

ULEY BASIN GROUNDWATER MODEL 2007

Purpose

The purpose of the groundwater model, as described in Zulfic, Harrington and Evans (2007), is to provide a management tool for determining sustainable yields for the Uley Basin aquifers and to predict the response of the aquifer system to potential groundwater use scenarios as well as climate variability.

Background

From Zulfic, Harrington and Evans (2007), the Uley Basin consists of three fresh groundwater lenses – Uley South, Uley East and Uley Wanilla – which form part of the Southern Basins Prescribed Wells Area. Groundwater obtained from the basin provides the reticulated water supply system for Eyre Peninsula and the Uley South lens alone contributes 70% to the total reticulated water needs for Eyre Peninsula.

In order to a gain better understanding of the groundwater resource in the Uley Basin and estimate the impacts increasing water demands might have on the resource, SA Water and the Eyre Peninsula Natural Resources Management Board, in partnership with DWLBC, initiated the Uley Basin groundwater modelling project in September 2005.

The model was based on integrated hydrogeological concepts of a number of authors, as presented in Harrington *et al.* (2006). The MODFLOW 2000 software package was used with the GMS platform to develop the model.

Location

The location of the model domain is shown in Figure 1.

Model structure

Model domain and grid size

The model domain simulates an area 24 km (east to west) by 33.7 km (north to south). The bounding coordinates of the model domain are 542840E, 6139140N (south-west) and 566980E, 6172890N (north-east) (GDA 1994, MGA Zone 53).

The model grid comprises 123 rows x 83 columns. The minimum grid size is 115 m x 125 m and a maximum grid size of 500 m x 500 m.

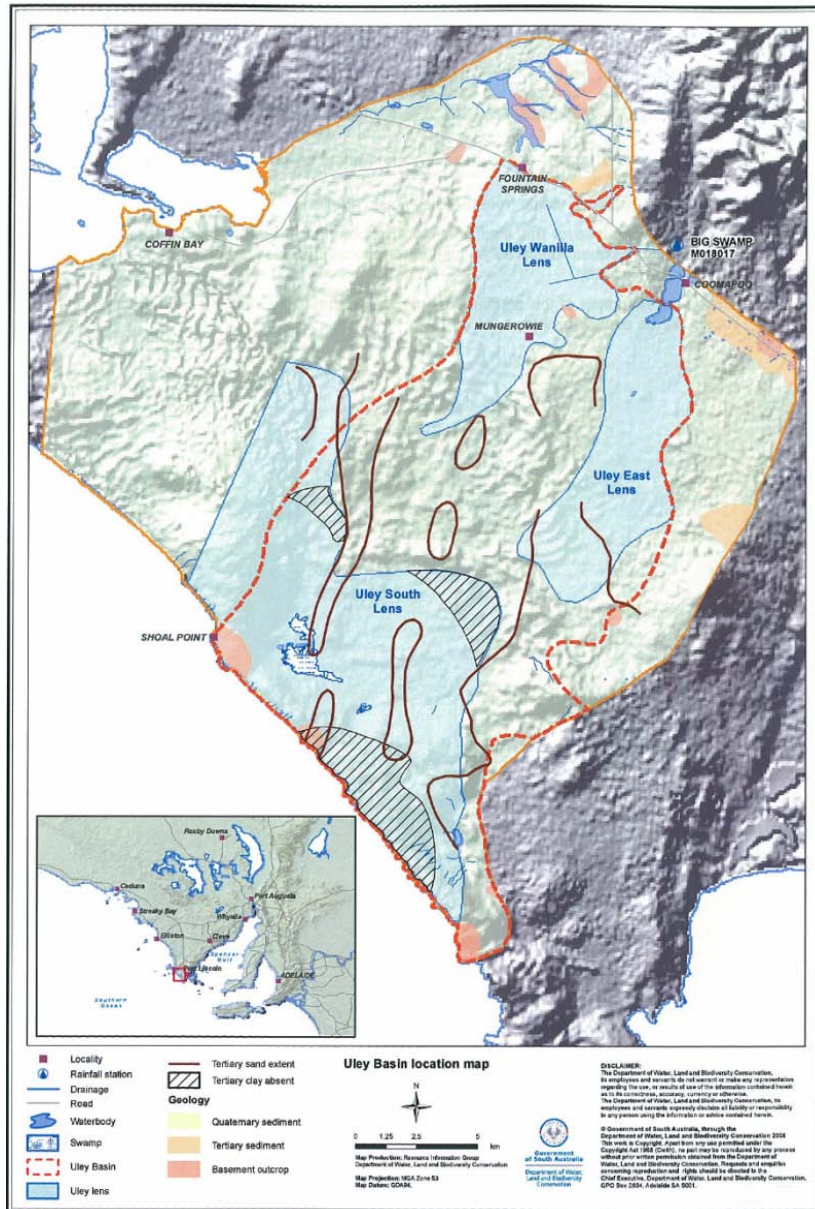


Figure 1. Uley South model domain

Model layers

The model has three layers, with two layers defined as convertible from unconfined to confined conditions and one layer as confined, as shown in Table 1 and Figure 2.

Table 1. Model layers

Layer	Hydrogeological unit	Aquifer/Aquitard	MODFLOW layer
1	Quaternary Bridgewater Formation Limestone	Aquifer	Type-3
2	Tertiary Uley Formation	Aquitard	Type-0
3	Tertiary Wanilla Formation	Aquifer	Type-3

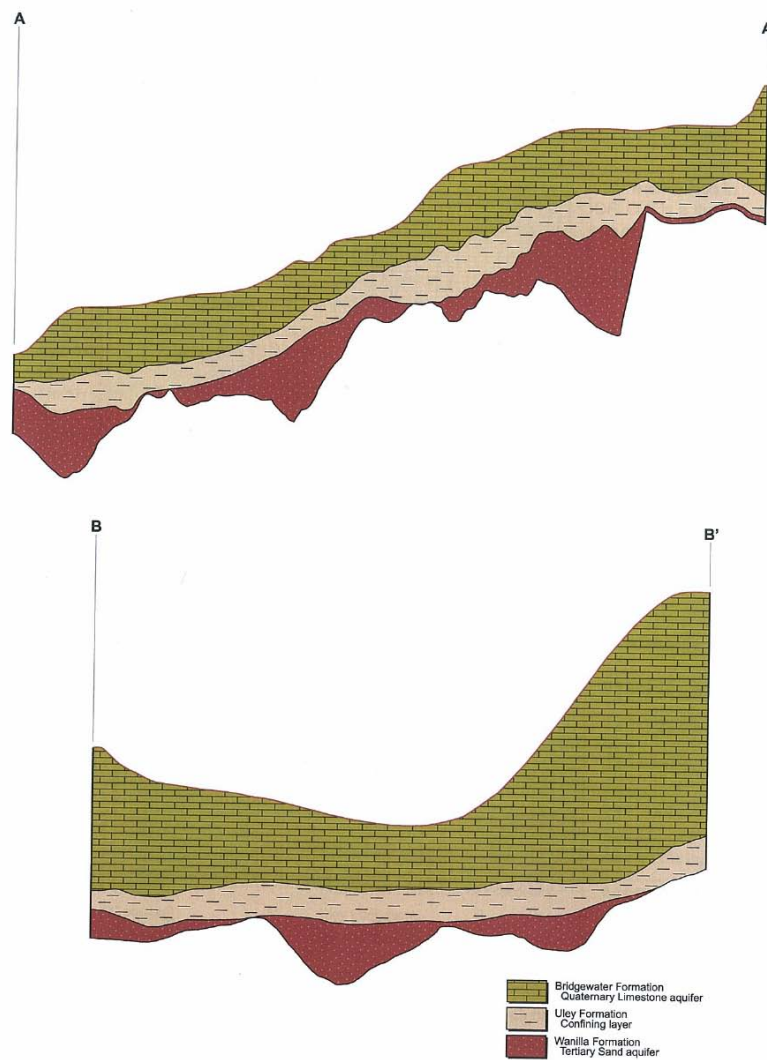


Figure 2. Cross-sections

Reports

Harrington N, Evans S and Zulfic D, 2006, *Uley Basin Groundwater Modelling Project, Volume 1: Project Overview and Conceptual Model Development*, Report DWLBC 2006/01, Department of Water, Land and Biodiversity Conservation, Adelaide

Zulfic D, Harrington N and Evans S, 2007, *Uley Basin groundwater Modelling Project, Volume 2: Groundwater Flow Model*, Report DWLBC 2007/04, Department of Water, Land and Biodiversity Conservation, Adelaide