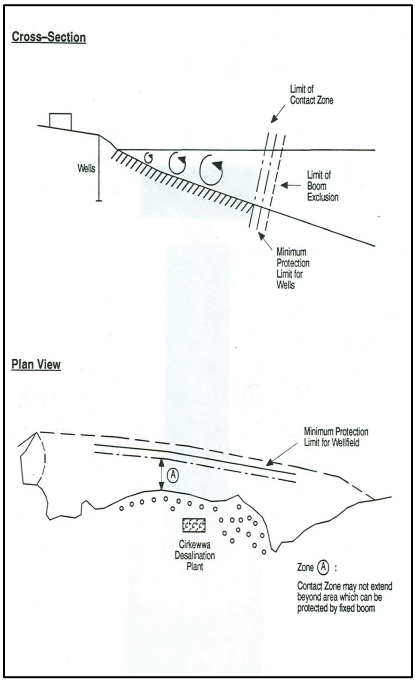
Water Services Corporation
National Water Resources Protection Program
Malta

The water supply of the Maltese islands consists of water obtained from freshwater ground water reserves and from the desalination of sea water. Feed water for the desalination plants is obtained from deep shore-based wells which draw seawater in through the island shoreline.

As a result of the reliance upon sea water to meet over half of the Maltese water supply requirements, sea borne oil pollution was recognized as a potential threat to the islands' water supply. A key factor in assessing the seriousness of this threat was to understand the way in which oil at sea might be transmitted through shoreline geological formations and into the sea water intake wells.

To evaluate the risk posed to the Maltese water supply, an investigation was commissioned with the following objectives:

- Perform a review of the geological formations of Malta and determine their hydraulic characteristics
- Evaluate seven well fields across the Maltese islands; review individual well field hydraulic parameters and performance
- Determine the major type of oil spill scenarios likely to occur
- Investigate key parameters which might affect well field vulnerability
- Provide a risk ranking of well field vulnerability
- Provide recommendations to improve well field security



Investigation Summary

The ground water flow system in Malta is dominated by flow through fractured and faulted limestone which has been modified by karst processes. The presence of this type of terrain creates zones of high permeability (in the form of solution cavities) within a low permeability limestone. These solution cavities enable the extraction of large volumes of water. However, it is precisely these features that were also determined to be responsible for the rapid transmission of oil in the event of an oil spill.

Each of the Maltese Islands seven well field sites has a different shoreline profile and differing geological conditions. At the conclusion of this investigation, each well field was ranked in terms of its vulnerability to a 1) on-shore, 2) near-shore and 3) off-shore oil spill.

PROJECT HIGHLIGHTS:

- ✓ **Evaluated complex geologic (karst) aquifer systems to evaluate ground water flow**
- ✓ **Developed ranking system to effectively assess well field vulnerability**