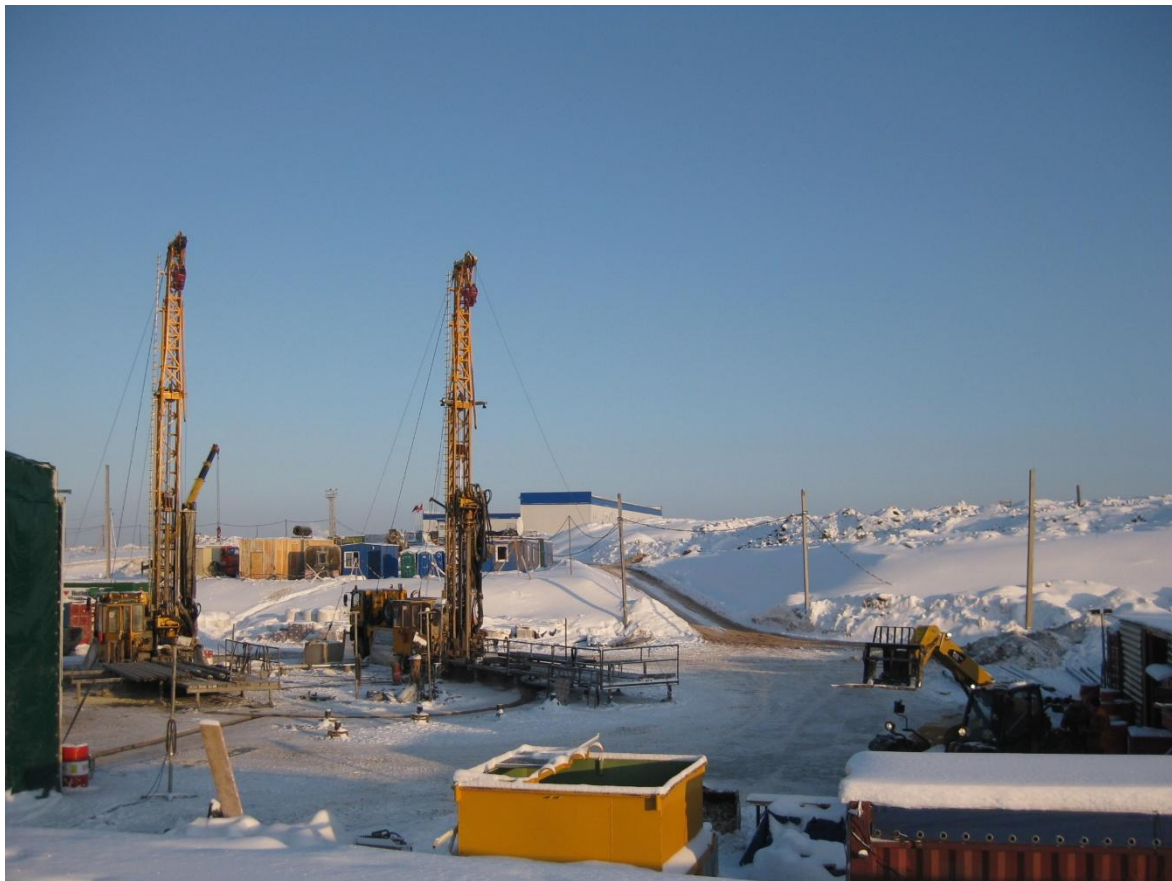




Status report Perm

Drilling work

After drilling work had started on the production shaft (number 1 shaft) in September the project reached its first key objective on 24.03.2011 when Thyssen Schachtbau could report the successful completion and casing of all 41 freeze holes and three temperature measurement holes to their end-depth of 270 m. In spite of the most adverse weather conditions (minimum temperatures were as low as -40 °C) the drilling work was completed on schedule and as per contract.



Drilling at -40 °C

Work has now begun on dismantling the drilling equipment for transfer to number 2 shaft so that a prompt start can be made on the next drilling phase. All the standpipes (depth 30 m) were also set in place in parallel with the drilling operation at number 1 shaft so that both machines will be ready to start on drilling and installing protective casings and freeze pipes in CW 15 of 2011. A total of 43 freeze holes will be drilled for number 2 shaft, compared with 41 in number 1 shaft.



The total number of temperature measurement holes is the same for both shaft sinkings. The drilling operation at number 2 shaft will be completed in the summer of 2011 when the last of the freeze pipes is lowered into place.

Freeze plant

The design and assembly work on the freeze plant is now complete. The equipment has an installed refrigeration output of 3,600 kW at a brine temperature of $-38\text{ }^{\circ}\text{C}$. After commissioning the plant will commence ground freezing simultaneously in both shaft columns. The strata temperature is measured every metre using fibre optic cables installed in the temperature measurement holes so that the freeze-wall buildup can be continuously monitored.



Freeze plant with condensers shown assembled and ready for shipment

The operation to ship out the freeze machines, brine pumps, pipe assemblies and measurement instruments commenced in CW 11 of 2011 and the first consignments are expected to arrive at the site in CW 13. Assembly work is to begin immediately so that the freeze plant for number 1 shaft can start operating in the summer. Ground freezing will also commence at number 2 shaft



this autumn as soon as the drilling and equipment installation work has been completed here. As the operator of the freeze plant Thyssen Schachtbau will remain under contract to EuroChem for the entire duration of the freeze-wall phase of the sinking operation and will therefore play an important role in bringing the shaft sinking project to a successful conclusion.

24.03.2011, Mülheim a. d. Ruhr