



Government of South Australia
Adelaide and Mount Lofty Ranges
Natural Resources Management Board



2011

Adelaide and Mount Lofty Ranges Natural Resources Management Board

REVIEW OF THE MCLAREN VALE PRESCRIBED WELLS AREA WATER ALLOCATION PLAN

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Background

- 1.1 A water allocation plan prepared by a regional NRM Board for a prescribed water resource in its region is taken to form part of the Board's regional NRM Plan, s76 (1) & (2).
- 1.2 The *Natural Resources Management Act 2004* (The Act) requires that Regional NRM Board must review its entire regional NRM Plan at least once during each period of 5 years following the adoption of the Plan, s81(4).
- 1.3 By regulation made on 24 December 1998, all existing and future wells within the McLaren Vale Prescribed Wells Area (PWA), which included the former Willunga Basin Prescribed Wells Area were declared to be prescribed wells. The first Water Allocation Plan for the McLaren Vale PWA was adopted in November 2000 with a review of the plan being completed in February 2004.
- 1.4 The current Water Allocation Plan for the McLaren Vale Prescribed Wells area was adopted on 17 February 2007. Therefore in accordance with the provisions of the Act a review is required to be completed by 17 February 2012.
- 1.5 The only requirement within the Act in relation to what a review should contain is s81(5) which stipulates that *'when reviewing a plan a Board must have regard to any relevant report of the NRM Council relating to the Board'*.

Matters for consideration

Comments from the Minister for Environment and Conservation

Prior to the adoption of the current Water Allocation Plan the Board received a letter from the Minister for Environment and Conservation on 5 December 2006 regarding the adoption of the draft McLaren Vale PWA Water Allocation Plan. The letter from the Minister outlined the need to:

- Account for climate change,
- Develop a quantitative framework for the definition of water requirements of water dependent ecosystems,
- Develop a definition of stressed areas within the transfer policy that is based on intensity of extraction, and
- Undertake annual irrigation reporting.

NRM Council

The Act s81(5) stipulates that *'when reviewing a plan a board must have regard to any relevant report of the NRM Council relating to the Board'*.

The NRM Council has not provided any reports in relation to the McLaren Vale Prescribed Wells Area.

Draft Western Mount Lofty Ranges Water Allocation Plan

The McLaren Vale Prescribed Wells area is located wholly within the boundaries of the Western Mount Lofty Ranges Prescribed Area.

By regulation made pursuant to the Natural Resources Management Act on 30 October 2005, the wells, surface water and water courses in the following respective areas was declared to be prescribed water resources:

- Western Mount Lofty Ranges Prescribed Wells Area
- Western Mount Lofty Ranges Surface Water Areas; and
- Western Mount Lofty Ranges Prescribed Water courses

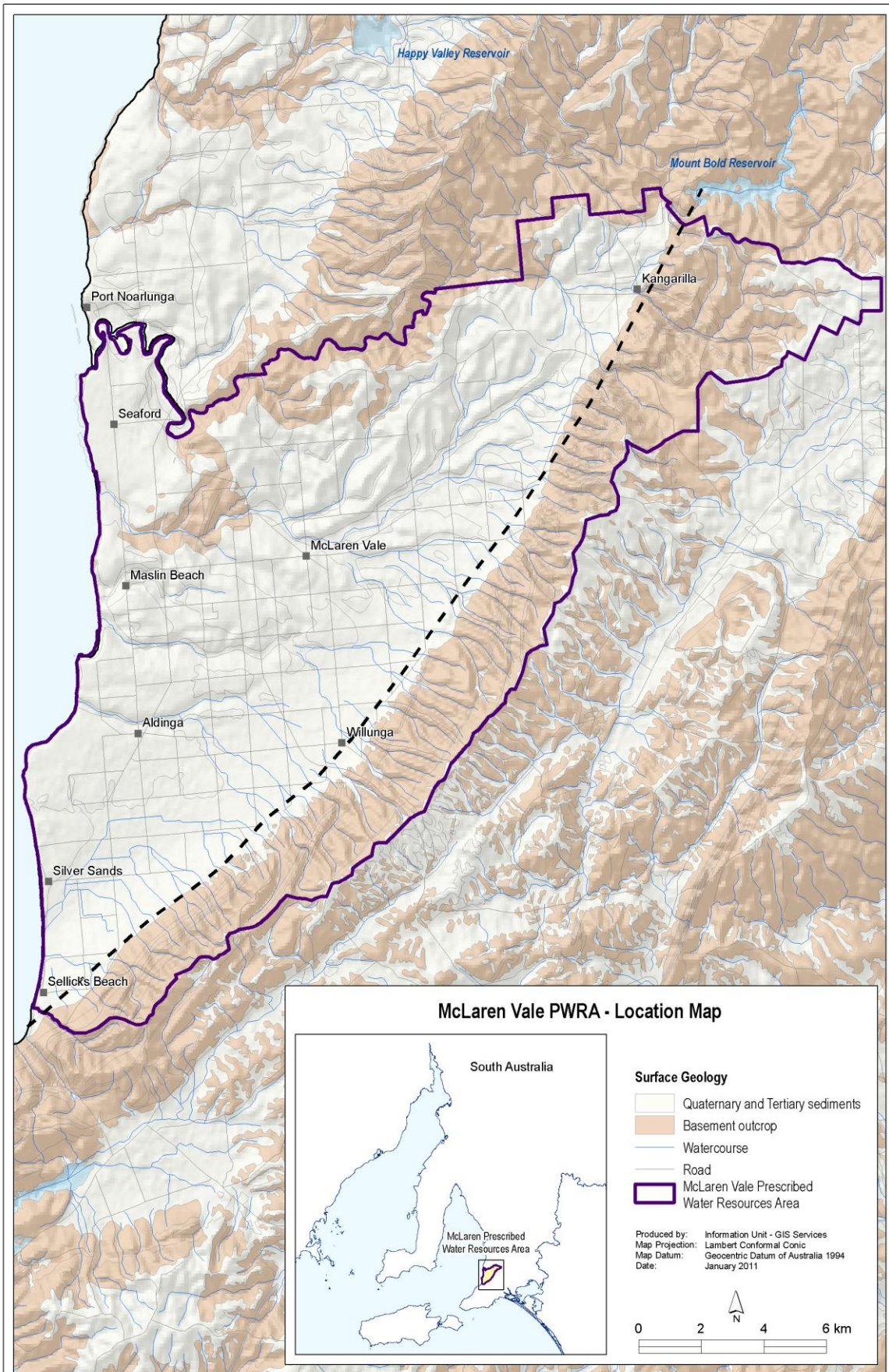
A draft water allocation plan for the Western Mount Lofty Ranges prescribed water resources has been prepared and consulted on. It is anticipated that this plan will be forwarded by the Board to the Minister for Sustainability, Environment and Conservation during the 2011/12 financial year for adoption.

This Plan does not replace or otherwise affect the Water Allocation Plan for the McLaren Vale Prescribed Wells Area, or water licences to take underground water in this area. The allocation of underground water in the McLaren Vale PWA and other dealings with water allocations have been and will remain to be assessed against the objectives and principles in the Water Allocation Plan for the McLaren Vale PWA.

The draft Plan includes a comprehensive section on Monitoring and Evaluation and Reporting which will be used for monitoring for surface water and watercourse water within the McLaren Vale region. The monitoring proposed while not requiring specific annual irrigation reporting will enable appropriate monitoring of the prescribed resource

It is recommended that the Board:

- 1. informs the Minister for Sustainability, Environment and Conservation that to avoid confusion from landholders and licence holders, the regulation to prescribe the Western Mount Lofty Ranges Prescribed Resources Area be amended to incorporate the McLaren Vale Prescribed Wells Areas and the first amendment to the Western Mount Lofty Ranges PWRA WAP include the McLaren Vale Prescribed Wells Area.**



State of the Resource

The estimated sustainable yield within the McLaren Vale PWA is 6,560 ml/yr which was based on analysis of the water balance and an analysis of trends in underground water levels. It was assumed that an extraction rate of 6,560 ml/yr would result in a reduction in the rate of decline of underground water levels and underground water levels would allow a new equilibrium. This would ensure that users of the underground water resource (including dependent ecosystems) would not be adversely affected.

There are 455 licenced users in the McLaren Vale Prescribed Wells Area. Figure 1 below shows that underground water use in the McLaren Vale Prescribed Wells Area has been under the sustainable yield in all years since the plan was adopted in 2007.

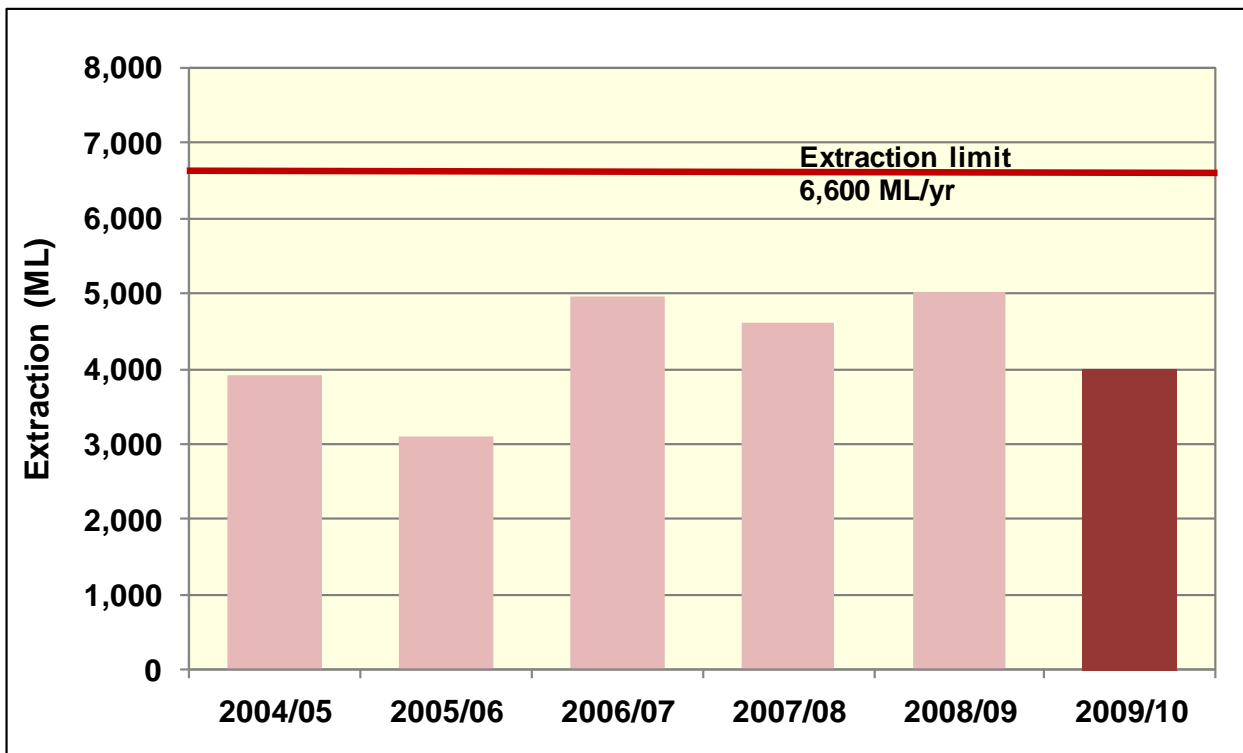


Figure 1 Licensed Groundwater Use in the McLaren Vale PWA

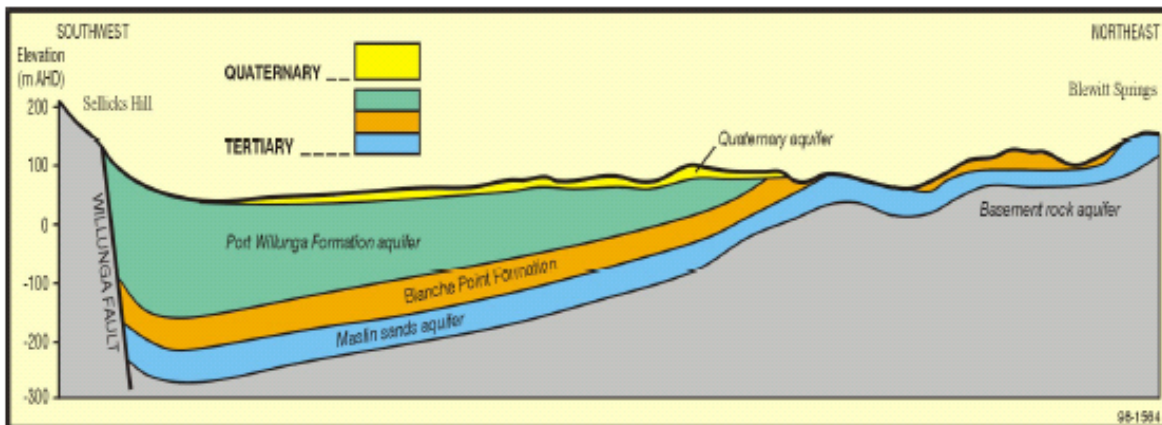
Source: Department for Water

The Department for Water has produced a Groundwater Level and Salinity Status Report 2009-10 for McLaren Vale PWA. The summary report identified the following:

1. Most of the underground water extraction (65%) occurs from the Port Willunga Formation Aquifer, with 18% pumped from the Maslin Sands Aquifer and 17% from the Freeland Rock Aquifer. Underground water is used primarily for the irrigation of vines.
2. Underground water level trends in the Port Willunga Formation Aquifer have shown widespread declines of up to 3 metres since 1993, at a long term average rate of decline of 0.12 m/yr. Since the 2006 drought, the rate of decline is averaging 0.22 m/yr with most observation wells showing a continued decline, despite extractions from this aquifer being relatively stable or declining. Over this period 75% of irrigation wells (139 wells) have shown an increase in groundwater salinity of 13% (an average of 135 mg/l). Despite this aquifer being

confirmed, higher rainfall during 2009-10 has stabilised or reduced salinity levels in about half of these wells; however, 65 wells are continuing to show a rising trend, averaging 48 mg/l/yr.

3. Groundwater levels in the Maslin Sands have been relatively stable since 2000. There have been declines of up to 1.5m following the 2006 drought, however, recent high rainfall has produced some recovery in water levels. Almost identical increasing salinity trends in the Port Willunga Formation Aquifer described above have been observed in the Maslin Sands following 2006.
4. Fractured Rock Aquifer groundwater level trends tend to follow rainfall patterns, especially where the basement rock crops out and receiving direct recharge from rainfall. Declines due to below average rainfall after 2006 have averaged just over one metre and recovery of water levels due to higher rainfall during 2009-10 have been variable. The Fractured Rock Aquifer has also experienced salinity trends very similar to the other aquifers.



Schematic cross section of the Willunga Basin

In the assessment of the status the report advises:

‘The McLaren Vale PWA has been assigned a status of Yellow. “Adverse trends indicating low risk to the resource in the medium term” based on current trends. This status is supported by:

- *a widespread gradual decline in groundwater levels in the Port Willunga Formation aquifer since 1993 that has accelerated since the 2006 drought, despite extractions from this aquifer being relatively stable or declining. However, these declines are not expected to affect access to the resources by groundwater users over the next 10-20 years.*
- *rising salinity levels in a significant number of irrigation wells in all major aquifers since 2006 drought.*

Further work will be undertaken to define the causes of these salinity increases and on-going monitoring will help determine if the groundwater level declines and salinity rises will be persistent and present a threat to the sustainability of the groundwater resource’.

The report identifies that the assigned status of yellow refers to:

Adverse trend indicating low risk to the resource in the medium term. Observed adverse trends are gradual and if continued, will not lead to a change in the current beneficial uses of the groundwater resources for at least 15 years. Beneficial uses may be drinking water, irrigation or stock watering.

It is recommended that:

- 1. the Board in partnership with DfW and the National Centre for Groundwater Research and Training identify and undertake the investigations necessary to determine the causes of salinity increases and groundwater level decline.**
- 2. that reporting of groundwater levels and salinity within the McLaren Vale PWA is undertaken annually by DfW.**
- 3. that the Board in partnership with the DfW provide regular and on-going information to groundwater users and the broader community on the status of the groundwater resource within the McLaren Vale PWA.**

The National Centre for Groundwater Research and Training

The National Centre for Groundwater Research and Training (NCGRT), co-funded by the Australian Research Council and the National Water Commission, is a consortium of 12 universities and 8 industry and government organisations. The Centre is based at Flinders University, South Australia, and also includes SA Water, United Water, Department for Water and CSIRO. It aims to build Australia's research capacity in groundwater, and train the next generation of hydrogeologists.

Funding for the NCGRT has included \$15 million from the Educational Investment Fund (EIF) through the Australian Super Science Initiative for infrastructure for groundwater monitoring. This commitment will permit the establishment of long term environmental monitoring sites that will allow Australian groundwater resources to be evaluated against a background of continuing climate variability and future climate change. The Willunga Basin has been selected as one of these sites, and \$3.3 million has been allocated for field infrastructure within the basin. The installation of this monitoring infrastructure, and the research which it will support, will lead to the Willunga Basin becoming one of the best-characterised groundwater systems in Australia.

Previous groundwater assessments in the Willunga Basin over the last two decades have identified a number of key data and knowledge gaps. These include issues around the exchange of water between the aquifers and the creeks, seawater intrusion and possible discharge of groundwater to the ocean, and uncertainty in the volume of water that flows across the Willunga Fault. The potential impact of climate change on all of these processes is also very poorly understood. These knowledge gaps will be the focus of the new studies.

Installation of groundwater monitoring equipment commenced in April 2010, and will continue for the next three years.

While most of this research will be focussed on groundwater hydrology, there is a separate and complementary project that will focus on the implications of improved hydrological understanding and modelling for water policy, planning and decision making in the region. These social and policy dimensions of NCGRT's work in Willunga Basin are being investigated by the Integrated Catchment Assessment and Management Centre (iCAM), based at the Fenner School of Environment and Society at the Australian National University, with support from the Charles Sturt University's Institute for Land, Water and Society (ILWS).

It is recommended that the Board:

- 1. maintains its collaboration with the National Centre for Groundwater Research and Training. The results of the investigations being undertaken by the National Centre for Groundwater Research and Training will inform future water allocation planning both within this area and other regions.**

Amendments to the Natural Resources Management Act 2004

The *Natural Resources Management Act 2004* (the Act) was amended in 2007 to create the system for unbundled water rights across the state. The amendment came into force on 1 July 2009, with transitional arrangements in place to allow water rights for prescribed areas to remain bundled until the water allocation plans for that prescribed water resources provides for unbundled water rights.

The Department for Water is currently developing a policy statement 'Policy on the Implementation of Unbundling Water Rights in South Australia'. The Policy (when adopted) will enable an assessment to be undertaken to determine whether a prescribed water resource should be unbundled.

The draft Western Mount Lofty Ranges Water Allocation Plan has been developed in the 'bundled' environment.

It is recommended that:

- 1. with the McLaren Vale Prescribed Wells Areas being within the boundaries of the Western Mount Lofty Ranges Prescribed Water Resources Area the unbundling of the groundwater resource within the McLaren Vale PWA should be considered at the same time as the surface water and water course water within the whole of the Western Mount Lofty Ranges region. This would occur with the review of the Western Mount Lofty Ranges Water Allocation Plan should the McLaren Vale PWA be incorporated within the region.**

Protecting the Barossa Valley and McLaren Vale

In September 2011 the State Government introduced legislation and a Development Plan Amendment (DPA) with the intention to provide a greater level of certainty in respect to the future development and character of the Barossa and McLaren Vale districts.

The legislation aims to provide certainty for future investment in the districts, balanced with a need to protect the rural landscapes that enhance the special character of the Barossa and McLaren Vale, their heritage and their natural environment.

The draft Barossa Valley and McLaren Vale Protection Districts DPA supports the intentions of the draft legislation. The purpose of the amendment is to impose development controls to protect the unique heritage, culture and integrity of the Barossa and McLaren Vale districts.

The draft legislation and DPA need to be considered in respect to any implications they may have on current water users and future Water Allocation Plans will need to identify (if necessary) any policy changes as a result of the legislation and DPA.

Climate Change

The Department for Water (Technical Report 2011/01) has undertaken a first order assessment of South Australia's water resources (both groundwater and surface water). The investigations prioritise the water resources according to the potential risk posed by climate change.

The risk rating developed considered resource significance, resource sensitivity to climate and climate change risk.

The unconfirmed and confirmed aquifers of the McLaren Vale Prescribed Wells area have been ranked 24 and 41 out of the 69 prescribed and unprescribed resources assessed.

It is recommended that the Board:

- 1. continues to review information and advice related to climate change to support the Board in monitoring and managing the McLaren Vale PWA**

Investigations undertaken since 2007

McLaren Vale WAP Review of Sustainable Yields Stage 1

Recognising the declining trend in groundwater levels and the rise in salinity levels the Board in 2009 commenced Stage 1 of a review of the sustainable yield within the McLaren Vale PWA. Further work is being undertaken with the objectives of improving the understanding of the McLaren Vale PWA groundwater system through targeted investigations over the short to medium term that will assist in developing a revised sustainable yield.

Groundwater dependent environmental assets of the Adelaide Plains and McLaren Vale (Stage 1)

The primary purpose of the project was to develop a sound knowledge base on the potential groundwater dependent ecosystems (GDEs) of the Adelaide Plains and McLaren Vale and outline any further works necessary to adequately account for water needs of GDEs within the WAP framework. This will be used to assist and inform the WAP process. The scope of works included:

1. Collation of previous information to summarise where GDEs have been identified and what is known about their current water requirements.
2. Desktop analysis to identify and describe GDEs.
3. Regional assessment of the significance of GDEs based on their ecological values, level of groundwater dependency and level of threat from groundwater extraction.
4. A review of existing information relating to marine GDEs.
5. Development of a management response framework that is commensurate with the level of risk to GDEs.

The report provided the following recommendations for further activities in relation to the GDE assets of the Adelaide Plains and McLaren Vale:

1. Seek a review and verification through the Department for Water of the potential GDEs identified.
2. Seek a review and verification through the Department for Water of the risk levels assigned to the potential GDEs identified.

3. Implement procedures as set out in the draft management framework.

The second stage has commenced which is an investigation based on field work to:

- assess the groundwater dependent ecosystems (GDEs) of McLaren Vale PWA, in terms of status, likely distribution, and flora and fauna;
- assess the water regime required for each GDE subtype; and
- describe the groundwater conditions that need to be provided to maintain the identified water regime (the EWRs)

This stage is due for completion at the end of November 2011.

It is recommended that the Board:

1. continues to undertake investigations in partnership with DfW and other organisations to improve on the level of understanding of the resources within the prescribed area.

Matters raised by the Community/Government Agencies and Others

Buffer distances between wells

A concern has been raised by a member of the local community that the current plan does not contain buffer distances between existing wells and new wells being constructed. There is therefore potential for interference between the existing well and new well.

Response:

The draft Western Mount Lofty Ranges Water Allocation Plan contains buffer provisions relating to the construction of new wells. At the time the McLaren Vale PWA is incorporated into the Western Mount Lofty Ranges PWRA these provisions will then apply, subject to any amendments.

Recharge period

SA Water has identified the following issues during the development of the Aldinga recycled water ASR scheme at Aldinga:

1. The recharge period and recovery period stipulated in the WAP. As recycled water is available up to the start of December (after which a fair proportion is used directly by Willunga Basin Water (WBW) and other growers), the cessation of injection in September, as per the WAP, will mean less water is available to inject. Likewise, there has been some discussion of recovering water during early spring to wet up the soil profile before high evaporation months occur. This would breach the recovery period criteria in the WAP. These dates are set for administration purposes only, but they inhibit flexibility, especially when seasonal changes are inconsistent or ASR operation needs to adjust to the climatic conditions.
2. In Section 7.1 (8) (b), it states that the attenuation zone should not extend past the property boundary. This can be overcome by a letter of consent from land owners, and may also be overcome by demonstrating that the water injected will actually improve the quality of water outside of the attenuation zone.
3. In Section 7.2 (9) (a), it states that up to 100% of treated effluent may be recovered. It is unfortunate that the EPA have enforced a 100% recovery for this scheme, as it doesn't allow the beneficial replenishment of the aquifer from leaving some water in the ground. The

depletion of the aquifer from continual taking may lead to seawater intrusion, with the ASR scheme potentially being a method to reduce the likelihood of intrusion occurring (this is outside of the NRM control).

4. In Section 8 (1) (a) in principles, the requirement for a Water Affecting Activity Permit (WAAP) – no WAAPs have been issued.
5. There are a number of issues with the monitoring requirements in Section 10. In Table 3 it states that 2 samples (for an effluent ASR) are required for every 5ML extracted. For a 400ML scheme, is equates to 160 samples, and as each sample will cost around \$500, a cost of \$80k in sampling per year. This could be addressed by a clause stating an EPA approved monitoring program will supersede this requirement.

Response:

While the issues are relevant, they have not significantly affected the recharge and recovery scheme and the issues will be addressed in the future amendment of the WAP with the WMLR WAP. It is recommended that the Board recommends that the Minister requests the Department for Water investigate whether amendments can be made to the existing Water Allocation Plan to address SA Waters concerns around water sensitive urban design and managed aquifer recovery schemes without the need to undertake the full amendment process.

Conclusion

There are observed adverse trends in groundwater levels and salinity levels. However, these trends are gradual and if continued, based on information from the Department for Water, will not lead to a change in the current beneficial use of the groundwater resource for at least 15 years. Beneficial use may be drinking water, irrigation or stock watering. There is a need to maintain monitoring to identify the causes of these trends and to determine whether in time the current sustainable yield should be altered.

On-going investigations by the Board and other organisations, particularly the National Centre for Groundwater Research and Training, will help inform future policy within the McLaren Vale region and the broader Adelaide and Mount Lofty Ranges region.

The McLaren Vale Prescribed Wells area is located wholly within the boundaries of the Western Mount Lofty Ranges Prescribed Area. Rather than developing a new separate Water Allocation Plan for the McLaren Vale Prescribed Wells Area, the regulation for the Western Mount Lofty Ranges Prescribed Water Resources Area should be amended to include the McLaren Vale Prescribed Wells Area and the next iteration of the Western Mount Lofty Ranges Water Allocation Plan should include the McLaren Vale PWA.

Recommendations

It is the recommendation of the review that:

1. the Adelaide and Mount Lofty Ranges Natural Resources Management Board endorses the Review of the McLaren Vale Prescribed Wells Area Water Allocation Plan adopted on 17 February 2007 as being undertaken in accordance with section 81(5) of The Natural Resources Management Act 2004.

2. the Adelaide and Mount Lofty Ranges Natural Resources Management Board informs the Minister for Sustainability, Environment and Conservation that a Review of the McLaren Vale Prescribed Wells Area Water Allocation Plan adopted on 17 February 2007 has been undertaken in accordance with section 81(5) of The Natural Resources Management Act 2004.

3. the Adelaide and Mount Lofty Ranges Natural Resources Management Board informs the Minister for Sustainability, Environment and Conservation that:
 - 3.1 based on information from the Department of Water there are observed adverse trends in groundwater levels and salinity. The Department for Water identifies that these trends are gradual and if continued will not lead to a change in the current beneficial use of the groundwater resource for at least 15 years.
 - 3.2 as the McLaren Vale Prescribed Wells Area is located wholly within the boundaries of the Western Mount Lofty Ranges Prescribed Water Resources Area, the Board does not propose to develop a new separate Water Allocation Plan for the McLaren Vale Prescribed Wells Area and recommends that the regulation for the Western Mount Lofty Ranges Prescribed Water Resources Area be amended to include the McLaren Vale Prescribed Wells Area. This would enable the next iteration of the Western Mount Lofty Ranges Water Allocation Plan to include the McLaren Vale PWA.
 - 3.3 the Board in partnership with the Department for Water and the National Centre for Groundwater Research and Training identify and undertake the investigations necessary to determine the causes of salinity increases and groundwater level decline.
 - 3.4 reporting of groundwater levels and salinity within the McLaren Vale PWA should be undertaken annually by Department for Water.
 - 3.5 with the McLaren Vale Prescribed Wells Areas being within the boundaries of the Western Mount Lofty Ranges Prescribed Water Resources Area the unbundling of the groundwater resource within the McLaren Vale PWA should be considered at the same time as the surface water and water course water within the whole of the Western Mount Lofty Ranges region. This would occur with the review of the Western Mount Lofty Ranges Water Allocation Plan should the McLaren Vale PWA be incorporated within the region.
 - 3.6 the Board in partnership with the Department for Water provide regular and on-going information to groundwater users and the broader community on the status of the groundwater resource within the McLaren Vale PWA.
 - 3.7 the Board will continue to undertake investigations in partnership with Department for Water and other organisations to improve on the level of understanding of the resources within the prescribed area.
 - 3.8 the Board requests the Minister to request the Department for Water investigate whether amendments can be made to the existing Water Allocation Plan to address SA Waters concerns around water sensitive urban design and managed aquifer recovery schemes without the need to undertake the full amendment process.

References

Adelaide and Mount Lofty Ranges Natural Resources Management Board

Western Mount Lofty Ranges Water Allocation Plan (draft) for consultation, October 2010.

Adelaide and Mount Lofty Ranges Natural Resources Management Board

McLaren Vale Prescribed Wells Area Water Allocation Plan, February 2007

Department for Water

Impacts of Climate Change on Water Resources, Phase 1: First Order Assessment and Prioritisation, Technical Report 2011/01

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McLaren Vale PWA Groundwater Level and Salinity Report 2009-10, Government of South Australia

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SA Policy Statement, Policy on the Implementation of Unbundling Water Rights in South Australia (Draft September 2011) Government of South Australia

Sinclair Knight Merz Pty Ltd

Groundwater-dependent environmental assets of the Adelaide Plains and McLaren Vale (Stage 1) November 2010

Sinclair Knight Merz Pty Ltd

McLaren Vale Water Allocation Plan Review of Sustainable Yield, Stage 1, November 2009