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20 YEARS

- Ground-source drilling
- Scandinavia
- Rental market

Aker Wirth does a dam good job

Drilling equipment manufacturer Aker Wirth is playing a key part in dam reinforcement in the US.

Lake Cumberland in Kentucky is one of the largest lakes in the US and is used with the adjacent Wolf Creek Dam to generate power. Over the years, erosion at the base of the dam has led to leaks that threaten its stability.

Attempts to stop seepage through injections were unsuccessful and the dam is being sealed using a drilling technique that Aker Wirth developed specially for this project together with its customer Trevi. The two form the joint venture responsible for the Wolf Creek Dam Rehabilitation Project for client US Army Corps of Engineers, which is responsible for all dams in the US.

The dam is a combined earth-fill and concrete structure. It is 1.7km long and up to 79m high. More than 1,000 boreholes are necessary for sealing, and these are drilled vertically up to a depth of 95m in the dam wall, right into the bedrock. The boreholes are realised with up to five Aker Wirth pile-top drill rigs, each with a drilling diameter of 1.25m.

The boreholes are realised in a special order, with holes 1, 3 and 5 being drilled first and then filled with concrete. Following setting, holes 2 and 4 are realised. A continuous concrete wall is created in the dam wall in this manner.

The boreholes must overlap adequately for the entire length to ensure the water-tightness of the dam in the long-term. To achieve this, the client specified extremely close tolerances for the straightness of boreholes. In order to achieve this to-date-unique level of precision,

Piling for the dam

Aker Wirth, in close co-operation with Treviicos, developed a drill string with triple-stabilised drill collars and a drill bit with stringer (centre point). This system was supplemented with a measuring device provided by the client to control verticality at any drilling depth. The client's requirement for quality documentation of straightness of the borehole was met.

Reverse-circulation drilling is employed with compressed air injected directly above the drill bit into the drill string. The resultant air-water mixture has a lighter specific density.

The pressure difference between the surrounding pressure and low pressure in the drill string starts the transport process. This energy-efficient and robust procedure is realised with clean water free of chemical additives, making it very suitable for use in ecologically sensitive areas.

The Aker Wirth pile-top drill rigs have already successfully mastered more than 90% of the total of 1,000 boreholes in the Wolf Creek Dam. Boring should be completed in spring 2013.

Trevi helps in salvage of Costa Concordia

Trevi Group division Soilmec's rigs are working at the site of the wrecked cruise ship Costa Concordia off the shore of the Tuscan island of Giglio in Italy.

The project to salvage the liner incorporates a seabed survey to determine the composition and the construction of an anchor system to secure the wreck before autumn, when storms can put at risk the ship's precarious stability.

The 2,380t of fuel on board were successfully removed in order to prevent the most immediate and major threat to the environment.

Stabilising the wreck will require anchors to be constructed between the liner and shore.

The Trevi drill rig is dwarfed by one of the funnels of the Costa Concordia

Secured to these anchors will be metal structures weighing over 30t attached with large steel cables to tie back the ship and prevent it from sliding deeper.

Survey and anchor construction have been handed over to Trevi Group, which split the job between two divisions: RCT for the geological survey and Trevi, specialising in ground engineering, now in the phase of constructing the anchors. The operation is unprecedented also from a geotechnical standpoint owing to the high specialisation and experience required.

RCT has been using an SM-20 drilling rig for the survey, and for anchor construction Trevi is using an SM-21 drilling rig. Both machines were supplied by Soilmec.

British Drilling begins work on Carlisle coal project

British Drilling and Freezing has started drilling the first of five holes at Australia-based New Age Exploration's (NAE) coking coal project near Carlisle in the UK.

The contract includes the option of a sixth hole. NAE has also completed seismic reinterpretations of historical data. The seismic reinterpretation results are being included in planning the drilling programme and will be used as a basis for the resource modelling.

NAE will undertake a full coal-quality analysis, including washability and preliminary coking tests, from drill core on completion of each hole.

The first borehole and analysis results are expected late in the first quarter, with Phase 1a completion and its Joint Ore Reserves Committee Resource (JORC) update in early Q3. Phase 1b and its JORC resource update are expected in early Q4.

"The initial drilling (Phase 1a) will provide an understanding of the size and quality of the coal contained within the western part of the Lochinvar project down to depths of 600m," NAE managing director Gary Fietz commented.

The company acquired the project in June 2012; it is part of the Canonbie coal field discovered in the 1950s by the National Coal Board. It has an exploration target of 330Mt to 410Mt.

Itag kit drills in Switzerland

German drill rig manufacturer and services provider Itag is embarking on a Swiss geothermal project.

Itag is currently transporting about 100 container loads to the city of St Gallen in Switzerland where drilling is expected to start in March.

The project aims to drill to a depth of about 4,500m and produce water of 140-150°C. Drilling is expected to show first results and allow for circulation tests in July this year.

The drilling is insured by Swiss-Grid under an exploration risk insurance for a total amount of SF24 million (US$25.8 million).

The project aims to provide both geothermal electricity and heating to the northern city. The district heating system is expected to cost about SF83 million ($89.3 million).

Itag operates a fleet of three heavy rigs for drilling and work-over operations to a depth of 8,000m; three medium rigs for drilling and work-over operations to a depth of 4,000m; and two light, mobile rigs for drilling and work-over operations to a depth of 2,500m.

The company celebrated 100 years in business last year.