

Sustainable Management of Victoria's Groundwater Resources



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Sustainable Management of Victoria's Groundwater Resources

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Victorian Auditor-General's Office
Auditing in the Public Interest

The Hon. Robert Smith MLC
President
Legislative Council
Parliament House
Melbourne

The Hon. Jenny Lindell MP
Speaker
Legislative Assembly
Parliament House
Melbourne

Dear Presiding Officers

Under the provisions of section 16AB of the *Audit Act 1994*, I transmit my performance report on *Sustainable Management of Victoria's Groundwater Resources*.

Yours faithfully

A handwritten signature in black ink, appearing to read "D D R Pearson".

D D R PEARSON
Auditor-General

5 October 2010

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Audit summary

Background

Groundwater is water that seeps from the surface into porous sands, silts and fractured rocks. Like the surface water in rivers, lakes and dams, it is a finite resource. When rain or snow falls on land some of it evaporates, gets absorbed by plants, flows into streams and rivers, and seeps into the soil. Surface water that seeps into underground spaces 'recharges' groundwater.

Groundwater is used as drinking water in more than 80 cities and towns, for crop irrigation, stock, dairy cleaning, and for domestic gardening and cleaning. Irrigators, domestic and stock users, and urban dwellers rely more on groundwater during drought.

Audit objective

This audit examined whether the use of groundwater resources is sustainable. Specifically, it examined whether water planners and managers use relevant and reliable information to manage the access to, and license the use of, groundwater. It also assessed the effectiveness of licence monitoring and enforcement activities.

Conclusions

The Department of Sustainability and Environment (DSE) and water corporations do not know whether groundwater use is sustainable. While a robust planning framework and planning tools have been developed, their effectiveness is undermined by inadequate groundwater data and monitoring, and delayed development and implementation of management tools.

Licensing, metering and compliance monitoring activities are not rigorous enough to assure DSE or water corporations about who extracts groundwater and how much they extract. There is also insufficient data about groundwater reserves and sustainable extraction rates.

Findings

Groundwater planning

The State Observation Bore Network (SOBN) is the main source of groundwater information, comprising around 2 500 groundwater bores. However, it cannot, by design, provide DSE or water corporations adequate information about groundwater stocks, extraction and recharge rates, or the interconnection between ground and surface water. Data gaps and the uncertainty about groundwater quality mean that DSE and water corporations cannot effectively monitor, plan and manage Victoria's groundwater resources.

DSE has recognised limitations with the SOBN. It has commenced a refurbishment program, replacing bores at, or near, the end of their useful life. The program also aims to improve bore network coverage in areas not currently or adequately monitored.

DSE's strategic planning is underpinned by a range of planning tools, including resource appraisals, management plans and rules and sustainable water strategies. Resource appraisals are providing DSE and water corporations with detailed information about groundwater to assist with sustainable management. However, management plans have not been developed and implemented for all extensively used aquifers as intended. This is in part due to what water corporations consider an unnecessarily slow and expensive process.

While other tools are in place to manage extractions, the absence of management plans increases the prospect of unsustainable use. Local management rules are in place for six groundwater management areas and one irrigation area. These rules are easier to implement than management plans, and there is greater opportunity for water corporations to use these more often and as an alternative to management plans.

Groundwater management

The sustainable use of groundwater depends on sound management practices. Given the increasing demand for this resource, management practices limiting access to, and extraction of, groundwater are vital. Effective monitoring is also needed, to assure that access and extraction conditions are met.

The licensing and metering regime for groundwater continues to evolve and improve, but there are several limitations around unlicensed users and bores. Uncertainty about the number of the unlicensed users and bores, and the inconsistency of metering practices, reduce the regime's effectiveness.

Metering groundwater extractions is crucial in managing sustainable groundwater use. It tells planners and managers how much water users are extracting and whether they are complying with the extraction limits of their licences. Despite progress in metering groundwater users, many remain unmetered, limiting the usefulness of metering as an important data source.

Meter readings are the main source of compliance activity. Without more robust compliance monitoring and enforcement activities, it is unlikely that non-compliance will be detected or deterred.

Recommendations

Number	Recommendation	Page
1.	The Department of Sustainability and Environment should: - reconcile its State Observation Bore Network program priorities with available resources to clarify whether refurbishment can occur in a reasonable time frame - update its sustainable water strategies to reflect the longer-term significance of groundwater and its sustainable management, incorporating climate change effects and the connections between ground and surface waters.	16
2.	Water corporations should develop and implement groundwater management plans, or apply local management rules, where appropriate, for all extensively used aquifers.	16
3.	The Department of Sustainability and Environment and water corporations should: - obtain up-to-date and reliable information on the number of groundwater bores, particularly for domestic and stock users - develop strategies to better understand domestic and stock groundwater use and manage its impact on groundwater systems.	22
4.	Water corporations should develop sound risk-based compliance monitoring to detect and deter non-compliance.	22
5.	Goulburn-Murray Water and Grampians Wimmera Mallee Water should develop sound enforcement frameworks to manage non-compliance.	22

Submissions and comments received

In addition to progressive engagement during the course of the audit, in accordance with section 16(3) of the *Audit Act 1994*, a copy of this report was provided to the Department of Sustainability and Environment, Goulburn-Murray Water, Southern Rural Water and Grampians Wimmera Mallee Water, with a request for submissions or comments.

Agency views have been considered in reaching our audit conclusions and are represented to the extent relevant and warranted in preparing this report. Their full section 16(3) submissions and comments, however, are included in Appendix A.

1 Background

1.1 Groundwater

Groundwater is water that seeps from the surface into porous sands, silts and fractured rocks. It collects in underground spaces that range from immense flooded sand beds to small fractures in rock layers. Like the surface water of rivers, lakes and dams, it is a finite resource.

Aquifers are underground spaces that hold water reserves, which vary in depth, quality and quantity, and in how they connect with surface water. Aquifer reserves deplete quickly if the rate of water extraction is faster than inflows from seeping surface water. Groundwater systems with high extraction rates need careful management.

This audit examines whether using groundwater from aquifers is sustainable. According to the National Water Initiative, a sustainable yield is 'the level of water extraction from a particular system which, if exceeded would compromise key environmental assets, or ecosystem functions and the productive base of the resource'.

1.2 Water policy and legislation

Our Water Our Future

Our Water Our Future is Victoria's strategy for managing water resources, including groundwater. It assesses future supply challenges and outlines policies for dealing with them, including groundwater.

Sustainable water strategies

Sustainable water strategies are 50-year regional plans that aim to secure water for community use, while balancing environmental concerns. The Department of Sustainability and Environment (DSE) has developed strategies for the Central and Northern regions, and a draft strategy for the Western region. These strategies provide further policy direction for groundwater management.

National Water Initiative

All state governments signed the National Water Initiative (NWI), an agreement on water reform. It aims to create a soundly regulated national water market, and planning for managing rural and urban use of surface and groundwater.

Each state and territory government is preparing an NWI implementation plan. Victoria has lodged a plan to protect and repair stressed rivers and groundwater systems, and to improve monitoring and reporting on the quantity and quality of the state's water resources.

The National Water Commission, which advises the Council of Australian Governments and the Australian Government on national water issues, has accredited Victoria's plan.

The Water Act 1989

Under the *Water Act 1989* (the Act) responsibility for managing groundwater rests with the Crown through the Minister for Water. DSE reports to the minister and is responsible for water through its Groundwater and Licensing Branch.

The minister delegates the administrative and operational management of rural groundwater to Goulburn-Murray Water, Grampians Wimmera Mallee Water and Southern Rural Water. Southern Rural Water is also delegated responsibility for metropolitan groundwater.

1.3 Groundwater access and management

1.3.1 Licences

The Act regulates the management of groundwater extraction. While landowners can extract groundwater as a matter of right for domestic and stock use, irrigators and commercial users must get a 'take and use' licence. However, all users need bore construction licences, aimed at minimising environmental impact.

Water corporations issue 'take and use' licences, valid for between one and 15 years, with conditions that specify the place, rate and annual volume of groundwater extraction.

1.3.2 Extraction management

Water corporations manage groundwater extraction from aquifers in geographical areas known as groundwater management units. There are three types of management units:

- **Water supply protection areas**—areas where there are heavily used groundwater systems. They are subject to intensive management through groundwater management plans.

- **Groundwater management areas**—areas where groundwater systems have been intensively developed or have the potential to become more highly used. These areas may need a high level of management in the future. All groundwater management areas are subject to water entitlement caps and some are managed through management rules developed and approved by water corporations.
- **Unincorporated areas**—groundwater systems where there has been limited development or use of groundwater. This is usually because the system is low yielding, the water quality is poor and has limited use, or there is limited information about resource availability.

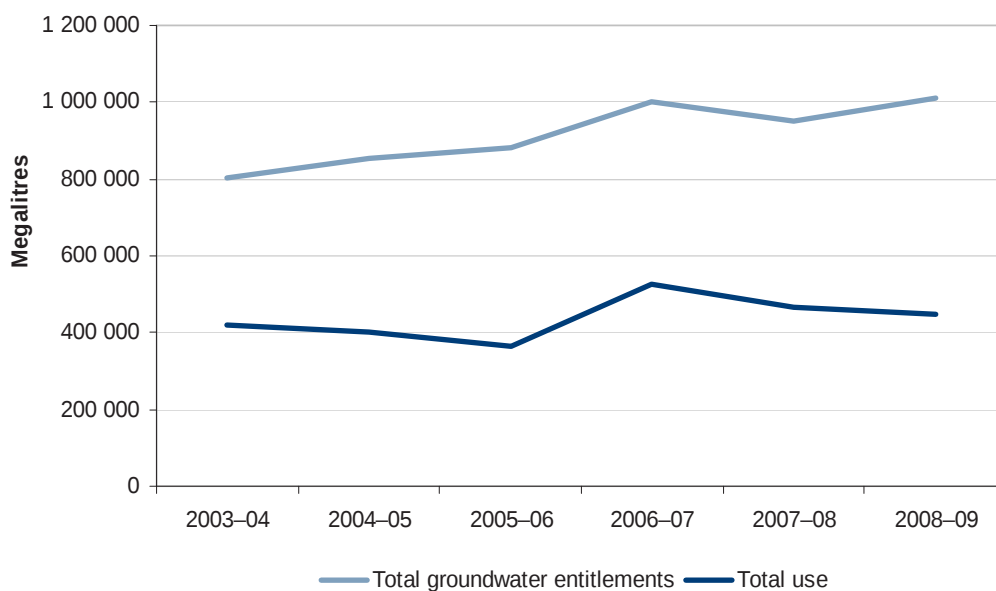
There are 62 geographic groundwater management units covering 100 per cent of the state's total groundwater allocations. In all water supply protection areas and groundwater management areas, the volume of groundwater for extraction has a permissible consumptive volume (PCV). This acts as a cap on the licensed entitlement issued for an area. Water corporations cannot issue new licences if the PCV has been reached or is likely to be breached. If a user needs more water than the licensed volume, they can only get it by permanently or temporarily obtaining a transferred entitlement from another licensed user.

1.4 Groundwater use and monitoring

1.4.1 Groundwater use

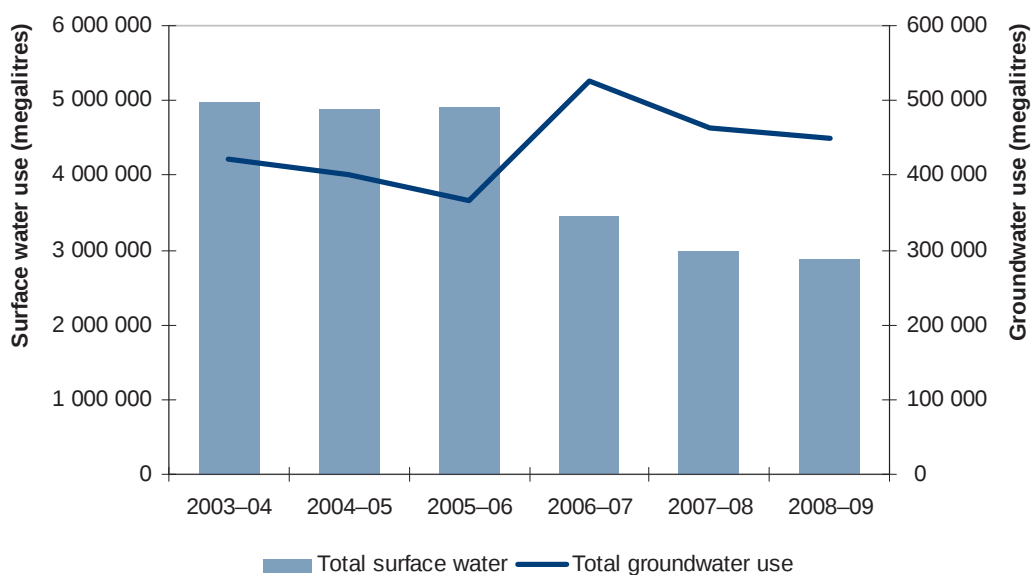
Groundwater is widely used in more than 80 cities and towns. Uses include crop irrigation, stock watering, dairy cleaning, domestic gardening and cleaning. Towns also use groundwater for drinking where it has been treated. Irrigators, domestic and stock users and urban dwellers have relied more heavily on groundwater during the drought. Figure 1A shows that groundwater entitlements and use have risen over the five years to 2008–09, peaking in 2006–07. This coincided with some of the lowest rainfall on record. Figure 1B shows the comparison between groundwater and surface water use, and the increased reliance on groundwater as the availability of surface water diminished.

Figure 1A
Groundwater licensed entitlement and use



Source: Victorian Auditor-General's Office, based on Department of Sustainability and Environment information.

Figure 1B
Comparison of ground and surface water use



Source: Victorian Auditor-General's Office, based on Department of Sustainability and Environment information.

1.4.2 Monitoring groundwater use

The State Observation Bore Network comprises around 2 500 bores that monitor the availability and quality of groundwater, and the links between groundwater and surface water systems. Monitoring can also provide water resource managers with information about the location of groundwater systems, and how extensive they are.

1.5 Audit objective and scope

The audit examined whether the use of groundwater resources is sustainable.

Specifically, it examined whether:

- water corporations and DSE use relevant and reliable information to manage the access to, and license the use of, groundwater
- licence monitoring and enforcement activities are effective.

The audit also examined the planning, monitoring, licensing and compliance processes for managing groundwater in rural Victoria.

The audit was performed in accordance with the Australian Auditing and Assurance Standards. The cost of this report was \$315 000.

2 Groundwater planning

At a glance

Background

Groundwater resources are finite and increasingly under pressure. The sustainability of the resource is dependent on effective planning.

Conclusion

The Department of Sustainability and Environment (DSE) and water corporations are not yet adequately planning for sustainable groundwater use, due to inadequate data and delayed implementation of planning tools.

Findings

- Gaps in the quality, comprehensiveness and accessibility of groundwater data limit its usefulness in planning and management.
- DSE has recognised the limitations of its bore network and is in the process of upgrading it.
- DSE has a sound groundwater planning framework. However, delayed implementation of specific management plans has hindered the effort to sustainably manage groundwater in high-risk areas.

Recommendations

- The Department of Sustainability and Environment should:
 - reconcile its State Observation Bore Network program priorities with available resources to clarify whether refurbishment can occur in a reasonable time frame
 - update its sustainable water strategies to reflect the longer-term significance of groundwater and its sustainable management, incorporating climate change effects and the connections between ground and surface waters.
- Water corporations should develop and implement groundwater management plans, or apply local management rules, where appropriate, for all extensively used aquifers.

2.1 Introduction

Victoria's groundwater is finite and increasingly under pressure. Its sustainability is dependent on effective planning and adaptive management. This requires managing the groundwater system on the available information, monitoring the responses of the groundwater system and then refining management actions based on the observed outcomes.

2.2 Conclusion

The Department of Sustainability and Environment (DSE) and water corporations are not yet adequately planning for sustainable groundwater use. Although improving, planning continues to be hampered by inadequate groundwater data. Effective planning tools have been developed and are used to manage groundwater stocks, but delayed implementation of some of these tools has increased the prospect that groundwater systems in high-risk areas will become unsustainable.

2.3 Groundwater data

Those planning and managing the sustainable use of groundwater need data on the:

- location of groundwater systems
- current water levels
- extraction and recharge rates
- connections between groundwater and surface water systems.

DSE and the water authorities collect groundwater data for their own activities. Although in some parts of Victoria there is a long history of groundwater management information, this information is neither complete nor sufficiently comprehensive because of the significant complexity and cost associated with data collection. These data limitations hinder planning and management.

2.3.1 State Observation Bore Network

Established in the 1950s, the State Observation Bore Network (SOBN) is the main source of groundwater data. Significant increases in the number of observation bores occurred throughout the 1960's and 1970's and SOBN has continued to grow. SOBN now comprises around 2 500 groundwater bores that DSE relies on, through quarterly monitoring, to measure groundwater levels and quality, as part of the State Groundwater Monitoring Program. SOBN cannot, by design, measure total water volumes, extraction and groundwater recharge rates in all aquifers. Other tools, including resource appraisals and metered data—where available—provide this information.

Over half the monitoring bores in groundwater management units provide DSE with adequate coverage to inform itself about groundwater levels, and the impact that extractions have on them. However, around 43 per cent of groundwater management units have inadequate or limited SOBN coverage. While this represents a nearly 10 per cent improvement since 2009, the lack of coverage continues to limit DSE's understanding of groundwater systems.

In addition to SOBN coverage, the condition of bores is also problematic. Around 55 per cent of groundwater management units have key bores that are at risk of failure, in part due to their age. Consequently, understanding Victoria's groundwater system will improve with the staged upgrade and refurbishment of SOBN.

Figures 2A and 2B summarise DSE's rating of SOBN coverage and condition by area, as at August 2010.

Figure 2A
Coverage of the State Observation Bore Network

	Inadequate	Limited	Adequate	Excessive	Total
Water supply protection areas	1	3	18	1	23
Groundwater management areas	10	10	17	1	38
Proposed groundwater management areas	0	0	2	0	2
Unincorporated areas	8	2	5	1	16
Total	19	15	42	3	79

Note: Department of Sustainability and Environment descriptions:
 Inadequate—insufficient bores (number or distribution) to provide meaningful data.
 Limited—some bores, providing local data, but insufficient for a reasonable aquifer-wide assessment.
 Adequate—sufficient bores to provide representative aquifer-wide data.
 Excessive—number of bores exceeds the needs of a baseline monitoring network.
Source: Victorian Auditor-General's Office, using Department of Sustainability and Environment data.

Figure 2B
Asset decline/risk of the State Observation Bore Network

	High	Medium	Low	Total
Water supply protection areas	4	10	9	23
Groundwater management areas	1	20	17	38
Proposed groundwater management areas	0	1	1	2
Unincorporated areas	2	6	8	16
Total	7	37	35	79

Note: Department of Sustainability and Environment descriptions:
 High risk—at or beyond end of life and/or artesian (also includes bores that have failed whose data is crucial for management).

Medium risk—some bores are over 15 years old (non-PVC)—non-artesian.

Low risk—less than 15 years old, artesian or non-artesian.

Source: Victorian Auditor-General's Office, using Department of Sustainability and Environment data.

The data shows that:

- Out of the 23 water supply protection areas, 18 (78 per cent) have adequate SOBN coverage. The other five (22 per cent) have either limited, inadequate or excessive coverage. Fourteen of the water supply protection areas (61 per cent) have key bores that are either nearing, at the end of, or past their useful life span.
- For the 38 groundwater management areas, 17 (45 per cent) have adequate SOBN coverage. The other 21 (55 per cent) have either limited, inadequate or excessive coverage. Also, around 55 per cent of groundwater management areas have key bores that are near, at the end of, or past their useful lives.
- Of the 16 remaining unincorporated areas, five (31 per cent) have adequate SOBN coverage. The other 11 (69 per cent) have either limited, inadequate or excessive coverage. Around 50 per cent of the unincorporated areas have key bores that are either near, at the end of, or past their useful lives.

DSE has recognised SOBN limitations, and has spent \$10.6 million to upgrade and maintain SOBN between 2006 and 2010, using a risk-based approach, concentrating on water supply protection areas and groundwater management areas. As at August 2010:

- 182 new bores had been developed, and 45 bores have been decommissioned
- 113 new bores, and 10 bores for refurbishment or decommissioning had been approved and funded, but were not completed.

In addition, DSE has identified the need for a further 92 bores and refurbishment of 129 bores on sites that they have approved, as well as 344 new bores on sites they are yet to approve. These works are currently unfunded.

2.3.2 Other groundwater data

Water corporations also monitor the SOBN as part of the local management of groundwater. This usually happens monthly at selected bores in water supply protection areas and groundwater management areas, as specified by the water corporations. They collect information about water levels and in some cases about water quality.

The water corporations report on groundwater extraction, allocation and use information for the three groundwater management unit types—groundwater management areas, water supply protection areas and unincorporated areas. The most reliable and up-to-date information is on water supply protection areas, followed by groundwater management areas and unincorporated areas. In unincorporated areas, the level of groundwater use and risk to the resource is low, reducing the need for more intense management or monitoring.

Figure 2C outlines the information systems that store the monitoring data and their purposes.

Figure 2C
Groundwater information systems

Information system	Owner	Focus
Victorian Resources Data Warehouse	Department of Sustainability and Environment	Groundwater monitoring information
Groundwater Management Inventory	Department of Sustainability and Environment	Graphics and text on groundwater management units
The State Water Register	The Water Registrar	The public register of all water entitlements. Also used to issue bore construction and 'take and use' licences
Groundwater Management System	Water corporations	An internal system for water corporations and their contractors with groundwater monitoring and licensing information
Bore Completion Report System	Department of Sustainability and Environment	Logs bore and water quality characteristics at the time of drilling. Linked to the water register to confirm the bore is active
SOBN management database	Department of Sustainability and Environment	The SOBN and its major works programs
Dryland Salinity Measurements	Department of Primary Industries	Dryland salinity bores
Utility Services website	Water corporations	Holds and displays groundwater data in real time for DSE, water corporations and catchment management authorities
Groundwater Infrastructure Management System	Department of Sustainability and Environment	Asset management system that records SOBN and monitoring instruments

Source: Victorian Auditor-General's Office.

Different agencies, or groups within agencies, manage the various groundwater information systems and databases. The lack of consolidated and centralised data impedes the roles of groundwater planners and managers, as well as the integration between information and reporting systems. This has also limited how effectively DSE, water corporations and other groundwater stakeholders can plan and manage the resource.

To address these issues, DSE has developed project specifications, which have recently gone to tender. The water measurement information system aims to offer a central point of access to water measurement information. Anticipated benefits from the water measurement information system include:

- streamlining the information and data systems
- making the current systems simpler and more useful
- meeting increasing demand for water measurement information for future policy and planning
- assuring compliance with legislative and business requirements.

2.4 Groundwater planning

Given the prolonged drought and the likely impacts of climate change on surface water, water users are increasingly drawing on groundwater. As groundwater is finite, DSE and water corporations have to plan for the long-term to make sure it is sustainably used and that environmental impacts are minimised.

DSE has developed a sound groundwater planning framework, incorporating a range of planning activities. However, delayed implementation of some of these activities has hindered the effort to sustainably manage groundwater in some areas.

2.4.1 Strategic planning

Victoria has a long history of groundwater planning, developing its first groundwater management strategy in 1993. The strategy's focus was the efficient and sustainable use and conservation of groundwater, for the maximum benefit of the community and environment. A key feature of the strategy was the development of groundwater management plans.

Planning and management activities for groundwater have increased markedly over the past 10 years. DSE's Groundwater and Licensing Branch (GLB) has been given responsibility for overseeing a range of groundwater functions.

These functions include:

- leading and guiding policy on groundwater management
- overseeing the management of groundwater sustainability for all users, including the environment
- protecting and promoting greater understanding of groundwater, its potential and limits, through its role as caretaker and manager
- responding to, and advising the water industry and users about groundwater access and use
- overseeing the metering and monitoring, and licensing programs.

The GLB has recently developed a new draft planning framework to drive long-term groundwater management in Victoria. Although yet to be implemented, the framework should assist the GLB to develop work priorities that better reflect contemporary approaches to sustainable groundwater management.

As strategic thinking around the management of whole groundwater systems continues to develop, the proposed systems approach by DSE outlined in the most recent sustainable water strategies is a progressive approach. Importantly, this means considering groundwater on a system-wide scale, based on the whole aquifer and its interconnectedness, and not on the basis of an area, jurisdiction or issue, as it has been in the past.

2.4.2 Groundwater planning tools

In addition to developing a planning framework, DSE developed and uses a range of planning tools to sustainably manage groundwater. These include undertaking resource appraisals, developing groundwater management plans and rules, and developing sustainable water strategies.

Resource appraisals

Resource appraisals are the key tool by which extensive and long-term planning frameworks are developed for groundwater management areas. The outcomes of resource appraisals are:

- new information on the location and boundaries of groundwater systems
- new information on sustainable yield and permissible consumptive volume, which can be used to inform decisions about future restrictions, allocations and groundwater levels
- identification of groundwater dependent ecosystems
- better understanding of the interaction between groundwater and surface systems
- updated management plans, if required, and improved performance of an existing groundwater management plan.

There have been 22 resource appraisals and studies undertaken for groundwater management areas or parts of areas, with priority given to areas at risk. Eight areas are currently being scoped for resource appraisal assessments. Guidelines to formalise the resource appraisal process are being developed by DSE.

Groundwater management plans

Management plans are evolving in their content, but generally the objective of a management plan is to achieve the sustainable use of the aquifer and the equitable management of the resource in terms of users and the environment.

The *Water Act 1989* requires a consultative committee to develop a groundwater management plan for all water supply protection areas. The Minister for Water appoints the committee after declaring a water supply protection area. The committee has to develop a management plan within 18 months.

Despite being a legislative requirement, DSE and water corporations do not consider groundwater management plans as essential as in the past. This is due to the wide range of tools used to manage groundwater, including caps across all water supply protection areas and groundwater management areas, universal licensing of commercial and irrigation extractions, metering and monitoring, coupled with resource appraisals and specific studies.

Of the 25 water supply protection areas, there are 10 approved management plans, with one more nearing completion. Current planning processes cover a further 14 groundwater management units. The development and implementation of the management plans has been delayed by legal challenges in the 2000s and more recently by water corporations being required to adhere to what they consider is an unnecessarily slow and expensive process for establishing consultative committees. DSE has advised that they are reviewing the process for developing groundwater management plans in an effort to reduce the time and cost involved.

The 10 approved groundwater management plans have improved the amount, accuracy and timeliness of information for managing groundwater resources. In the 15 water supply protection areas without management plans, water levels are generally declining, due to a combination of climate factors, drought conditions and the lack of timeliness in implementing appropriate management tools. Most of these areas have water levels below the historical average, or the lowest on record.

Local management rules for groundwater management areas

Water corporations can develop local management rules as an alternative to groundwater management plans, where an amendment to conditions on 'take and use' licences are not required.

Local management rules describe the resource, management aims and specific rules for restrictions in times of water shortage, carry over of allocations and provisions for water trading. As the rules are approved by water authority boards, they enable quick responses to changes in groundwater levels and local management issues, given the shorter and less rigorous approvals process compared to management plans. If risks are not able to be successfully managed through the preparation and implementation of local management rules, then a management plan should be considered.

Local management rules are in place for six groundwater management areas and one irrigation area. However, given these rules are easier to implement than management plans, there is greater opportunity for water corporations to use these more often and as an alternative to management plans.

Sustainable water strategies

DSE released the final versions of two of the four sustainable water strategies—the Central region and the Northern region—in 2006 and 2009 respectively, and released a draft strategy for the Western region in March 2010. The Gippsland region strategy has yet to be developed.

Despite the relative recent release of the Central and Northern region water strategies, neither particularly focus on groundwater, mainly because groundwater use in these regions is only around 8 per cent and 5 per cent respectively. Consequently, greater planning attention has been given to surface water. However, given the strategies were released during a severe drought, when demand for groundwater was high, limiting the focus on groundwater in strategies with a 50-year outlook is a deficiency that does little to assure that groundwater will be sustainably managed in the long-term.

The Western region's draft strategy better reflects the significance of groundwater and sets out a framework for groundwater planning and management. The framework covers:

- **resource appraisals**—gathering and building knowledge about groundwater systems before developing management plans
- **management objectives**—included in local management rules or management plans and based on sustainable use of groundwater
- **groundwater management arrangements**—specifying the issues to consider during management plan and rule development
- **monitoring and review**—to underpin all groundwater planning and management processes.

Recommendations

1. The Department of Sustainability and Environment should:
 - reconcile its State Observation Bore Network program priorities with available resources to clarify whether refurbishment can occur in a reasonable time frame
 - update its sustainable water strategies to reflect the longer-term significance of groundwater and its sustainable management, incorporating climate change effects and the connections between ground and surface waters.
 2. Water corporations should develop and implement groundwater management plans, or apply local management rules, where appropriate, for all extensively used aquifers.
-

3 Managing groundwater use

At a glance

Background

Groundwater sustainability depends on sound management. Given the increasing demand for the resource, management must balance the extraction of groundwater with its recharge rate.

Conclusion

There is incomplete information about who is extracting water and how much they extract. As a result, the impact of extractions on groundwater systems is not fully understood. This is compounded by water corporations' lack of comprehensive compliance monitoring and enforcement activities to inform them about unauthorised water use.

Findings

- While the licensing and metering regime for groundwater continues to evolve and improve, there are limitations affecting groundwater sustainability.
- Many groundwater users do not have their extraction metered—a significant information gap.
- Meter reading is the principle method of compliance monitoring. Any other monitoring of compliance with groundwater licence conditions is minimal.

Recommendations

- The Department of Sustainability and Environment and water corporations should:
 - obtain up-to-date and reliable information on the number of groundwater bores, particularly for domestic and stock users
 - develop strategies to better understand domestic and stock groundwater use and manage its impact on groundwater systems.
- Water corporations should develop sound risk-based compliance monitoring to detect and deter non-compliance.
- Goulburn-Murray Water and Grampians Wimmera Mallee Water should develop sound enforcement frameworks to manage non-compliance.

3.1 Introduction

Given the increasing demand for groundwater, access to and extraction of the resource must be balanced against the replenishment rate. Rigorous monitoring is needed to show users are complying with access and extraction conditions and appropriate enforcement action taken when non-compliance occurs.

3.2 Conclusion

There is incomplete information about who is extracting water and how much they extract. Consequently, the impact of extractions on groundwater systems is not fully understood. This situation is compounded by water corporations' lack of comprehensive compliance monitoring and enforcement activities to inform them about unauthorised water use.

3.3 Groundwater licensing and metering

Water corporations mainly use licensing and metering to limit and monitor the extraction of groundwater. Licences enable water corporations to put conditions on groundwater use, such as the annual volume of water that users can pump, and the rate of pumping. Metering allows water corporations to track how much water users extract and whether they are complying with licence conditions.

Licensing and metering of groundwater continues to evolve and improve, but major limitations still need addressing, including uncertainty about the number of unlicensed users and bores, and inconsistent metering practices. Licensing and metering arrangements are also complex and potentially inequitable. For example:

- all users need a licence to build a groundwater bore
- most users need a licence to extract groundwater, except for people who use it for domestic and stock purposes
- most users must have their groundwater extractions metered, although some use is unmetered—even if the user needs a licence to extract groundwater.

3.3.1 Groundwater licences

Bore licences

Under the *Water Act 1989*, anyone wanting to use groundwater must apply for a bore construction licence. These licences aim to assure water corporations that:

- bores built will not damage the groundwater resource
- information and data about bores is recorded for future reference
- bores are located to minimise interference with other groundwater users or the environment, such as surface water flows.

Records on domestic and stock bores across the state are inaccurate because water corporations do not have up-to-date and reliable information on bore construction. Water corporations advise this is largely due to bore constructors not informing water corporations about all the bores they drill, even though they are required to; or about bores built before they had to be registered; and because compliance activities do not detect illegal bores.

The Department of Sustainability and Environment (DSE) has recognised the weaknesses in the bore construction licence data and has developed the on-line bore completion reporting system. Requiring information to be added to the water register should provide better bore construction data.

Extraction licences

While every groundwater user needs a licence to construct a bore, not all water users who extract groundwater need a licence to do so. The reasons for this are sometimes unclear, highlighting a system inequity. For example, while domestic and stock users are exempt from needing a 'take and use' licence to extract groundwater and can access groundwater free, many dairy farmers who should have a licence for their commercial operations either do not, or their licence conditions do not reflect their actual use.

The three water corporations could not identify how much water is used for washing dairies. Based on voluntary reporting, they estimate that dairy farms typically use between two and ten megalitres of groundwater annually to wash down dairy sheds. Because water corporations do not have accurate information about how much groundwater is used, the effectiveness of sustainable management strategies for groundwater is compromised.

During 2009, water corporations offered an amnesty to dairy wash licensees and users. Under the amnesty they could apply for a licence, or extend the volume on their surface or groundwater licence, and then install a meter. At August 2010, around 1 800 licence applications were being processed by the water corporations.

3.3.2 Groundwater metering

Water metering is fundamental to the responsible management of Victoria's groundwater resources. As groundwater demand keeps increasing, metering improves user accountability, which means the resource is shared more equitably between users. Metering also shows planners and managers how much water users are extracting, and whether they are complying with the limits of their licences.

Victoria has been active in non-urban water metering. Since 2005, under the *Our Water Our Future* metering program, DSE and water corporations have introduced a retroactive program to meter groundwater. Under DSE's metering program, all extraction sites with licenses to extract 20 megalitres or more of groundwater annually, and all new licences for water for irrigation or commerce, must be metered. Victoria currently has around 5 100 groundwater meters.

Unmetered groundwater use

Despite progress in metering licensed groundwater use, numerous unmetered groundwater users, and extraction thresholds, limit how effectively meters can identify groundwater extraction and usage rates.

Some groundwater use is not metered. For example, because domestic and stock users can use groundwater free, water corporations do not require them to have a meter. In addition, 'take and use' licence holders—licensed before 2005—who fall below threshold metering levels (generally between 10 and 20 megalitres annually) do not have their licensed entitlement metered.

Without meters, water corporations can only estimate annual groundwater use. Estimates are based on historical analyses of domestic use, which show that each licensed bore uses around two megalitres of groundwater annually. This figure does not account for the impact of recent climate conditions.

The lack of metering for these groundwater users, and the approach to estimating unmetered groundwater use, poses a threat to the sustainable management of groundwater because of the uncertain impact of extraction on groundwater stocks.

This is particularly so for domestic and stock users, whose demand for groundwater has increased from estimates of around 44 000 megalitres, or 9 per cent of total extractions in 2006–07, to 51 000 megalitres (11 per cent) in 2007–08. Without meters, water corporations have no reliable way of checking whether unmetered users permitted to extract up to 20 megalitres annually, are using less than the threshold.

3.4 Monitoring compliance with licence conditions

A risk-based approach is the best way to monitor compliance with groundwater licence conditions, including volumes and rates of extraction. This approach will help identify and manage the highest risks to non-compliance. Compliance monitoring requires effective enforcement for users who are not complying, including general and specific deterrents to educate groundwater licensees about appropriate behaviour.

The water corporations are responsible for compliance monitoring and enforcement. There was no consistency in the way they managed these activities. Compliance activities usually focused on metering use, annual meter reading and spot checks on meter installations. Measuring annual meter readings against licence limits was the main compliance activity. Extended compliance monitoring to identify illegally drilled bores and excessive pumping rates was limited and inconsistent.

3.4.1 Compliance checks

Meter readings and spot checks on meter installations are the main way water corporations assess compliance with licence conditions. They allow authorities to compare user entitlements with volumes used.

The three water corporations read meters for all metered water users, with the frequency of readings varying appropriately, depending on the 'supply' risk. For example, meters in high-risk water supply protection areas were read monthly, while other areas were generally read every 6–12 months.

Meter reading was the water corporations' only scheduled compliance activity. It was unclear how the three water corporations identified user 'demand' risks to compliance with groundwater licence conditions and extractions, or how they prioritised non-scheduled compliance activities.

Neither Goulburn-Murray Water, nor Grampians Wimmera Mallee Water had documented risk-based policies and procedures for compliance activities, although Goulburn-Murray Water had done limited compliance monitoring activities. These activities included measuring compliance with licence conditions, meter tampering and water diversions. Apart from reading meters, Grampians Wimmera Mallee Water does not monitor compliance, and believes non-compliance, such as meter tampering and water theft does not exist. It has not documented evidence to back this up.

Southern Rural Water uses unapproved documented compliance policies to guide its compliance activity. The policies that aim to make its approach to compliance consistent include:

- a compliance procedure manual, which tells staff how to conduct investigations and gather evidence
- a compliance protocol, which tells staff how to deal with specific types of non-compliance, such as unauthorised drilling, unlicensed use and use beyond entitlement.

3.4.2 Enforcement

The three water corporations' penalty enforcement for breaches of groundwater licence conditions, groundwater theft or meter tampering is markedly different.

Southern Rural Water's documented, graduated enforcement policy promotes responses that reflect the level of risk. This approach should produce consistent enforcement decisions and actions. The main features of Southern Rural Water's enforcement include:

- advisory letters when there is minor overuse
- written warnings when there is blatant overuse, previous advice has been disregarded, or there has been a gross breach of the *Water Act 1989*
- formal directions and prosecutions when there has been significant overuse.

At Goulburn-Murray Water there is no documented enforcement policy to guide consistency in decision-making. Without such a policy, its approach is to enforce penalties for breaches of the *Water Act 1989*—particularly related to the licensed use of groundwater, water theft, and interference with bore works and meters. This usually involves prosecutions at the outset. If there is not enough evidence of wrongdoing, or the likelihood of a successful prosecution is assessed as low, the enforcement action may be a warning letter.

Grampians Wimmera Mallee Water does not actively pursue enforcement because it believes there are no instances of non-compliance. As a result, it does not have a documented enforcement policy.

Recommendations

3. The Department of Sustainability and Environment and water corporations should:
 - obtain up-to-date and reliable information on the number of groundwater bores, particularly for domestic and stock users
 - develop strategies to better understand domestic and stock groundwater use and manage its impact on groundwater systems.
 4. Water corporations should develop sound risk-based compliance monitoring to detect and deter non-compliance.
 5. Goulburn-Murray Water and Grampians Wimmera Mallee Water should develop sound enforcement frameworks to manage non-compliance.
-

Appendix A.

Audit Act 1994 section 16— submissions and comments

Introduction

In accordance with section 16(3) of the *Audit Act 1994*, a copy of this report was provided to the Department of Sustainability and Environment, Goulburn-Murray Water, Southern Rural Water and Grampians Wimmera Mallee Water, with a request for submissions or comments.

Responses were received as follows:

- Department of Sustainability and Environment.....24
- Southern Rural Water26
- Goulburn-Murray Water32
- Grampians Wimmera Mallee Water.....34

The submissions and comments provided are not subject to audit nor the evidentiary standards required to reach an audit conclusion. Responsibility for the accuracy, fairness and balance of those comments rests solely with the agency head.

Submissions and comments received

RESPONSE provided by the Secretary, Department of Sustainability and Environment



Department of Sustainability and Environment

Ref: SEC007140



Mr D D R Pearson
Auditor - General
Auditor General Victoria
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Dear Mr Pearson

PERFORMANCE AUDIT - SUSTAINABLE MANAGEMENT OF VICTORIA'S GROUNDWATER RESOURCES

Thank you for your letters of 1 and 16 September 2010 in respect of the proposed Audit Report "Sustainable Management of Victoria's Groundwater Resources".

In general, the recommendations of the review are supported as they reflect or align with activities and programs that are already being undertaken by DSE and the water corporations, and I welcome the finding that DSE's groundwater planning framework is robust.

While I appreciate that in general more data would be beneficial to the management of groundwater, there are inherent limitations in the capacity to measure and monitor groundwater resources in a cost effective way. This does not, however, prevent a responsible and sustainable approach to the management of groundwater resources. DSE has a clearly articulated plan for the strategic management of groundwater and continues to invest in arrangements to improve the capture of groundwater data.

Please find attached DSE's response to the findings and recommendations. If you require further information or clarification of these comments, please contact Ms Jennifer Fraser, Director, Groundwater and Licensing Branch, Office of Water on (03) 9637 8432).

Thank you for raising this matter with me.

Yours sincerely

Greg Wilson
Secretary

Encl.

Privacy Statement
Any personal information about you or a third party in your correspondence will be protected under the provisions of the Information Privacy Act 2000. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Manager Privacy, Department of Sustainability & Environment, PO Box 500, East Melbourne, 3002.



RESPONSE provided by the Secretary, Department of Sustainability and Environment – continued

**RESPONSE FROM
DEPARTMENT OF SUSTAINABILITY AND ENVIRONMENT TO
PROPOSED AUDIT REPORT
SUSTAINABLE GROUNDWATER MANAGEMENT OF VICTORIA'S GROUNDWATER
RESOURCES**

Main findings

Groundwater planning

- DSE agrees that a range of strategic planning tools are required to best manage Victoria's groundwater resources. Strategic planning for water resources has been a strong focus for DSE, particularly over the last 6 years since the release of *Our Water Our Future*.
- The Report correctly identifies that appropriate statutory compliance with those sections of the *Water Act 1989* that deal with management plans, whilst necessary, can be slow. The development of alternative planning mechanisms such as local management rules is one response to that situation, as is the current review of the relevant sections.
- The State Observation Bore Network (SOBN) is a useful source of groundwater information. Time series of data can demonstrate aquifer response to seasonal changes and changes over time. Water levels in individual bores can be used to trigger management responses to aquifer conditions. DSE, working with the rural water corporations, has completed the first phase of a redevelopment of this network.

Groundwater management

- DSE supports the finding that in areas where there is increasing demand for the groundwater resource limiting access to the resource is a key management tool. For this reason Permissible Consumptive Volumes which cap access to the resource have been set for all Water Supply Protection Areas and Groundwater Management Areas.
- DSE acknowledges that not all groundwater users have a licence. However, all groundwater users required by law to be licensed are licensed. Domestic and stock users of groundwater are not required by law to have a licence and this limits the information that can be obtained about use of the resource by those users.
- DSE is strongly supportive of water metering and Victoria is a national leader in this respect. A risk management approach to water metering has been adopted and DSE estimates that less than 2% of the total volume of groundwater under licence remains unmetered.

Recommendations

1. The Department supports the recommendation.
 - Working with the Rural Water Corporations and within the funds available for the first phase, DSE has ensured the SOBN redevelopment project has identified key bores for Water Supply Protection Areas and Groundwater Management Areas, drilled new nested bore sites and removed failed bores. DSE is working to identify further funds for further necessary works.
 - The Draft Western Region Sustainable Water Strategy (released 17 March 2010) and the Draft Gippsland Sustainable Water Strategy (released 6 September 2010) propose strategic improvements to management of Victoria's groundwater resources.
2. The Department supports the recommendation and is working with the 3 rural water corporations on their current planning projects.
3. The Department supports the recommendation and has recently introduced a new electronic system to ensure that all bore completion reports are loaded onto the Water Register. However, the Department and Rural Water Corporations are limited in respect of actions that can be taken in respect of domestic and stock groundwater use where the law requires that access to this water be provided free of charge.

Response provided by the Managing Director, Southern Rural Water



10 September 2010

D D R Pearson
Auditor General
Victorian Auditor-General's Office
Level 24, 35 Collins Street
Melbourne VIC 3000

Via email

Dear Mr Pearson,

AUDIT ACT 1994, s16(3) - Performance Audit Sustainable Management of Victoria's Groundwater Resources

In accordance with Section 16(3) of the Audit Act 1994 please find attached our formal comment on the proposed audit report. The report has focussed on planning and measurement of groundwater to achieve sustainable management.

Managing groundwater is a function that is either delegated to us or attributed directly to us as an Authority under the Water Act 1989. The sustainable management of groundwater is a critical priority for Southern Rural Water. In fact our vision is managing rural water sustainably for the benefit of our communities.

Groundwater is an important element of rural water and our management of this resource is consistently improving. We see many further opportunities for improvement, and are working with DSE, customers and stakeholders to pursue these.

I appreciate the acceptance of many of our comments provided in response to the draft audit report. We do however continue to differ on some of the interpretations made which lead to some of the findings made as part of the audit.

In reviewing and commenting on the proposed audit report SRW has targeted its comments on areas where we have direct control.

If you or your auditor has any queries please feel free to contact Manager Groundwater and Rivers, Craig Parker, on 1300 139 510.

Yours sincerely,

Clinton Rodda
Managing Director

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RESPONSE provided by the Managing Director, Southern Rural Water – continued

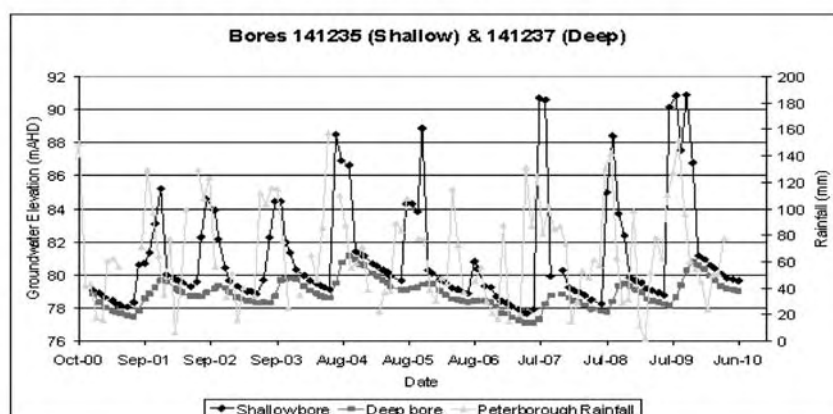


Overall Conclusion (page vii)

The report concludes that "...DSE and water authorities do not know whether the current use of groundwater is sustainable". We agree that there are a number of improvement opportunities available. We disagree however with this conclusion based on the availability and use of the tools for planning, monitoring and management that DSE and Southern Rural Water have at their disposal.

This comment appears to be based on the understanding that groundwater levels are currently declining. Shallow groundwater, where most extraction occurs, responds to rainfall. Groundwater levels increase and decrease in accordance with rainfall and to a lesser extent extraction.

An example which illustrates this trend is from the Nullawarre borefield ...



We do not believe that this aquifer is declining, merely responding (primarily) to variation in rainfall. Adaptive management responds not to annual fluctuations but to cyclical fluctuations. There are many approaches taken by Southern Rural Water that respond adaptively to these fluctuations including:

- Groundwater management plans;
- Local Management rules;
- Groundwater Appraisals;
- Section 40 Assessments for new License applications.

We have elaborated further on this in the following sections. Where required, we have provided comment on the relevant sections of your report.

**RESPONSE provided by the Managing Director, Southern Rural Water –
continued**



Main Findings

Section 2.4 Groundwater Planning

This section recognises the various tools available for managing groundwater areas. The section infers that these are short term tools until Groundwater Management Plan (GMP) is prepared. The report also identifies, in a number of places, that management practices limiting access to, and extraction of groundwater is vital and that effective monitoring is vital. We agree with these principals. In most areas these principals are accomplished through the full range of tools referred to above. We do not believe that Groundwater Management Plans are the most effective way of achieving sustainable management in all circumstances.

Section 2.4.2 Groundwater Planning

The report identifies four mechanisms of groundwater planning. It does not note two further important instruments available which are important for the sustainable management of groundwater – these are Allocations and Restrictions and Section 40 Appraisals and License conditions.

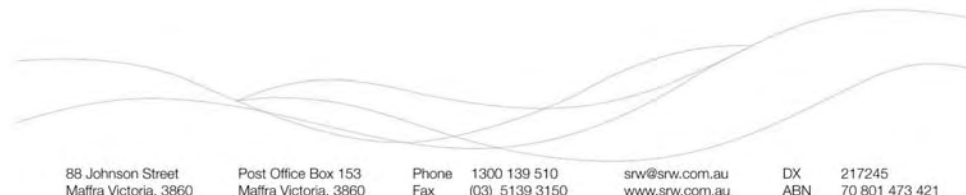
Section 40 Assessments - New license and Transfer Applications

Most areas are capped and no new licenses can be issued. However, where new licenses can be considered we apply a risk based and precautionary approach to our assessment. As an example, we recently refused a number of new applications in southwest Victoria following an assessment that took into account land use change, climate change, existing entitlements and projected groundwater availability in the area. The matter was appealed and VCAT strongly endorsed our use of the precautionary approach taken in reaching our decision.

Our consideration of any application is long term - that is, a decision made today is a decision forever. As a result our considerations take into account the long term impacts an approval would have on the resource and on existing users. Our process includes community and agency input along with technical investigations that are tiered according to the volume sought to be extracted.

Section 33AAA and License Conditions

We also use legislative provisions to manage extraction to protect the resource. Section 33AAA of the Act allows us to declare a water shortage and qualify rights to water where the evidence supports this approach. We have used this provision in Deutgam WSPA to limit extractions of both licence holders and domestic and stock rights in order to protect the resource from saline intrusion. In Sale WSPA we have used this provision to limit trade of water into an area that has been identified as at risk of saline intrusion.



**RESPONSE provided by the Managing Director, Southern Rural Water –
continued**



We also use licence conditions to manage extractions. In some of our Groundwater Management Areas we have used licence conditions to reduce extractions where there is interference with surrounding bores.

Recommendation

We agree with the principle that appropriate planning tools need to be in place for all extensively used aquifers, however we don't believe that a groundwater management plan is the best means to achieve that in all cases.

In SRW's area, GMU's with or without plans are managed according to risk. In all areas metering is completed, regular monitoring occurs through the SOBN, compliance activities are undertaken and usage is reported. Our intervention escalates in an area regardless of whether a plan exists or not. There is no evidence to support the assertion that a formal plan leads to improved outcomes.

An example is at Werribee South in the Deutgam Water Supply Protection Area. Our technical analysis revealed that low water levels have been caused by drought (low rainfall and therefore recharge) along with normal extraction rates created a risk that saline sea water would infiltrate the aquifer. In response we have limited extractions, including total bans in the last two years, an extensive monitoring program and a substantial compliance effort. A formal management plan does not exist for this area; yet our adaptive and evidence based approach using formal processes has lead to responsible management.

We see that the most effective use of a GMP's is in areas where licence entitlements need to be reduced to achieve sustainable water management.

3D Hydrogeological Mapping

Whilst we have an adequate level of understanding about groundwater, there remains much room to improve. We note that no mention of our 3D Hydrogeological mapping project was made in the audit report. We believe that this initiative is of both local and national significance. It provides a more systematic approach to groundwater management in SRW's region through the preparation of 3D hydrogeological maps. We recently invested over \$700,000 into a project which used a data base of around 70,000 data points and provides a visual tool that aids in understanding groundwater systems, their connectivity, density of usage and many other important features. This allows us to manage groundwater more scientifically taking into account the size, extent and potentiometry of groundwater systems.

The information in the maps enables unprecedented opportunity for communication, analysis and strategic planning which will be rolled through our "Southern Groundwater Futures" project. The hydrogeological framework developed for the mapping has been adopted as a national pilot by the NWC and BoM for data capture and groundwater management. The mapping will enable development of a system of local management rules for the southern region based on aquifers.

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**RESPONSE provided by the Managing Director, Southern Rural Water –
continued**



Section 3 – Managing Groundwater Use

3.3.1 Unmetered Groundwater use

The report expresses concern over the number of unmetered licenses due to the threshold (10ML for SRW) before metering is required, and due to unmetered D&S use.

SRW has installed 2413 meters on licensed groundwater users under various metering programs. Our decision to reduce the metering threshold from 20 ML to 10 ML resulted in only 74 additional meters being installed across the entire SRW area. Reducing this threshold further would add a maximum of 1557 licenses or approximately 4348 ML across the entire SRW area. From our experience only about half of these would be actively using water, so the benefit is that only around 2000 ML of additional usage metered. The entitlement would only be a little over 1% of our total GW entitlements of 376,326 ML. A metering program of this nature would cost between \$1M - \$1.5M.

SRW takes a risk based approach to groundwater management, and we do not believe the cost of this metering exercise is justified right across Southern Victoria. However a case for metering in aquifers identified as higher risk may be supportable after an assessment of the specific circumstances.

The report did not note that SRW's policy since February 2002 has been to meter all new licenses. So the unmetered licenses are limited to those less than 10 ML issued before February 2002.

Section 3.2 – Conclusion – part 1

Your conclusion states that *"there is a lack of information on who is extracting groundwater and therefore the impact of extractions is not understood"*.

We believe that the information gap is not material taking into account:

- Legislative constraints on metering Domestic and Stock, and the ability to estimate volumes to a material level;
- SRW metering all extractions above 10ML;
- The information provided on the negligible impact of extending that to all extractions;
- The completion of the dairy wash amnesty and the imminent licensing and metering associated with that project; and
- SRW having required metering for all licenses issued since 2002,

We agree that a risk based approach is appropriate. We direct our resources and efforts to where there is most benefit to groundwater and its users. Whilst our knowledge is not complete, we believe lack of complete certainty is not material in our ability to sustainably



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**RESPONSE provided by the Managing Director, Southern Rural Water –
continued**



manage groundwater with the information, planning and management instrument tools available.

Section 3.4 - Monitoring Compliance with Licence Conditions

Our compliance effort takes a risk based approach. As an example, in Werribee South where there is high risk to the aquifer from saline intrusion, we have:

- field officers dedicated to the area;
- perform monthly meter reads;
- are in the field daily performing inspections and ,
- all breaches detected are prosecuted.

This is an intensive approach and licensees in this area pay an additional intensive management fee to cover this cost. The approach is not warranted in areas where the risk does not support a high level response. We believe that our practices demonstrate a risk based approach to monitoring compliance.

The report did not comment on the extensive compliance effort we put into the drilling industry. Illegal and unprofessional bore construction poses a risk to groundwater. We have a dedicated group of qualified drillers who undertake bore construction compliance. As a result our inspectors know the drillers in their area very well, know their movements and are highly likely to know if an illegal bore is being constructed. Due to the nature and expense of bore drilling equipment, there is a low risk of landowner constructing anything other than very shallow bores without using a licensed driller.

We note that you have recognised SRW's compliance and enforcement policies which have been in place since 2004. The report refers to SRW using "unapproved" document policies. While these policies have not been formally approved, they been developed by staff with extensive expertise in the area of compliance and are supported by all levels of management . I can advise that they are now in the final steps of being approved.

Conclusion 3.2 – part 2

Your conclusion states that water authorities compliance and enforcement activities are not sufficient to deter non compliance. We believe, and note that it is recognised in your text, that Southern Rural Water has effective compliance and enforcement activities.

One area that is not discussed in your assessment is the outcome of prosecutions undertaken for non compliance. Our license holders may have crops of tens of thousands of dollars in value that are at risk if they do not irrigate, particularly during hot weather. When facing a first offence, which may bring a reprimand or fine and costs less than \$1000, the economic driver can be to risk a prosecution but save a crop. The only way to address this is to strengthen the penalties for such offences.

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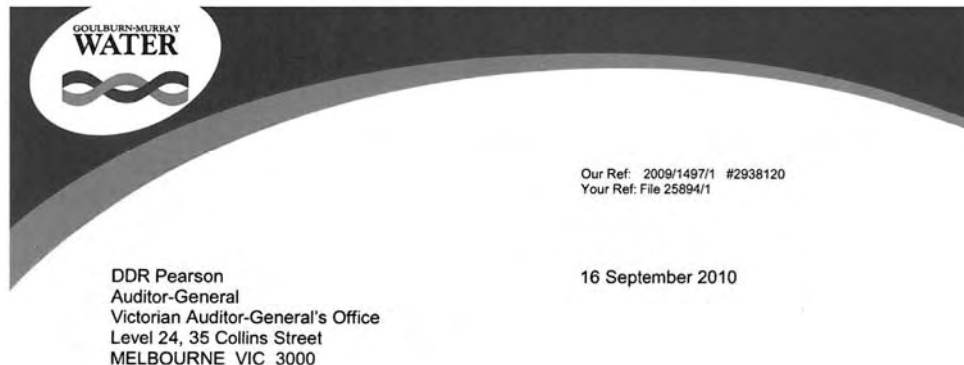
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RESPONSE provided by the Managing Director, Goulburn-Murray Water



Dear Mr Pearson

RE: Performance Audit on Sustainable Management of Victoria's Groundwater Resources, Proposed Audit Report — Request for submissions or comment

I write regarding the above-mentioned request for submission or comment. This letter can be considered as a replacement for our letter dated 13 September 2010. We have offered this replacement letter based on your advice of 15 September 2010 that you have deleted the first paragraph in the section headed Groundwater Management Plans on page 12. The removal of this paragraph addresses our concerns.

In accordance with the requirement under section 16(3) of the *Audit Act 1994* I offer Goulburn-Murray Water's (G-MW) comments on the proposed audit report.

The bulk of G-MW's comments remain consistent with those previously supplied in our letter dated 13 August 2010; many of which have not been addressed. G-MW still stands by these comments, however the following is provided for your consideration.

Comments in response to Recommendation 3 (Water Use Accounting)

The report is critical throughout of the lack of accounting for domestic and stock and small volume licensed use. There is no attempt in the report to discuss the role of G-MW in managing licensing as a delegated function under the *Water Act 1989*, or how G-MW must recover fees to fund management of licensed use.

Discussion of "unlicensed use" made throughout the report needs to clarify Victoria's water entitlement framework in respect of domestic and stock access (section 8 of the *Water Act 1989*). Domestic and stock use is a legislated right which describes how water is to be used and is not defined in volumetric terms. This means that G-MW is not able to raise a fee for domestic and stock access and undertake activities to assess volumetric use. Comment on these aspects in the report would help to explain why domestic and stock users are currently not metered.

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**RESPONSE provided by the Managing Director, Goulburn-Murray Water –
continued**

It is requested that VAGO considers whether the report's discussion and recommendations relating to domestic and stock use are better framed in terms of current legislative constraints, rather than leaving the reader with an impression that not metering domestic and stock use is a failure of G-MW to adequately perform its duty. Unfortunately nothing is offered in the document regarding these constraints other than a cursory comment on Page 17, under the heading 'Extraction Licences'; under which the ability to use water without a licence is briefly discussed.

Regarding the metering of licensed use below 20 ML/yr, and despite comment throughout the report, VAGO does not list the number of groundwater users, or the relative percentage of unmetered licensed use to provide context about relative risks of unmetered use below 20 ML/yr. There is also no specific recommendation that seeks to address this issue.

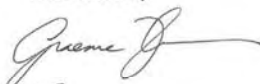
It should be noted that an investigation of relative costs and benefits was conducted during the process of formulating the Victorian Government's Statewide Metering Guidelines. Metering below 20 ML/yr was not considered to be a cost effective means of managing low volume licensed use. It is also noted that this work was conducted at a time prior to the introduction of National Metering Standards.

Errors/Omissions:

- A number of minor typographical errors occur throughout the proposed report.
- Paragraph 4 on Page 17 refers to "dairy farms typically use between two and ten megalitres of water daily to wash down dairy sheds", this should be amended to "annually" rather than "daily".
- Use of the term "supply" to describe water in aquifers in the document is problematic. Note that this term has specific meaning in legislation such as *The Safe Drinking Water Act 2003*. Groundwater licences regulate access to the resource and are not a supply.

Should you have any further queries regarding the comments provided please contact Mr Simon Cowan on (03) 5833 5733.

Yours sincerely



FOR.
David Stewart
MANAGING DIRECTOR

RESPONSE provided by the Managing Director, Grampians Wimmera Mallee Water

Our ref: 09/036/002/O2010/2789
Contact: Jeff Rigby
Office: Horsham

22 September 2010

Mr D D R Pearson
Victorian Auditor-General's Office
Level 24, 35 Collins Street
MELBOURNE VIC 3000



Dear Mr Pearson

GWMWater Response to Performance Audit; 'Sustainable Management of Victoria's Groundwater Resources'

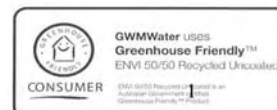
Please consider our management response for the above final audit report. It was misunderstood by GWMWater that the final audit response was required for the published report, not a final factual review. If accepted, comments for the report are provided below.

Page vii - Conclusions

GWMWater submits that the statement "DSE and water corporations do not know whether groundwater use is sustainable" is too generalised. GWMWater and Audit recognised that there is significant confidence in areas such as the West Wimmera, where an appropriate network of monitoring bores contribute significantly to regional groundwater knowledge. GWMWater acknowledges the need for greater knowledge in other areas. It would be more appropriate to add "in some areas" at the end of this sentence to reflect the significant work that is being done in the areas of groundwater management across large parts of the State.

Page ix - Recommendations

GWMWater submits that Recommendation 2 does not represent the purpose of Local Management Rules. Such rules are intended to be an alternative for groundwater management plans which will streamline the planning process. This directly addresses concerns raised about the slow process on p viii of the report i.e. "an unnecessarily slow and expensive process". On this basis, GWMWater agrees with the intent of the recommendation, i.e. that Local Management Rules be applied for all extensively used aquifers. GWMWater is currently developing the



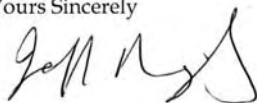
RESPONSE provided by the Managing Director, Grampians Wimmera Mallee Water – continued

West Wimmera Groundwater Management Strategy for this purpose, and has recently undertaken resource appraisals in most of the remainder of its region, with funding provided by DSE, as referred to on page 12 of the report.

Recommendation 3. A risk-based approach should be used and applied to the collection of improved information on domestic and stock water use. The collection of this data can be expensive, and its collection should only proceed where the volume of use is likely to be significant in terms of the management of the resource.

Recommendations 4 and 5. GWMWater agrees that a more proactive approach to ensuring compliance, using a risk-based approach, should be implemented. GWMWater is already proceeding with this. The introduction of new metering technology that provides real-time usage information will assist in this regard. GWMWater is currently planning the installation of this type of technology to all groundwater users in the Murrayville WSPA. Improved documentation of procedures will also be undertaken.

Yours Sincerely



Jeff Rigby
Managing Director

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