



**Project: LANDFILL EXTENSION
Review and Investigation**

**Location: Lucas Heights, NSW
Client: NSW Department of Planning
NSW Waste Recycling and Processing Service**

Highlights

- Major municipal solid waste (MSW) landfill
- Initial review of EIS and existing data
- Full hydrogeological study
- Representation at planning inquiry

Background

The Lucas Heights Regional Waste Depot is a major MSW landfill which receives waste from much of the Sydney metropolitan area. It was originally developed by the NSW Waste Management Authority (WMA) in 1987; no hydrogeological investigation was carried out at that time. In 1991 the WMA submitted an Environmental Impact Statement for a proposal to expand the depot both laterally and vertically (by overtopping). The NSW Department of Planning asked C. M Jewell to review the EIS and prepare a report on hydrogeological aspects of the proposal. This report highlighted the lack of hydrogeological data concerning the site, and identified a number of potential problems; it was submitted as evidence to the inquiry. Subsequently the Waste Recycling and Processing Service (WRAPS), the successor to the WMA, commissioned Coffey Partners and D. J. Douglas and Partners to carry out a hydrogeological investigation of the site. Coffey appointed C. M. Jewell initially as project manager, and subsequently as an external consultant on the project.

Hydrogeological Environment

The site is underlain by Hawkesbury Sandstone, which in this area forms the Woronora Plateau, which slopes gently to the north and is deeply dissected by a series of watercourses. These watercourses drain recreational and residential areas to the Georges River, a tidal estuary containing valuable shellfish beds. The Hawkesbury Sandstone has very low intergranular permeability, so that groundwater transmission occurs almost entirely by means of fractures. These may be associated with low-angle bedding planes or predominantly high-angle joints, and may be localised in discrete zones associated with geomorphological features, and controlled by the area's tectonic history.

Objectives and Scope

The investigation included geological mapping, an extensive drilling program, hydraulic testing, seismic refraction and surface-to-downhole seismic surveys, and a program of hydrochemical sampling and analysis. It was concluded from the results of this work that part of the site was underlain by a moderately transmissive and laterally extensive fracture system. Consequently it was recommended that engineering controls be implemented to limit migration of contaminants from the site. A review of available engineering options was carried out, and preliminary designs prepared for a leachate collection system and clay-based lining system.

A joint report setting out the conclusions of the investigation, and the recommended engineering approach, was prepared.