

Northam Platinum Mine - South Africa 1989**Mine Shaft**

During 1989 the sinking crew at No 1 Shaft reported intersecting water in a pilot hole at level 4 (depth 1483m/4865 feet). The drilling of additional cover holes in the area enabled geologists to create a model of where the water was coming from. These additional drilled holes fractured the surrounding rock so that, what was once an intersection in a pilot hole, had now become a badly fractured face and sidewall. The water quantities increased to approximately 850 litres per minute.

The geological model indicated that the water was associated with a vertical fracture zone approximately 1 metre in cross-section. The fracture zone consisted of 5 to 6 fractures and core samples indicated the presence of calcite within them.

An aggravating factor was the high temperature of the water (+ 55°C/131 Fahrenheit). It also became evident that the high static water pressure (170 Bar/2465 P.S.I) and the relatively weak tensile strength of the rock (14Mpa), coupled with the proximity of the fracture to the face, would simply break open any seal.

It was agreed that the ground immediately around the break out was too fractured and that a more remote seal, which would seal the water closer to its source, should be attempted.

Holes were drilled as required and dye was used to confirm their relative positions in the water flow. The dye was also used to ensure that all holes intersected each other.

The sealing method required that Sovereign's patented emulsion be injected. Once the Scem66 emulsion reported to the face, an activator was injected into adjacent holes causing the water to carry the activator to the Scem66 emulsion causing coagulation within the fractures.

A complete seal was achieved in a single 8 hour shift.