

# Salmon Undisturbed in Scottish Drilling Project

The River Deveron in Inverness, Scotland

Scotland - well-known for its salmon, mountains and cold winters - was the location of a dry-rock directional drilling project in December involving a new high pressure gas main that will supply northern areas of the country.

Powermole International, manufacture, supplier and contractor of the new dry-rock technology, was contracted by Underground Moling Services in Scotland for Turriff Contractors (BGTransco).

The project involved directionally drilling under the River Deveron - a habitat for salmon - near Inverness, Scotland.

Following concerns of the Scottish Environmental Protection Agency, it was considered advantageous to use a dry drilling system rather than conventional, wet drilling methods. The latter would have involved copious amounts of drilling mud and water to drill through the hard schist rock, which had a 20,000 psi (1,379 bar).

The length of the bore was 508

ft (154 m) and the diameter of the HDPE pipe was 7 in. (180 mm). The Powermole dry rock drilling system - PM903 - was used.

It took seven hours for the crew to complete the pilot bore. Various ground conditions were encountered during the drilling, including a large formation of strong gray quartz schist rock. Using the PM903, the job was done with little difficulty, Powermole officials say.

The Powermole dry rock drilling system uses compressed air with a small amount of biodegradable lubricant to do the drilling. The lubricant produces a filter cake around the bore, and combines with the compressed air to prevent collapse of the bore. Spoil from drilling is removed via the airflow through the borehole. Being a dry system, it does not require mud motors, mixing or a recycling plant. **Salmon Safe**

The drill head was initially steered to a depth of 3 ft (1m) below the riverbed. While boring, a sudden drop in resistance indicated a void along the bore

line. However, it was discovered that the void was actually a salmon pool - only recently created. This required that the bore line would have to go much deeper to avoid the pool. The depth reached 17 ft (5.4m).

To achieve this, part of the drill string was retracted and a new direction was taken, going down the schist rock, beneath the pool and rising to the original level at the other side of the pool.

During the project, the Powermole system was able to steer 8 in. (200 mm) through only 10 ft (3 m) in the schist rock. After 14 hours of pre-reaming and six hours of pullback, the HDPE pipe was installed.

*This article was edited by Sharon M. Bueno, managing editor of **Directional DRILLING**, from material provided by Powermole International, which is headquartered in Kent, England.*



Underground Moling Services subcontracted Powermole International to use its PM903 drill for this dry rock job.