Katunga Water Supply Protection Area

International Association of Hydrogeologists

GMW Tatura

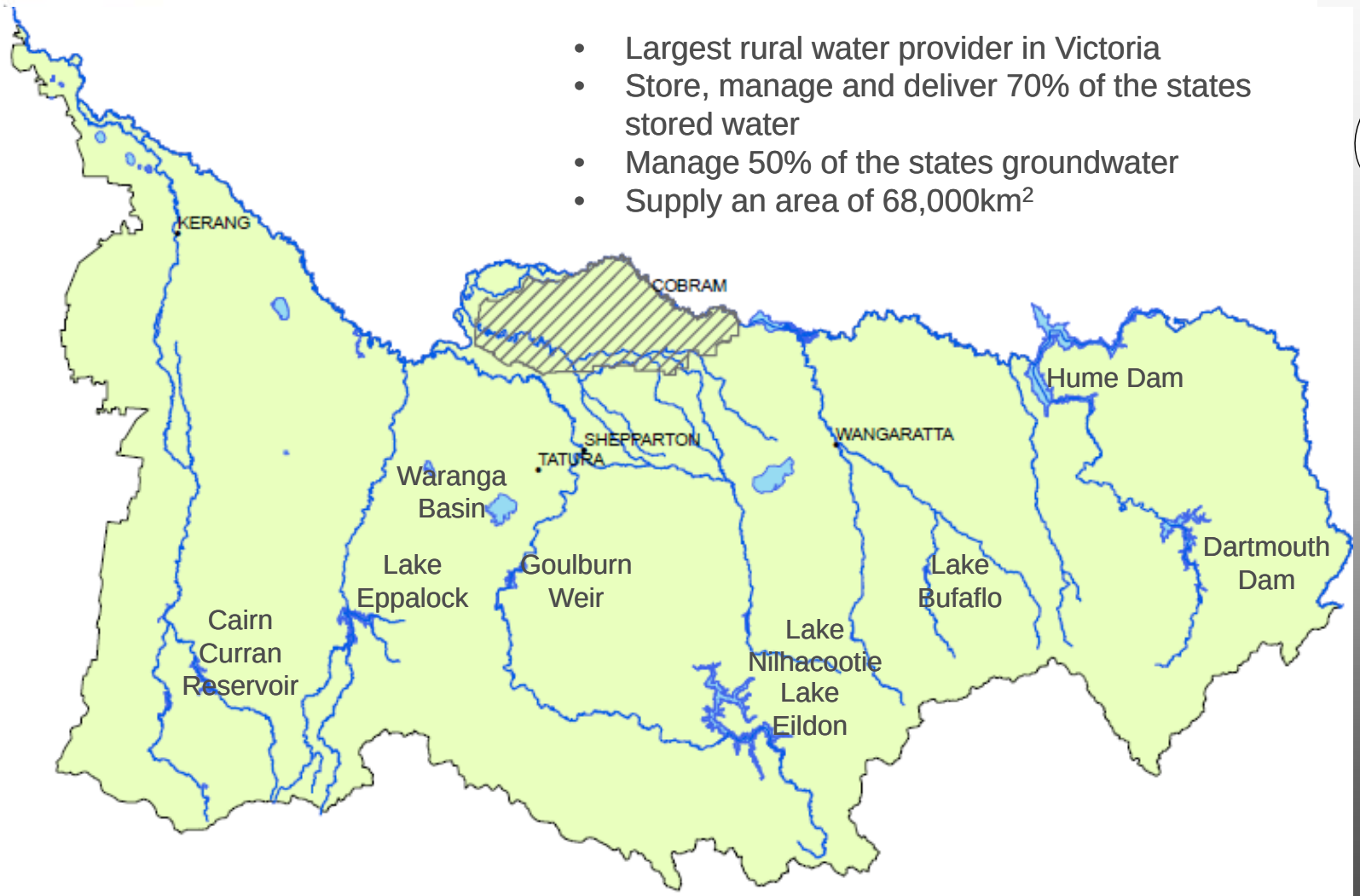
6 February 2018

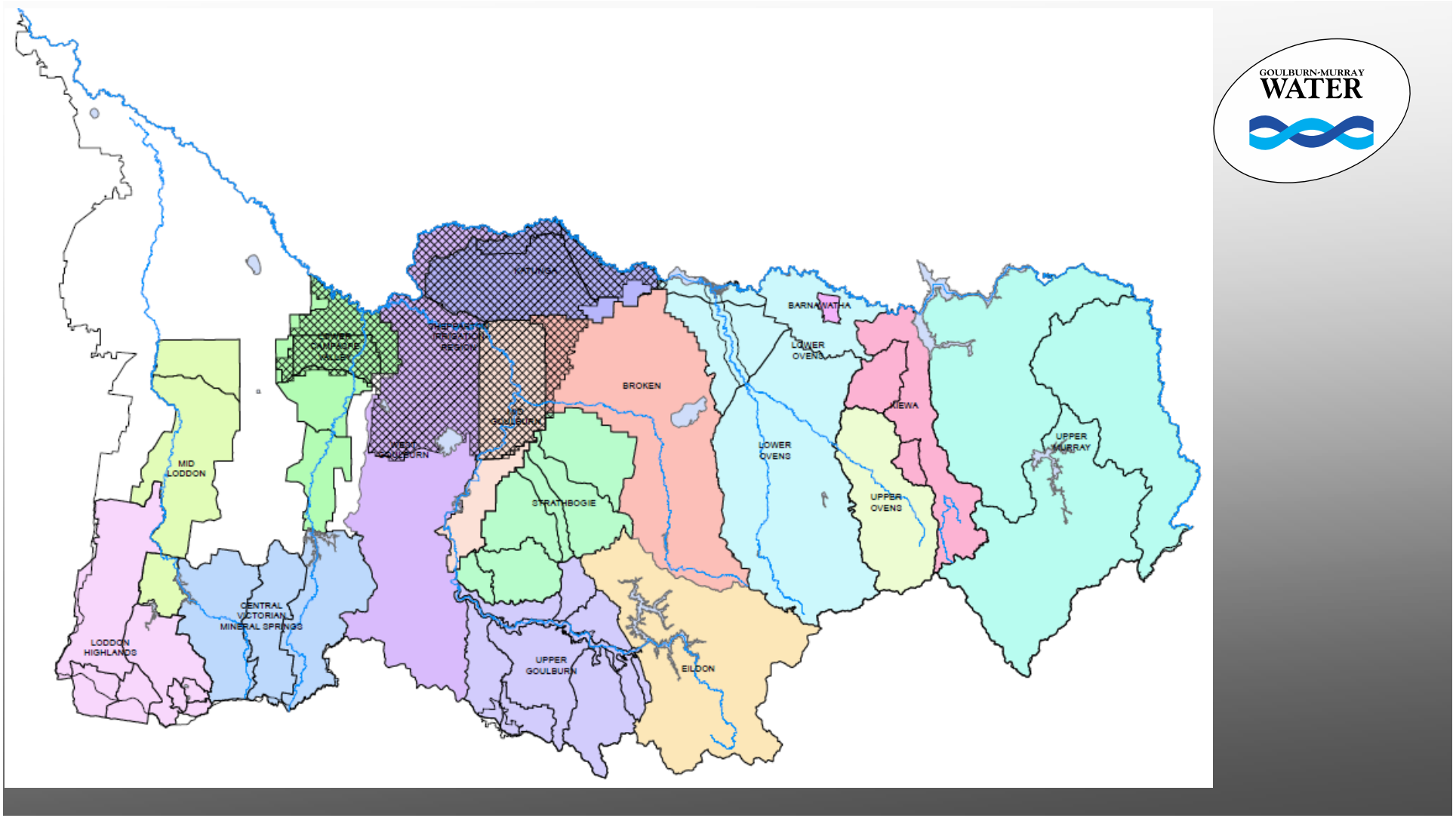
Scott Ridges Goulburn-Murray Water

Overview

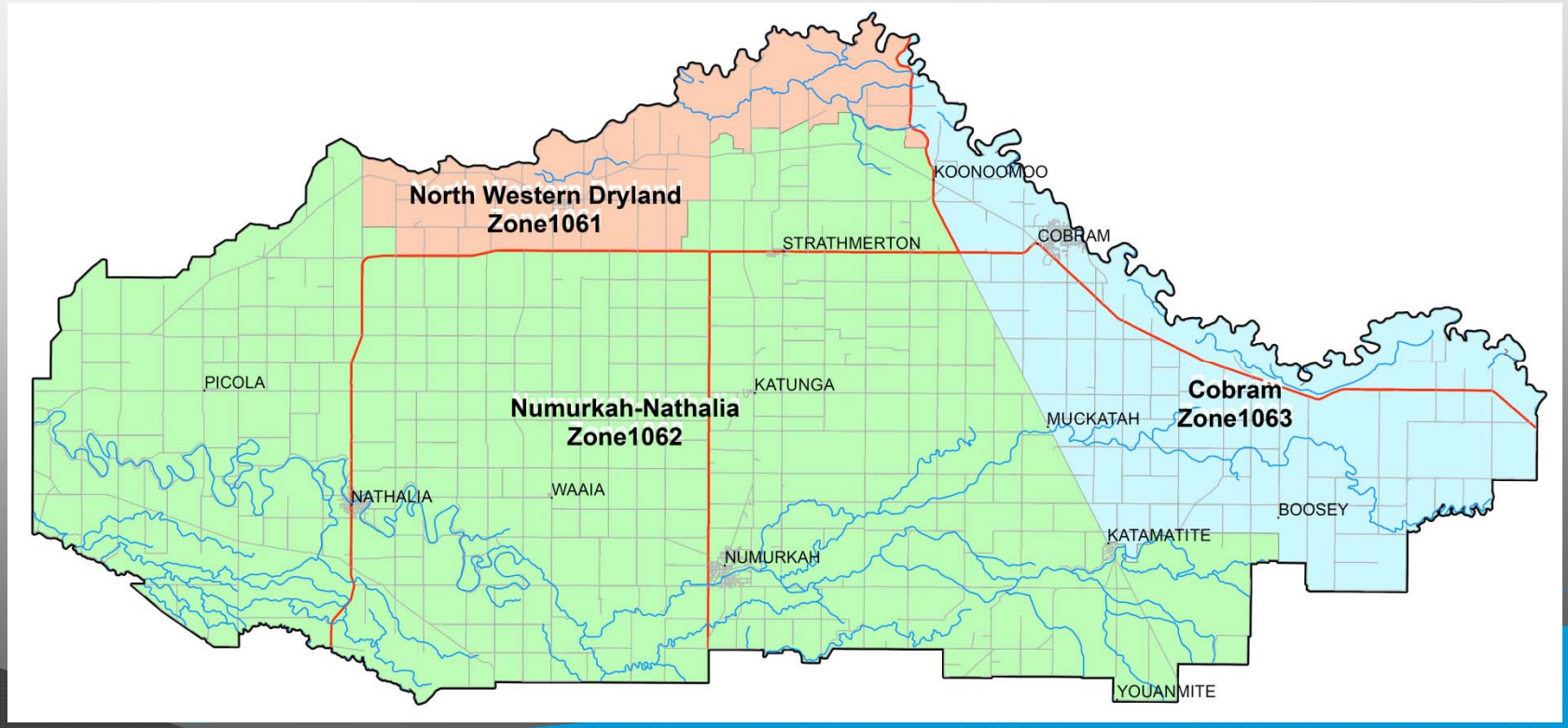
- Overview of Katunga WSPA
- Hydrogeology of the Katunga WSPA
- Changes to management
- Stakeholder engagement
- Questions

- Largest rural water provider in Victoria
- Store, manage and deliver 70% of the states stored water
- Manage 50% of the states groundwater
- Supply an area of 68,000km^2




GOULBURN-MURRAY
WATER
KATUNGA
SHEPPARTON IRRIGATION REGION
LOWER CAMPASPE VALLEY
BROKEN
MID GOULBURN
KIEWA
BARNAWATHA
LOWER OVENS
UPPER MURRAY
MID LODDON
STRATHBOGIE
UPPER OVENS
CENTRAL VICTORIAN MINERAL SPRINGS
LODDON HIGHLANDS
UPPER GOULBURN
EILDON

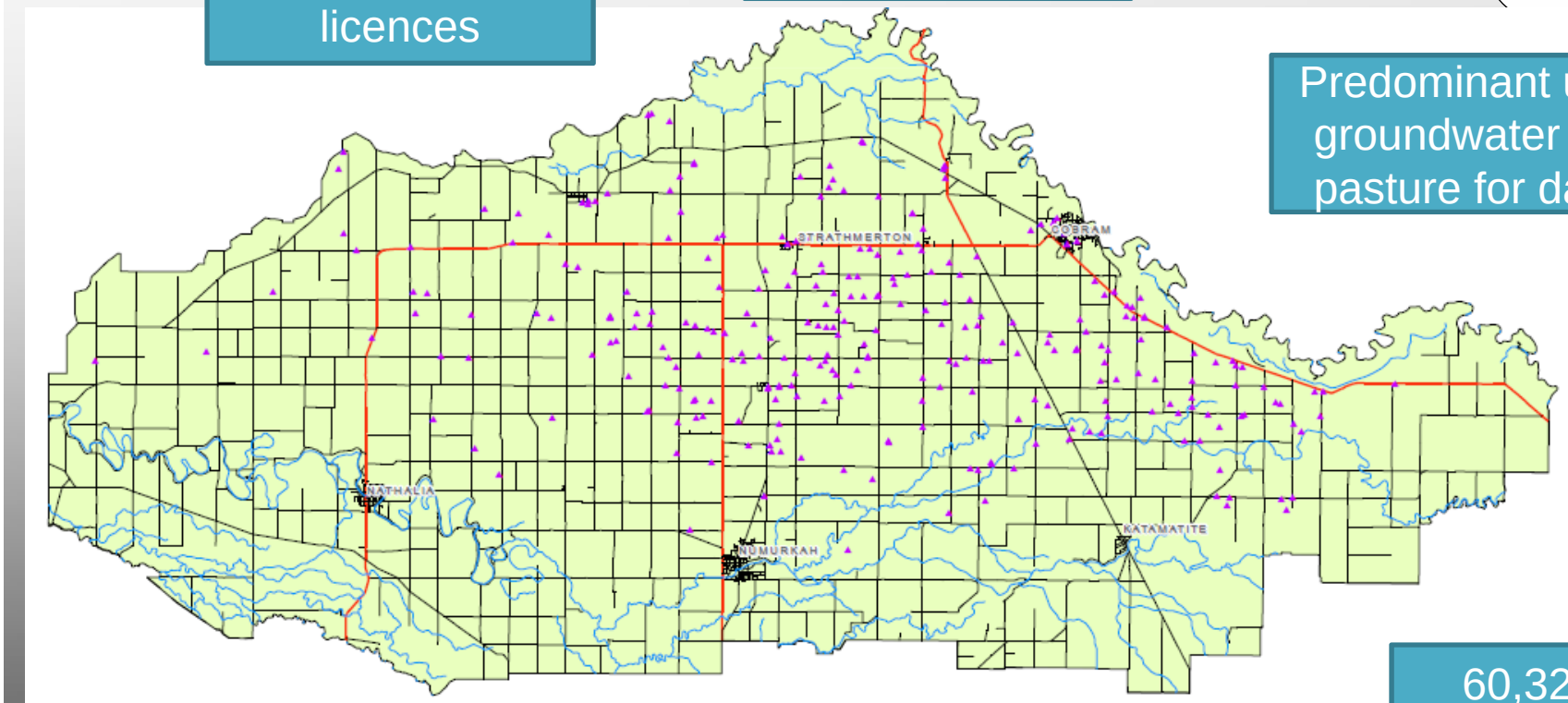
Katunga Water Supply Protection Area



250 groundwater licences

240 licensed bores

Predominant use of groundwater is for pasture for dairies



60,323.7 ML entitlement

Over to Damien

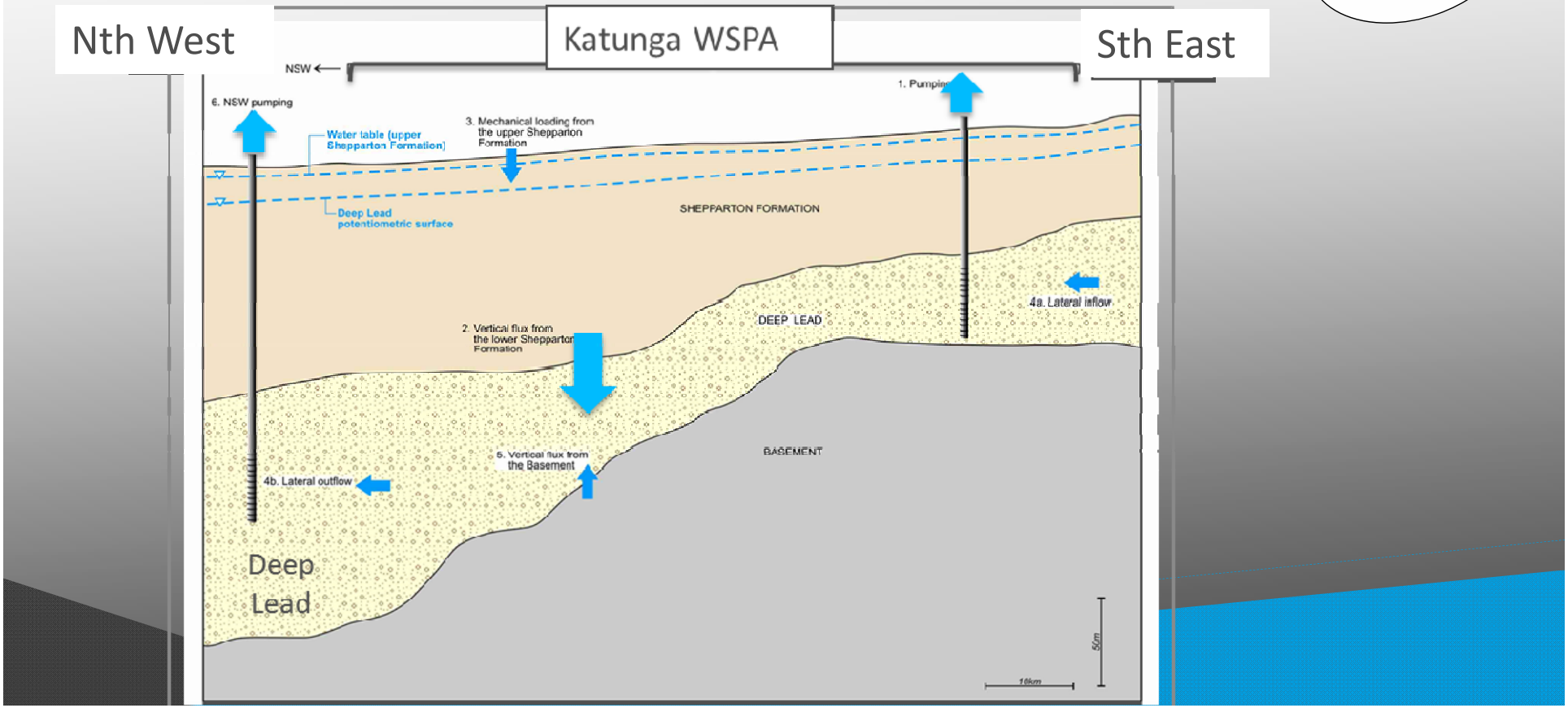
Stratigraphy

GEOLOGICAL UNIT NAME	VAF AQUIFER NAME	VAF AQUIFER CODE	VAF AQUIFER LETTER	HYDROGEOLOGICAL UNIT NAME IN THIS REPORT
Coonambidgal Formation	Quaternary Aquifer	100	QA	Coonambidgal Formation
Shepparton Formation	Upper Tertiary/ Quaternary Aquifer	102	UTQA	Shepparton Formation (upper, mid, and lower)
Calivil Formation	**Upper Tertiary Aquifer (fluvial)**	**105**	**UTAF**	**Deep Lead**
Renmark Group	Lower Tertiary Aquifer	111	LTA	
Urana Formation	Cretaceous and Permian Sediments	113	CPS	Basement
Adaminably Group	Mesozoic and Palaeozoic Bedrock	114	BSE	

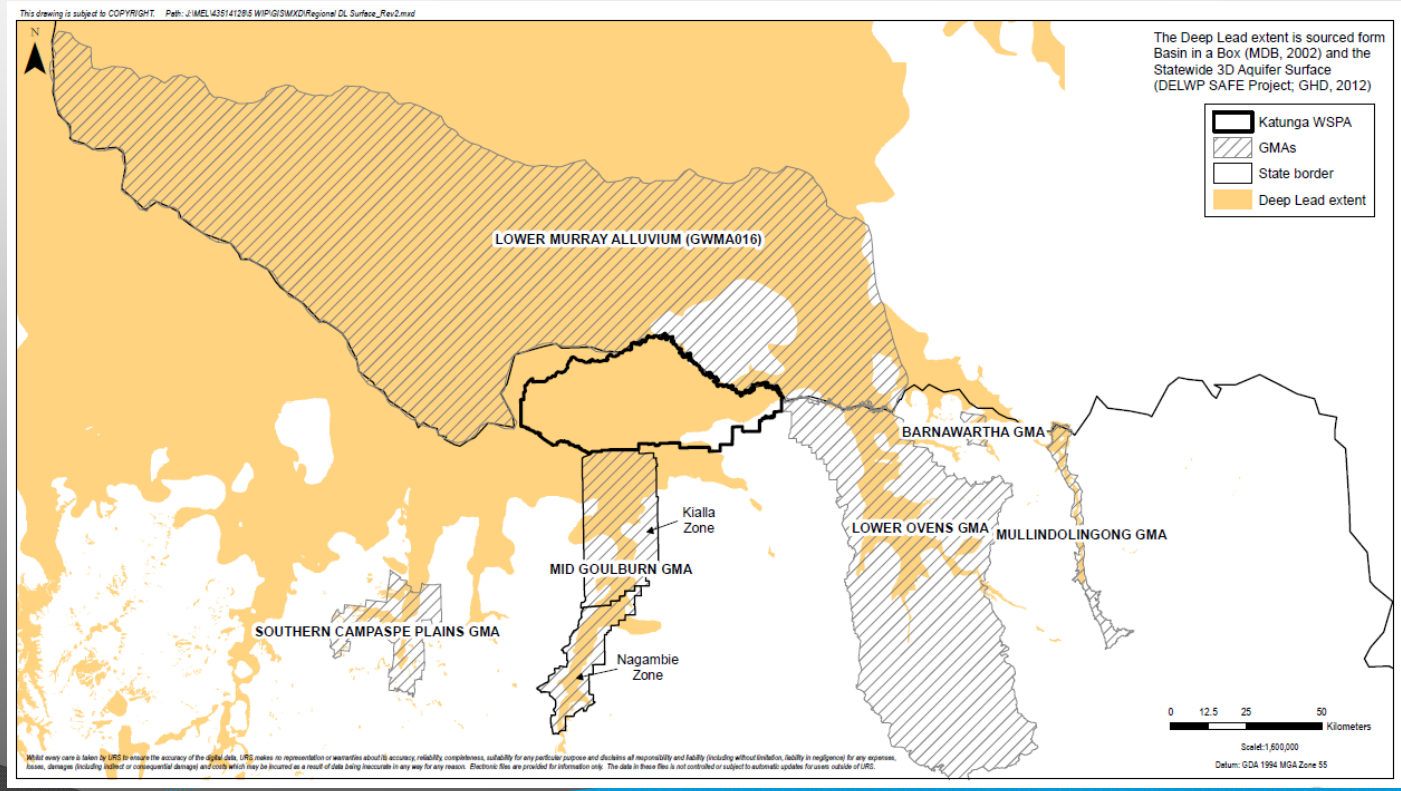
Primary units of interest

- Shepparton Formation; layered aquifer-aquitard, unconfined to semi-confined
- **Deep Lead; aquifer, confined**
- Bedrock; aquitard, confined

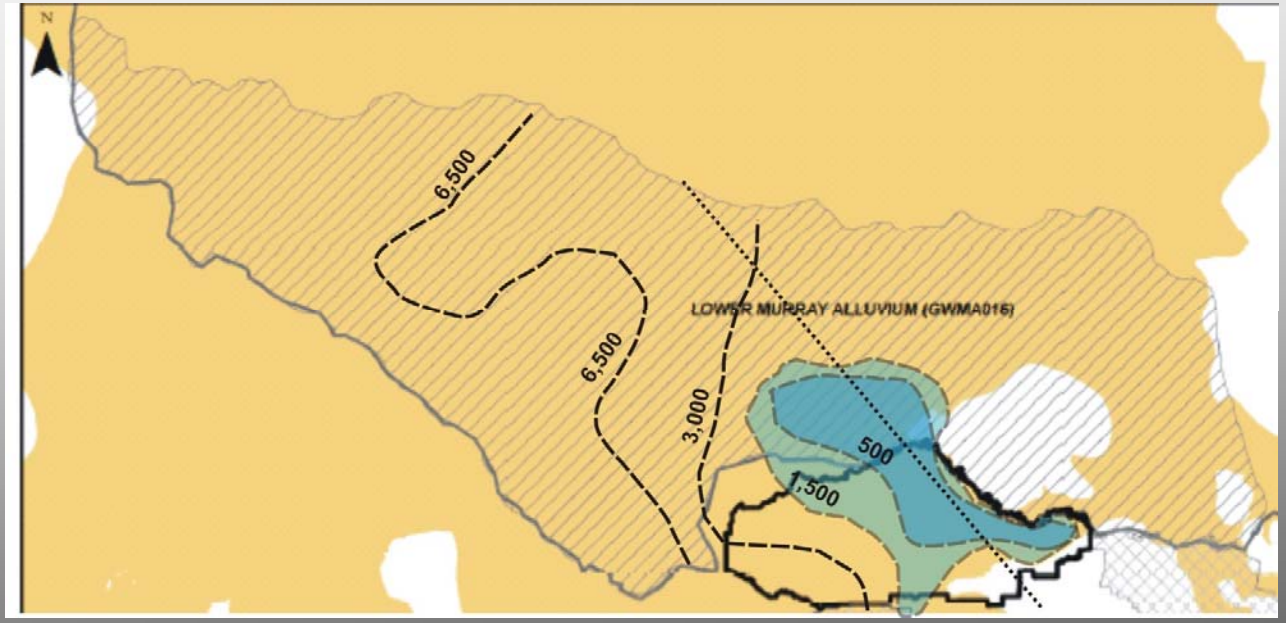
Deep Lead – Groundwater Movement



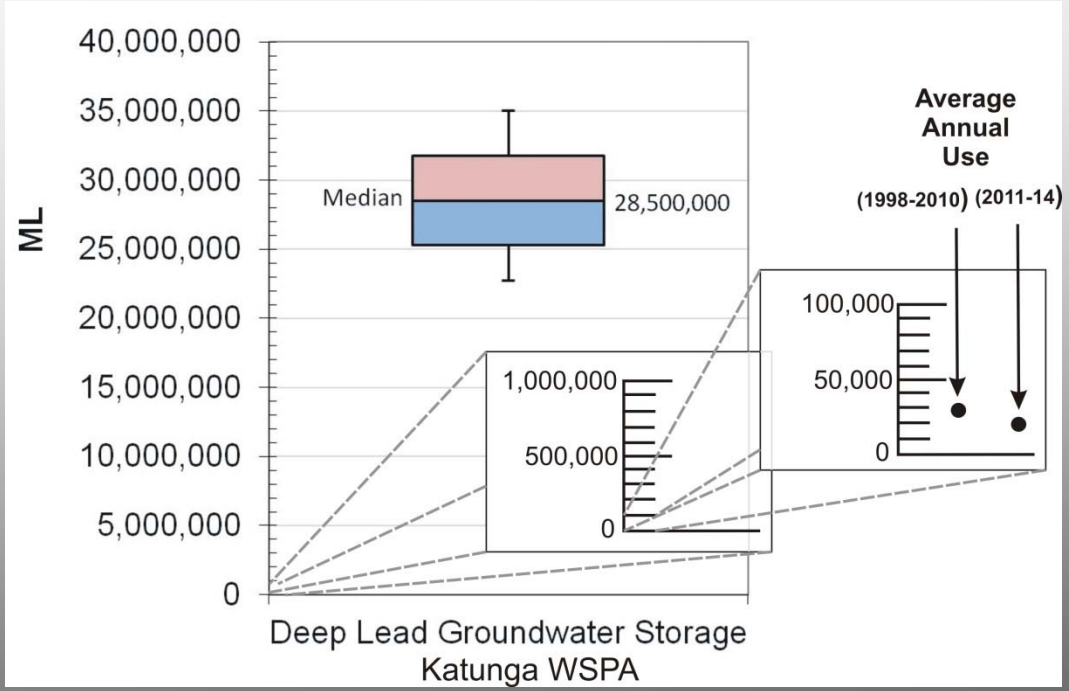
Katunga GMA – Regional Context



Deep Lead – Salinity



Groundwater In Storage – Katunga GMA Footprint

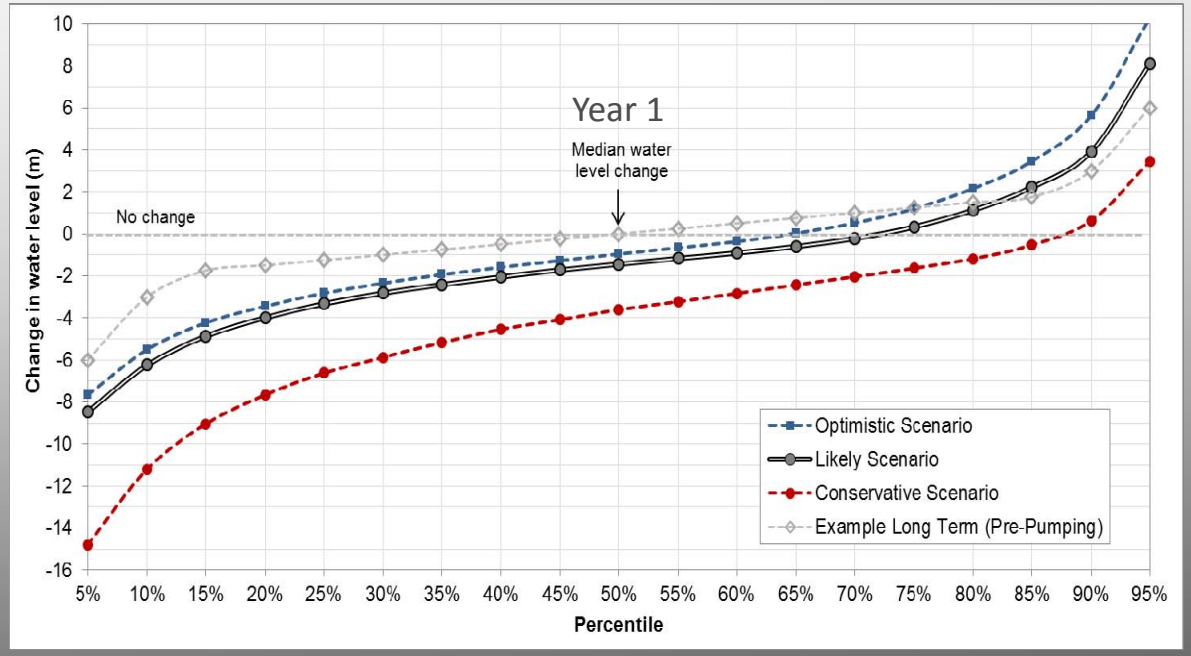


Monte Carlo estimates of total groundwater in storage in the Deep Lead aquifer within the Katunga WSPA boundary compared to average annual use.

At the P50 (median) level of confidence, the volume of groundwater held in elastic storage (storage from water compression within the aquifer that leads to artesian head) is around 8% of the total volume of groundwater in storage (28,500,000 ML at P50).

The bulk of the water is held in primary porosity.

Resource Assessment – Monte Carlo

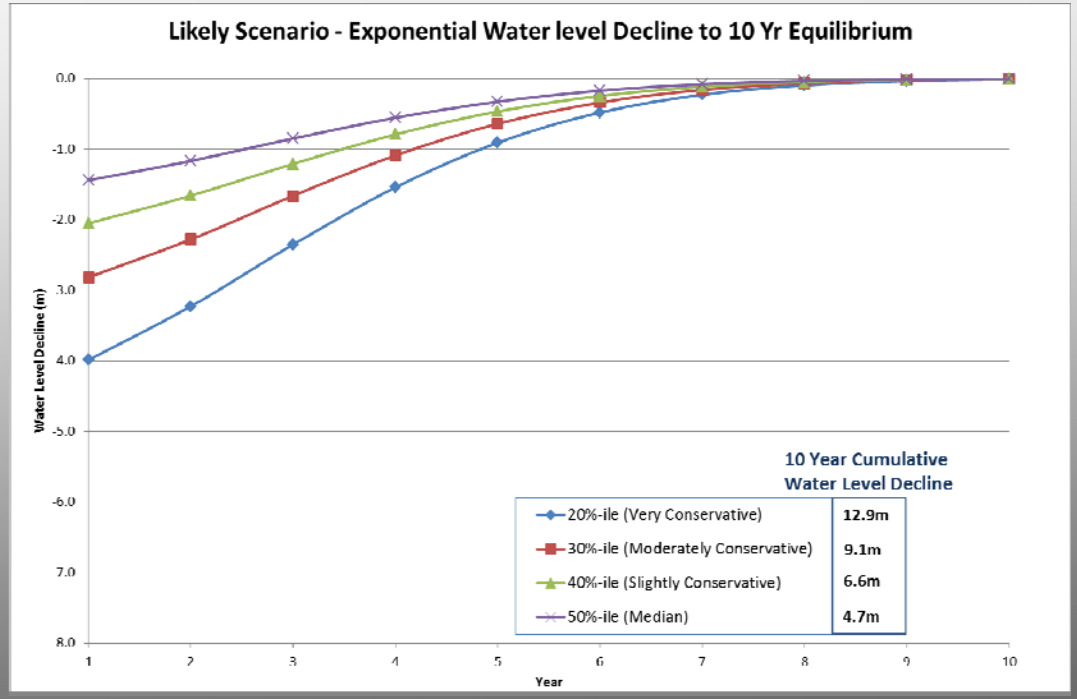


Probabilistic Approach – converting a change in volume (as elastic volumetric component) to a change in potentiometric pressure (head).

Took into account, the cumulative impact of scenarios (optimistic, likely, conservative) of:

- Climate change (extreme dry, dry, wet)
- Katunga Pumping (50%, 70%, 100% allocation usage)
- NSW Pumping (conservative, more conservative)

Resource Assessment – Monte Carlo



Outputs from Monte Carlo impact scenarios at differing levels of conservatism were cumulated over a 10 year re-equilibrium period to give an estimate of the relative levels of potentiometric decline.

The relative impacts were used by GMW and the Katunga Consultative Committee to assist thinking into new arrangements for management options in the GMA.

Changes to management

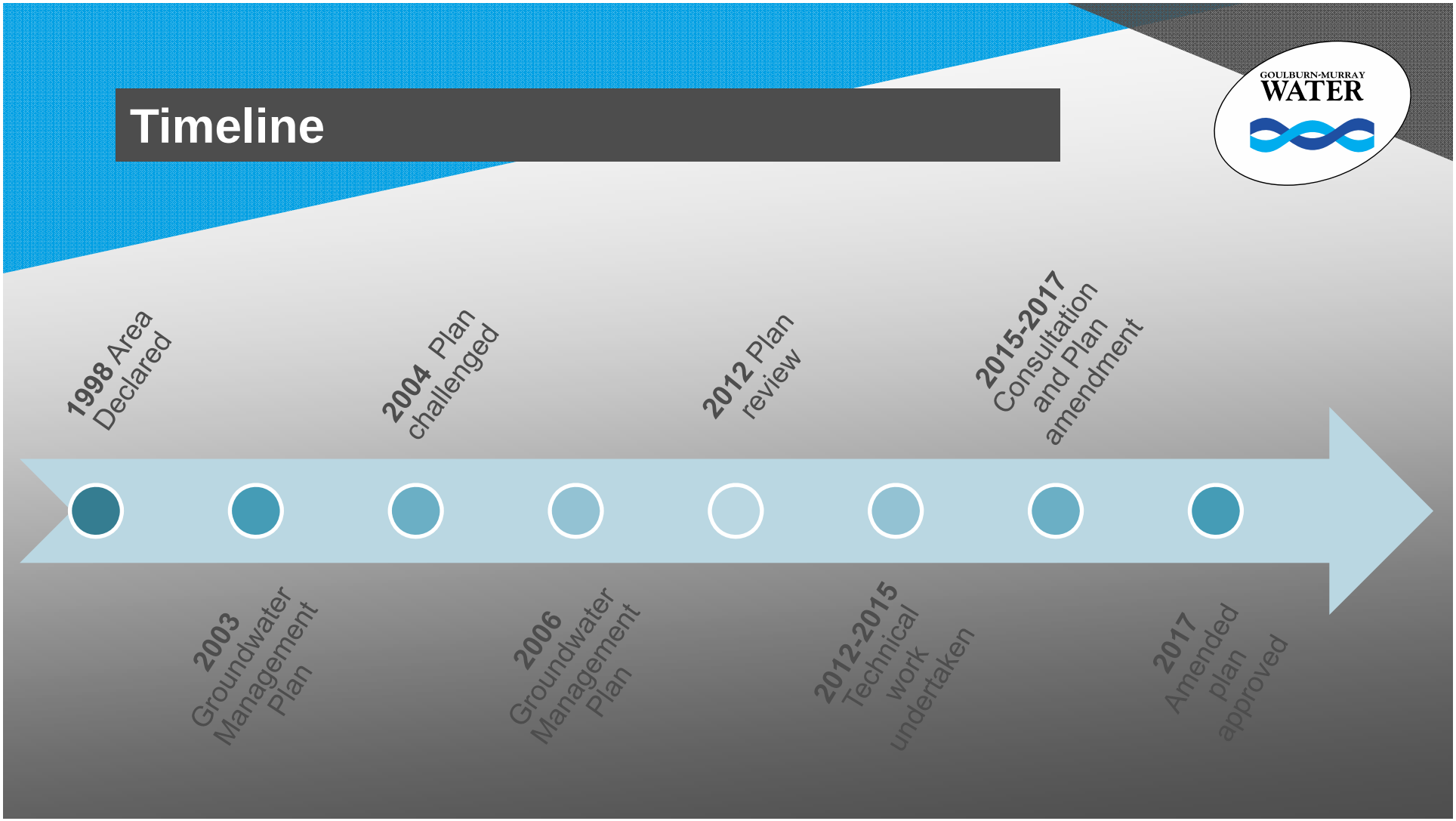
Overview

History

Plan review

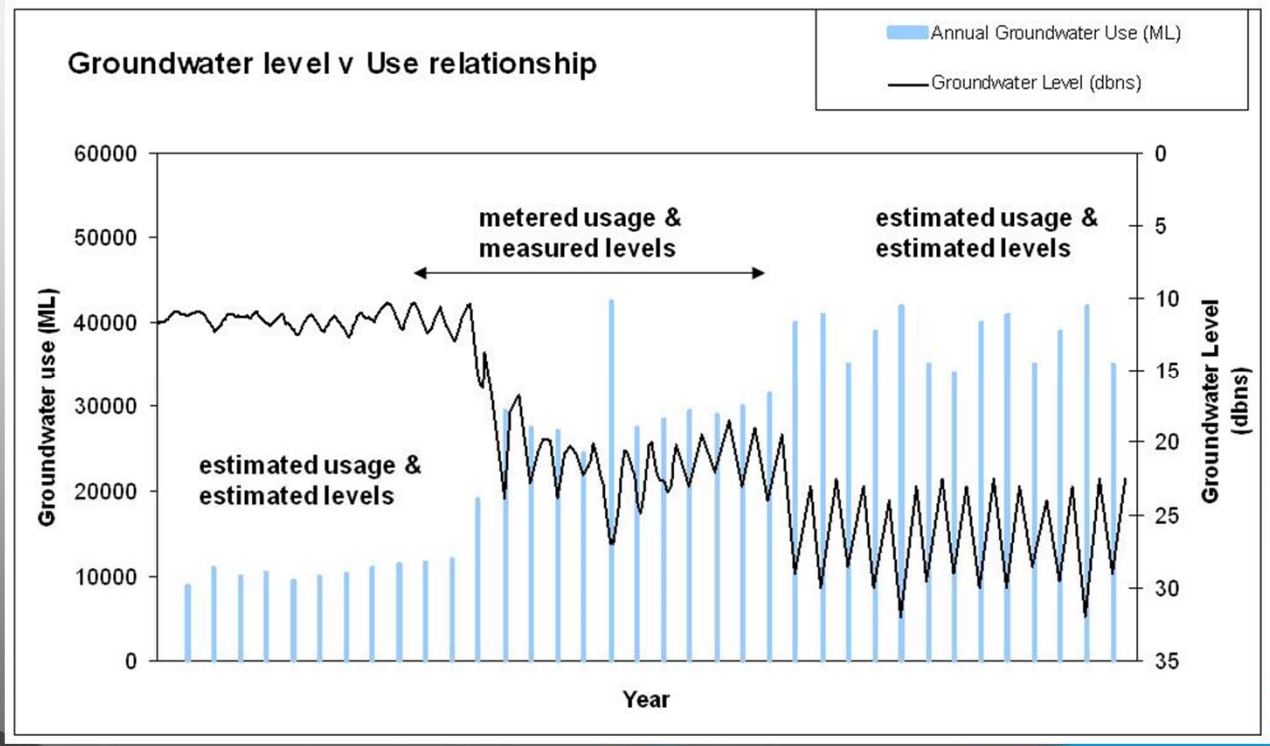
Plan amendments

Timeline


1998 Area Declared
2003 Groundwater Management Plan
2004 Plan challenged
2006 Groundwater Management Plan
2012 Plan review
2012-2015 Technical work undertaken
2015-2017 Consultation and Plan amendment
2017 Amended plan approved

Allocations

Allocation method - 2006

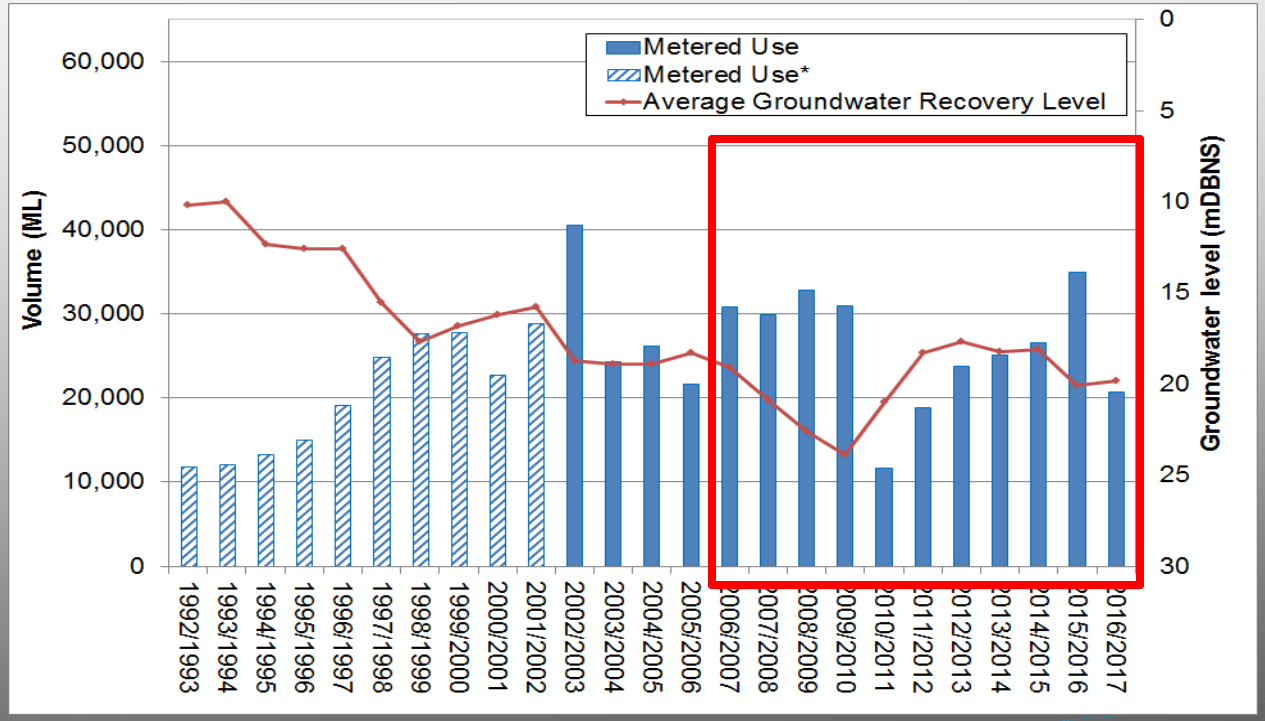


Based on assumed relationship between groundwater recovery levels and groundwater use using data from 1992 - 2006

Allocation method - 2006

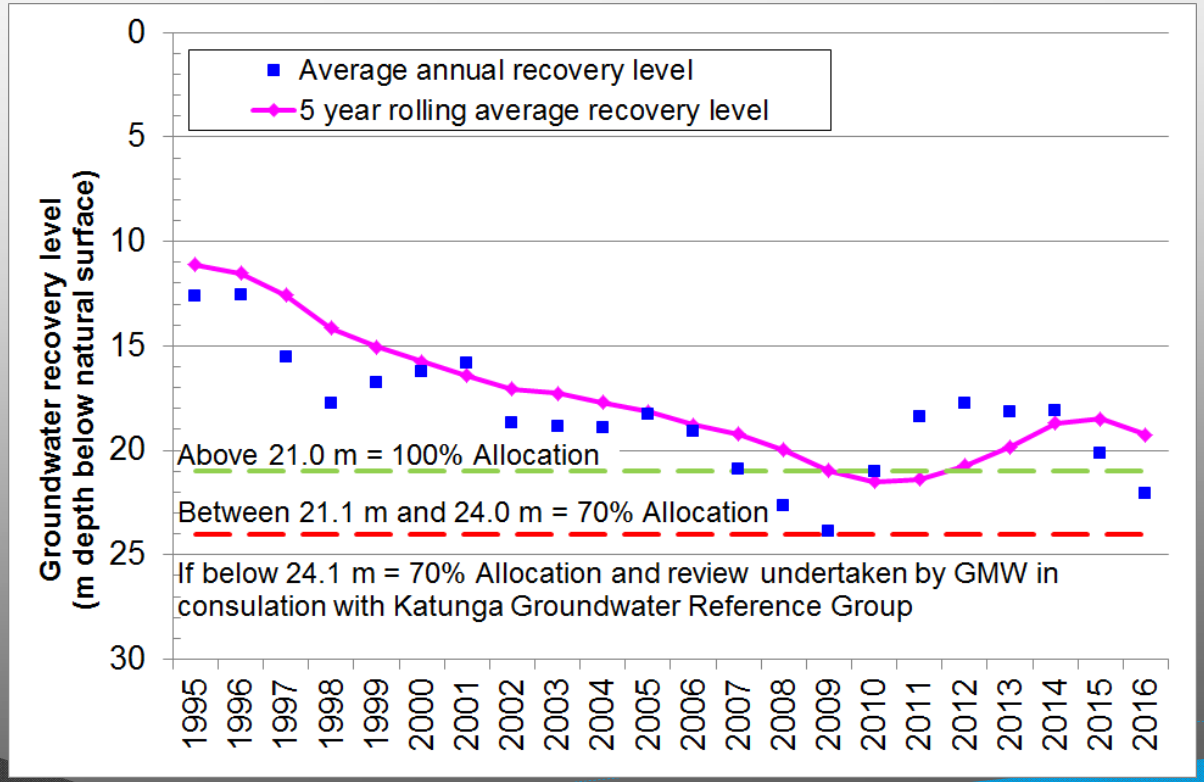
Groundwater use	Assumed average groundwater recovery level	Allocation
10,000 ML	~10 mDBNS	70%
30,000 ML	19 – 20 mDBNS	70%
38,000 ML	23 – 25 mDBNS	50%

Groundwater use and recover level



Groundwater extraction not the only factor impacting groundwater levels

Amended allocation method



Trading

2006

- 20% reduction on permanent trade volume
- 2km buffer zone along River Murray
- No temporary transfers unless already licensed

Not consistent with:

- removing barriers to trade
- Basin Plan
- Understanding of surface water groundwater interactions

Trading

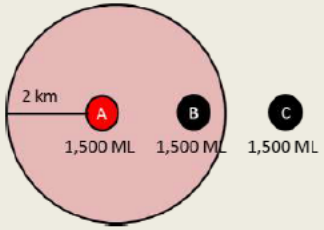
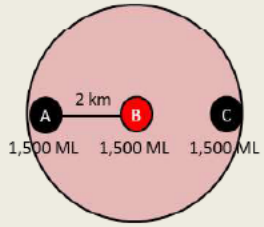
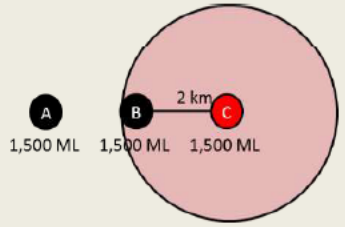
2017

- Removed 20% reduction on permanent trade volume
- Removed 2km buffer zone along River Murray
- Temporary trade now allowed to new entrants
- Temporary trade allowed to 125% of licensed volume where intensity rule is exceeded

Intensity Rule

Example 1 – Intensity rule explained

Limit on licensed volume of 3,700 ML within a 2 km radius of a bore

There are three bores, Bore A, Bore B and Bore C. The bores are located on neighbouring properties and each bore is licensed to extract 1,500 ML/year.	
Bore B is located within a 2 km radius of Bore A so the intensity of licences within 2 km of Bore A is 1,500 ML + 1,500 ML = 3,000 ML. The owner of Bore A could transfer in up to 700 ML without the total groundwater entitlement within 2 km of Bore A exceeding 3,700 ML (Prescription 3.1 (b) & Prescription 3.2 (b)).	
Bore A and Bore C are located within a 2 km radius of Bore B so the intensity of licences within 2 km of Bore B is 1,500 ML + 1,500 ML + 1,500 ML = 4,500 ML. As the intensity within 2 km of Bore B exceeds 3,700 ML, the owner of Bore B would only be able to increase their licensed volume by: - temporarily trading in an additional 25% of entitlement to use in a season from outside of the 2 km radius (Prescription 3.2 (c) (ii)). - trading a licence (temporarily or permanently) from inside the 2 km radius from either the owner of Bore A or Bore C (Prescription 3.2 (c) (i)).	
Bore B is located within a 2 km radius of Bore C so the intensity of licences within 2 km of Bore C is 1,500 ML + 1,500 ML = 3,000 ML. The owner of Bore C could transfer in up to 700 ML without the total groundwater licensed volume within 2 km of Bore C exceeding 3,700 ML (Prescription 3.1 (b) & Prescription 3.2 (b)).	

Groundwater salinity monitoring

2006

All licence holders provided a sample bottle

- Unreliable source of data for salinity monitoring
- Cost for postage increasing annually
- 20% return rate
- Not consistently sampled (i.e. different bores sampled each year)

Groundwater salinity monitoring

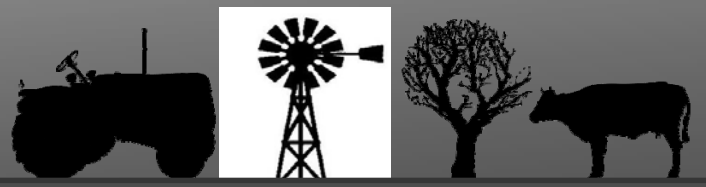
2017

Key State observation bores monitored annually

Groundwater users provided a sample bottle upon request

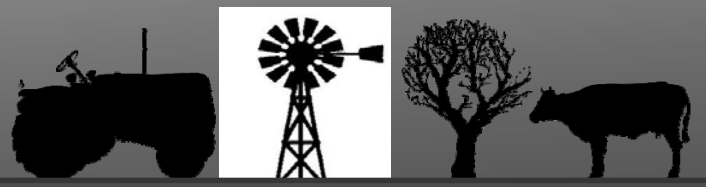
Over to Natalie

Stakeholder Consultation



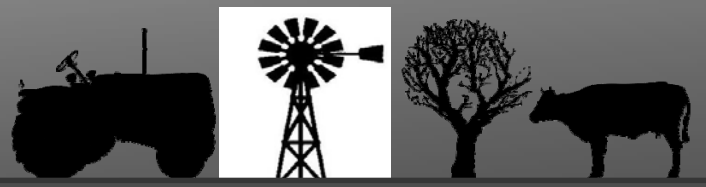
Consultative Committee

- Appointed by Minister for Water
- Required to be at least 50% landholders & 50:50 Male:Female
- Four agency representatives: Goulburn Broken Catchment Management Authority, Goulburn-Murray Water, Goulburn Valley Water, Department of Environment, Land, Water and Planning
- Eight landholder representatives



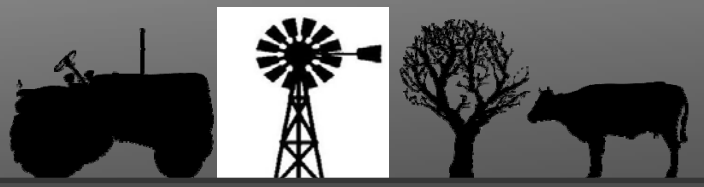
Consultative Committee

- Surveyed groundwater users
- Ran public meetings
- Held 11 meetings to discuss key issues and develop proposed amendments
- Media releases & responses
- Submission of proposed amendments to Minister for Water



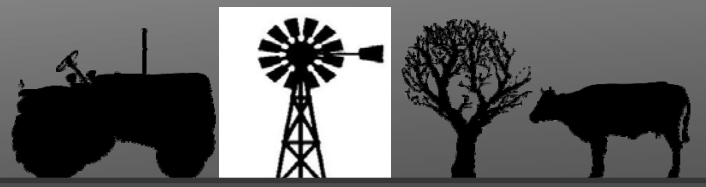
Groundwater user surveys

- Groundwater users surveyed twice:
  - To inform Plan amendment process and identify key issues
  - To gauge opinion on proposed amendments



Public meetings

- Four public meetings held by Consultative Committee across region
- Presentation of technical information and proposed amendments
- Captured opinions on proposed amendments



Key challenges

- Managing expectations of committee and community members
- Responding to media enquiries
- Responding to challenges from a groundwater user group
- Maintaining committee function and focus