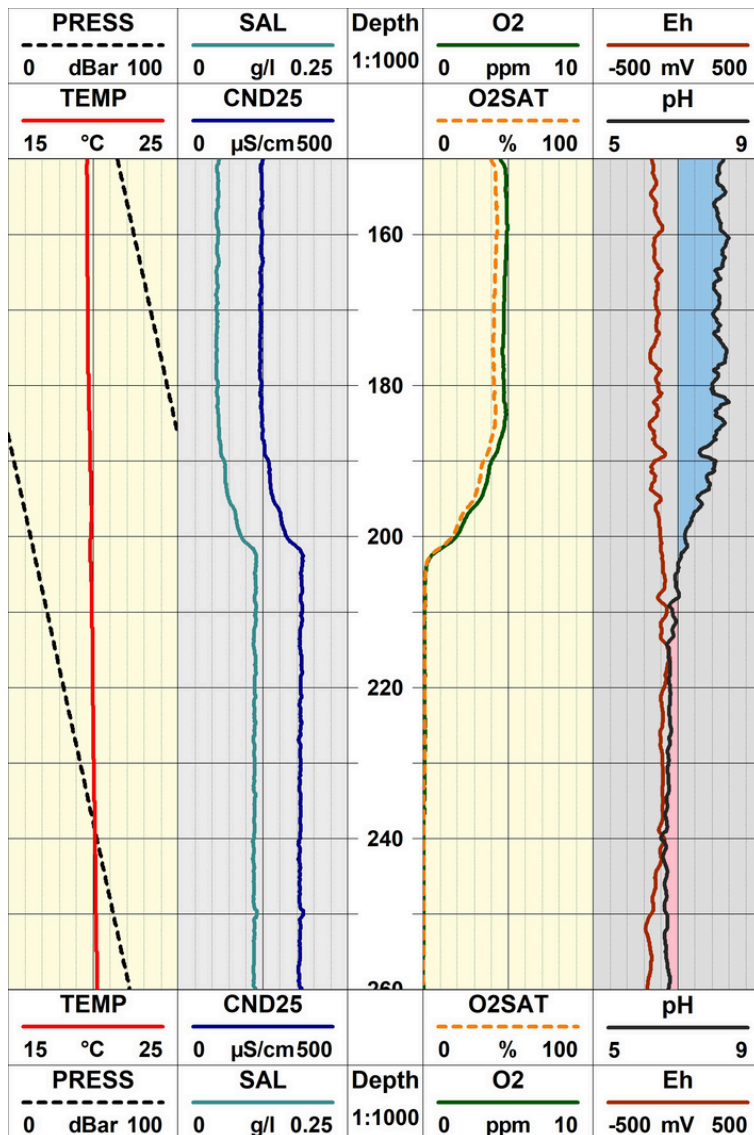


## Case study - Water quality



The multi-parameter **WQP48** water quality probe was used to record the example log shown opposite during the geological reconnaissance campaign for the new Lyon – Turin high-speed rail link currently under construction in the Franco-Italian Alps.

At the borehole location, trains will run in a tunnel situated several hundred metres below the local ground surface. For reasons related to optimising construction methods and materials, the geophysical logging programme for the series of reconnaissance boreholes of which this was one, included measurements of groundwater properties and flow volumes.

This log shows a significant change in fluid properties over the interval between 185 and 205 m.

Below 205m, the fluid column contained stagnant, slightly acid water with essentially zero dissolved oxygen content. Dating later showed that this water had resided for a considerable time period in the geological formations.

The upper section of the hole was filled with “recent” water having a significant dissolved oxygen content, lower electrical conductivity and a pH of approximately 8. This water was infiltrating down from the surface into the massif via a network of permeable faults and fractures.



The photo to the left shows a typical borehole location in the Maurienne valley study area.

The WQP48’s sensor array is protected by a stainless steel cage as shown on the photo to the right. The rapid reaction times of the sensors allows logging to be carried out at typical speeds of 5 to 8 metres per minute.

