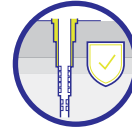


# GEOTHERMAL SERVICES



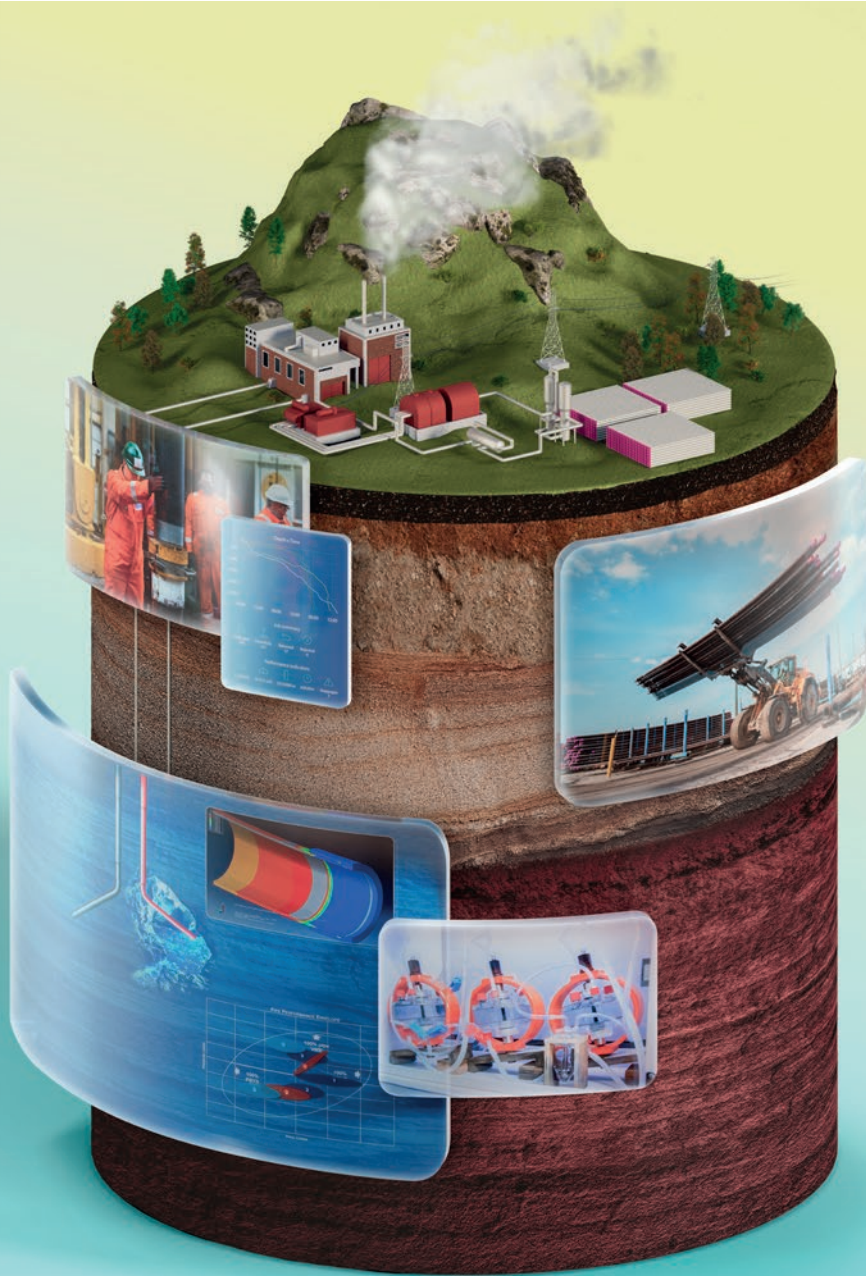
LONG-TERM  
WELL INTEGRITY



OPERATIONAL  
EFFICIENCY



ENHANCED  
COST  
MANAGEMENT



PROVEN EXPERTISE, FROM ENGINEERING  
DESIGN TO SEAMLESS OPERATIONS

# Tailored support from Vallourec® Services

With Vallourec® Services, geothermal operators can choose from a wide range of expert services to achieve their targets and tackle their challenges. From well design to pipe running, Vallourec's team has over 30 years of experience, enabling it to provide support throughout the lifetime of your geothermal projects.



## LONG-TERM WELL INTEGRITY

Benefit from tailored engineering and tubular expertise to mitigate risks and strengthen resilience.



## OPERATIONAL EFFICIENCY

Boost everything from design to maintenance thanks to expert consulting and digital services.



## ENHANCED COST MANAGEMENT

Select the right materials and optimize rig operations for a better return on investment.

► FOR MORE ABOUT SERVICES FOR GEOTHERMAL PROJECTS, VISIT



## THE CHALLENGES OF GEOTHERMAL OPERATIONS

Most geothermal projects have two major objectives. The first is to ensure the long-term integrity of wells. The second is to reduce installation costs and optimize the Levelized Cost of Energy (LCOE).

To meet these goals, geothermal operators face numerous challenges - and Vallourec® Services is there to support them.

- **ENGINEERING ACTIVITIES** are key in every project and are often challenging. With the right support, operators can optimize well engineering to ensure long-term integrity.
- **ADAPTED TUBULAR TECHNOLOGY** is crucial for ensuring operational safety and efficiency. Operators therefore need access to expertise in pipe and connection materials.
- **LOGISTICS MANAGEMENT** is often complex, with urban or remote sites posing challenges to equipment storage and proving difficult to access during the drilling phase.
- **ENVIRONMENTAL CHALLENGES** associated with the corrosive nature of geothermal brine demand experience to understand and implement best practices.

1

## ENGINEERING SERVICES

By combining decades of experience with unique know-how, cutting-edge software and proprietary tools, Vallourec delivers precision expertise in geothermal well engineering.



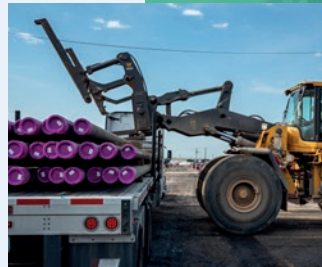
### ANTICIPATING WELL NEEDS IN EUROPE

A European operator worked with Vallourec to conduct a well design optimization review for a new project of multiple geothermal wells. The analysis focused on initial design and expected loads, and particularly on the horizontal stress that can lead to casing collapse. Thanks to the findings, the operator was able to choose the best-adapted premium pipes and connections for the production and shut-in phases.

2

## MANUFACTURING, REPAIR & PIPE MANAGEMENT

Proximity is key to Vallourec's offer for tubular repairs and production. With made-to-measure services available close to their sites, operators benefit from rapid response times and flexible solutions.



### OVERCOMING LOGISTICS CONSTRAINTS IN EUROPE

With limited space around its rig site, a geothermal operator in Germany entrusted Vallourec with the storage, inspection and rig preparation of pipes. Stored less than a 6-hour drive away, the casing pipes can be prepared on demand. Depending on the operators' needs, certain pipes can be equipped with accessories such as centralizers or cable clamps. When they reach the rig site, all pipes are ready to use, saving the operator valuable time and increasing onsite safety.

3

## RUNNING SUPERVISION & TRACEABILITY

With Vallourec's support, geothermal operators can benefit from peace of mind for the installation and operation of their wells. Our dedicated team provides hands-on guidance and digital solutions to uncover new efficiencies on the rig.



### APPLYING BEST PRACTICES TO A PULL-OUT OPERATION

An American geothermal operator was pulling casing pipes out of a well, but faced high reject rates due to connection galling during the brake-out. For the second pull-out operation, it sought the support of an experienced VAM® Field Service technician. This time, the reject rate was reduced to zero.





## Well design optimization

Vallourec's team of expert engineers uses state-of-the-art software to precisely calculate the best-adapted pipe combinations in terms of OD, WT and material grade. All analyses are customized to account for expected well loads and operator constraints and ambitions.

- › **Ensure long-term well integrity** by preventing corrosion and mechanical failure
- › **Reduce engineering time** by delivering a clear framework for well architecture

## Casing wear, torque & drag studies

By calculating expected wear, torque and drag along the entire length of the casing string, Vallourec enables operators to optimize casing dimensions. Our offer is built around a team of experienced drilling engineers using powerful well design software.

- › **Optimize casing and connection selection** for durability and efficiency
- › **Benefit from peace of mind** by ensuring required quality standards



## Tubular Management Services

Vallourec offers a range of services to optimize pipes across their lifetime, either directly or through trusted partners. These include **storage** to keep pipes in the best conditions, and **rig preparation** services such as pipe cleaning, inspection and setup. Operators can also benefit from **pipe accessory installation, thread protector recycling**, and a **dedicated web portal** offering real-time visibility on pipe status.

- › **Save valuable space onsite** by storing pipes nearby
- › **Save time** thanks to pipes delivered in a sequence that aligns with your operations
- › **Boost rig efficiency** by improving pipe preparation and management on the rig
- › **Increase safety** by reducing the need to handle and inspect pipes
- › **Optimize inventory management** thanks to local storage and real-time pipe tracking



## Best-in-class On-site Support

Vallourec's VAM® Field Service technicians provide **onsite support**. Our team of experts can oversee the installation and operation of your wells, ensuring processes conform with safety standards, costs are reduced, and performance is improved. We also offer **pipe and connection inspections** to uphold the highest standards of quality, saving you time by detecting any defects early on.

- › **Extend well lifetime** by relying on experts to identify potential issues
- › **Maximize operational efficiency** through meticulous supervision and maintenance support
- › **Boost safety** thanks to onsite guidance from experts
- › **Easily obtain rental equipment** such as: pressure test fixtures, stabbing guides, handling & well control equipment

## Material selection

Through its experience in different energy sectors, Vallourec has a thorough understanding of which materials work best in environments susceptible to corrosion, scaling or collapse. Our extensive material behaviour database, cutting-edge simulation software, and own testing facility allow us to replicate customer well environments in Fit-for-Purpose testing.

- ▶ **Select the right material** for cost efficiency & well performance
- ▶ **Adapt & improve existing installations** thanks to long-term support

## Thermal calculations for closed-loop wells

Vallourec has developed its own simulation tool providing optimized thermal calculations for close-loop wells. This allows operators to select the best-adapted materials and technologies to minimize heat loss and maximize temperature differences between injected and produced fluids.

- ▶ **Optimize thermal insulation** and heat storage to improve power output
- ▶ **Maximize return on investment** for the well design

## Manufacturing & Repair Services

Thanks to a network of around 150 VAM® Licensees worldwide, operators can always find a trusted partner nearby for **VAM® connection** repairs, so that any issues are addressed rapidly. They can also benefit from **accessory manufacturing** close to their site, including custom designs adapted to their well architecture and environment.

- ▶ **Reduce lead times & accelerate repairs** thanks to local maintenance & manufacturing
- ▶ **Boost long-term well performance** with tailored pipe design and production
- ▶ **Increase efficiency** by minimizing transportation costs and delays



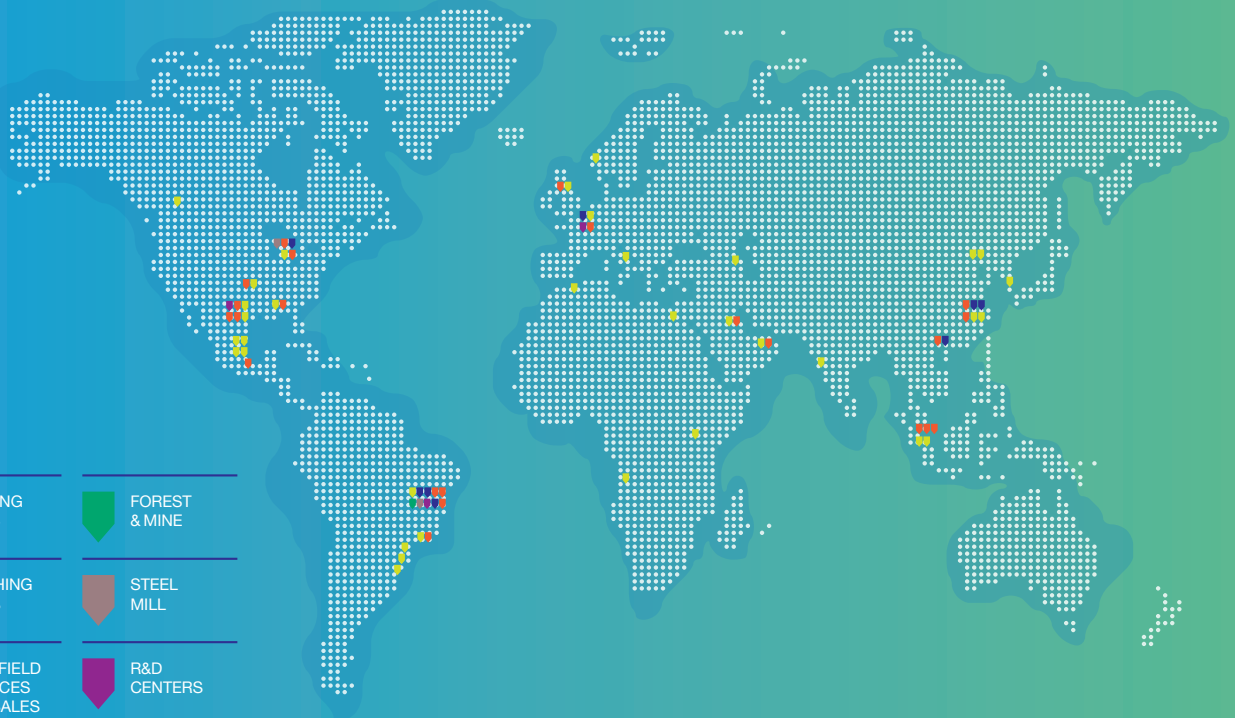
## Transparency with TallyVision

TallyVision is an easy-to-use digital solution providing full pipe traceability on the rig. Through its data-driven approach, it ensures all pipes and accessories are run according to the planned sequence, and brings significant improvements to deck management, running supervision and long-term performance.

- ▶ **Track pipes in real time, anywhere** to simplify rig receipt and enhance monitoring
- ▶ **Optimize running operations** by sharing up-to-the-minute KPIs across the rig
- ▶ **Drive continuous improvement** through data-driven analysis of rig performance



YOUR PARTNER, SETTING  
THE PACE FOR INNOVATION  
AND PERFORMANCE  
EVOLUTION



- ROLLING MILLS
- FOREST & MINE
- FINISHING UNITS
- STEEL MILL
- VAM® FIELD SERVICES AND SALES
- R&D CENTERS

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INFORMATION?

Information is available online on [solutions.vallourec.com](http://solutions.vallourec.com) or by scanning the following QR code.



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