Southern Rural Water
Managing Water. Serving Communities.

South West Limestone Local Management Plan

Version 3

February 2023

Plan Approval

The South West Limestone Local Management Plan (SWL LMP) has been developed for the south west Victorian upper mid-Tertiary limestone aquifer. The LMP was developed in 2016 after an extensive period of consultation with groundwater users and key stakeholders. The LMP provides clear information to Southern Rural Water (SRW) customers and the general community on the management and use of groundwater in this aquifer.

This LMP aims to balance the productive use of groundwater with the protection of high value environmental assets and the rights of domestic and stock users.

This LMP will require periodic review as changes to Victoria's groundwater management framework take effect and as information about the aquifer continues to improve. SRW will continue to work with our customers, local communities and other stakeholders on reviews and updates.

BRYCE MORDEN
Manager Groundwater & Rivers
23 February 2023

Acknowledgements

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SRW acknowledges the work of the following people who were members of the SWL LMP Reference Group.

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Version Control

Version	Change summary	Date
2	Updated from the May 2016 version. Minor amendments to format, content, maps, and inclusion of references to PCV areas.	November 2021
3	Updated to reflect the abolition of the Glenelg WSPA and PCV	February 2023

Contents

1. Glossary

Common terms	
Allocation	The volume of water actually available for use or trade under an entitlement to water in a given year after any resource management decisions. (expressed as ML/year)
Aquifer	A layer of fractured rock, gravel, sand or limestone below the ground that is porous enough to hold groundwater and allow it to flow
Aquitard	A layer of rock or clay that may hold some groundwater but is not porous enough to allow it to flow significantly
Baseflows	The component of streamflow supplied by groundwater discharge
Carry-Over	The ability for licence holders to carry a percentage of their unused water allocation into the next water year.
CMA	Catchment Management Authority
Dairy wash	Water used to wash down farm dairies
Domestic and stock (D&S)	Water used in households and animals / stock
DELWP	Department of Environment, Land, Water and Planning
DEPI	Department of Environment and Primary Industries
Entitlement	A licence to take and use water issued under S51 of the Water Act 1989
Groundwater	Groundwater is water that is found under the ground. It is stored in and can flow through layers known as aquifers
Groundwater Dependent Ecosystem (GDE)	Ecosystems such as wetlands, streams, estuaries or vegetation that rely totally or in part on groundwater to provide water
Groundwater Management Area (GMA)	Discrete area where groundwater resources are suitable for commercial purposes
Groundwater management unit (GMU)	A groundwater management area or water supply protection area
Licence Volume	The maximum volume of water authorised to be used or traded in a given year under an entitlement issued on a permanent basis.
Permissible Consumptive Volume (PCV)	The volume of water permitted to be allocated. Previously known as Permissible Annual Volume
Recharge (groundwater)	The process where water moves downward from surface water to groundwater due to rainfall infiltration, seepage or leakage
Southern Rural Water (SRW)	Rural Water Corporation of southern Victoria
Water Supply Protection Area (WSPA)	An area declared under the Water act to protect groundwater and/or surface water resources in the area
Water Year	1st July to 30 June inclusive
ML	Megalitres = 1 million litres
ML/yr	Megalitres per year

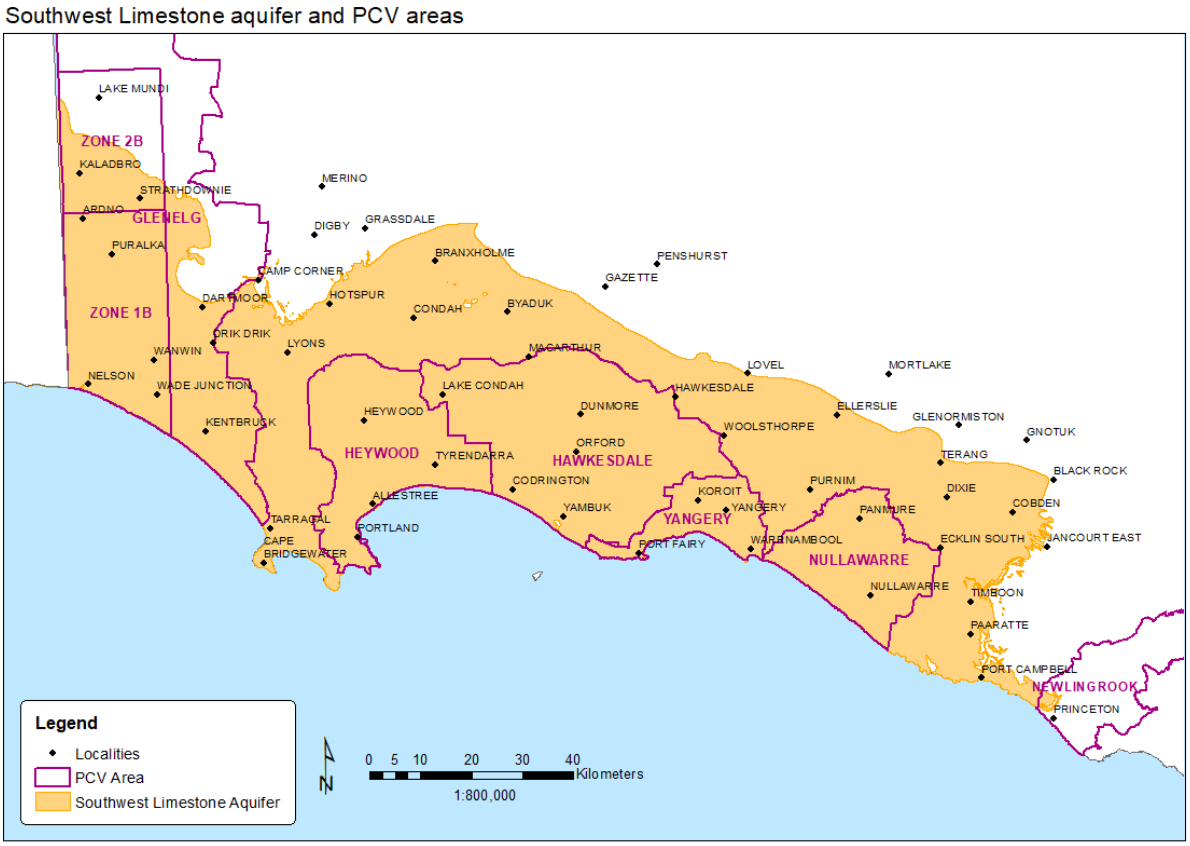
2. Introduction

Groundwater resources in the SWL GMA are important for domestic and stock use, irrigation, commercial and industrial purposes, urban supply and the environment. These aquifers currently provide approximately 50% of the total water used for farming, industry and potable water supplies for cities and towns in the region. They will become an increasingly important resource providing a highly reliable supply of quality water for a growing population and the increased production of food and fibre.

The SWL GMA replaces a number of former management areas and also the previously unincorporated groundwater areas. The management areas that have been replaced are:

- Nullawarre Water Supply Protection Area
- Yangery Water Supply Protection Area
- Hawkesdale Groundwater Management Area
- Heywood Groundwater Management Area

The Glenelg Water Supply Protection Area has also been abolished (September 2022).



Map 1: Extent of South West Limestone aquifer and PCV areas

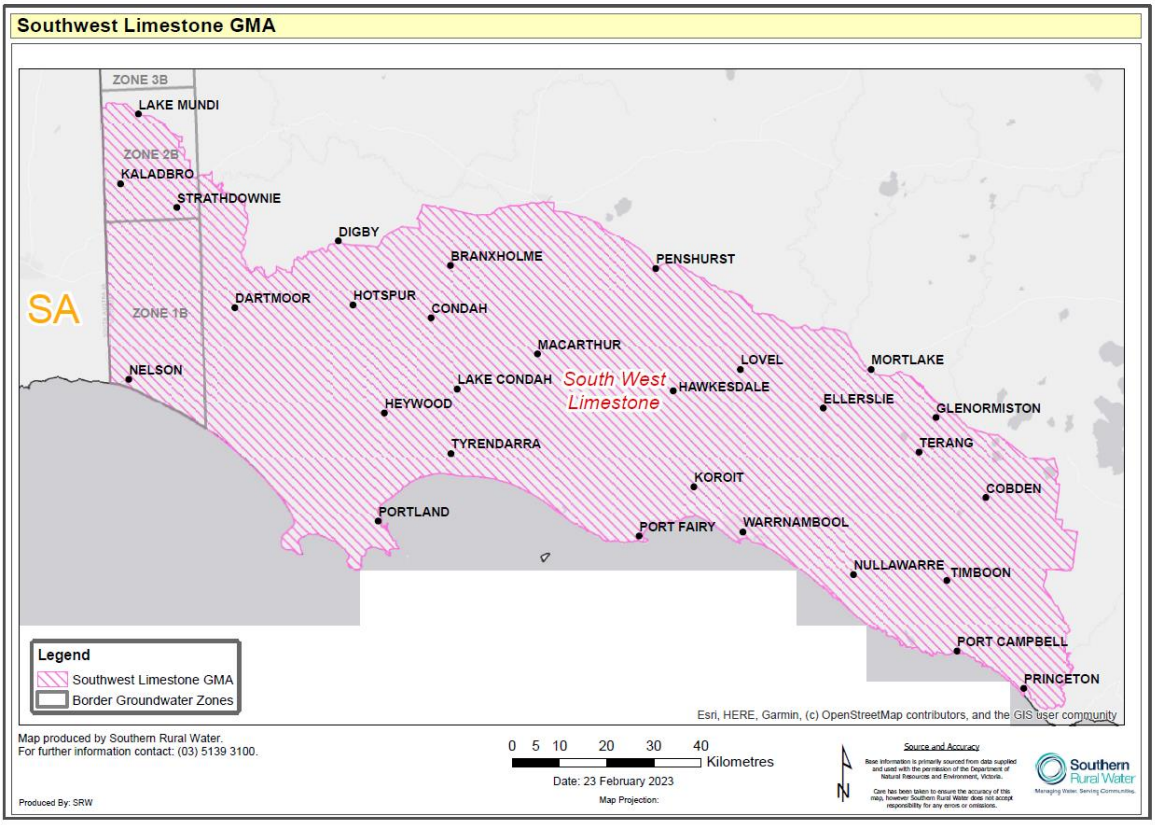
SRW is responsible for administering and enforcing the SWL LMP.

This plan replaces the statutory management plans for the former Nullawarre and Yangery Water Supply Protection Areas.

In the event of any conflict that arises from the implementation of this plan over areas bounded by the Border Zone Agreement (BZA) between South Australia and Victoria, the BZA shall be the determining document.

3. Management objectives

The objective of the SWL LMP is to make sure that the groundwater resources in the SWL GMA are managed in an equitable and sustainable manner. The plan is lodged with the Central Plan Office, reference number LEGL./15-199.



Map 2: South West Limestone Groundwater Management Area

More specifically, the SWL LMP aims to:

- provide security of access to existing groundwater users (including licence holders, domestic and stock users, and the environment), considering the impacts of climate change and plantation forestry.
- encourage trading and provide more flexibility for current and prospective licence holders.
- protect the resource from seawater intrusion.
- reduce allocation “hot spots” and localised risks to the environment and groundwater resource; and
- increase the equity of groundwater access in a system where allocation is capped.

As the limestone aquifer is the most heavily used aquifer in the region, it is necessary to have specific management rules for this aquifer.

4. Water system

4.1. Areal aquifer extent

The SWL GMA applies to the management of groundwater in the south west Victorian upper mid-Tertiary limestone aquifer. The limestone aquifer in this region falls entirely within the Otway-Torquay Basin. Groundwater flow is generally from the north to the south towards the coast.

The SWL GMA includes the:

- Gambier Limestone
- Port Campbell Limestone
- Portland Limestone

The SWL GMA excludes:

- The Duddo Limestone (upper mid-Tertiary) aquifer in the northern part of the Glenelg catchment. This aquifer is disconnected from the subject limestone aquifer and groundwater within it flows north and out of SRW's jurisdiction.
- Overlying Quaternary and upper Tertiary aquifers [QA. UTB, UTAF, UTAM] (e.g. the Newer Volcanics Basalt), which exist in parts of the management area
- The underlying aquifers and aquitards (e.g. lower mid-Tertiary Clifton [LMTA] and lower Tertiary Dilwyn [LTA])
- Isolated occurrences of upper mid-Tertiary limestone that are not hydraulically connected to the main extent.

Recharge to the aquifer is via direct rainfall infiltration (where the aquifer is at the surface) or via indirect rainfall infiltration where it is overlain by shallow aquifers.

While the subject limestone aquifer is regionally connected to other aquifers (with no regionally significant aquitards), the local connections are patchy (due to the presence of low permeability soils such as clays).

Map 4 shows the region's major waterways, the region's High Value Wetlands and Groundwater Dependant Ecosystems (GDE's) (as per DEPI's SAFE project dataset) and areas where the limestone aquifer is less than 5 metres deep. In these areas, the limestone aquifer may contribute to waterway baseflows. The most significant of these are the Glenelg River estuary and Long Swamp.

In general, the lower reaches of all the identified rivers are likely to receive baseflow contributions, as well as the upper reaches of the Crawford and Curdies Rivers. In particular, the lower reaches of the Moyne and Eumeralla Rivers are likely to receive significant contributions from the aquifer.

There may be additional GDE's associated with the limestone aquifer of varying value but little information is known.

More information about the water system can be found in the supporting technical information (SRW, 2014).

The currently known extent of the SWL GMA is shown in Map 1. Potential groundwater users will be assessed by SRW as being located within the SWL GMA if the drilling data indicates that the bore is located in the SWL aquifer. If necessary SRW may need to amend the boundary of the SWL GMA as new information becomes available.

4.2. Aquifer depth boundary

The vertical depth boundary of the SWL GMA shall be:

- from the ground surface (where the upper mid-Tertiary limestone is the upper aquifer) or
- from the top of the upper mid-Tertiary limestone (where upper Tertiary or Quaternary aquifers exist)

down to:

- 50 metres below the top of the underlying upper mid-Tertiary aquitard (UMTD). In limited areas where the aquitard is thin or absent, the depth limit shall be the base of the aquitard or base of the limestone (see Diagram 1). This is adapted from the approach recommended by DEPI and the SAFE project.

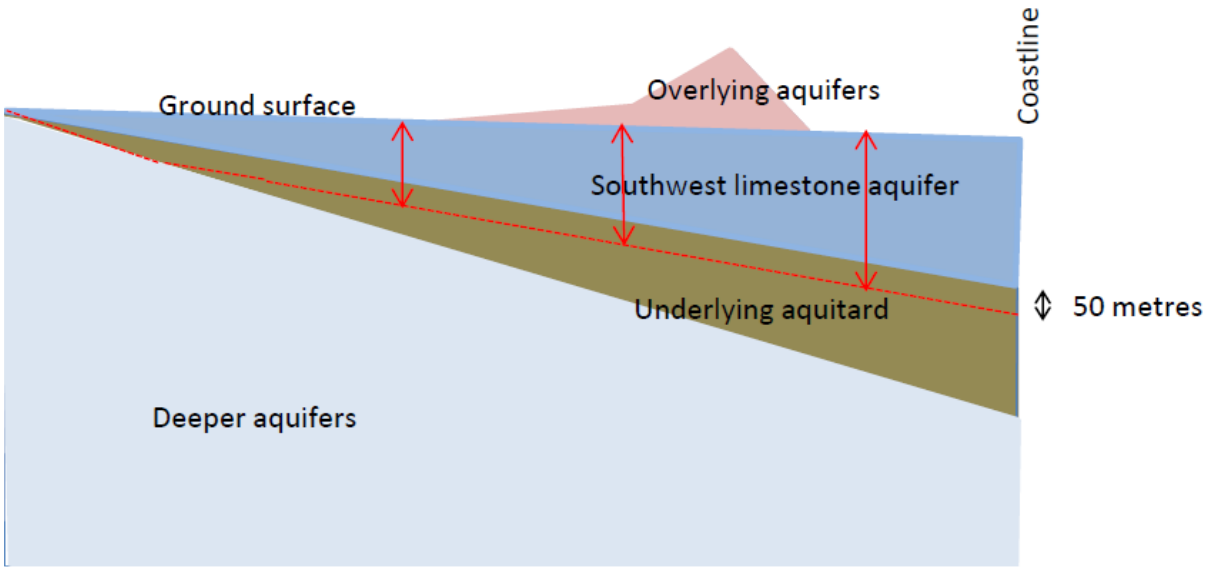
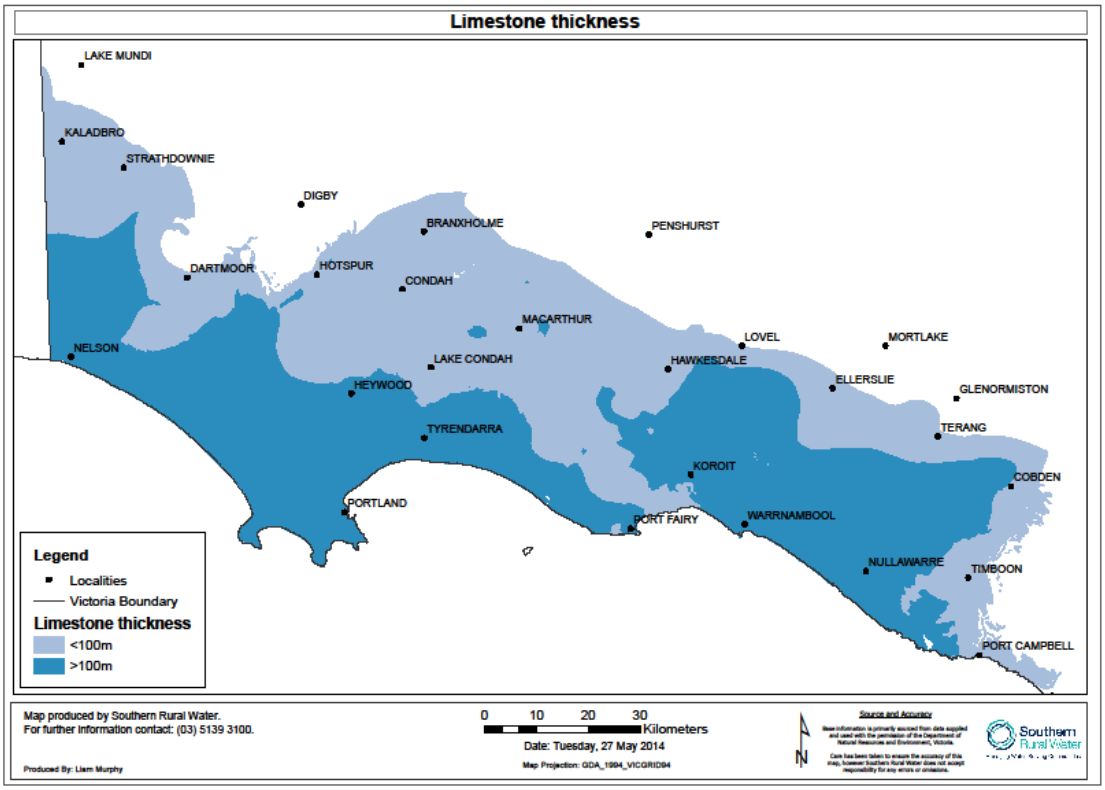


Diagram1: Aquifer Depth Boundary *showing boundary at base of limestone or base of aquitard (where aquitard is thin or absent) and at 50m into aquitard where aquitard is thick.*

4.3. Aquifer thickness

As shown on Map 3, the SWL aquifer is generally thinner in the north and thicker in the south (near the coast). However, there is a relatively thin area in the south between Port Fairy and Koroit. The size and shape of a drawdown cone is directly affected by aquifer thickness and so aquifer thickness shall be used by SRW to manage drawdown (see publication *South West Victoria Groundwater Atlas* for more information on groundwater drawdown. See *Trading Rules* for management rules related to aquifer thickness).



Map 3: South West Limestone aquifer thickness

4.4. Groundwater Dependent Ecosystems (GDEs)

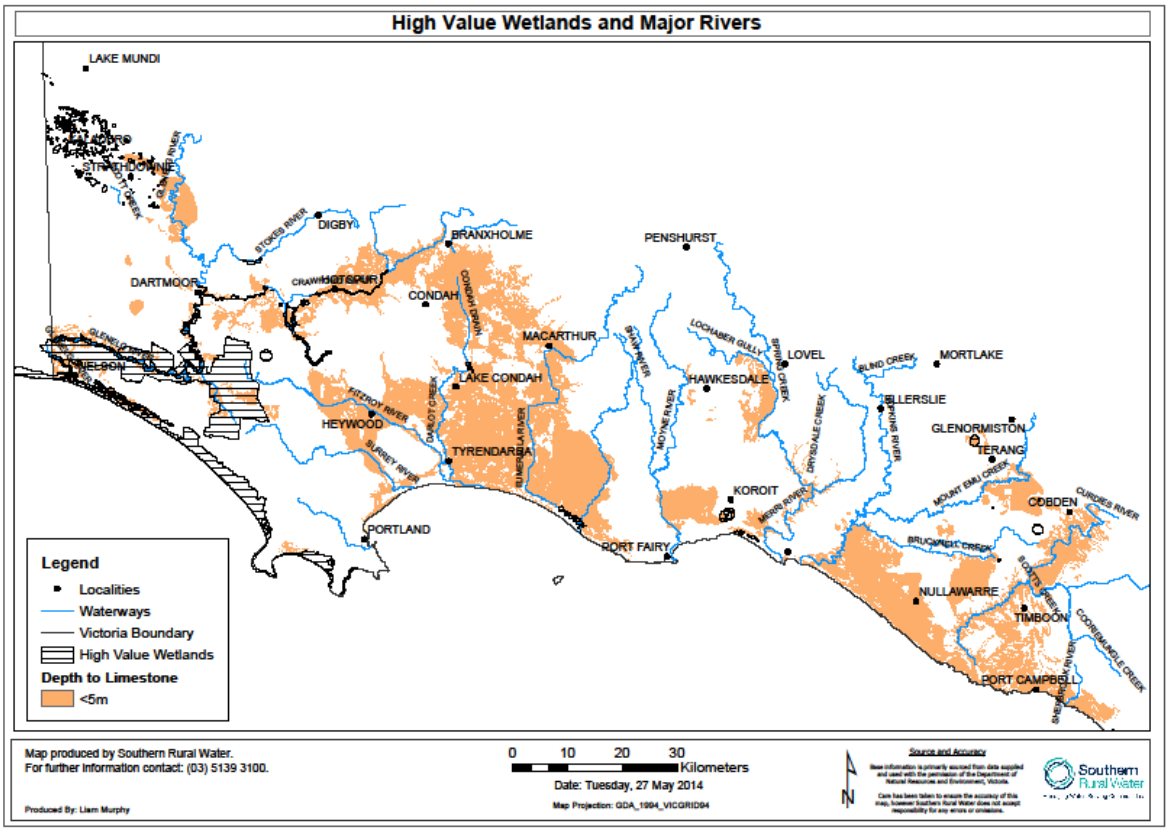
Groundwater provides important baseflows to waterways and other ecosystems (such as wetlands) within the management area. These are known as Groundwater Dependent Ecosystems (GDEs).

There are numerous waterways and wetlands that overlie the SWL GMA. When groundwater levels are above the base of the waterway or wetland, groundwater can contribute water to them. However, there are seasonal periods where the waterways or wetlands may discharge to the SWL GMA if groundwater levels decline. That is, waterways may also lose water to the groundwater or become “losing” streams. This can happen naturally or as a result of groundwater extraction.

Major waterways within the boundaries of the SWL GMA include the Mt Emu Creek, Hopkins River, Curdies River, Merri River, Brucknell/Cudgee Creek, Eumerella River, Fitzroy River, Darlot Creek, Glenelg River, Shaw River, Crawford River and the Surry River. The most significant wetlands in the region are the Glenelg River estuary and Long Swamp.

There may be additional GDE’s associated with the limestone aquifer of varying value but little information is known. Consultation with Catchment Management Authorities (CMAs) and other stakeholders shall be ongoing, in accordance with the *Water Act 1989.*

The significant waterways and high-value wetlands shown on the Map 4 are taken from the *Glenelg Hopkins CMA Regional Catchment Strategy* and the *2014 Waterway Management Strategy* along with work done by DEPI to produce their High Value Wetlands dataset. The waterways and high-value wetlands shown on Map 4 will be protected by this LMP, as per the trading rules in section 8.3.



Map 4. High value wetlands and major rivers

4.5. Permissible Consumptive Volume (PCV)

There is no Permissible Consumptive Volume (PCV) that applies to the whole of the SWL, however, several pre-existing PCVs are still active and relate to the abolished GMAs and WSPAs shown in Map 1. Please refer to section 8.3 on how PCV's relate to trading.

PCV Area	Volume (ML)	Boundary
Hawkesdale	16,161	Zone 1 – 0-200m Zone 2 – All depths
Heywood	8,500	All formations from surface to 70m below the surface
Nullawarre	22,741	All formations from surface to 250m below the surface
Newlingrook	1,977	All formations below the surface
Yangery	14,352	All formations from surface to 100m below the surface

Table 4.1 PCV areas and depth boundary description

5. Licensed water entitlements

The extraction of groundwater for purposes other than domestic and stock (D&S) use is authorised under Section 51 of the *Water Act* 1989.

Over 90% of groundwater licensed in the management area is for irrigation purposes. Groundwater is also used for urban, commercial and industrial water uses. Metered groundwater use is less than the total groundwater entitlements and varies each year according to the seasonal conditions. Licence holders must not take more than their annual licence volumes.

6. Domestic and Stock use - rights and responsibilities

People have rights to take groundwater from a bore for their own domestic and stock use without a groundwater licence as per section 8 of the *Water Act 1989*. Landholders can apply to SRW for a works licence to construct and install a bore for D&S use. D&S bores are registered in a state groundwater database when a bore licence is issued and updated when a bore completion report is returned. SRW will consider the impacts on known D&S bores when making licensing decisions. For this reason, D&S users are encouraged to ensure that their bore(s) are registered.

D&S bores must be constructed to the minimum standards by a licensed and appropriately qualified driller. Bores should also be constructed with consideration of any seasonal fluctuations of groundwater levels in the local area to ensure security of supply, including periods of drought that may extend groundwater levels downward. Bores should be properly maintained and pumping infrastructure installed to maximise the efficiency of the bore and maintain the security of supply.

During dry years and extended dry periods some domestic and stock bore owners may experience declining groundwater levels resulting in reduced or no water supply from their bore. In some cases, this is occurring when a bore is not maintained properly or is not constructed sufficiently deep into the aquifer. To protect future domestic bore users against both long and short term climate variations, SRW will be recommending domestic and stock bores to be constructed to a minimum depth into the targeted aquifer. This minimum depth guideline will provide some protection against declining groundwater levels during dry periods; however, landowners may choose to exceed this minimum.

SRW minimum depth guideline:-
The minimum depth of the bore to be to the level of water interception in the targeted aquifer plus 3 x 15 year average annual variation of groundwater water level of the closest State Observation Bore Network (SOBN) bore in the targeted aquifer

Access to groundwater from D&S bores will be managed by limiting the depth to which groundwater levels may fall as a result of interference from licensed groundwater use. SRW will encourage landowners to reach agreement with each other where there is concern about interference from neighbouring bores before considering application of restrictions.

7. Plantations

Plantations within the SWL GMA are a significant land and water use. There is currently no mechanism in Victoria to directly address the water resource impacts from plantation forestry. Plantation water use is currently not recognised or accounted for under the State's water entitlement system. However, plantation groundwater use was taken into consideration when determining the PCV.

"In November 2011, the Victorian Government announced policies for managing the adverse impacts of rural land use changes on water resources in the Western Region and Gippsland Region sustainable water strategies. These policies followed a general increase in the intensification of rural land uses as well as the rapid expansion of the forest plantations on private land…"

"The only areas in the State that are currently being considered for declaration as forest plantation areas were identified in the Western Region Sustainable Water Strategy (and are all located within the SWL GMA boundary). They are all or part of the:

- Crawford River catchment
- Stokes River catchment
- Glenelg Water Supply Protection Area, particularly around Lake Mundi." (DEPI, 2013)

This LMP does not have any specific rules around plantation management and the impacts on groundwater, but may be amended in the future in accordance with any changes to state policy and legislation.

8. Rules

8.1. Annual allocations, rosters or restrictions

The LMP does not place specific restriction rules on taking groundwater. If necessary, SRW may request that the Minister for Water temporarily qualify rights to groundwater under section 33AAA of the *Water Act 1989* if a water shortage occurs - for example, if regional drawdown is significantly affecting access to groundwater by users or sea water intrusion is detected.

Groundwater licences also allow SRW to restrict individual extraction if required - for example, to manage bore interference impacts on neighbouring users or the environment. Bore interference complaints are investigated by SRW upon request.

If restrictions are necessary, SRW will notify licence holders in advance.

It is not considered appropriate to impose a roster system on groundwater users based on that used to manage surface water extraction across the management area, due to:

- The greater storage in the groundwater system;
- The significant part that rainfall plays in surface water availability; and
- The low use of groundwater compared to licensed volume.

8.2. New licences and licence renewal

No significant additional allocation is proposed under this LMP. Trade shall be the primary mechanism to increase access to groundwater.

Groundwater licences may be renewed by SRW, upon application, in accordance with the Water Act. If groundwater licences are surrendered, SRW may make that water available for re-allocation.

In some cases requiring a short term or small volume licence, it may be appropriate to issue a licence rather than require trade. To support regional development and community benefits, new licences for may be issued up to the PCV (and in accordance with the *Water Act 1989* and *Policies on Managing Take and Use Licences*) in the following circumstances:

- Up to 5ML/year for community use (e.g. irrigation of recreation areas, Country Fire Authority)

- Up to 15ML/year for up to 5 years for new businesses and projects. These enterprises will need to acquire a groundwater entitlement through permanent or temporary trading before the end of the 5 year period.

New groundwater extraction bores shall not be permitted within 200 metres of an identified waterway or potential GDE (as determined by SRW).

8.3. Trading Rules

In considering an application to transfer a licence temporarily or permanently, SRW must thoroughly assess the application. An application to transfer a licence is not automatically approved. In deciding whether or not to approve an application, SRW must consider section 40 of the Act, including:

- Availability of water now and in the future;
- Adverse effects that an approval may have on existing users, on waterways and aquifers and on the environment; and
- Existing and projected water quality in the management area.

When an application is made, SRW will assess whether groundwater extractions at the new site will cause adverse and material interference to any nearby groundwater user. If interference is likely, SRW may set transfer conditions to minimise interference, or it may refuse the application. Approval of an application to transfer may be subject to technical assessments to determine bore interference and impact on surface water bodies or GDEs.

In the SWL GMA, the following principles apply to trading:

- Groundwater trading will allow access to water without increasing allocation; and
- Allocation intensity in some areas shall be reduced over time. and
- The Border Zone Agreement shall be complied with and, in the case of a conflict, will be the determining document.
- The PCV for Nullawarre, Yangery, Hawkesdale, and Heywood (Map 1) will be enforced. Refer to section 4.5 for more information.

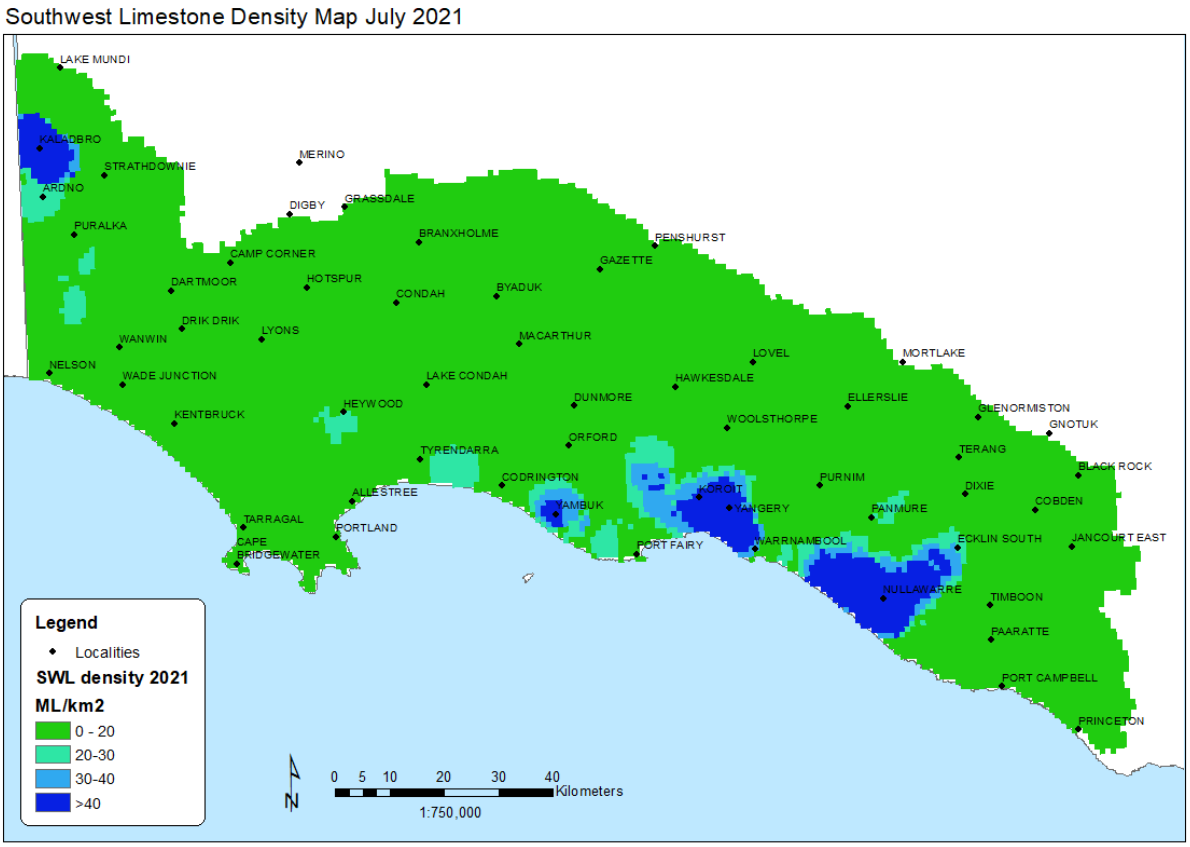
The following rules shall apply:

- Trading shall be allowed across the entire aquifer, with the following limits:
    - Where the aquifer is more than 100m thick, the average allocation intensity shall not exceed 40 ML/year/km^2 within a 5km radius
    - Where the aquifer is less than 100m thick, the average allocation intensity shall not exceed 30 ML/year/km^2 within a 5km radius
    - Within 5 km around specified baseflow-dependent rivers and high-value GDEs the allocation intensity shall not exceed 20 ML/year/km^2 (see Map 4).
- Where the allocation intensity is already greater than or equal to the specified limit, trading shall be allowed into the area from an adjacent area of equal or greater allocation intensity.
- Trading shall not be allowed between areas where the average allocation intensity is greater than 40ML/year/km^2 within a 5km radius, except at SRW's discretion, taking all relevant maters into account.

SRW will determine which aquifer thickness management zone applicants are in (see Map 3). A buffer area will be applied to the mapped boundary between the thin and thick aquifer areas. Management rules for the thinner part of the aquifer would apply to any applicant within 5 km of the boundary. Where thickness zone or buffer boundaries cross properties, SRW shall apply a common-sense solution.

The allocation intensity shall be determined by SRW and shall include temporarily traded groundwater (see Map 5).

Allocation intensity, aquifer thickness and specified GDE maps will be updated as new data becomes available and will be available on SRW's website.



Map 5: SWL LMP allocation density (as at July 2021).

8.4. Simplified trading assessment

In order to simplify and encourage trade of groundwater, the following rules shall apply in addition to allocation intensity rules:

- For new users and permanent trades:
  - if SRW assesses the application to be "low risk" (low volume, no nearby GDEs or neighbours), new users may be approved for 1 year without submitting a professional hydrogeological report
- For existing users – temporary trades for additional extraction may be approved for up to 1 year without submitting a professional hydrogeological report for volumes of:
  - up to 50% of their permanent entitlement; or
  - up to 50ML; or
  - up to 50% of their average annual usage (including all temporarily traded water) over at least the last three years

whichever is greater.

Standard protections will apply to all licences issued under these rules. This includes conditions relating to the protection of existing users (including D&S) and the environment and may also include groundwater level monitoring. At the end of the 1 year trial period, users may apply to have their licence extended and/or to have the trade made permanent. SRW will assess these requests in accordance with S40 of the *Water* Act.

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8.5. Metering

Southern Rural Water meters new and existing groundwater users with an annual volume greater than 20ML . This allows SRW to keep track of how much water is being used and enables licence holders to keep within their allocated volume.

The meters are supplied by SRW, and the licence holder is responsible for paying the full cost of the meter and initial installation. The meter remains the property of SRW and SRW is responsible for maintenance and replacement. Meters are read at least twice per year.

8.6. Carryover

As it is a large, regional groundwater system with significant storage, carryover of groundwater entitlement has been enabled within the SWL GMA.

Licence holders with carryover have the potential to use up to their allocation plus carryover in any water season provided they are able to extract the water under their licence conditions.

Licence conditions limit daily extraction rates and volumes to manage interference and should be sufficient to effectively manage the impacts of drawdown to existing groundwater users and the environment with the introduction of carryover.

Carryover will be managed in accordance with the following rules and in accordance with the declaration from the Minister for Water:

- Unused groundwater may be carried over to the following year, up to a maximum of 30% of annual allocation
- Carryover volume shall be considered to be “used first” in SRW’s usage accounting
- There is no accumulation of carryover year on year
- Carryover is non-tradable
- Carried over (unused) groundwater allocation can be accessed from 1 July 2016.

An example of how this might work is given below starting in first year of operation

Licensee has total entitlement of **100ML**
Year 1 - **100ML available for use** 40ML are used (60ML unused), **30ML** (maximum carryover 30% of total entitlement) is carried over to the next year
Year 2 –**130ML available for use** (110ML used), **20ML** is available to be carried over to the next year
Year 3 – **120ML available for use** (120ML used). 0ML is available to be carried over as all entitlement and carry-over used in this year
Year 4 – **100ML available for use** (0.0 ML used) **30ML** (maximum carryover 30% of total entitlement) is carried over to year 5
Year 5 – 130ML available for use (0.0 ML used) 30ML (maximum carryover 30% of total entitlement) is carried over to the next year (**30ML carried over**). No accumulation of carry-over from previous year.

Season	Year 1	Year 2	Year 3	Year 4	Year 5
Entitlement	100	100	100	100	100
Carryover available for use	0	30	20	0	30
Total entitlement	100	130	120	100	130
Usage	40	110	120	0	0
Unused	60	20	0	100	130

Table 8.1 Carryover example

9. Monitoring

The condition of the groundwater resource shall be monitored by SRW and DELWP using the State Observation Bore Network (SOBN). This shall include groundwater level monitoring across the management area, as well as salinity monitoring in selected coastal bores. All monitoring data shall be regularly reviewed by SRW to ensure that the groundwater resource and environment are in acceptable condition.

The frequency and location of groundwater level and salinity monitoring shall be determined by SRW and regularly reviewed. Groundwater level monitoring results are available at www.srw.com.au. Groundwater salinity monitoring results are available at www.data.water.vic.gov.au/monitoring.htm.

SRW shall also consider any additional monitoring information that is available, such as ecological condition and surface water flow information.

10. Communications

SRW shall provide an update to customers annually through our Local Water Reports.

SRW shall make available on its website, and upon request mail out, a copy of the LMP. Any newsletters or reports relating to the SWL aquifer and groundwater level monitoring results shall be similarly available.

11. Review

The LMP may need to be adapted in response to policy changes in groundwater resource management, or in response to an improved understanding of the aquifer system. This LMP may result in changes to groundwater use and unexpected impacts on the resource, requiring amendments to the rules.

SRW will undertake a comprehensive review of the LMP after five years from its approval, or sooner if warranted by significant changes in groundwater use, levels, GDE condition or groundwater quality.

Any significant changes to the LMP must be based on sound technical understanding of the issues, contemporary legislation and policy settings and will be subject to consultation with customers and other stakeholders.

12. More information

More information on groundwater in the region can be found at:

South West Victoria Groundwater Atlas
http://www.srw.com.au

SRW has published a groundwater Atlas for South West Victoria which can be viewed or downloaded free-of-charge.

Groundwater Resource Reports:
http://www.depi.vic.gov.au/water/groundwater/groundwater-resource-reports
This provides a one page summary of the aquifers and groundwater quality of any point clicked on a Google based map.

Visualising Victoria's Groundwater:
http://www.vvg.org.au/
This site is hosted by Federation University, and includes data such as water table levels, groundwater bores, EPA sites, and much more data.

Water Measurement Information System (WMIS)
http://data.water.vic.gov.au/monitoring.htm
This is a DEPI site, where you can download all groundwater data relating to bores in any part of Victoria.

GDE Atlas
http://www.bom.gov.au/water/groundwater/gde/map.shtml
This site is hosted by BOM, and shows all of the groundwater dependent ecosystems across Australia.

SRW has also compiled a technical review of information supporting this plan; - 'Upper mid-Tertiary Limestone Aquifer – Technical information to support Local Management Plan' This information is available by contacting the groundwater team at SRW.

13. References

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