



**Project: BEEMERY OFF-STREAM STORAGE**

**Location: Bourke, Western NSW**

**Client: Clyde Agriculture**

## **Background**

Clyde Agriculture proposed irrigating 1820 hectares under cotton cultivation; this proposal included the provision of water storage reservoirs of up to 10,800 ML capacity. Concerns were raised by the authorities managing Barwon River water quality that mounding of the underlying water table could result in additional seepage of saline groundwater to the river.

Hoynes Wheeler & Thorne and subsequently Terra Sciences Ltd commissioned C. M. Jewell & Associates Pty Ltd to undertake EM geophysical surveys, soil mapping, soil profile logging, extensive drilling of boreholes, groundwater sampling and integrated data analysis, which included groundwater flow modelling.

## **Hydrogeological Environment**

The alluvial profile beneath the 'Beemery' site comprises a clay/ironstone unsaturated zone to depths of 6-16 metres overlying a saturated zone dominated by fine sands with accessory silty and clayey layers. Flow of the native, saline groundwater is hosted within the fine sand, which is about 10 metres thick. This, in turn, is underlain by clays and siltstone that do not host any significant groundwater flow.

Native groundwater beneath the site has an electrical conductivity range of 30-50 mS/cm.

## **Scope**

Following a review of existing data, thematic mapping, aerial photogrammetry and EM geophysical surveying, an in-depth assessment of site hydrogeology using backhoe pits and borehole logging was undertaken to confirm the distribution and properties of various alluvial materials. C. M. Jewell & Associates Pty Ltd prepared a series of reports from 1995 to 1998, which detailed:

- planning and costing analyses
- initial drilling, geophysics and mapping
- modelling using Intersat
- advanced modelling using Visual MODFLOW
- impact assessment.