

# Geothermal well construction consulting services



GeothermEx™ geothermal consulting services encompasses comprehensive geothermal well design, well construction, and formation evaluation operations.

We provide engineers and supervisors, wellsite geologists, reservoir engineers, and project managers. As appropriate, we can also provide purchasing and contracting specialists, accounts clerks, and related support staff. Our portfolio includes consulting services for

- turnkey project management
- wellsite selection and drilling readiness reviews
- evaluation and preparation of basis of design, well design, and detailed drilling programs
- preparation of bid documents, contractor and subcontractor selection, and HSE programs
- coordination with regulatory agencies for permitting and environmental clearances
- management and onsite supervision of well construction operations
- design, management, and supervision of formation evaluation programs
- remedial activities, including well cleanouts, workovers, and abandonments
- technical support on well insurance, blowout prevention, and well control
- expert witness provision and technical support for legal cases.

Our well construction experience includes high-temperature—up to 360 degC [680 degF], low-temperature, steam-dominated, two-phase, single-phase, and hypersaline systems and ranges from consultation for specific operations to complete management of all aspects of well construction and formation evaluation. Project scopes have encompassed single wells to entire field developments and vertical holes to multilateral wells and multiple deviated wells from a single pad.

We've managed well construction operations with foam, mud, water, and air to depths exceeding 4,000 m [13,000 ft]. Cumulatively, GeothermEx services has been involved in drilling approximately 250,000 m [800,000 ft] of exploration, production, and injection wells.

## Temperature gradient and slim well construction

We've managed well construction and formation evaluation of more than 300 temperature gradient (TG) and slim wells worldwide—including in the US, Philippines, Costa Rica, Portugal, and Indonesia—to depths of 50 m to 1,200 m [150 ft to 4000 ft], for a cumulative footage of approximately 100,000 m [325,000 ft]. This work has involved

- analysis of exploration data
- drillsite selection and well design
- technical assistance for permitting and contracting
- environmental impact mitigation
- onsite management of drilling, formation evaluation, and testing
- data analysis and interpretation
- reporting and resource assessment technical guidance.

We have extensive experience with continuous coring diamond bits, air hammers, roller cone bits, and PDC bits in volcanic formations, sedimentary basins, granitic plutons, and metamorphic formations.

## Operations management: The GeothermEx services model

GeothermEx services has provided operations management services since its founding in 1973. We maintain a roster of highly qualified and experienced supervisors in the geothermal sector and select the supervisor with the most appropriate qualifications and experience for your project. State-of-the-art reporting software records all critical drilling parameters and daily activities 24/7.

The complete daily report is transmitted to the home office, where it is reviewed by our well construction team. This information is critical to discussions with onsite supervisors about planned activities in the field. Round-the-clock support is available for urgent situations; a senior engineer is dispatched rapidly to the site as required for drilling-related issues. The engineer also visits the site at the start of well drilling to ensure that onsite personnel are following correct protocols and procedures. This model, with onsite supervisors in communication with highly experienced drilling experts in the home office, is not only highly effective in maximizing drilling success but also enhances cost efficiency.

In addition to operational expertise, our onsite supervisors have extensive knowledge and practical experience with procurement, equipment and material specifications, site safety, environmental compliance, personnel management, and communication with the customer's project management team.

Because well construction and field development typically account for about half of the expenses in a geothermal project, improved drilling efficiency speaks directly to the bottom line. GeothermEx's drilling management approach has repeatedly yielded efficiency improvements through a combination of three key factors: preventive planning and rapid intervention to resolve drilling problems and delays, provision of reputable and knowledgeable drilling supervisors to oversee field operations, and regular communications and oversight by senior well construction engineers with decades of experience in geothermal drilling. Let us put this expertise to work for your next project.