

# AvantGuard

## Advanced flowback services

### APPLICATIONS

- Conducting well flowback and coiled tubing (CT) operations between postfracturing treatment and production
- Securing well productivity by applying geomechanical modeling and real-time monitoring and control
- Conducting high-frequency production, flowback, and solids monitoring

### BENEFITS

- Protects hydraulic fractures and formation stability
- Preserves the connection between hydraulic fractures and the wellbore
- Diagnoses early well behavior
- Minimizes proppant flowback and solids production
- Derisks scaling and precipitation issues
- Secures investment for optimal NPV

### FEATURES

- Synergizes fracturing, flowback, and CT operations
- Uses the robust Vx Spectra\* surface multiphase flowmeter for real-time measurements

AvantGuard\* advanced flowback services optimize well performance from poststimulation operations through production startup. Ongoing, real-time monitoring ensures the well is being operated within a secure operating envelope to minimize risk of fracture and formation damage throughout the life of your well.

### Bring synergy to fracturing, flowback, and CT operations

AvantGuard services bring synergy to fracturing, flowback, and CT operations enabling each operation to be performed while simultaneously accounting for requirements and results of other operations. The service applies to plug drillout and well flowback operations.

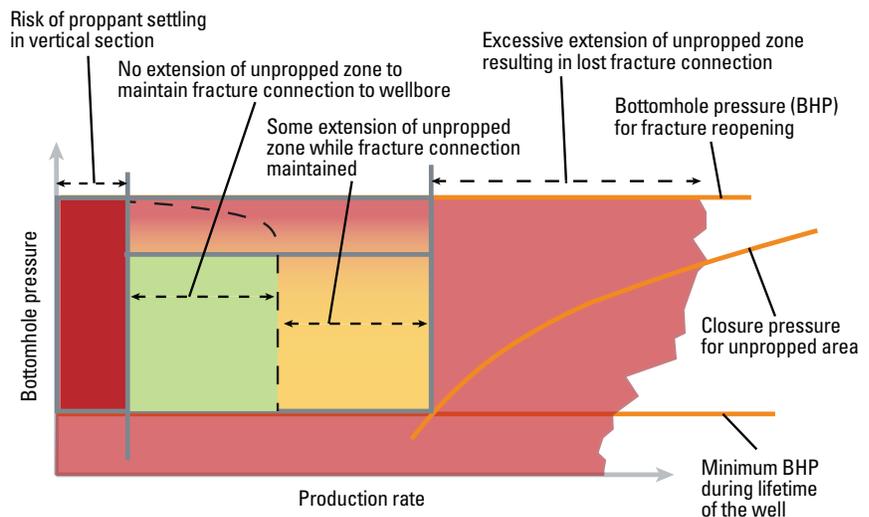
### Continuously operate within the zone of stability

AvantGuard services are based on the application of the secure operating envelope, which is a combination of operational parameters that preserve the connection between hydraulic fractures and the wellbore. Operational parameters are defined from real-time pressure and production data, including solids production monitoring.

Changes in production rates are defined using the Vx Spectra surface multiphase flowmeter, which accurately captures multiphase flow dynamics in any flow regime for all fluid and solids types to enable real-time monitoring and analysis. The integrated dataset is used to characterize well performance and provide recommendations for a choke management strategy to preserve both the hydraulic fractures and the formation.

### Minimize the risk of damage to the hydraulic fractures and the formation

AvantGuard services' monitoring and analysis ensures the well is being operated within the secure operating envelope to predict and prevent fracture and formation damage compared with conventional rate transient analysis, which is used to identify postfracture impairment. This also ensures proppant flowback and solids production are minimized.



*Operating within the secure operating envelope ensures connection to the reservoir is continuously maintained. Real-time well performance analysis enabled by AvantGuard services protects hydraulic fractures and minimizes formation damage. It also helps you diagnose, quantify, and prevent proppant production.*