identify CQ and RQ, giving you the hard data needed to improve the economic equation for future wells:

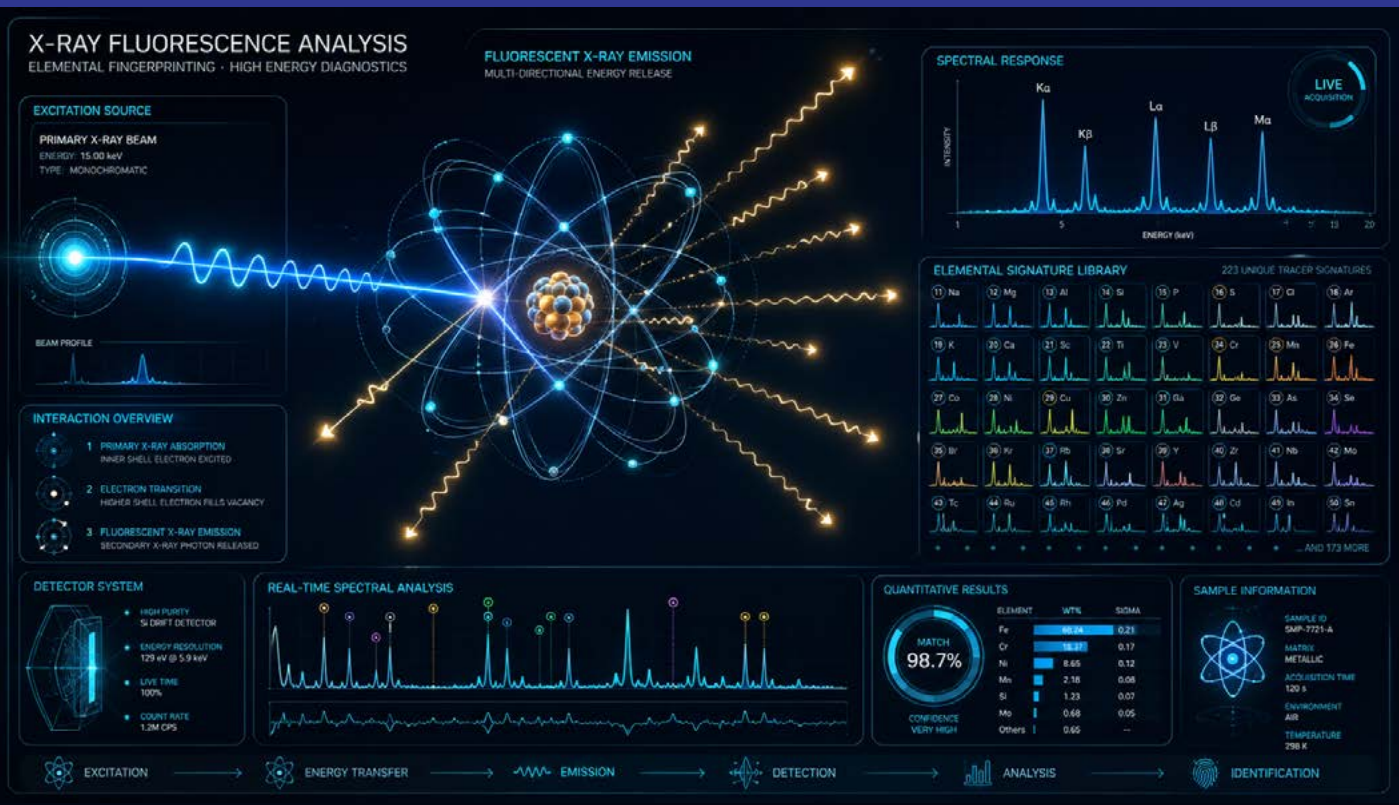
- **High CQ / Low RQ:**
  You executed a good frac, but the rock is poor. Action: Increase stage spacing or skip this zone entirely.
- **Low CQ / High RQ:**
  The rock is rich, but the frac failed to connect. Action: Aggressively optimize the completion design and frac pumping schedule to unlock stranded reserves.

"By analyzing nanoparticle tracer results and well-established production rates over time valuable and critical insights into stage-level production can be gained... distinguishing sections that underperform due to completion issues versus reservoir limitations."

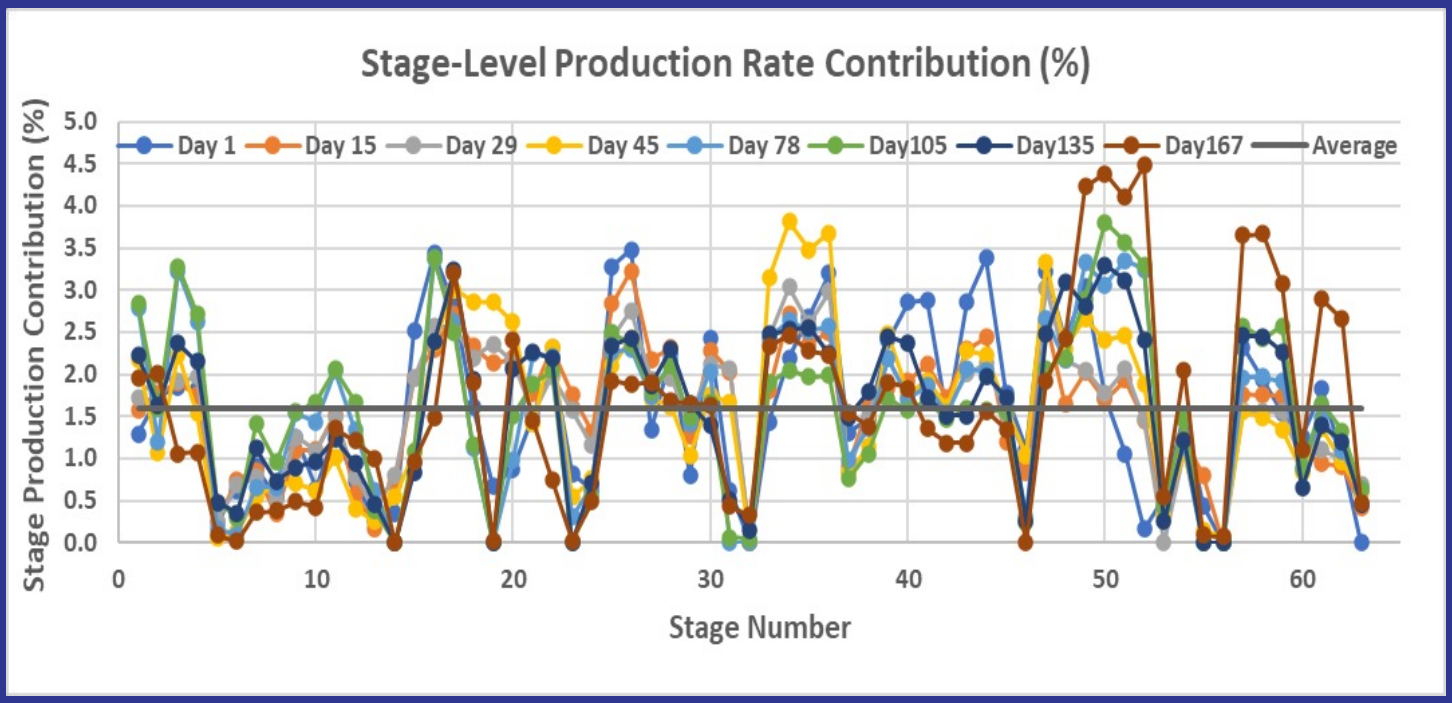
Proven Field Results: Eagle Ford Case Study

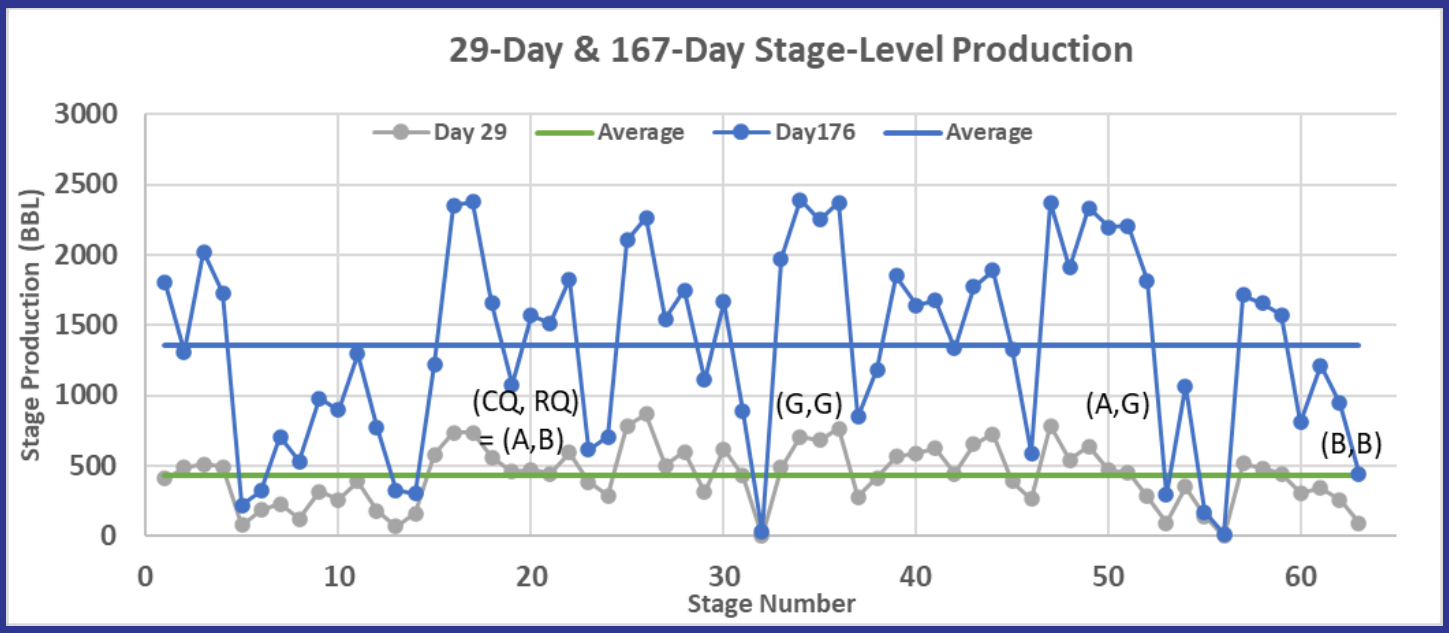
In a recent deployment in the Eagle Ford Basin, QuantumPro, Inc.'s nanoparticle tracers were utilized in a 63-stage well to evaluate flow performance and fault communication.

- **Methodology:**
  63 unique tracers were injected (one per stage). Samples were collected over 167 days.
- **Diagnostics:**
  The study revealed that the toe and heel sections underperformed due to geological faults and lower reservoir quality, while the middle sections (Austin Chalk) drove the majority of production.
- **Outcome:**
  The operator used the data to optimize future completion designs, validating that fewer stages and optimized spacing could yield better economic returns.



The operator used the data and analysis to optimize future completion designs, validating that fewer stages and optimized spacing could yield better economic returns.





Legend:

- CQ Index
- RQ Index
- # - Stage No.

Key CQI & RQI Values

Standard Deviation

CQ Index:	0.49
RQ Index:	0.50

Uniformity Index

Completion:	0.51
Reservoir:	0.50

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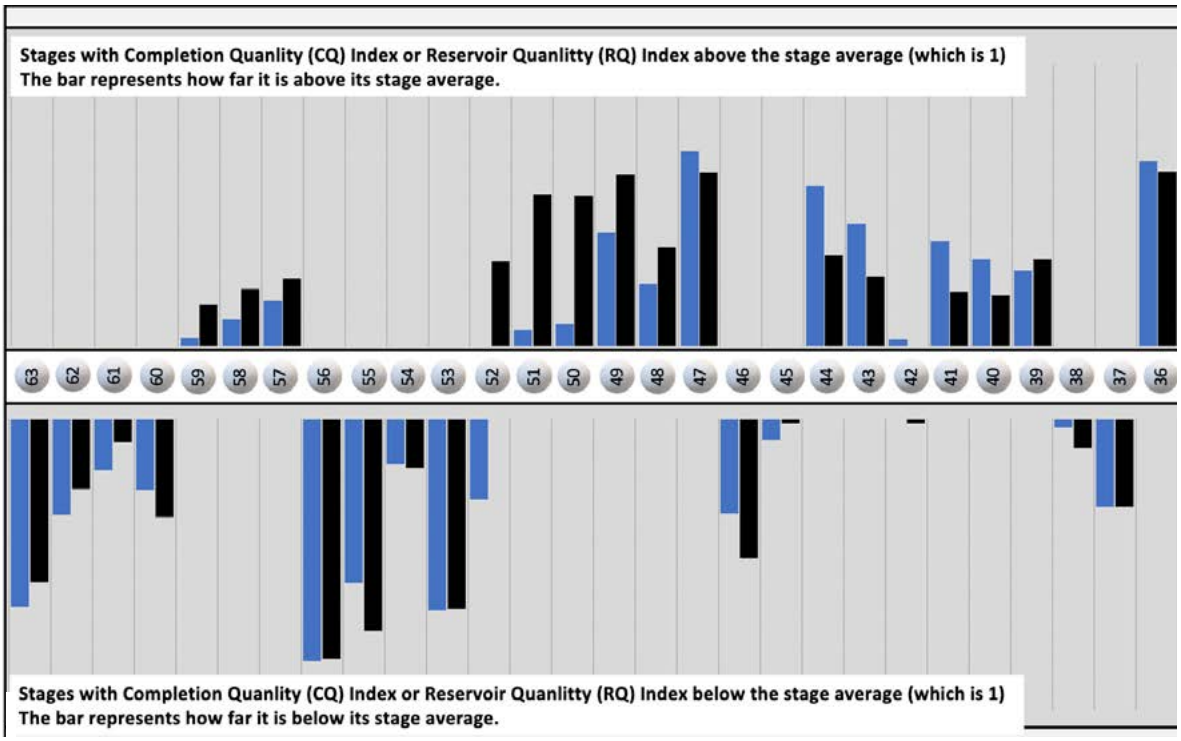

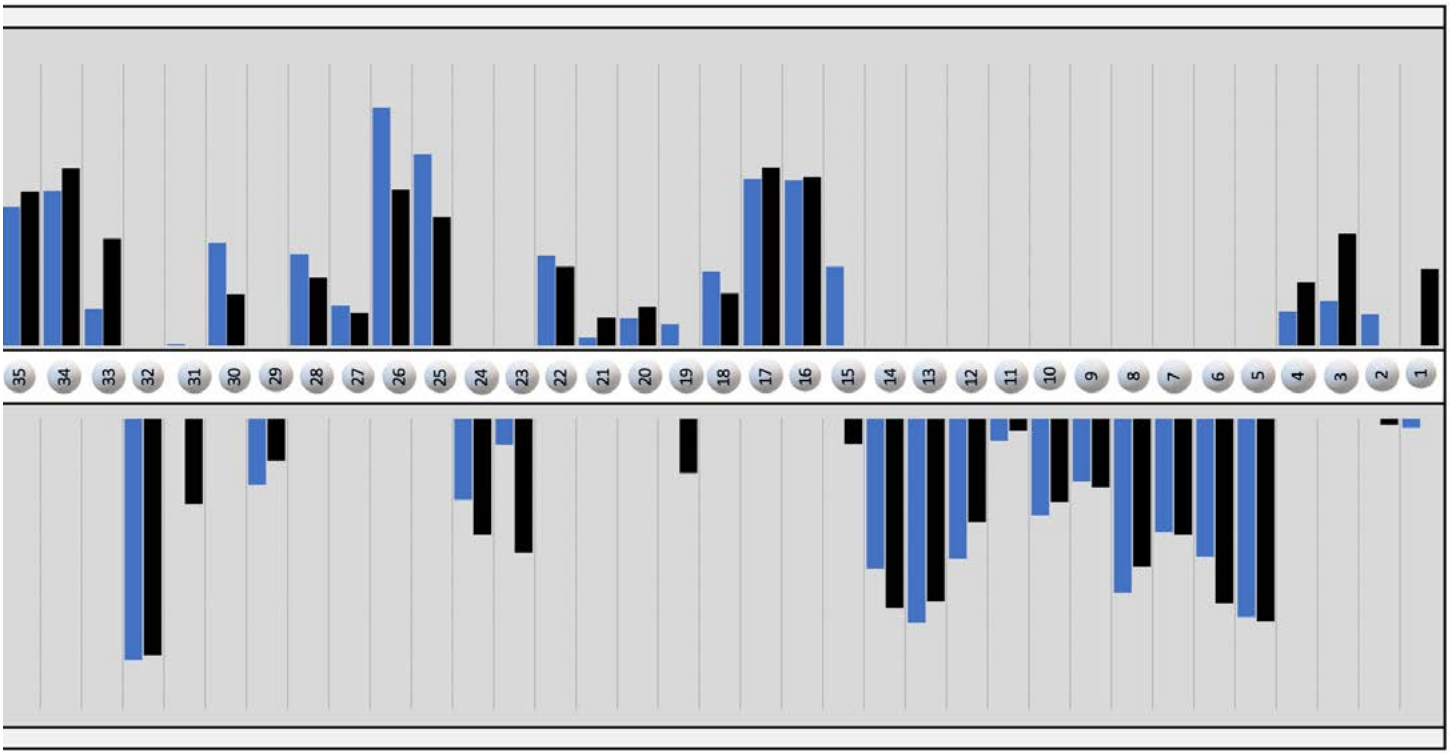

Stages 1-63 with Completion Quality (CQ) Index and Reservoir Quality (RQ) Index (represented by bars) above or below the stage average of 1.

Key Features

- **Solid & Inert Formulation:** Tracers are completely miscible with carrier fluids but insoluble in reservoir fluids, preventing early washout.
- **Extreme Durability:** Engineered to withstand formation temperatures up to 2,000°F and high closure stresses, making them ideal for unconventional and geothermal applications.
- **Sub-Atomic Precision:** The high energy sub-atomic analysis detects unique "fingerprints" at parts-per-billion sensitivity.
- **Non-Intrusive:** Requires no downhole tools or wireline intervention with zero risk.
- **Vast Portfolio:** Library of 220 unique tracer signatures allows for distinct fingerprinting of dozens of stages within a single well.
- **Inert & Safe:** Completely non-radioactive, and environmentally safe, simplifying handling and HSE compliance.

Applications

- **Unconventional Shale Reservoirs:** Optimize multi-stage hydraulic fracturing.
- **Geothermal Wells:** Stability >1,000°F where chemical tracers and PLT fail.
- **Fault Detection:** Identify leakage or connections to natural fractures.
- **Inter-Well Communication:** ("Frac-hits"): Quantify cross-well interference.
- **Zone Categorization:** Categorize specific sections of the lateral as "Good," "Average," or "Bad," highlighting underperforming areas that may require design changes in future wells.
- **IOR/EOR:** Monitoring injection fronts and breakthrough in Enhanced Oil Recovery operations.



Why Choose QuantumPro, Inc.?

With over 50 years of industry experience in subsurface reservoir modeling, geomechanics, nano-tracing, and advanced technology evaluation, our team of experts offers unparalleled expertise in designing cost-effective and technically optimized ultra-high-resolution nanoparticle tracer reservoir monitoring programs.

IntelTrace FYI™

Frac Yield Insights for Enhanced Productivity

Gain high-resolution clarity into completion quality and reservoir quality to drive superior returns

QuantumPro, Inc.

To learn more about how **IntelTrace FYI™** can help maximize the production and value of your oil, gas, geothermal or water asset, contact:

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