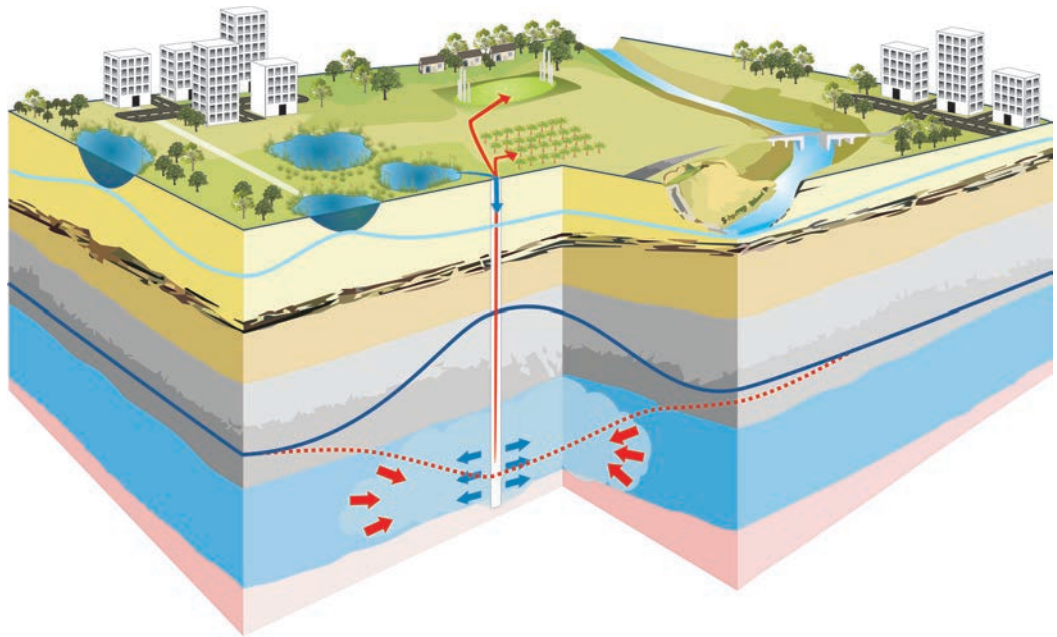




Managed Aquifer Recharge



Schematic of ASR scheme illustrating change in groundwater levels during the recharge (blue) and recovery (red) cycles.

Australian Groundwater Technologies (AGT) is Australia's leading specialist consulting company providing sustainable water management solutions using Managed Aquifer Recharge (MAR) techniques including Aquifer Storage and Recovery (ASR).

The need to conserve, reuse and recycle water is becoming increasingly important for both environmental and economic reasons. MAR and ASR are being recognised by water resource managers and planners as practical solutions to water management challenges, including complementing existing water supplies (e.g. surface storages and desalination plants) without the need to expand costly infrastructure. MAR/ASR generally allows high quality water to be stored underground in suitable aquifers during periods of low demand or excess supply and then to be withdrawn during peak summer months, when demand is greatest.

Leaders in MAR and ASR

- AGT is the only consultancy in Australia specialising in Managed Aquifer Recharge (MAR) and Aquifer Storage and Recovery (ASR).
- Our key staff are acknowledged as being amongst the top five technical specialists internationally and nationally in the field of stormwater harvesting for managed aquifer recharge.
- This experience enables us to cost MAR/ASR work programs reliably. We know what is required, where in the project lifecycle it needs to be delivered, and how long it should take.
- No matter how complex your ASR scheme, with AGT's experience you can be assured that the project will be delivered within the agreed budget.





Due to our expertise, AGT has been involved in over 80% of the MAR feasibility investigations and in the implementation of around 90% of the operational schemes carried out in Australia.

- AGT is the only hydrogeological consultancy that has successfully remediated ASR wells using acid to improve production performance.
- AGT routinely uses the risk management framework outlined in the national water reuse guidelines (2009) in the delivery of MAR/ASR schemes.

Over 40 schemes delivered

Key staff at AGT have over 20 years' practical experience in the delivery of more than 40 operational MAR schemes in varying hydrogeological conditions, principally in South Australia, and in Western Australia, Victoria and Queensland. In total, these schemes are harvesting in excess of 15 gigalitres of stormwater each year.

AGT's capabilities

- Feasibility investigations including aquifer suitability, demand estimates and source water reliability studies that consider maintenance of environmental flows and impacts of climate change
- Liaison with regulating authorities
- ASR and MAR business case development
- Well design, site selection, project supervision and pressure testing of wells
- Aquifer discharge testing to confirm aquifer hydraulic properties
- Trial aquifer injection and recovery testing
- Groundwater numerical modelling using industry standard software packages including Visual Modflow and Feflow
- Solute transport modelling and geochemical modelling using PHREEQC
- Risk assessments consistent with state and national guidelines
- Functional design for MAR schemes and cost estimates
- Design of well remediation and stimulation (including fracturing and acidisation)
- Development of monitoring and management plans to assist with licensing
- Operational management, monitoring and compliance reporting
- Independent reviews and scheme auditing.

Successes

Cities of Salisbury, Playford and Tea Tree Gully

AGT has assisted the cities of Salisbury, Playford and Tea Tree Gully in South Australia to deliver the \$80 million 'Waterproofing the North' strategy. A number of wetlands have been constructed to harvest 17 GL/yr of urban stormwater runoff as well as associated recharge wells for the storage and recovery of the captured stormwater.

The hydrogeological setting included both fractured rock and Tertiary limestone aquifers where sustainable injection rates of over 20 L/sec/well have been achieved. AGT carried out the drilling supervision, testing, siting, modelling and risk assessments to assist in obtaining operational licences. AGT continues to provide ongoing operational advice and compliance reporting.

Kingswood Golf Club Victoria

Australian Groundwater Technologies was commissioned by the Kingswood Golf Club, Victoria, to conduct a study into the potential for ASR to meet shortfalls in their irrigation source water, particularly during extended drought periods.

Based on a target injection volume of 25 ML/yr of stormwater and a range of criteria such as bore yield, native groundwater quality and aquifer storage capacity, AGT recommended targeting the lower Fyansford Formation/Silurian Bedrock (fractured) aquifers.

Following detailed investigations and trials a fully operational scheme harvesting 70 ML/yr was commissioned in September 2010.

Aldinga Reclaimed water ASR

AGT carried out the preliminary hydrogeological investigations and managed a trial which injected 20 ML of treated reclaimed water from the Christies Beach Wastewater Treatment Plant into the aquifer.

Following the successful trial AGT completed the functional design leading to the establishment of a fully operational scheme capable of storing 400 ML/yr of treated reclaimed water in 2009 and is the first licensed treated wastewater ASR scheme in Australia.



AGT forms the nucleus of the Mecrus Group's water services business

Unit 5, London Road, Mile End South, Adelaide, South Australia, 5031. Tel 08 8352 4262
Unit 21, Business Park Drive, Notting Hill, Melbourne, Victoria, 3168. Tel 03 8545 8800

MECRUS

A member of the Mecrus Group