



delivering solutions with powerful

expertise



StrataGen[®]
ENGINEERING

Get more from your reservoir.

StrataGen® Engineering:

Developing *strategic* solutions to *generate* improved production. StrataGen can help you maximize value from virtually any reservoir environment.



StrataGen Engineering teams with our clients throughout the world to maximize their asset ROI.

Integrated Solutions

StrataGen applies knowledge and technology to achieve economic results.

Anytime and anywhere there's a challenge involving an oil or natural gas reservoir, StrataGen is ready to answer the call. Customers ranging from global oil companies to independent operators turn to StrataGen for a broad range of services including:

- Reservoir and fracture engineering studies
- Fracture treatment design
- Completion engineering support
- Onsite treatment supervision, engineering and quality control
- Post-treatment evaluation and optimization
- Rock mechanics
- Software application and training

StrataGen Engineering is an independent consulting company. Since our founding in 1992, we have provided objective, results-oriented solutions for all types of reservoirs around the world. Our recent focus is primarily on unconventional reservoirs. StrataGen is particularly renowned for our expertise in horizontal well completions.



Fracture Engineering

StrataGen® Engineering helps get the most out of your well.

We take a thorough approach to any reservoir stimulation scenario. Our engineering services include fracture design using state-of-the-art technology combined with years of experience in every type of formation. Our engineers are experts in using Fracpro®PT, the most popular stimulation software, to optimize fracture conductivity. The ability to combine frac design knowledge with real-time FracproPT analysis allows us to help you achieve optimal proppant placement. Our goal is to arrive at the solution that will provide the best yield for your investment.

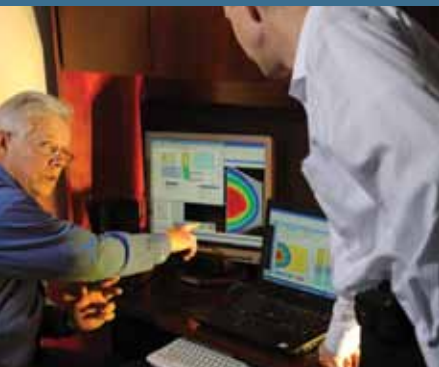
Our StrataStim™ workflow develops custom solutions through a comprehensive, iterative process involving petrophysics and reservoir understanding, real-time optimization, post-frac optimization, diagnostic analysis, production history analysis, field optimization and re-frac selection.

StrataShale™ is a similar process involving analysis and application of petrophysics, completion and stimulation techniques required to economically produce shale reservoirs. This workflow focuses on integrating these diverse inputs together to provide an optimized economic completion for unconventional shale reservoirs.

Our expertise includes:

- Design and execution of fractures to optimize reservoir conductivity
- Number of stages and zone coverage
- Equipment requirements
- Economic analysis and optimization studies

Each reservoir is unique and presents its own challenges. StrataGen developed StrataStim and StrataShale workflows to develop optimum completion strategies in any situation.



Wellsite Delivery

StrataGen's Frac Pros are there to assure success.

After a stimulation treatment is designed, we continue to work for your benefit. At the wellsite, we provide engineering and quality monitoring to help ensure that the fracture treatment is executed properly. We also provide an extraordinary level of treatment evaluation and reporting through our expertise with FracproPT software. With experience in all phases of the stimulation process, our consultants are especially adept at creating an environment of teamwork at the wellsite.

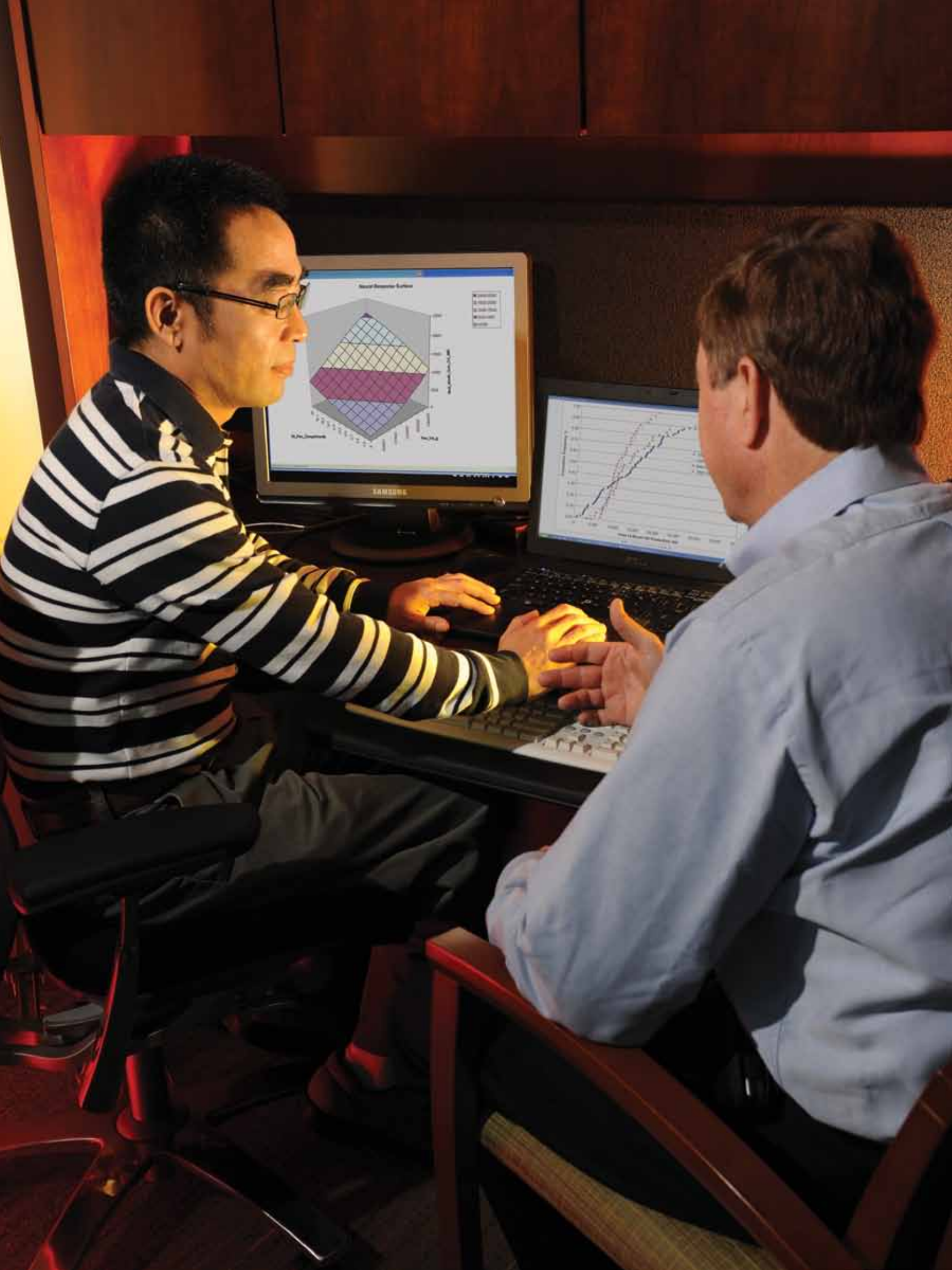
Our onsite treatment supervision and engineering services include:

- Quality monitoring of fluids, proppant and equipment
- Real-time fracturing analysis
- Mini-frac analysis
- Step-down test analysis and slug design
- Proppant slugs application

Treatment evaluation and reporting include:

- Post-treatment fracture analysis
- Fracture performance studies
- Permeability analysis using mini-frac data
- Re-fracture studies where requested
- Detailed documentation of project results
- Recommendations for improvements going forward





StrataGen consultants continually integrate fracture data into reservoir models to provide the most accurate understanding of fracture design and reservoir productivity.

Reservoir Engineering

Taking a deeper look at the reservoir.

StrataGen® Engineering provides a broad range of engineering services related to the optimization of reservoir productivity. These include reservoir modeling, feasibility studies, new field development strategies, infill drilling studies and well completion strategies.

StrataGen is especially qualified to provide sophisticated engineering services for particularly challenging reservoir extraction situations, such as horizontal well stimulation studies and multi-well, multi-layer reservoir modeling field studies. We have unmatched expertise in completion design, evaluation and execution of horizontal wells in unconventional formations that are some of the most promising plays in the industry.

Our expertise includes:

- Reservoir modeling
- Economic feasibility studies
- Production data analysis
- Well completion studies
- Multi-well, multi-layer reservoir modeling
- Horizontal well stimulation studies, modeling and completion strategies



Experience

Delivering solutions worldwide.

StrataGen® Engineering consultants provide world-class capabilities that help our clients succeed. StrataGen team members are recognized as industry leaders in virtually every aspect of reservoir stimulation, with unmatched expertise in unconventional and tight gas field developments.

- StrataGen analyzed more than 1,000 Barnett shale wells and developed methods for comparing diagnostic fracture outputs to pressure pumping profiles to characterize the type of hydraulic fractures created by a given frac treatment history report.
- In the Bakken shale, StrataGen recently provided both wellsite services and office support to an operator who successfully completed the deepest Bakken producer yet in North Dakota, opening up a new area of production in the play.
- StrataGen teamed with many operators in the Eagle Ford shale and successfully placed high concentrations of high-conductivity proppants in the liquids-rich portion of the play where others have failed.
- In the Haynesville shale, StrataGen worked with several key clients and developed a tiered reservoir quality approach to optimizing total ROI for the play based on reservoir quality and conductivity of proppants placed.
- StrataGen provided treatment design and evaluation, rock mechanics, offshore supervision, quality control and mini-frac analysis that led to the world record for proppant



pumped in a single well – 13.1 million pounds in the North Sea chalk. This well was one of 100 propped fracture treatments in this horizontal well development. Production increase from this treatment allowed the operator to continue field development.

- In the Granite Wash of the Texas Panhandle, StrataGen's data-driven and engineering-validated approach recommended modifications to completions, enabling operators to better manage and exploit the reservoir through the use of strategically placed horizontal wells along with restimulated and improved vertical wells.
- In the gas sands of Sonora, West Texas, StrataGen consultants conducted infill drilling and fracture engineering studies involving 1,000 wells. The study allowed the operator to select re-frac candidates, economize their completions and increase cash flow.
- StrataGen developed waterfrac technologies that have been integral to the industry's successful development of gas sands and shale reservoirs.

With U.S. offices in Houston, Dallas, Denver, and Bakersfield, California, and international offices in the Netherlands and Russia, StrataGen can responsively serve clients virtually anywhere in the world.





Best Practices

Identifying keys to performance.

In reservoirs and fields where there has been significant drilling activity, public records and selected client data can reveal much about the area's completion and production relationships. Also, StrataGen® Engineering works together with operators to gather a wealth of detailed data. StrataGen analyzes this vast amount of data with our proprietary expert neural network using spatial sampling, multivariate analysis, nonlinear analysis, expert fuzzy logic and other sophisticated research techniques. When only wells in the same reservoir and field are compared, the differences in production among wells can be attributed to differing methods of drilling and completion.

All operator-provided data is kept confidential. Clients can rely on StrataGen's vast experience and analytical capabilities to generate best practices to increase production from their wells.





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