



Confined Aquifer Condition and Extraction Limits in the Tintinara Coonalpyn Prescribed Wells Area (PWA)

How much water can we extract?

The confined aquifer in the Tintinara Coonalpyn PWA consists of the Buccleuch Formation found under the Coastal Plain landform and the Renmark Group Formation under the Mallee highlands. In the 2003 Water Allocation Plan (WAP), the Permissible Annual Volume (PAV) for the confined aquifer was defined as the volume of water that could be extracted on an annual basis in the Management Area (MA) without causing significant adverse water pressure level or water quality impacts to that aquifer.

It is proposed under the revised WAP that the sum of all water taking and water holding allocations, plus an allowance for unlicensed stock water use and domestic water use (S & D water use), must be managed within a Target Management Level (TML).

The TMLs for each Management Area have been calculated in the following manner:

Tolmer MA: the TML is a new sustainable amount based on updated scientific information, and will require reductions to allocations in this Management Area to meet the TML.

Kynoch MA: there is no extraction from the confined aquifer in this MA and consequently the TML is set at nil.

Tauragat MA: Same as the PAV set under the 2003 WAP.

Review of Groundwater Resources Condition

A review of the condition of the groundwater resources was carried out by the Department of Water, Land and Biodiversity Conservation (now Department for Water) in 2007. The review utilised groundwater depth and salinity monitoring, volumetric extraction figures and rainfall trends to determine the TMLs for the Tintinara Coonalpyn PWA.

What did the review of the resource condition find?

Tolmer Management Area

Groundwater extractions from the confined aquifer in the Tolmer MA have climbed steadily to over 5,400 ML/yr (Figure 1) in the drought year of 2006/07, and represent approximately 70% of the PAV set under the 2003 WAP.

Groundwater monitoring in the Tolmer Management Area (MA) is showing that during the irrigation season, extractions have a major influence on pressure levels. In recent years the peak drawdown has stabilised to a maximum of about five metres even with increased extraction (Figure 2). Monitoring is also showing that there is a downward water level trend in many of the observation wells. The downward trend can be attributed to increased extraction and demand due to drought years and also the reduction of hydrostatic loading on the confined aquifer (i.e. the weight of unconfined aquifer places pressure on confining layer and unconfined water level rise equals confined water level rise).

Figure 1: Water allocation and extraction in the Tolmer management area

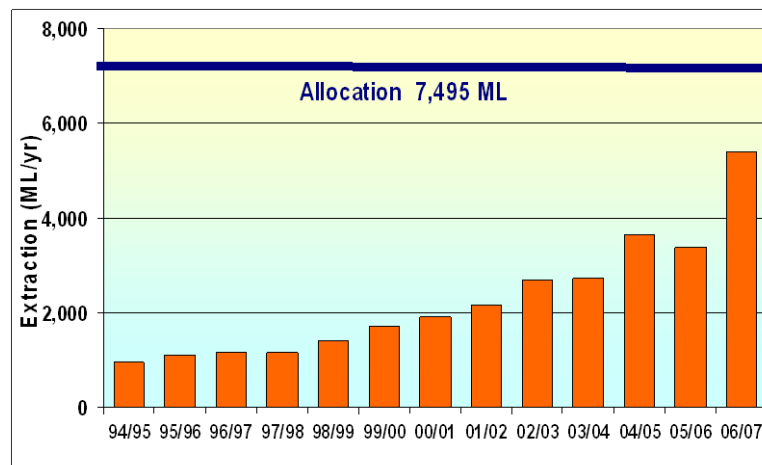
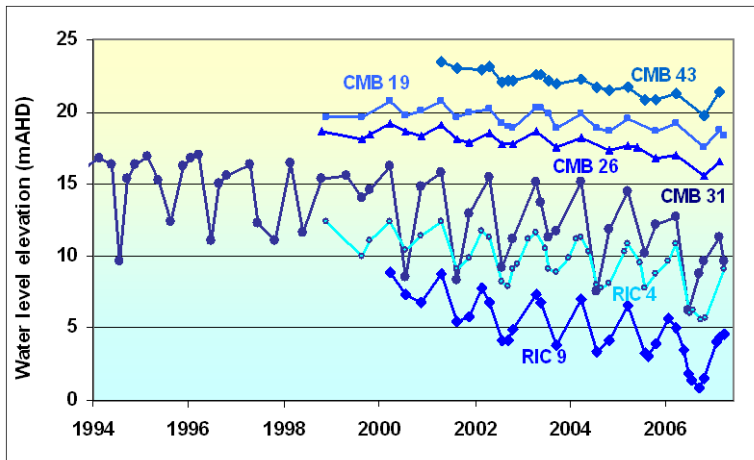




Figure 2: Water level trends in the Tolmer management area



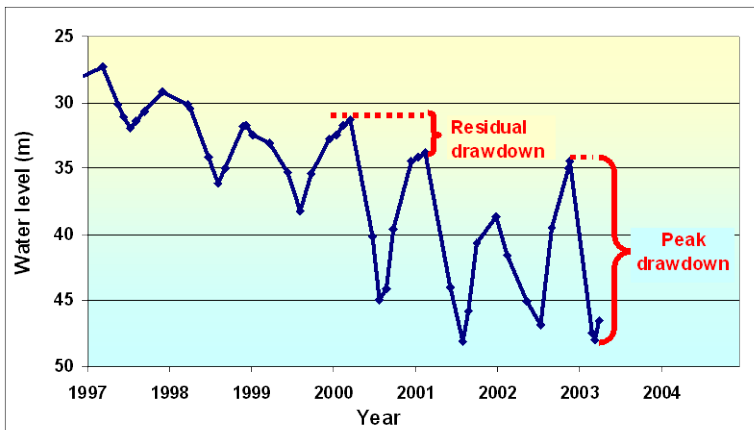
Salinity monitoring of the confined aquifer in the Tolmer MA is showing a slight decreasing trend for a number of wells, possibly due to the inflow of fresher water from the east. The salinity resource condition trigger was not exceeded over the previous five years.

The peak seasonal drawdown trigger for the Tolmer MA of 10 metres at the centre of the Tintinara township was not exceeded in 2006/07; however the four metres drawdown up to four kilometres from the town centre was exceeded in several wells. The residual seasonal drawdown trigger was not exceeded in 2006, and only one well exceeded the trigger level in 2007.

Drawdown triggers for Tolmer

The groundwater monitoring triggers for the Tintinara Coonalpyn PWA were reviewed by the DWLBC (now the Department For Water) as part of the review of the condition of the groundwater resource.

Figure 3: Diagram illustrating the calculation of the residual and peak drawdowns for each hydrograph

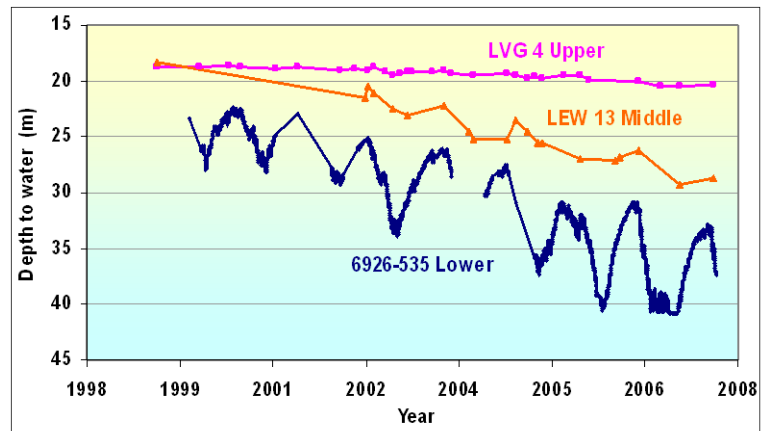


The groundwater monitoring triggers for the Tolmer management area currently stipulate that peak drawdown must not exceed ten metres in the Tintinara township, and four metres at a distance of four kilometres from the township. Residual drawdown is also measured at the centre of the township and must not exceed 2.5 metres, or two metres at a distance of four kilometres from Tintinara. Due to the dispersal of extraction from the Tolmer confined management area over the past five years these triggers are no longer considered adequate for monitoring drawdowns. It is proposed that peak and residual triggers measured at the Tintinara township are removed, together with the four kilometre radius trigger for peak and residual drawdown.

Tauragat Management Area

Groundwater extraction from the confined aquifers in the Tauragat Management Area were well below the amount set in the 2003 WAP prior to the 2006/07 irrigation season. Due to the drought in 2006 and the establishment of new olive plantings, extractions increased significantly to approximately 50% of the total allocation for the area.

Figure 4: Water level trends in the Tauragat Management Area



Monitoring of confined aquifer pressure levels for the three confined aquifers in the Tauragat MA are showing declining pressure levels which correspond with increases in extraction rates. As shown in Figure 4, the



impact of extraction from the lower confined aquifer seems to be having little or no effect on pressure levels in the upper confined aquifer, with water levels having only fallen one metre since olive irrigation began. The drawdown trigger levels for the three confined aquifers in the Tauragat management area have not been exceeded over the past five years

What risks do the results pose?

The capacity of the confined aquifer resource to meet demand is linked to the magnitude of drawdowns caused by extraction, and the effect that this may have on downward leakage from the unconfined aquifer, and/or reversal of flow potentially drawing saline water in from the west.

The *Natural Resources Management Act 2004* requires that water resources be sustainably managed, particularly where a water resource is potentially or actually under significant risk. In addition, the National Water Commission, as the administrator of the National Water Initiative, has a firm expectation that water plans will set a path to reduce any over-allocation.

Proposed management response

Setting new Target Management Levels

The TMLs for the Tintinara Coonalpyn confined Management Areas have been revised using the data collected over the past five years on the confined aquifer response to groundwater extraction (see Table I). This will result in the need for allocations in the Tolmer MA to be reduced over the life of the new WAP to ensure allocations are within the TML (minus an allowance S & D water use).

Table I: Target Management Levels for confined aquifer MA

Management Area	Current PAV (ML)	Current licensed allocations (ML)	New Target Management Level (ML)	% Reduction required to bring allocations back within TML (minus S & D water use)
Tauragat	11,350	10,788	11,350	0%
Tolmer	8,924	7,435	6,350	12%

This document is for information purposes only. The contents may change pending further consultation and review.

For more information, contact the

SE NRM Board on (08) 8724 6000 or visit www.senrm.sa.gov.au



Page left blank for your notes: