

10. SDLs





10.1 Basin Plan requirements

Clause 5.02 of the Basin Plan states:

Objective and outcomes in relation to long-term average sustainable diversion limits (SDLs)

1. *The objective in relation to long-term average sustainable diversion limits is to establish environmentally sustainable limits on the quantities of surface water and groundwater that can be taken for consumptive use from Basin water resources, having regard to social and economic impacts, and in doing so:*
 - a. *inform environmental water recovery measures, including water purchasing and infrastructure that improves water use efficiency; and*
 - b. *provide greater certainty for all water users, including in times of drought and low water availability; and*
 - c. *provide time for water access entitlement holders and communities to transition and adjust to long-term average sustainable diversion limits.*
2. *The outcomes in relation to the establishment of long term average sustainable diversion limits are:*
 - a. *(a) the restoration and protection of water-dependent ecosystems and ecosystem functions in the Murray-Darling Basin; and*
 - b. *(b) well-informed water recovery measures, including water purchasing and infrastructure, enable a transition to long-term average sustainable diversion limits; and*
 - c. *(c) greater certainty of access to Basin water resources; and*
 - d. *(d) water access entitlement holders and communities of the Murray-Darling Basin are better adapted to reduced quantities of available water.*

10.2 Surface water

Schedule 2 of the Basin Plan shows the surface water SDL for the Wimmera-Mallee is the baseline diversion limit (BDL) minus 23 GL¹³. The MDBA, in Schedule 3 of the Basin Plan, estimates the BDL to be 129 GL per year and so the SDL is estimated to be 106 GL per year. The 23 GL corresponds to the Basin Plan estimate of long-term average annual take by the former Wimmera Irrigation District under its entitlement of 28 GL (which included a 9 GL loss entitlement). This 28 GL entitlement was transferred to the control of CEWH under an agreement in 2013 and is now used for environmental watering.

Victoria's surface water SDL and BDL estimates in the Wimmera-Mallee WRP area are summarised for each form of take in [Table 6](#). The surface water entitlement volumes and the characteristics of each class of right and any conditions on the exercise of the rights are provided in [Table 3](#).

¹³ Note that the MDBA reports this entitlement as equivalent to 22.6 GL long-term average on its website. This estimate will be updated when Victoria's baseline diversion limit and SDL models have been finalised.

Table 6 – Long-term average surface water diversion limits in the Wimmera-Mallee WRP area according to the forms of take specified in the Basin Plan

Form of take – surface water	BDL (GL)	SDL (GL)
(a) Take from regulated rivers (excluding basic rights)	67	44
(b) Take from regulated rivers under basic rights	No estimate	No estimate
(c) Take from watercourses that are not regulated rivers (excluding take under basic rights)	6	6
(d) Take from watercourses that are not regulated rivers under basic rights	No estimate	No estimate
(e) Take by runoff dams (excluding take under basic rights) -	13	13
(f) Take by runoff dams under basic rights	30	30
Sub-total Items (e) and (f)	43	43
(g) Take by commercial plantations	6	6
Total (GL)	122	99

Notes:

1. Volumes above are preliminary estimates rounded to the nearest GL and may be revised following public consultation and discussions with the MDBA
2. The BDL minus the SDL volume above is 23 GL as required in Schedule 2 of the Basin Plan
3. See section 10.2.2 below for discussion of differences between these estimates and Basin Plan estimates

10.2.1 Accounting for inter-basin transfers

There are three inter-basin transfers associated with the take in the Wimmera-Mallee WRP area. Firstly, under its Wimmera-Mallee system bulk entitlement, GWMWater takes water from several sources in the Glenelg Basin for transfer into the Wimmera basin. These diversions are the upper Wannan River to Stawell and Lake Bellfield, the upper Glenelg River to Moora Reservoir, and the Glenelg River at Rocklands Reservoir.

The Victorian Government's approach to Murray-Darling Basin cap compliance has been to include the Glenelg basin transfers in the Wimmera basin inflows because the:

- Glenelg basin is a major source of water for the Wimmera-Mallee system and contributes to the resources that determine available water and allocations for entitlement holders
- The Wimmera-Mallee is operated as an integrated system and it is not practical to track Glenelg water once it enters the system.

Any consumptive use and environmental releases in the Glenelg basin from the Wimmera-Mallee system are not accounted for in the Wimmera-Mallee WRP area.

Secondly, GWMWater holds two bulk entitlements authorising it to take water from sources other than the Wimmera basin to supply its customers in the Wimmera-Mallee WRP area:

- *Bulk entitlement (River Murray – Grampians Wimmera Mallee Water) Conversion Order 1999* authorises GWMWater to up to 3,492 ML per year from the Murray River to supply its customers in the Northern Mallee pipeline area

- *Bulk entitlement (Quambatook – Grampians Wimmera Mallee Water) Conversion Order 2006* authorises GWMWater to up to 100 ML per year from the Goulburn system to supply the township of Quambatook.

These transfers into the basin are accounted as diversions in the Victorian Murray and Northern Victoria WRPs, and so are not considered in the BDL or SDL for the Wimmera-Mallee WRP area.

Thirdly, GWMWater's Willaura water supply system takes water from three small creeks on the eastern slopes of the Grampians (*Gariwerd*) to supply a group of towns (Willaura, Wickliffe, Moyston, Lake Bolac and Glenthompson) and rural properties. Two of these creeks are located in the Wimmera Basin and the other in the Hopkins Basin while all the towns except Moyston are located in the Glenelg or Hopkins basins.

For SDL and BDL water accounting purposes, the Victorian Government assumes all three diversions are located in the Wimmera Basin because the:

- total quantity of diversions is small – the upper limit of diversions is 390 ML per year
- diversions from the three creeks are managed as a single source
- streams in the Wimmera basin account for most of the water diverted.

To supplement its Willaura system, GWMWater takes water from bores located within the Wimmera-Mallee WRP groundwater area. This groundwater use is accounted for as groundwater take from the Wimmera-Mallee WRP area (see section 10.4 on [page 117](#)).

- This bulk entitlement also includes the separate Elmhurst and Buangor water supply systems, which take water from small streams in the upper catchment of the Wimmera but supply towns in the Hopkins Basin. These diversions are accounted as surface water take from the Wimmera-Mallee WRP area.

10.2.2 Comparison to Basin Plan estimates of BDL and/or SDL

This section provides a brief discussion and comparison of Victoria's estimates of BDL and SDL provided in Table 6, compared to the estimates of these numbers provided in Schedules 2 and 3 of the Basin Plan. Refer to section 10.3 for more detailed discussion of the method used to determine the SDL in each case. Overall the total surface water BDL was estimated to be 129 GL in the Basin Plan compared to 121 GL in Victoria's estimate. The difference between the total surface water BDL and SDL is the same, 23 GL.

Item (a) Take from regulated rivers (excluding take under basic rights)

- The Basin Plan estimates were 66 GL for BDL and 43 GL for SDL. Victoria's revised estimates are very close to Basin Plan estimates and are based on the best available information and an updated model.

Item (b) Take from regulated rivers under basic rights

- The Basin Plan did not estimate this form of take and neither has Victoria. The volume of take is considered to be insignificant and there is no cost effective, fit-for-purpose method of estimating this form of take.

Item (c) Take from watercourses that are not regulated rivers (excluding take under basic rights)

- The Basin Plan BDL estimate was 1 GL and no estimate was provided for SDL. Victoria's estimate is 6 GL for both BDL and SDL and this is the volume of existing entitlements based on data from the Victorian Water Register. Victoria's estimate is based on the best available information.

Item (d) Take from watercourses that are not regulated rivers under basic rights

- The Basin Plan did not estimate this form of take and neither has Victoria. The volume of take is considered to be insignificant and there is no cost effective, fit-for-purpose method of estimating this form of take.

Items (e) and (f) Take by runoff dams

- The Basin Plan BDL estimate for take by runoff dams (sub-total of (e) and (f)) was 61 GL and no estimate was provided for SDL. Victoria's estimate is 43 GL for both BDL and SDL and this is the volume of existing licences based on data from the Victorian Water Register of 13 GL for item (e) and an estimate based on aerial photography of 30 GL for item (f).
- It is expected that the significant difference in these two estimates is due to the large number of dams in the region that were historically connected to the channel supply system, but do not harvest surface runoff and hence have been excluded from Victoria's estimates of take via detailed analysis of the aerial imagery. We have been unable to confirm the source of the Basin Plan estimate or the method MDBA used to determine it. Victoria's estimates are based on the best available information and a fit-for-purpose method.

Item (g) Net take of water by commercial plantations

- The Basin Plan BDL estimate was 1 GL and no estimate was provided for SDL. Victoria's estimate is based on modelling recently undertaken by DELWP, whereas the Basin Plan volume was an estimate prepared by the MDBA. The proposed volume is considered to be the best available information.

10.3 Annual determinations of surface water permitted to be taken (BP 10.10)

The Basin Plan requires the Wimmera-Mallee WRP to set out the method for determining the maximum quantity of water that the plan permits to be taken for consumptive use during a water accounting period for each form of take shown in Table 6.

The proposed methods are set out below.

Item (a) Take from regulated rivers (excluding take under basic rights)

The Wimmera-Mallee system includes all regulated rivers in the Wimmera-Mallee WRP area.

GWMWater's bulk entitlement (*Bulk Entitlement (Wimmera and Glenelg Rivers – Grampians Wimmera-Mallee Water) Conversion Order 2010*) grants the corporation the right to harvest and store water flows in the Wimmera-Mallee system with a complementary obligation to supply all entitlement holders.

This system corresponds to item (a) in [Table 6](#) but it also includes take from several small diversions on unregulated tributaries in the catchment that are part of the overall Wimmera-Mallee supply system and are covered under GWMWater's bulk entitlement. These include the Mt Cole, Langi Ghiran and Panrock Creek diversions in the upper reaches of the Wimmera Basin.

It also includes water taken from the Glenelg River catchment and used to supply the Wimmera-Mallee system. These flow diversions are transfers into the Murray-Darling Basin.

The SDL for the Wimmera was estimated by the MDBA based on:

- the infrastructure of the Wimmera-Mallee (post-pipeline) system as at 31 October 2010
- full development of the bulk entitlements issued for the Wimmera-Mallee system following completion of the pipeline
- water purchase and transfer of the irrigation entitlement and associated losses to the Commonwealth Environmental Water Holder
- Wimmera-Mallee system operating rules as at 31 October 2010.

Method for determining the maximum quantity of water that the plan permits to be taken for consumptive use

The bulk entitlements contain all the provisions required to determine the maximum quantity of water that the Basin Plan permits to be taken for consumptive use during a water accounting period.

GWMWater, as the storage manager, is required to determine the available water that can be taken from the system during the accounting period and make the corresponding water allocations for all consumptive users and the environment. Schedule 3 of the storage manager instrument of appointment¹⁴ establishes the rules the storage manager must use when determining available water and allocations.

The distribution of available water is determined by a formula which allocates water to each user group, including the environment, according to the reliability of their entitlement. The storage manager determines the available water (and corresponding entitlement allocations) on a monthly basis throughout the accounting period from 1 July to 30 June each year.

Under the proposed method, this quantity, which is the upper limit of consumptive take, is compared with the sum of the actual quantities taken as metered by the bulk entitlement holders and reported by the water corporations in their annual reports.

[10.10(4) - The plan must also set out a demonstration that the method relates to the SDL of each resource unit in such a way that, if applied over a repeat of the historical climate conditions, it would result in meeting the SDL for the resource unit, including as amended under section 23B of the Act.]

There is a relationship between the long-term SDL and the maximum quantity of water that the plan permits to be taken for consumptive use determined by the proposed method. This relationship stems from the rules used to determine both quantities and these rules are specified in GWMWater's bulk entitlement and the complementary Wimmera-Mallee System Storage Management Rules¹⁵.

The SDL is estimated by a simulation model which uses the above rules to estimate allocations for entitlement holders throughout the accounting period. The storage manager uses identical rules to determine allocations.

A Resource Allocation Model (REALM) computer simulation model has been developed for the Wimmera-Mallee system covering all take under item (a). The Wimmera-Mallee system model represents:

- system waterways
- historical recorded and estimated streamflow and climate data from January 1891 to June 2015
- system infrastructure including reservoirs, diversion weirs and transfer channels and the pipeline delivery network
- system operating rules as specified in the bulk entitlements and storage management rules as at 31 October 2010
- rural, urban and environmental demand groupings with climate-varying demands applied, including a mechanism to simulate entitlement carried over to another accounting period
- evaporation and transfer and delivery losses.

¹⁴ <http://www.gwmwater.org.au/about-the-storage-manager/instrument-of-appointment>

¹⁵ <http://www.gwmwater.org.au/about-the-storage-manager/storage-management-rules>



**BASIN
PLAN
10.10(4)**

The SDL model was run over the historic record and results show that the proposed method results in the SDL being achieved (refer to Appendix 3 for details).

The Wimmera-Mallee system simulation model will be run when the Western Region Sustainable Water Strategy is next reviewed. This will independently check metered take for each accounting period. The periodic process of assessing compliance using the Wimmera-Mallee system model will provide additional assurance and ensure the model is periodically updated as required to ensure that it remains fit-for-purpose.

Item (b) Take from regulated rivers under basic rights

These are rights under section 8 of the Victorian Water Act to take water free of charge from a waterway for domestic and stock purposes under prescribed circumstances (see [Table 3](#)). In general terms, people or businesses can exercise that right if they own the land over which the water is flowing, or their land is next to a waterway of which the bed and banks remain the property of the Crown. The rights do not apply where there is Crown frontage between the waterway and freehold land.

The take under this category is generally not metered and the quantity take is unknown, but considered to be insignificant because any water taken under this right cannot be used for commercial purposes and the majority of the regulated parts of the Wimmera and Avoca Rivers and their tributaries are covered by a Crown Reserve.

Item (c) Take from watercourses that are not regulated rivers (excluding take under basic rights)

This category includes take by small urban water supply systems and take and use licences.

A number of very small towns have their water supplies in the headwaters of the Wimmera and Avoca catchments:

- Amphitheatre, Avoca, and Redbank are supplied by Central Highlands Water from small reservoirs on tributary streams in the upper Avoca catchment under three bulk entitlements:
 - *Bulk Entitlement (Amphitheatre) Conversion Order 2003*
 - *Bulk Entitlement (Avoca) Conversion Order 2003*
 - *Bulk Entitlement (Redbank) Conversion Order 2003*
- Landsborough and Navarre are supplied by Central Highlands Water from tributary streams in the upper Wimmera catchment under Bulk Entitlement (Landsborough-Navarre) Conversion Order 2003
- Elmhurst, Buangor, Moyston, Wickliffe and Lake Bolac are supplied by GWMWater, and Glenthompson is supplied by Wannon Water with water sourced partly from GWMWater's diversion weirs on small tributary streams in the upper Wimmera and Wannon catchments under:
 - *Bulk Entitlement (Willaura, Elmhurst and Buangor systems - Grampians Wimmera Mallee Water) Conversion Order 2012*
 - *Bulk Entitlement (Willaura System - Wannon Water) Conversion Order 2012*

These small water supply systems are independent of the nearby Wimmera-Mallee system and are classified as diversions from watercourses that are not regulated. They have a combined upper limit take of 804 ML per year.

A total of 4,928 ML of take and use licences are issued to individuals on various unregulated watercourses, comprising:

- 2,239 ML of licences on the Wimmera River and its tributaries
- 2,689 ML of licences on the Avoca River and its tributaries.

Method for determining the maximum quantity of water that the plan permits to be taken for consumptive use

**BASIN
PLAN
10.10(1)**

For item (c) in **Table 6** the proposed method of determining the maximum quantity of water permitted to be taken in the accounting period is a fixed annual amount corresponding to the sum of:

the upper limit of take as specified in the water corporations' bulk entitlements in the case of the urban supply systems and licensed volumes in the case of the take and use licences.

This approach is appropriate because:

- the upper limit of take from unregulated watercourses is a small fraction of the SDL volume for the Wimmera-Mallee WRP area (6 GL out of 99 GL, or about 6 percent)
- this is the method used by the Victorian Government to determine annual compliance with the Murray-Darling Basin cap.
- the existing simulation model for the Wimmera-Mallee system does not include take on these unregulated streams. The Victorian Government does not support the development of a new simulation model suitable for determining annual SDL compliance for this component of take because of the high cost for a very limited return
- the bulk entitlements specify rules that limit take at each of the diversion points, including:
 - minimum passing flows to be met before diversions can occur, and in some cases the months of the year when no diversion is permitted
 - capacity of on-stream storage
 - maximum rates of diversion
 - volumetric limits on take.

Item (d) Take from watercourses that are not regulated rivers under basic rights

The take under this category is generally not metered and the quantity take is unknown, but considered to be insignificant because any water taken under this right cannot be used for commercial purposes, the unregulated rivers in this area dry up regularly and the majority of the unregulated parts of the Wimmera and Avoca Rivers and their tributaries are bordered by Crown Reserve.

Item (e) Take by runoff dams (excluding take under basic rights)

Runoff dams (often referred to in Victoria as small catchment dams) are small dams not located on a defined watercourse. Runoff dams used for commercial and irrigation purposes are required to be licensed or registered in Victoria. Refer to Chapter 13 for further details on runoff dams.

The volume of water authorised to be taken by these runoff dams by individuals is estimated to be 12,753 ML in the Wimmera Avon and Avoca Basins.

**BASIN
PLAN
10.10(1)**

For item (e) in **Table 6** the proposed method of determining the maximum quantity of water permitted to be taken in the accounting period is estimated from the total volume of licences and registrations in the Victorian Water Register.



Item (f) Take by runoff dams under basic rights

Runoff dams (often referred to in Victoria as small catchment dams) are small dams not located on a defined watercourse and from which landholders extract water for domestic and stock purposes. Refer to Chapter 13 for further details on runoff dams

The Victorian Government has estimated the number and volume of runoff dams used for domestic and stock purposes in the Wimmera-Mallee WRP area and also the total annual extraction, which varies with climatic conditions. These estimates were made from desktop studies using maps and aerial photographs.

Many dams identified in aerial photographs were already licensed and so were already counted as a different form of take. These licensed dams were separated, based on the imperfect data available, to avoid double counting of take.

Under section 8 of the Victorian Water Act (see [Table 3](#)), landholders may take water free of charge for domestic and stock use under prescribed circumstances. As with other section 8 rights, the take is not required to be metered.

The volume of water authorised to be taken by unlicensed runoff dams used for stock and domestic (basic rights) purposes within the Wimmera-Mallee WRP area is 29,826 ML.

BASIN PLAN 10.10(1)

For item (f) in [Table 6](#) the proposed method of determining the maximum quantity of water permitted to be taken in the accounting period is estimated by DELWP from the number and capacity of runoff dams and adjusted for climate conditions.

Item (g) Net take of water by commercial plantations

The effect of commercial forestry plantations on the water balance in the Wimmera-Mallee WRP area is not accurately monitored and good data is not readily available.

The annual permitted take of water by commercial plantations will be estimated as the difference between the long-term average rate of evapotranspiration from plantations that were present in 2009 and from the vegetation type that was thought to be present before the plantation was established. The long-term average rate of evapotranspiration will be estimated using the SoilFlux Model. Commercial plantations cover an area of 42 km² within the Wimmera-Mallee WRP area and take an estimated 5,700 ML per year.

BASIN PLAN 10.10(1)

For item (g) in [Table 6](#) the proposed method of determining the maximum quantity of water permitted to be taken in the accounting period is to estimate it as the difference between the long-term average rate of evapotranspiration from plantations that were present in 2009 and from the vegetation type that was thought to be present before the plantation was established. The long-term average rate of evapotranspiration will be estimated using the SoilFlux Model.

10.4 Annual determinations of groundwater permitted to be taken (BP 10.10)

A summary of the Basin Plan groundwater management units in the Wimmera-Mallee WRP area and the relationship with the BDLs and SDLs, the Victorian Management Units and the licensed volumes is shown in [Table 7](#). Please note that the groundwater SDL does not include groundwater take within the West Wimmera GMA, because the groundwater resources in the West Wimmera GMA have been excluded from the water resources of the Murray-Darling Basin under the Water Regulations 2008 (available at <https://www.legislation.gov.au>). This is due to the groundwater resources within the West Wimmera GMA being only remotely hydrologically connected to the Murray River and disconnected to surface ecosystems in the Murray-Darling Basin.

Table 7 – Groundwater entitlements in the Wimmera-Mallee WRP area

MDBA Groundwater SDL Unit	BDL ¹ (ML)	SDL ² (ML)	Victorian groundwater management	PCV (ML)	Licensed volume ³ (ML)	Domestic and stock ³ (ML)
Sedimentary Plain	68,900 ML less West Wimmera take ⁴	190,700 ML less West Wimmera take ⁴	Murrayville GMA	10,883	9,634	214
			Wimmera-Mallee Groundwater Catchment	N/A	16,032	1,187
			Avoca Groundwater Catchment	N/A	1,169	60
Deep	0 ML	20,000 ML	Murrayville GMA	N/A	0	0
			Wimmera-Mallee Groundwater Catchment	N/A	0	0
			Avoca Groundwater Catchment	N/A	0	0
Highlands	1,260 ML	2,140 ML	Wimmera-Mallee Groundwater Catchment ⁵	N/A	886	65
			Avoca Groundwater Catchment	N/A	1,200	66

Notes to table:

- BDL is the baseline limit of take from a SDL resource unit (i.e. the amount of take before the SDL has been achieved) and the diversion estimates from Column 3, Schedule 4 of the Basin Plan have been adopted.
- SDL means the long-term average diversion limit to be achieved and the estimates from Column 4, Schedule 4 of the Basin Plan have been adopted.
- From Victorian Water Accounts, includes Sedimentary and Highlands systems (most expected to be in Highlands)
- The West Wimmera GMA allocation is 22,658ML and includes groundwater resources outside the Murray-Darling Basin
- Does not include salt interception volume



For purposes of the Basin Plan requirements for groundwater management and trade, Victoria acknowledges that the state management unit (as defined by the Commonwealth groundwater trade guidelines) is the WRP (comprising the Highlands SDL unit that is longitudinally connected to the Sedimentary SDL unit and the Deep SDL unit at depth). Within this WRP area, Victoria has the ability to manage the resource management and administer licensing.

The groundwater management parameters used for measurement and reporting by the Victorian Government do not align exactly with the groundwater SDL unit resource units specified in the Basin Plan.

Further work is required to enable Victoria's water accounting and reporting arrangements to accurately differentiate the amount of groundwater taken from the groundwater resources included in the Wimmera-Mallee WRP.

The Victorian Government plans to upgrade the Victorian Water Register to enable better reporting at the scale of the WRP SDL units. This will help with the application of relevant MDBA trading rules, where applicable, and reporting on compliance with the Basin Plan SDL unit for groundwater in future. Given that total licensed volume of groundwater take in the area is significantly below the total SDL, there is no risk to groundwater SDL compliance in the Sedimentary Plain, and only a low risk in the Highlands.

BASIN PLAN 10.10(1) The proposed method of determining the maximum quantity of groundwater permitted to be taken in the accounting period is to use the Permitted Consumptive Volume (PCV) where applicable, and the licensed volume where a PCV is not applicable.

The Basin Plan is required to include the rules that ensure that the quantity of water actually taken from the Wimmera-Mallee system for consumptive use in a water accounting period that, beginning on or after 1 July 2019, does not exceed the Wimmera-Mallee system annual permitted take for the period.

Chapter 7 explains the rules that govern the volume of water that can be taken from the Wimmera-Mallee system.

BASIN PLAN 10.11(1) From 1 July 2019, a person must not take water from a water resource in the Wimmera-Mallee surface-water water resource plan area or the Wimmera-Mallee groundwater water resource plan area unless that person is authorised to do so under the Victorian Water Act or by instruments made under that Act.

10.5 Matters relating to accounting for water (BP 10.12)

BASIN PLAN 10.12(1) The matters in **Table 8** are accounted for in the methods proposed for determining the maximum quantity of water that the plan permits to be taken for consumptive use during a water accounting period (the alphabetical numbering corresponds to the paragraph numbering in BP 10.12).

Table 8 – Matters relating to accounting for water

Matters which must be accounted for by the methods proposed above		BP 10.12
(a)	All forms of take from the SDL resource unit and all classes of water access right	All forms of take from the SDL resource unit and all classes of water access right are accounted for by the methods specified above, for surface water and groundwater, apart from forms of take where the volume of take is considered to be insignificant
(b)	Water allocations that are determined in one water accounting period and used in another, including water allocations that are carried over from one water accounting period to the next (also referred to as carryover)	<p>Carryover applies to the take from regulated rivers under GWMWater's bulk entitlement for the Wimmera-Mallee system (item (a) in Table 6). Carryover is accurately accounted for and is included in the equation the storage manager must use to determine available water and allocations</p> <p>Carryover of groundwater take is permitted in some groundwater management areas and is accounted for in annual allocation rules</p>
(c)	For a surface water SDL resource unit, return flows must be taken into account in a way that is consistent with arrangements under the Murray-Darling Basin Agreement immediately before the beginning of the Basin Plan	There are no significant return flows in the Wimmera-Mallee WRP area
(d)	Trade of water access rights	<p>Trade of entitlements and allocation is permitted in the Wimmera-Mallee system (item (a) of Table 6). Trading is accounted for by the proposed method, including separate accounting of held environmental water (10.12(3)).</p> <p><i>Minister's Policies for Managing Take and Use Licences</i> apply to the trading of surface water take and use licences.</p> <p>Trade of entitlements to take and use groundwater is permitted in the WRP. Groundwater statutory and local management plans apply to the trading of groundwater licences</p>
(e)	Water resources which have a significant hydrological connection to the water resources of the SDL resource unit	<p><i>Guidelines for groundwater licensing and the protection of high value groundwater dependent ecosystems</i> apply</p> <p>Surface water transfers from the Glenelg system to the Wimmera-Mallee system are included in the SDLs and the annual permitted take for Wimmera-Mallee WRP</p>
(f)	Circumstances in which there is a change in the way water is taken or held under a water access right	Environmental entitlement created from water savings and purchase will have different demand pattern to original consumptive demand pattern
(g)	<p>Changes over time in the extent to which water allocations in the unit are utilised.</p> <p>Note: Paragraph (g) includes what is commonly known as a growth-in-use strategy</p>	Assumed full utilisation in the regulated system and total licensed volume or PCVs for take and use licences
(h)	Water sourced from the Great Artesian Basin and released into a Basin water resource, by excluding that water	Not applicable in the Wimmera-Mallee WRP area
(i)	Water resources which are used to manage aquifer recharge	<i>Minister's Policies for Managing Take and Use Licences and Policies for Managing section 76 Approvals</i> apply

10.6 Limits on certain forms of take (BP 10.13)

Section 10.13(1) of the Basin Plan states that a WRP must require that the long-term annual average quantity of water that can be taken from a surface water SDL resource unit for consumptive use by:

- a. take under basic rights or
- b. take by runoff dams
- c. net take by commercial plantations

does not exceed the level specified in column 2 of Schedule 3 for the form of take.

BASIN PLAN 10.13(1)(a) The long-term annual average quantity of water that will be taken from the Wimmera-Mallee (surface water) SDL resource unit by basic rights from rivers that are regulated and not regulated is generally not metered and the quantity is insignificant.

Column 2 of Schedule 3 does not specify a volume for these forms of take and **Table 6** provides no estimate.

BASIN PLAN 10.13(1)(b) Take by runoff dams (including take under basic rights) – the long-term annual average quantity of water that will be taken from the Wimmera-Mallee (surface water) SDL resource unit by runoff dams is expected to remain below 61 GL. This does not exceed the level of net take for runoff dams specified in column 2 of Schedule 3.

BASIN PLAN 10.13(1)(c) The long-term annual average quantity of water that will be taken from the Wimmera-Mallee (surface water) SDL resource unit by commercial plantations is expected to remain below 5.7 GL. This does not exceed the level of net take for commercial plantations specified in column 2 of Schedule 3, which is calculated based on the level of development that existed on 30 June 2009.

10.7 Actual take

The Basin Plan (section 10.15) requires a WRP to set out how the quantity of water actually taken will be determined after the end of the water accounting period using the best information available.

BASIN PLAN 10.15(1) The approaches to determine water actually taken in the Wimmera-Mallee WRP area are described in **Table 9**. The approaches are consistent with those used to estimate the annual determinations of water permitted to be taken for surface water (**Table 6**) and groundwater (**Table 7**). The approaches allow for the inclusion of held environmental water which was disposed of and then used in the SDL resource unit for consumptive use.

Table 9 – Approaches to determine actual take for surface water and groundwater

Form of take	Determination of actual take
Surface water	
a. Take from regulated rivers (excluding basic rights)	Measured at diversion sites listed in Table 3 of (GWMWater, 2009)
b. Take from regulated rivers under basic rights	N/A – no estimate
c. Take from watercourses that are not regulated rivers (excluding take under basic rights)	Measured at diversion sites listed in Table 3 of (GWMWater, 2009)
d. Take from watercourses that are not regulated rivers under basic rights	N/A – no estimate
e. Take by runoff dams (excluding take under basic rights)	To be estimated from the total volume of licences and registrations in the Victorian Water Register
f. Take by runoff dams under basic rights	<p>Changes in the extent of runoff dams within the Wimmera-Mallee WRP area will be determined using aerial imagery periodically.</p> <p>The net take of water by runoff dams will be estimated</p>
g. Net take of water by commercial plantations	<p>Changes in the extent of plantations within the Wimmera-Mallee WRP area will be determined using information that is provided by the managers and owners of large plantation estates for bushfire and emergency management purposes on an annual basis.</p> <p>The net take of water by commercial plantations will be estimated as the difference between the long-term average rate of evapotranspiration from plantations and from the vegetation type that was present before the plantation was established. The long-term average rate of evapotranspiration will be estimated using the SoilFlux Model, which is considered to provide the best available information</p>
Groundwater	
Licensed take	Measured
Take under basic rights	The calculation of take is based on the number of bores less than 30 years old with a rate of 1.5 or 2 ML/year



11. Trade of water access rights





11.1 Basin Plan requirements

Water trading of surface water in the Wimmera-Mallee WRP area is covered in Chapter 12 of the Basin Plan, which sets out the Basin Plan surface water trading rules that came into effect in Victoria on 1 July 2014. The Basin Plan does not require general surface water trading arrangements to be included in WRPs. Trade of groundwater is prohibited under the Basin Plan unless certain conditions can be met.

Part 8 of Chapter 10 of the Basin Plan requires WRPs to set out circumstances in which trade between:

- two locations within a groundwater SDL resource unit is permitted (BP 10.37)
- two groundwater SDL resource units is permitted (BP 10.38)
- a groundwater SDL resource unit and a surface water SDL resource unit are permitted (BP 10.39).

These circumstances are described in the following sections.

11.2 Victorian trading policies and rules

As per chapter 7.9, Victoria's regulatory regime for statewide water trading is set out in the:

- Victorian Water Act
- Ministerial Order specifying the trade rules for declared systems (Minister for Water, 2014)
- Minister's *Policies for Managing Take and Use Licences*
- *Guidelines for groundwater licensing and the protection of high value groundwater dependent ecosystems*.

The Victorian Water Act provides a framework for water trading. It enables trades to occur within trading rules that protect against impacts to other water uses or the environment. In accordance with section 12.19 of the Basin Plan, Victoria has provided evidence to the MDBA regarding restrictions on trade in surface water systems which are necessary and in accordance with 12.18.

Groundwater trade can occur in the Wimmera-Mallee WRP area. The circumstances under which this is possible are described in the Ministerial policies for take and use licence. Further system-specific trading rules are defined in local or statutory management plans.

GWMWater has established trading rules that enable trading of domestic and stock allowances in the Wimmera-Mallee system (GWMWater, 2015). These allowances are within GWMWater's bulk entitlement. These rules are primarily designed to ensure there is sufficient capacity in the pipe system to deliver water that is traded without unduly impacting on third parties.

11.3 Entitlement trade in the Wimmera-Mallee WRP area

11.3.1 Trades between two locations within a groundwater SDL resource unit

Trading between two locations in the Wimmera-Mallee WRP area is permitted by the Victorian Water Act, subject to the Minister's *Policies for Managing Take and Use Licences* and any rules in a local or statutory management plan that apply to the area. Trading between two locations currently occurs in the Murrayville GMA.

11.3.2 Trading between two locations in the Murrayville GMU

The Murrayville GMU is managed by the rules within the Murrayville Groundwater Management Plan 2001. This plan is currently being reviewed.

The Murrayville plan sets trading rules for temporary and permanent trading, with relevant caps and trading zones.

The process for assessing a transfer of entitlement requires a section 40 (Victorian Water Act) assessment. This is the same process as applying for a new groundwater licence.

A hydrogeological assessment is required to ensure that the proposed take at the buyer's location will not affect any existing groundwater users or the environment. Transfers are not approved if they would cause the permissible consumptive volume (PCV) to be exceeded. The PCVs are set out by Ministerial Orders.

Trade of Murrayville groundwater resources that are in the SA-Victoria Designated Area are permitted, subject to the South Australia Victoria Border Groundwaters Agreement (see below).

Temporary and permanent trade of groundwater entitlements are set out in: local management plans, statutory management plans, and statewide policies.

11.3.3 Trades between two groundwater SDL resource units

The Wimmera-Mallee groundwater WRP area contains a single SDL groundwater resource unit (GS9 Wimmera-Mallee).

Interstate trade is provided for through complimentary legislation in South Australia, New South Wales and Victoria. To date, there has been no trade in groundwater.

11.3.4 Trades between surface water and groundwater SDL units

Trade may be permitted between surface water and groundwater SDL resource units according to rules set out in local management plans. However, there are no local management plans in the Wimmera-Mallee WRP area that permit trade between surface water and groundwater. This is primarily because physical connections between surface water and groundwater resources have not been researched thoroughly enough.

BASIN PLAN Trade between two locations within the Wimmera-Mallee WRP SDL groundwater resource unit are permitted subject to:

10.37(1)

- any local management rules
- not exceeding diversion limits
- no adverse effects on:
 - other authorised uses of water
 - the aquifer
 - the environment.

These arrangements meet the requirements of the Basin Plan for trade within a groundwater SDL resource unit.

BASIN PLAN Trade between two groundwater SDL resource units is subject to the same rules as above.

10.38(1)

BASIN PLAN No trade is permitted between a groundwater SDL resource unit and a surface water SDL resource unit in the Wimmera-Mallee WRP area.

10.39(1)