

## ***Improving groundwater management and protection in Lebanon***

### ***The challenge...***

Excessive pumping and uncontrolled exploitation of groundwater has increased seawater intrusion in Lebanon's coastal aquifers, leading to salinization. In addition, excessive use of fertilizers in agricultural areas has resulted in the infiltration of mineral and organic pollutants into groundwater. In order to address water shortages and pollution, the National Council for Scientific Research sought to establish a well-equipped isotopic analysis centre at the Lebanese Atomic Energy Commission (LAEC) that would be capable of supporting all future water projects, in cooperation with the relevant ministries and other national institutions.

### ***The project***

An IAEA technical cooperation project was set up to build national isotopic analysis human resource capacities and to establish an isotopic hydrology laboratory. Training on groundwater hydrology was also provided through fellowships and scientific visits to increase the skills of staff in this area.

The new technical skills and equipment were expected to support the establishment of the status of groundwater reservoirs and their renewal, to evaluate the links between groundwater reservoirs and surface water, and to determine potential sources of water pollution.

### ***The impact...***

As a result of the project, an isotopic hydrology laboratory was established at LAEC that can perform the analysis needed for the development of a strategy for the use of isotope techniques in water management and dating. The laboratory can date different water samples and is thus able to determine the appropriate status of groundwater reservoirs and their renewal, as well as evaluate interconnections between groundwater reservoirs and between ground and surface waters and potential sources of water pollution.

The use of isotope techniques in water management in Lebanon has proved to be very useful. Sources of water, water dating, recharge rates and the renewal of groundwater reservoirs can now be evaluated, and efforts can be made to solve the water shortage problem. With the increased knowledge of the staff in the laboratory, it has been possible to develop a water management framework.



*Benzene synthesis line.*



*Preparation of samples for the electrolysis tritium enrichment system (LAEC).*