

Hydrogeological Modeling

The three-dimensional mathematical hydrogeological modeling is a tool that allows the reproduction of flow and transport conditions in an aquifer using computational resources. Through this tool, it is possible to simulate the behavior of an aquifer contamination, evaluating its horizontal and vertical migration over time in different scenarios, given the characteristics of the hydrogeological basin and local geology. By using of calibration processes, it is possible to reproduce plumes of contamination from its beginning to the present times. The hydrogeological modeling also allows the simulation of future scenarios, considering different remediation alternatives, which allows the choice of more effective scenarios, not only in terms of protection to the receptors, but also in terms of costs involved in the implementation and operation of these systems.

According to the procedure currently in force (Board Decision DD-038/17, or simply DD38 CESTESB) mathematical hydrogeological modeling should be used to simulate the temporal behavior of the contamination, enabling the verification of changes in exposure scenarios, and predict the potential change in the quality of surface and groundwater resources, as well as define the need to adopt intervention measures.