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Landslide of Morasses : Borehole campaign and hydrogeology study

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The landslide of Morasses, located on the left bank of the Val de Zinal (Valais, Switzerland), belongs to a large slope sagging covering more than $2km^2$. It covers green quartz paragneiss interbedded with amphibolites and micas. Bounded upstream by a former scar and lateral slip-faults, it consists of two compartments fitted into the axis of slope. The downstream compartment is directly affected by the erosion of the river "Navisence". The sliding mass is estimated at $900'000m^3$, from which $100'000m^3$ is the most active part. Known and studied since 2001, this landslide was relatively stable between 2004 and 2007, and it was reactivated in autumn 2008. A major crisis followed in the spring of 2009 due to the slow melting of a large snowpack.

The cantonal geologist immediately proposed the realization of two boreholes to determine the depth and characteristics of the aquifer which is at the origin of that reactivation. The F1 reached the aquifer (half-artesian) in contact with the bedrock at 57m. The F2 reached the same aquifer (artesian [5L/min at the drilling head]) at 51m, always in contact with the bedrock. Given the success obtained in the F2, a drain has been drilled in the slope 40m below. This drain lowered the level of the aquifer and reduced the sliding velocity. The drop in the level of F2, and to a lesser extent in F1, far off 90m, was almost instantaneous when the drain reached the aquifer.