

GOULBURN-MURRAY

WATER



Katunga

Water Supply Protection Area

Groundwater Management Plan

Annual report for the year ending

30 June 2012

Foreword

This is the sixth annual report on the Groundwater Management Plan (the Plan) for the Katunga Water Supply Protection Area (WSPA), covering the period 1 July 2011 to 30 June 2012. The report summarises the Plan's performance over the year, including a summary of groundwater use, licence transfers, groundwater levels, compliance, metering activity and salinity data.

The Plan has continued to provide a robust management framework, which has ensured that licence holders and stock and domestic users have retained access to a valuable groundwater resource. The demand for groundwater has been relatively low for a second successive year, with a continuation of wetter than average conditions. Groundwater recovery levels have remained relatively high as a result of the low levels of pumping. The low level of usage means that allocations will remain at the maximum allowable level of 70% of entitlement in 2012/13.

It is a requirement that a review of the Plan is undertaken every five years. Goulburn-Murray Water (G-MW) completed this review in November 2011 and the findings were endorsed by the Department of Sustainability and the Environment in February 2012.

The aim of the review was to consider the performance of the Plan since its approval in 2006, taking into account new data gathered over the life of the plan, changes in policy and legislation, and the views of groundwater users. The review highlighted the success of the Plan but did make some recommendations which could be considered as amendments to the Plan.

As you may be aware, a draft Murray-Darling Basin Plan has been developed and is awaiting review and agreement by the Commonwealth Water Minister before it is tabled in federal parliament.

It will important to consider the extent to which a Murray-Darling Basin Plan might affect any proposed amendments to the Plan and, mindful of this uncertainty, it has been agreed that a process to amend the Plan should not commence until the final Murray-Darling Basin Plan is clearly understood. This means any process to amend the Plan is unlikely to commence before early 2013.

This annual report will be submitted to the Minister for Water and the Goulburn Broken Catchment Management Authority and a notice of report availability will also be published in the Cobram Courier and the Numurkah Leader.

A copy of this report will also be available for inspection at the Cobram and Tatura offices of Goulburn-Murray Water (G-MW), on the G-MW website (www.g-mwater.com.au), or upon request.

I encourage all groundwater users in the Katunga WSPA to take the time to read this annual report.

Signed:



Gavin Hanlon
MANAGING DIRECTOR

(John Calleja)
on behalf of

Executive Summary

The 2011/12 irrigation season was characterised by above average rainfall conditions. The rainfall for the period was 670 mm (Bureau of Meteorology (BOM) gauge 080109 at Cobram), compared to average annual rainfall for the area of 466 mm (BOM gauge 080109 at Cobram). The 2011/12 season saw a groundwater allocation of 70% announced for all zones. This resulted in 18,809.3 ML of metered usage (44.4% of the allocated volume of 42,405.1 ML). This is an increase from the 2010/11 season's usage of 11,654.7 ML, but is still significantly lower than the 2009/10 figure of 30,994 ML. The wetter than average conditions in early 2012 and good surface water resource availability and allocations are the main reasons for a continuation of relatively low groundwater usage.

There were 11 groundwater temporary transfers in the 2011/12 season for a total volume of 682 ML. This is higher than the volume transferred in 2010/11 (217 ML) but still significantly lower than the volume temporarily transferred during the 2009/10 season which totalled 2915.5 ML. The lower volume of licence transfers reflect the higher surface water availability and above average rainfall during the 2011/12 irrigation season. The total volume of entitlement permanently traded during 2011/12 was also very low (40 ML).

The annual salinity sample survey saw a total of 44 salinity samples returned from the 240 sample bottles that were sent out in March 2011, a return rate of 18%. This is slightly less than the return rate in previous years and is likely to be correlated with a reduction in groundwater usage for the period (with many bores not used).

It is a requirement that a review of the Katunga WSPA Groundwater Management Plan (the Plan) is undertaken every five years. Goulburn-Murray Water (G-MW) completed this review in November 2011 and the findings were endorsed by the Department of Sustainability and the Environment in February 2012.

Although the Plan has performed well, the review has concluded that some changes should be considered which could improve groundwater management. The recommendations for change to the Plan relate primarily to the annual allocation methodology, and to the current trading rules. In addition it is recommended that the introduction of carryover be considered, along with improvements to the way groundwater salinity is monitored.

For any changes to the Plan to be made, the Minister for Water must appoint a Consultative Committee. This committee would then consider any potential amendments to the Plan, and make recommendations back to the Minister for approval. This process would be coordinated by G-MW.

Given that the draft Murray-Darling Basin Plan is awaiting review and agreement by the Federal Water Minister before it is tabled in the Commonwealth parliament there is still some uncertainty about what effect the Basin Plan might have on any amendments to the Plan.

Mindful of this uncertainty, it has been agreed that the process to amend the Plan should not commence until outcomes of the Basin Plan are clearly understood. As a result, the process to amend the Plan is unlikely to commence before early 2013.

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1. Description of the Water Supply Protection Area

1.1 Boundary

A Water Supply Protection Area (WSPA)¹ is declared under the *Water Act 1989* to protect groundwater resources. The Katunga WSPA was declared on 14 January 1999. It is located in the Murray and Goulburn Valleys, extending from just west of Yarrawonga to Barmah and from the River Murray to just south of Numurkah. It covers an area of approximately 2,100 km² and incorporates parts of the floodplains of the River Murray, Broken Creek and Goulburn River (Figure 1).

1.2 Land use

A large part of the WSPA is within the Murray Valley Irrigation Area, which is supplied with surface water from the River Murray through a network of channels. Pasture production for the dairy industry is predominant in the WSPA and is generally flood irrigated. A mixture of flood and pressure (drip or micro-spray) irrigation occurs in the limited horticultural areas in the north-eastern part of the WSPA.

1.3 Geology

The geology of the region consists of alluvial deposits overlying bedrock made up of Palaeozoic shale, siltstone and sandstone. The alluvial deposits are divided into three principal geological units:

- Shepparton Formation;
- Calivil Formation; and
- Renmark Group.

The Shepparton Formation overlies the Calivil Formation and the Renmark Group and forms the uppermost geological formation (usually 80 to 100 m thick) over most of the region. The Shepparton formation is comprised of clays, silts, sands and gravels. The relative amounts of silts, clays, sands and gravels varies greatly throughout the Shepparton formation which means that it performs better as an aquifer in some locations relative to other locations. This also causes the water quality (as salinity) to vary significantly throughout the Shepparton formation.

The Renmark Group and Calivil Formation are often considered to be one aquifer. The Calivil and Renmark deposits overlie the Paleozoic bedrock. They are made up of unconsolidated gravels and sands deposited by ancient rivers which once flowed from the highlands onto the plains, along broad valleys. In the riverine plains of Northern Victoria, the Renmark Group/ Calivil Formation forms three major aquifers (commonly referred to as "Deep Leads"). The deep leads generally follow the course of today's Murray, Goulburn and Campaspe Rivers. These aquifers broaden toward the north and west and merge to form a continuous sheet under much of the south-eastern Murray Basin. In the eastern part of the WSPA, where the bedrock is closer to the land surface, the Renmark and Calivil formation deposits are around 15m thick and located at a depth of 50m below the surface. The deposits thicken westwards and are typically 80m thick in the centre of the WSPA, and around 100m below surface.

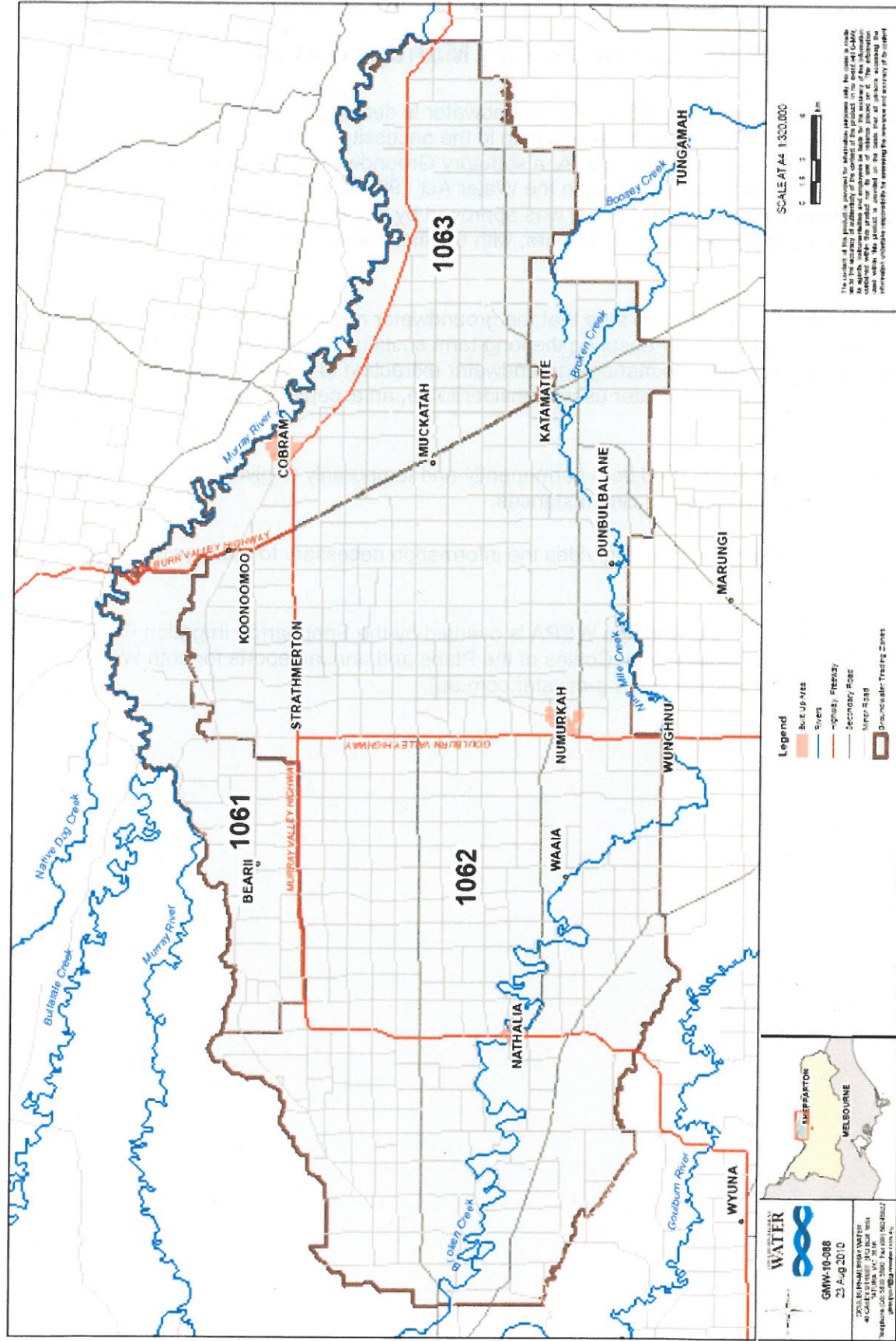
1.4 Overall management of the resource

The Katunga WSPA boundary has been set to manage groundwater resources at a depth of greater than 25 metres below the ground surface. While the groundwater resource is primarily the Murray

¹ These areas have also previously been referred to as Groundwater Supply Protection Areas (GSPA)

Valley "Deep Lead" Aquifer system, high yields can also be obtained from parts of the lower Shepparton Formation aquifers. For management purposes the WSPA is divided into three zones, zone 1061, zone 1062 and zone 1063 (Figure 1).

The overlying upper Shepparton Formation (at depths less than 25 metres) also contains significant groundwater resources which are managed under the Shepparton Irrigation Region (SIR) WSPA Groundwater Management Plan.



o Figure 1 - Katunga WSPA boundary and management zones

2. Purpose of the Groundwater Management Plan

A Water Supply Protection Area (WSPA) for groundwater is declared when a significant demand for water causes aquifer decline and stress; resulting in the necessity for a more intensive management regime. When an area is declared a WSPA, a statutory Groundwater Management Plan must be developed and implemented as specified in the Water Act 1989 (the "Act"). The Katunga WSPA Groundwater Management Plan (the Plan) was approved by the Minister for Water on 24 July 2006. The Plan is scheduled for review every 5 years, with the first review due in the year commencing 2011/12.

The objective of the Plan is to make sure that the groundwater resources within the WSPA are managed in an equitable manner ensuring the long-term sustainability of those resources. The Plan aims to use annual allocations to manage groundwater extraction to prevent groundwater levels from falling below, what many groundwater users consider to be, an acceptable level based on equity, accessibility and cost.

Licences are able to be transferred both permanently and temporarily to give licensees the flexibility to adjust their operations to changing circumstances.

A monitoring and metering program provides the information necessary to manage groundwater in the WSPA.

As explained in Section 1, the Katunga WSPA is overlaid by the Shepparton Irrigation Region WSPA which has its own management plan. Copies of the Plans and annual reports for both WSPAs are available on the G-MW website (www.g-mwater.com.au).

3. Plan implementation

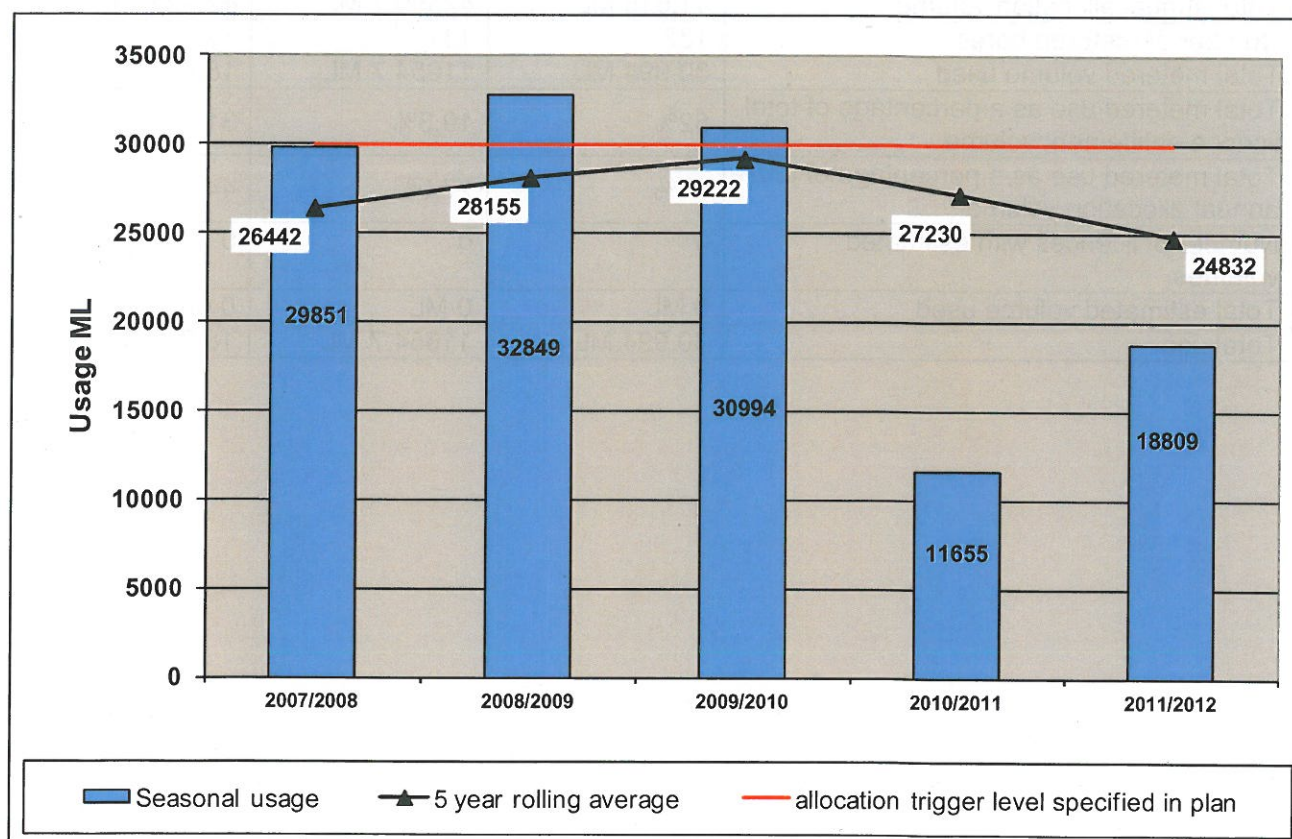
3.1 Annual allocation

Prescription 3 of the Plan states that if the 5 year rolling average usage figure is greater than 30,000 ML then the annual allocation is reduced to 50% of entitlement in the following year. If the 5 year rolling average usage is below 30,000 ML the allocation is set at 70% of entitlement.

The 2011/12 season saw an allocation of 70% announced for all zones.

The 5 year average usage for the period 1 July 2007 to 30 June 2012 was 24,832 ML (Figure 2). The 2011/12 allocation was announced in a notice circulated in the "Cobram Courier", "Yarrawonga Chronicle" and "Numurkah Leader" on the 25 July 2011. A media release was also distributed to media outlets in the region and all licensees were notified of the allocation.

Figure 2 - The 5 year rolling average of usage



3.2 Usage

3.2.1 Usage volume

The majority of irrigation bores in the WSPA are metered (see section 3.6 of this report). The metered usage for the 2011/12 season was 18,809.3 ML (Table 1).

The location of all licensed (metered and un-metered) bores is shown in Figure 3 while the recorded 2011/12 usage for each extraction point (presented as a range) is shown in Figure 4.

Table 1 - Groundwater use in 2011/12 compared to the previous two years

Parameter	2009/10	2010/11	2011/12
Number of groundwater licences ²	190	249 ³	251
Total licence entitlement volume	59,450 ML	60,503 ML ⁴	60,578.7 ML ⁵
Annual allocation	70%	70%	70%
Total annual allocation volume	41,615 ML	42350.7 ML	42,405.1 ML
Number of metered bores	132	131	143
Total metered volume used	30,994 ML	11654.7 ML	18,809.3 ML
Total metered use as a percentage of total licence entitlement volume	52%	19.3%	31.0%
Total metered use as a percentage of total annual allocation volume	74%	27.5%	44.3%
Number of licences with estimated volumes	0	0	0
Total estimated volume used	0 ML	0 ML	0 ML
Total use	30,994 ML	11654.7 ML	18,809.3 ML

² Sole private rights and Domestic & Stock use is not included in this number

³ Number of licences increased mainly due to the issuing of groundwater licences under the Dairy Shed Water Licence Transition Program

⁴ Licence entitlement has increased due to the inclusion of remaining dairy shed water licences.

⁵ Licence entitlement has increased due to the inclusion of remaining dairy shed water licences.

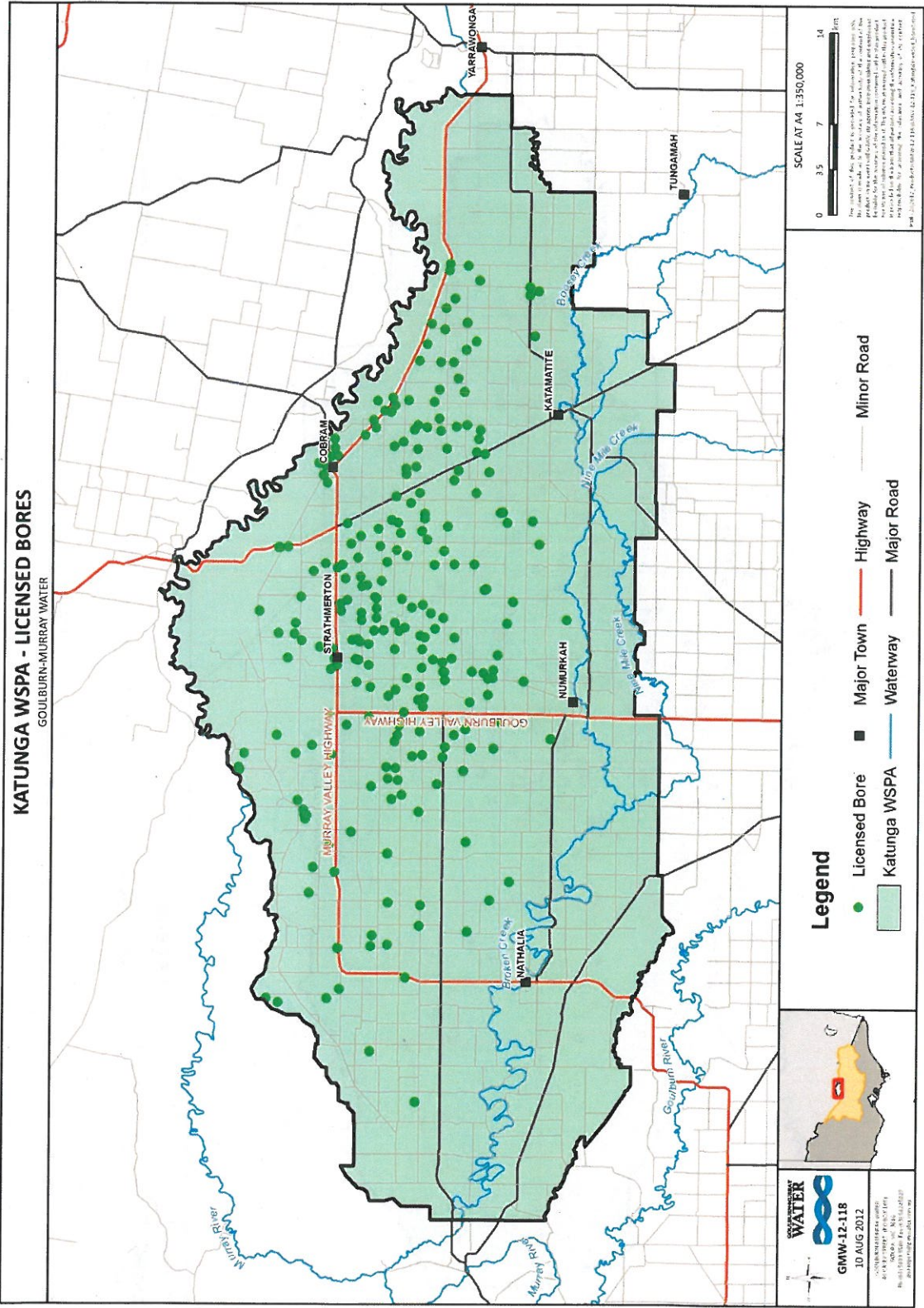
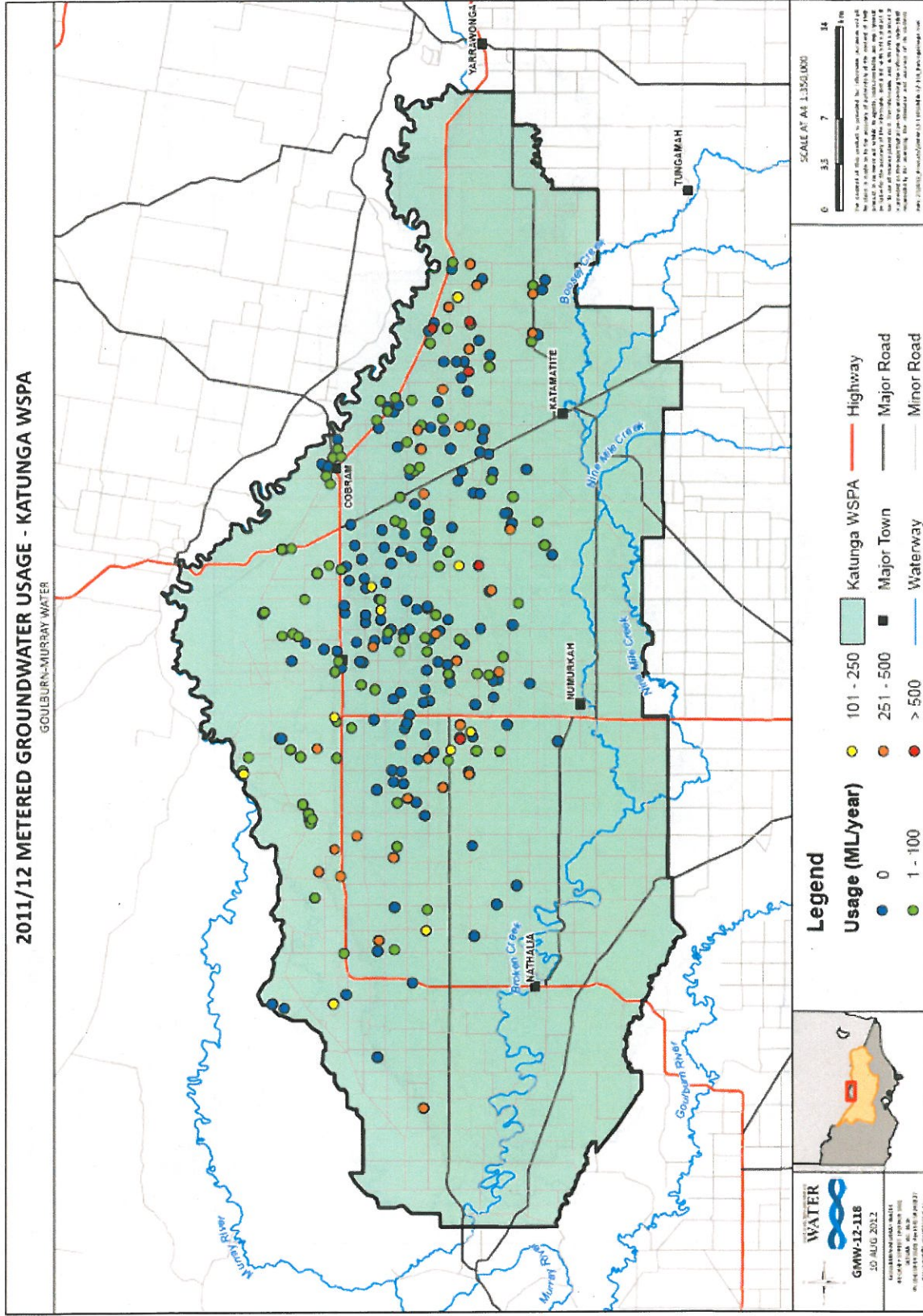


Figure 3 - Location of licensed bores within the Katunga WSPA



o Figure 4 - Metered usage for individual extraction points

3.2.2 Factors affecting usage

Usage in the 2011/12 season was the second lowest recorded since licensed bores were metered. Over the past 14 years, usage has generally been over 20,000 ML each season. The relatively low usage is the result of above average rainfall during the 2011/12 season with a reduced irrigation demand and increased surface water availability for irrigation.

Figure 5 shows annual groundwater usage over the last 5 seasons with corresponding rainfall for each season. As shown in Figure 5, the high rainfall occurred throughout the beginning and middle of the irrigation season. Figure 5 shows that the 100% surface water allocation (high-reliability water shares) for the Murray surface water system occurred early in the season (15 November). Figure 6 shows the surface water availability over the past 5 seasons.

Figure 5 - Metered groundwater extraction for the Katunga WSPA compared with total season rainfall (1 July to 30 June) recorded at Bureau of Meteorology station at the Cobram Goulburn-Murray Water Office (BOM site 080109).

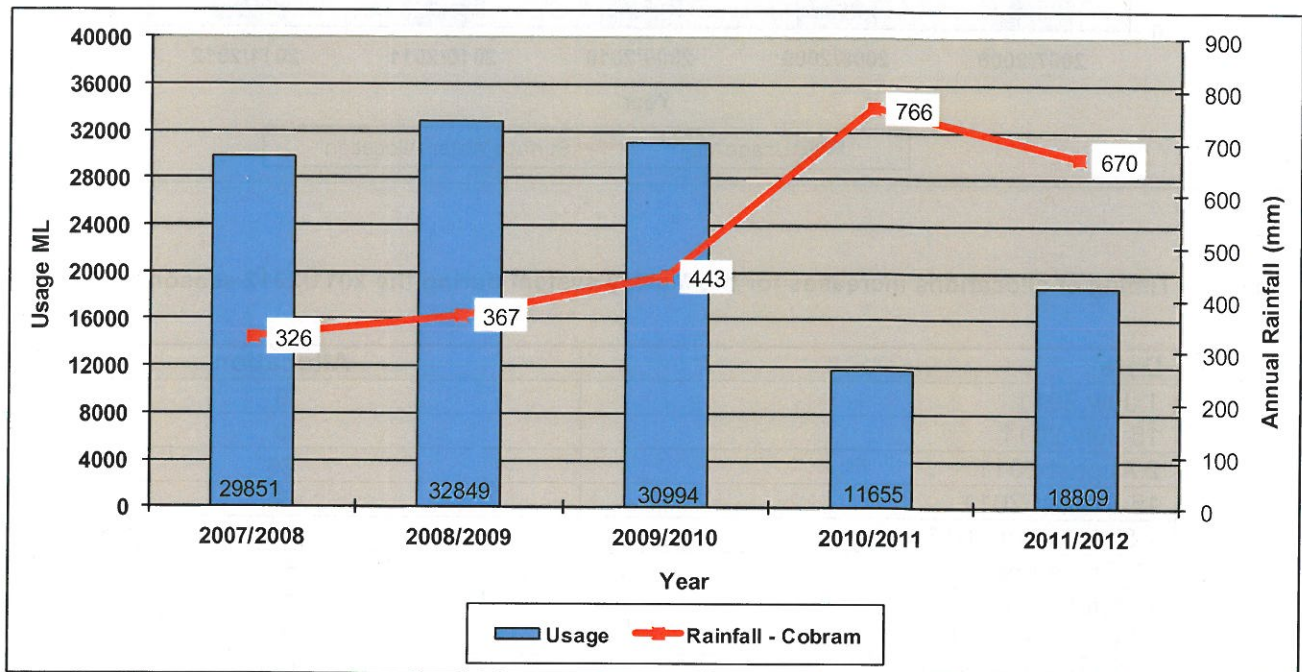


Table 2 - Rainfall distribution patterns for the last 3 irrigation seasons (July to June) recorded at Bureau of Meteorology station at the Cobram Goulburn-Murray Water Office (BOM site 080109).

Season	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
2009/2010	24.6	21.8	32.6	16.2	66.2	6.4	19.4	78.2	67	26.4	62.2	22
2010/2011	31.8	70.4	66.4	145	40.8	N/A	101.4	175.6	56.4	45	16.8	17.2
2011/2012	31.8	62.8	33	18.6	62.2	42.2	55	130.2	184.2	26.6	13.8	10

Figure 6 - Total metered groundwater usage for the Katunga WSPA compared with final surface water allocations for the Murray system.

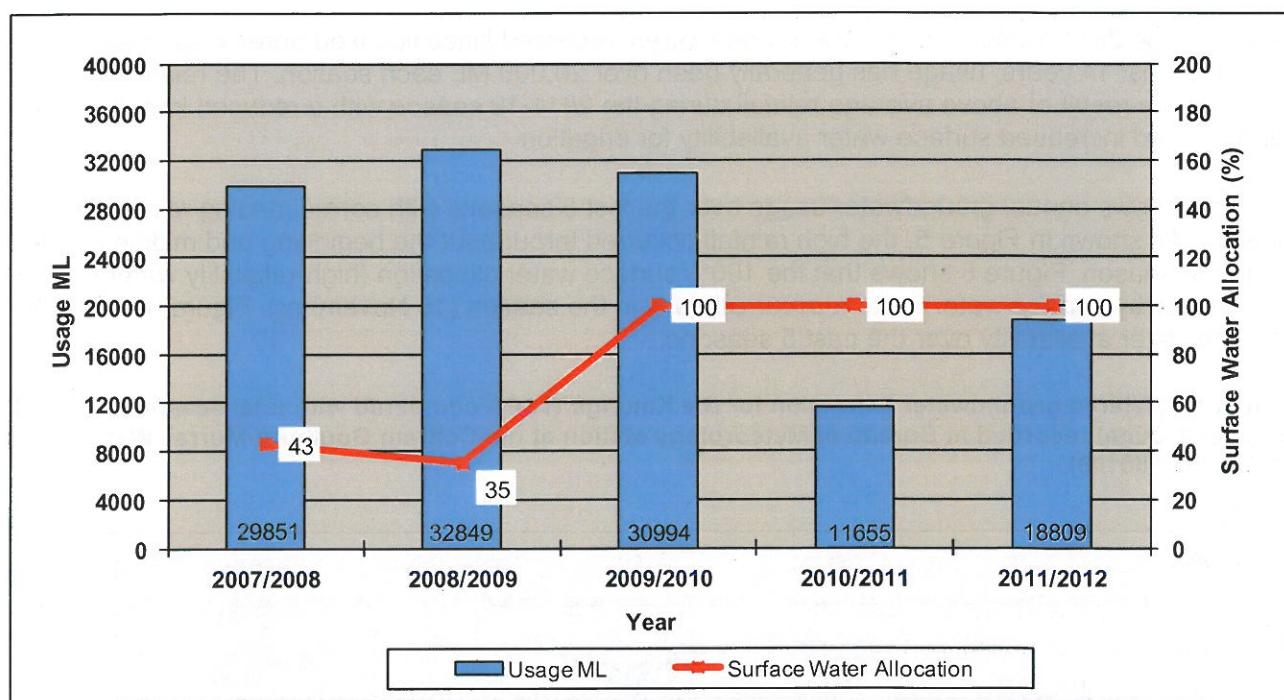


Table 3 – Timing of allocations increases for the Murray system during the 2011/2012 season

Date	Allocation
1 July 2011	0
15 July 2011	0
2 August 2011	35
15 August 2011	50
1 September 2011	61
15 September 2011	69
3 October 2011	71
17 October 2011	86
15 November 2011	100

3.2.3 Overuse and compliance

The establishment of a dedicated compliance unit within G-MW has led to a continued improvement in the management of compliance issues across the G-MW region.

Identification and in-field monitoring of potentially high use bores occurred throughout the season. In addition Goulburn-Murray Water has continued its communication to licence holder to maintain extractions within licence entitlement, and to outline the consequences of use in excess of entitlement. A summary of compliance activity for the Katunga WSPA is provided in Table 4.

Table 4 – Summary of Compliance Activity in the 2011/2012 season

Compliance Issue	Number of Cases Investigated	Number of Compliance Breaches	Action Taken
Use in excess of licence entitlement	6	6	Temporary trades were required in all cases.
Meter Interference	5	1	Warning letter issued
Unauthorised Use	15	4	Two warning letters issued, two under further investigation

3.3 Groundwater levels

Groundwater levels across the WSPA are regularly measured in a network of observation bores (see section 3.7 of this report). Hydrographs of water levels in key bores in the various zones are presented in Appendix 1 – Representative Hydrographs⁶. Bores presented in Appendix 1 can be located on the map of monitoring bores in Figure 9.

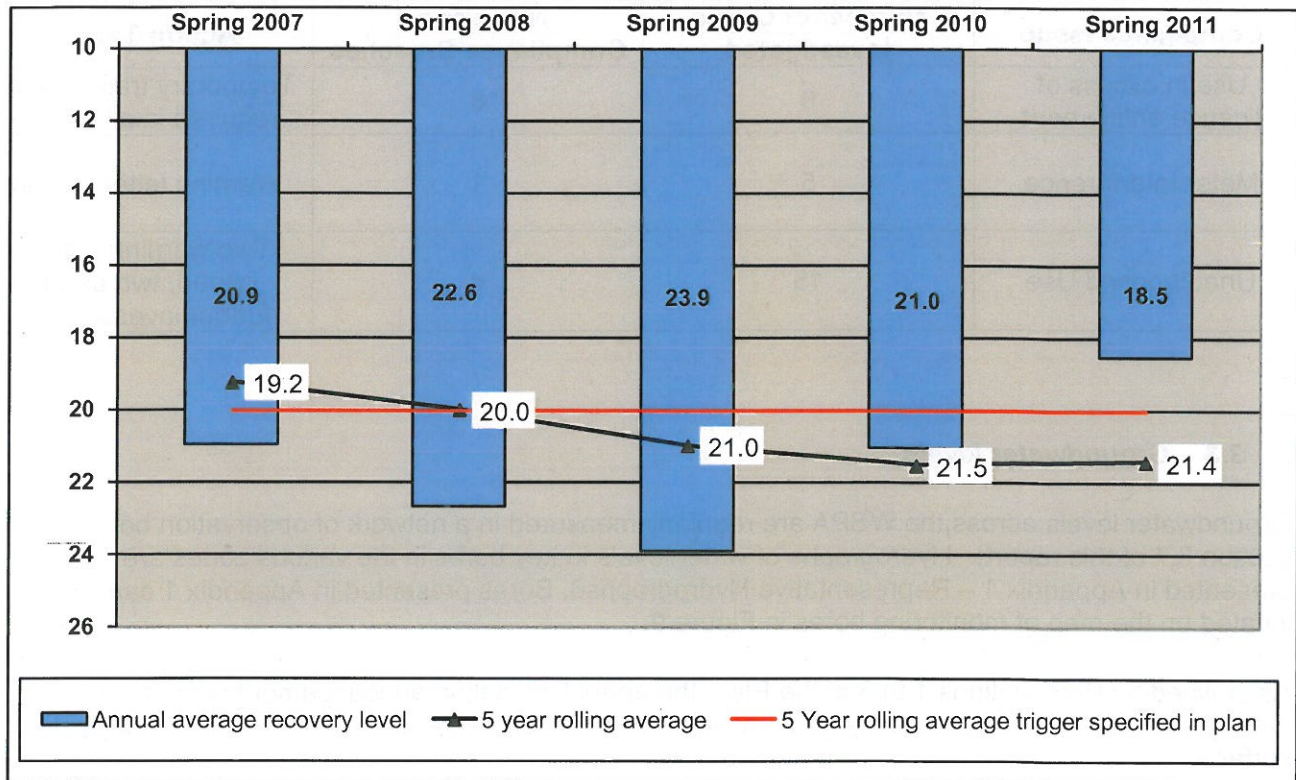
As outlined by Prescriptions 1 to 3 of the Plan, the annual allocation announcement aims to prevent the 5-year average spring recovery groundwater levels falling greater than 20 m below the natural surface.

Figure 7 shows that the 5-year rolling average annual groundwater recovery level (black line) and the annual recovery level for each of the last five seasons (purple column). Annual spring groundwater levels have continued to recover in the last two years, mainly due to the significantly lower volume of groundwater use. However, while the annual levels showed good recovery in 2010/11 and 2011/12, the 5-year average recovery level is still deeper than the target level of 20m below natural surface. This is because annual average groundwater levels were well below the 20m target in 2008 and 2009, which in turn effects the rolling average 5-year groundwater level.

Based on the inferred relationship between use and groundwater level referred to in the Plan, the 5 year average recovery level is approximately 5 metres lower than expected. Whilst this is not an immediate cause for concern, and while no groundwater access issues have been reported, it is an issue that has merited further consideration. The relationship between groundwater use and groundwater level recovery has been considered further detail in the 5 year review of the Plan referred to in Section 4 of this report.

⁶ In the hydrographs, the water levels in some shallow bores (screened at a depth less than 25 m) are presented. These bores are in the SIR WSPA and not the Katunga WSPA but are presented to show the contrasting response to pumping, of the shallow Shepparton formation with the deeper Shepparton formation aquifers and the Calivil/Renmark aquifer.

Figure 7 - Spring annual recovery levels compared with 5 year rolling average levels



3.4 Licence transfers⁷

3.4.1 Temporary trading

Allowing licences to be temporarily transferred allows individuals to flexibly manage businesses depending on individual needs and circumstances. Temporary trading is allowed providing the requirements of Prescription 7 of the Plan are met.

There were 11 groundwater temporary trades in the 2011/12 season for a total volume of 682 ML. This is higher than in 2010/11 (217 ML) but still significantly lower than the volume temporarily transferred during the 2009/10 season which totalled 2915.5 ML. Low levels of trade are also a reflection of the higher surface water availability and above average rainfall during the 2011/12 irrigation season.

3.4.2 Permanent trading

Permanent licence transfers enable new licences to be issued without establishing new entitlement. They are allowed provided they meet the requirements of Prescriptions 8 to 10 of the Plan. To reduce the total groundwater licence entitlement in the WSPA, a permanent off-property transfer of a licence is subject to adjustment of volumes on transfer whereby the individual licence entitlement is reduced by 20%. For example a licence issued for 100 ML/year is reduced to 80 ML/year when transferred.

The total volume of entitlement permanently traded during 2011/12 was very low (40 ML). A new groundwater licence was created within zone 1063 following this permanent transfer (see Figure 8).

⁷ Temporary and permanent trading data provided by Victorian Water Register

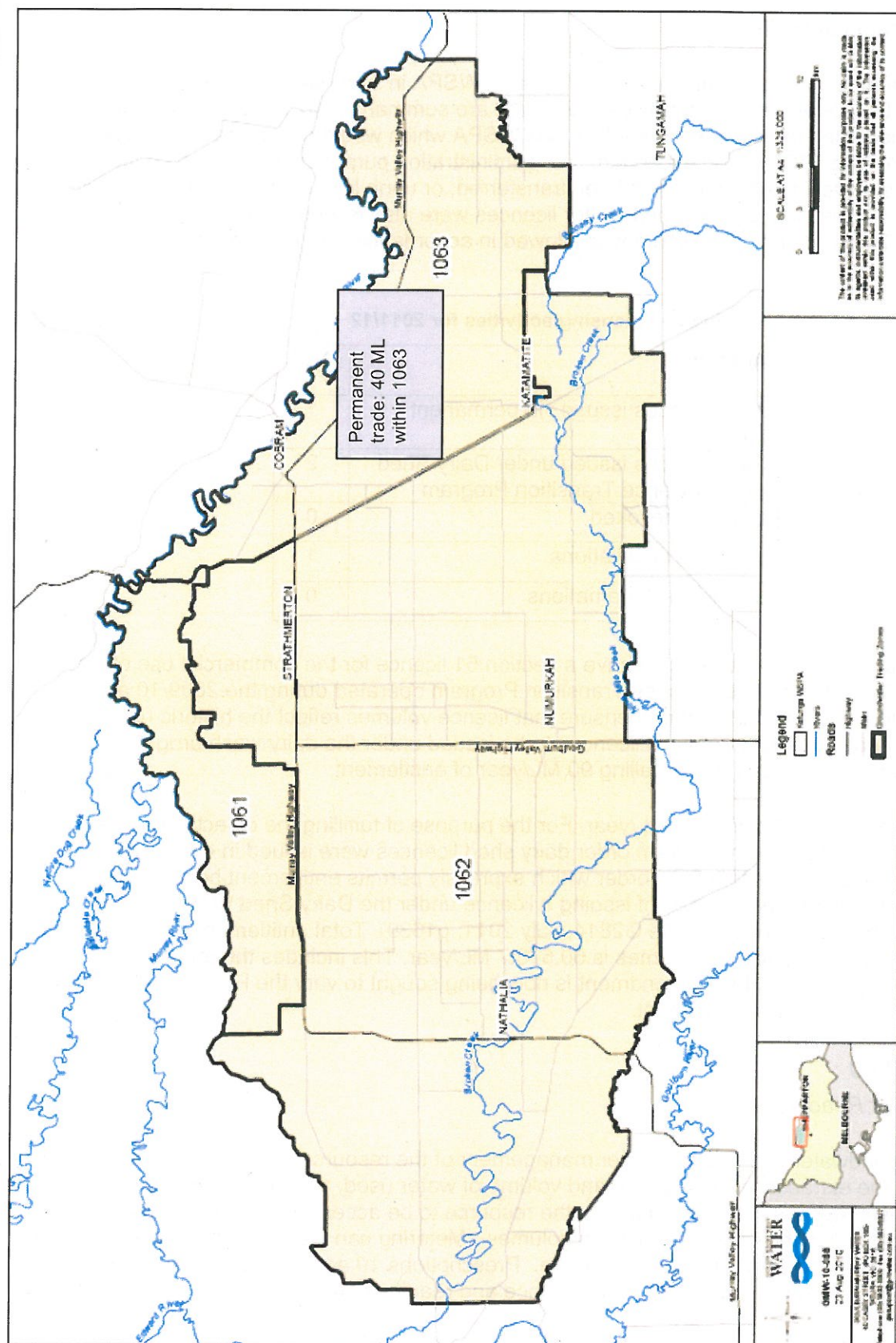


Figure 8 - The volume and number (in brackets) of permanent transfers within and between management zones.

3.5 Licensing activities

G-MW must manage licence entitlement in the Katunga WSPA in accordance with Prescriptions 11 to 18 of the Plan. Details of licensing activities in 2011/12 are summarised in Table 5. No new licence entitlement is permitted to be issued in the Katunga WSPA which would cause the Permissible Consumptive Volume (PCV) to be exceeded. For administration purposes however, new groundwater licences may be issued if entitlement has been transferred, or upon licence amalgamation or division. During the 2011/12 season, 2 new groundwater licences were also issued as part of the Dairy Shed Water Licence Transition Program which was allowed in accordance with Prescriptions 16 and 17 of the Plan.

Table 5 - Licensing activities for 2011/12

Activity	No.
New licences issued via permanent trade	1
New licences issued under Dairy Shed Water Licence Transition Program	2
Licences revoked	0
Licence cancellations	1
Licence amalgamations	0

All operating dairies are now required to have a section 51 licence for the commercial use of water in the dairy. The Dairy Shed Water Licence Transition Program operated during the 2009/10 and 2010/11 irrigation seasons and aimed to ensure that licence volumes reflect the historic use of water within dairies. Two out of the three final licences to be issued under the dairy wash programme were issued and/or amended in 2011/12, totalling 90 ML/year of entitlement.

The Plan stipulates a PCV of 59,780 ML/year. For the purpose of fulfilling the objectives of the Dairy Shed Water Licence Transition Program order dairy shed licences were issued in excess of PCV. This was made possible due to a PCV order which expressly permits entitlement being issued in excess of PCV if it is for the purposes of issuing a licence under the Dairy Shed Water Licence Transition Program (Vic. Govt. Gazette G2814, July 2011, p1639). Total entitlement volume including the 2011/2012 dairy shed licence volumes is 60,578.7 ML/year. This includes the remaining dairy shed licence application.⁸ A PCV amendment is now being sought to vary the PCV to include the additional dairy shed licence entitlement.

3.6 Metering

3.6.1 Meter Readings

Metering of groundwater use enables better management of the resource by providing vital information on the extraction point location and volume of water used, and comparing this to groundwater level responses. Metering allows the resource to be accessed equitably and ensures licensees extract within their annual allocation volumes. Metering can also provide benefits to farming operations and can lead to efficiency of water use. Prescriptions 19 and 25 set out the requirements under the Plan in relation to installation, maintenance and reading of meters.

⁸ The remaining dairy wash licence (51 ML/year) has since been issued

Under the requirements of the Plan, all existing irrigation and commercial use for groundwater licences that authorise the use of groundwater for 20 ML/year or more must be metered. In addition, all new licences are to be metered irrespective of the amount of groundwater licensed to be extracted.

Meters are read at least three times during the season, generally in November, March and May/June. Metered usage for each bore is calculated by subtracting the start meter reading from the end of season reading. All metered usage has been verified.

3.6.2 Data storage

For effective management of the groundwater resource, data management systems are required to allow the storage, retrieval, analysis and reporting of large quantities of data. Metering data is stored and maintained by G-MW using its Irrigation Planning Module database.

3.6.3 Meter installation and maintenance

The condition of meters was noted when readings were taken. One hundred meters required some form of maintenance (including minor repairs), one meter was replaced and thirty four new meters (mainly dairy shed licences) were installed during 2011/12.

Table 6 - Meter installation and maintenance activities 2009/10 – 2011/12

Activity	Total at 30 June 2010	Total at 30 June 2011	Total at 30 June 2012
Number of new meters installed	3	1	34
Meters requiring maintenance	6	12	100 ⁹
Meters replaced	1	8	1

3.7 Groundwater level monitoring

3.7.1 Monitoring sites

Monitoring of groundwater levels provides information to enable sustainable allocation and management of the resource. Observation bores provide vital information which allows G-MW to:

- assess annual and long term impacts on water levels from groundwater pumping;
- monitor regional and local seasonal drawdown;
- examine relationships between aquifers;
- provide information for future resource assessments; and
- assess potential or emerging management issues.

⁹ The reported number of meters requiring maintenance now includes all activity, such as battery replacement and other minor works (not previously reported). There has also been a significant uplift in maintenance activity in 2011/12 taking advantage of the low number of licence applications (information from G-W Diversions staff).

The Plan requires groundwater levels to be monitored in 52 State Observation Bores (specified in Schedule 2 and 3).

Goulburn-Murray Water coordinated the Department of Sustainability and Environment (DSE) funded State Observation Bore Network Refurbishment Program (SOBN), which was completed in 2011. Four new SOBN bores were drilled at two sites in the Katamatite and Katamatite East area. One of these sites includes three bores which screen at various depth intervals. This site will improve G-MW's knowledge of relationships between aquifers in the Katunga WSPA. These bores address recommendations of the plan (page 16) and have increased the understanding of the depth and location of the Murray Trench.

The locations of Schedule 2 and 3 monitoring bores and the newly drilled bores are shown in Figure 9.

3.7.2 Level readings

The monitoring of observation bores continued in 2011/12 according to the requirements of prescriptions 26 to 28 of the Plan.

The monitoring shows that groundwater levels (groundwater pressure heads) have declined steadily as the development of groundwater based irrigation increased from 1990 onwards. The monitoring bores also show a strong seasonal variation in response to pumping. Groundwater levels have recovered significantly during 2010/11 and 2011/12. This is as a result of the reduction in pumping caused by the significantly wetter than average conditions over these two years.

3.7.3 Data storage

As discussed in section 3.6.2 of this report, databases are required for the storage and retrieval of collected data to enable analysis and reporting. Groundwater level monitoring data is stored in the Groundwater Management System (GMS). This state-wide database is managed by the Department of Sustainability and Environment (DSE). Groundwater levels for all bores are entered into this database within 30 days of measurement so that the data can be accessed and interpreted.

3.7.4 Maintenance program

Bores are visually inspected during monitoring and any maintenance required is noted. During the reporting period, no long-term maintenance issues were identified. Maintenance such as painting the bores or clearing the site is undertaken by the sub-contractor as required. The hydrographs for each monitoring bore have been reviewed and no anomalies in data obtained during 2011/12 have been identified.

Katunga WSPA - Monitoring Bores

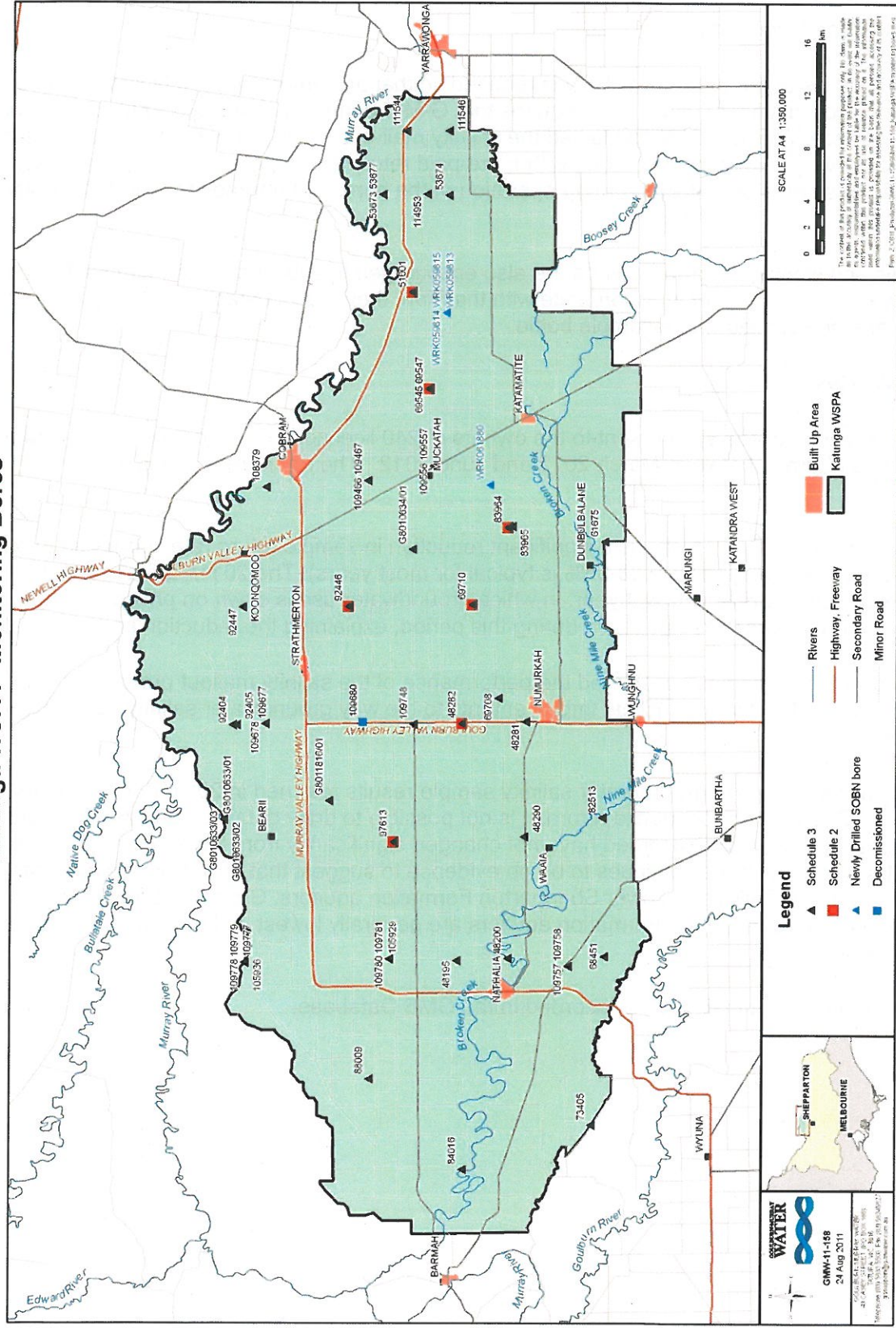


Figure 9 - Location of monitoring bores

3.8 Salinity monitoring

3.8.1 Monitoring program

Regular analysis of groundwater salinity is required so that any emerging salinity issues can be identified. Prescription 29 of the Plan requires that G-MW conducts a salinity sample mail-out to customers once a year. G-MW conducted the salinity mail-out in early March 2012. A sample bottle was sent to every licence holder, along with a pre-paid return envelope and a letter requesting that a groundwater sample be collected during operation of the bore, and returned to G-MW for salinity determination.

Domestic and stock groundwater users are also encouraged to submit a salinity sample from their groundwater bore, however in accordance with the Plan, they must contact G-MW to register their interest and be supplied with a sample bottle.

3.8.2 Results

Sample bottles and letters were sent to the owners of 240 licensed bores and a total of 44 samples (18%) were returned between March 2012 and June 2012. The return rate during the 2010/11 season was 16%.

Although similar to 2010/11, this is a significant reduction in sample return rate compared to previous year (a return rate ranging from 23-35% is typical for most years). The 2011/12 mailout was undertaken during a relatively wet year, in which groundwater use is down on previous years. It is likely that many bores were not in use during this period, explaining the reduction in sample return.

The review of the Plan has considered the performance of the salinity mailout program. It is likely that amendments to the Plan will include improvements to the way groundwater salinity information is collected.

The spatial distribution of groundwater salinity sample results returned in 2011/12 is presented in Figure 10. Due to the poor sample return, it is not possible to draw detailed conclusions about salinity in the area. Salinity values recorded have not changed significantly from those recorded in the 2010/11 season and there continues to be no evidence to suggest that salinity levels are changing significantly in the Calivil and Lower Shepparton Formation aquifers. Groundwater salinities within the Calivil and Lower Shepparton Formation aquifers are generally lowest in the central and eastern parts of the WSPA.

Results of the salinity mail-out are recorded in the GMS Database.

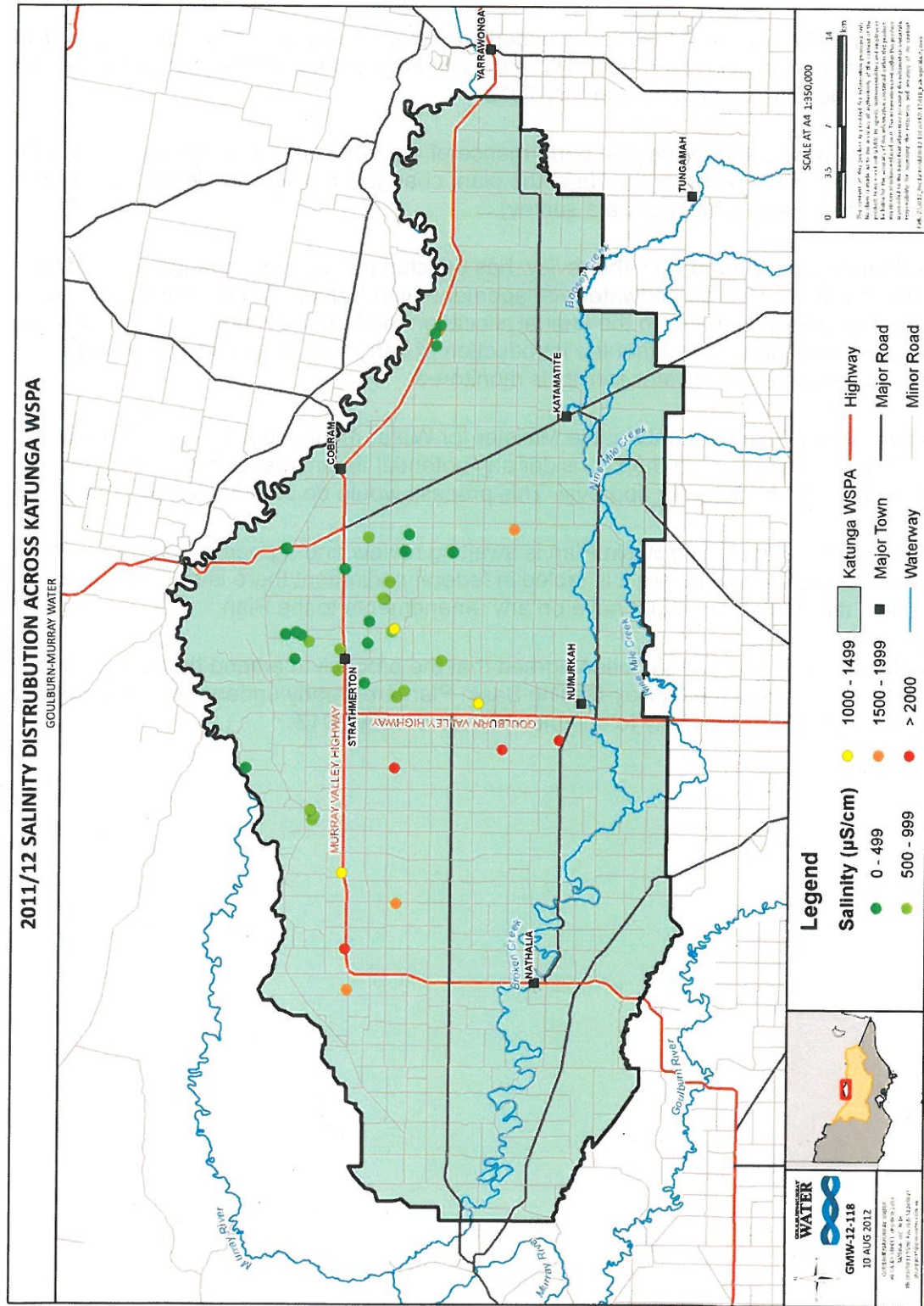


Figure 10 – Distribution and EC range of returned groundwater salinity samples from licensed bores in Katunga WSPA

4. Future considerations

4.1 *Katunga WSPA Groundwater Management Plan Review*

It is a requirement that a review of the Plan is undertaken every five years. Goulburn-Murray Water (G-MW) completed a review in November 2011 and its findings were endorsed by the Department of Sustainability and the Environment in February 2012.

The aim of the review was to consider the performance of the Plan since its approval in 2006, taking into account new data gathered over the life of the plan, changes in policy and legislation, and the views of groundwater users (obtained via a survey).

Although the Plan has performed well, the review has concluded that some changes should be considered that could improve groundwater management even further. The recommendations for changes to the Plan relate primarily to the annual allocation methodology, and to the current trading rules. In addition it is recommended that the introduction of carryover be considered, along with improvements to the way groundwater salinity is monitored.

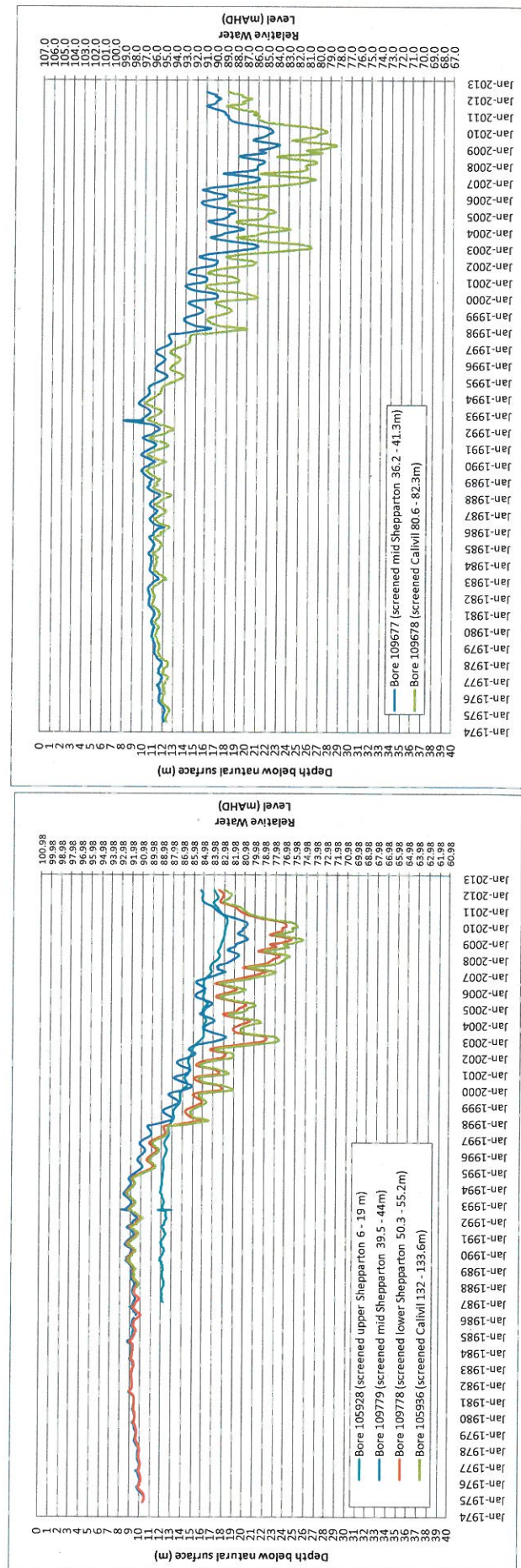
For any changes to the Plan to be made, the Minister for Water must appoint a Consultative Committee. This committee would then consider any potential amendments to the plan, and make recommendations to the Minister for approval. This process would be coordinated by G-MW.

Given that the draft Murray-Darling Basin Plan is awaiting review and agreement by the Commonwealth Water Minister before it is tabled in federal parliament there is still some uncertainty about what effect the Basin Plan might have on any amendments to the Plan.

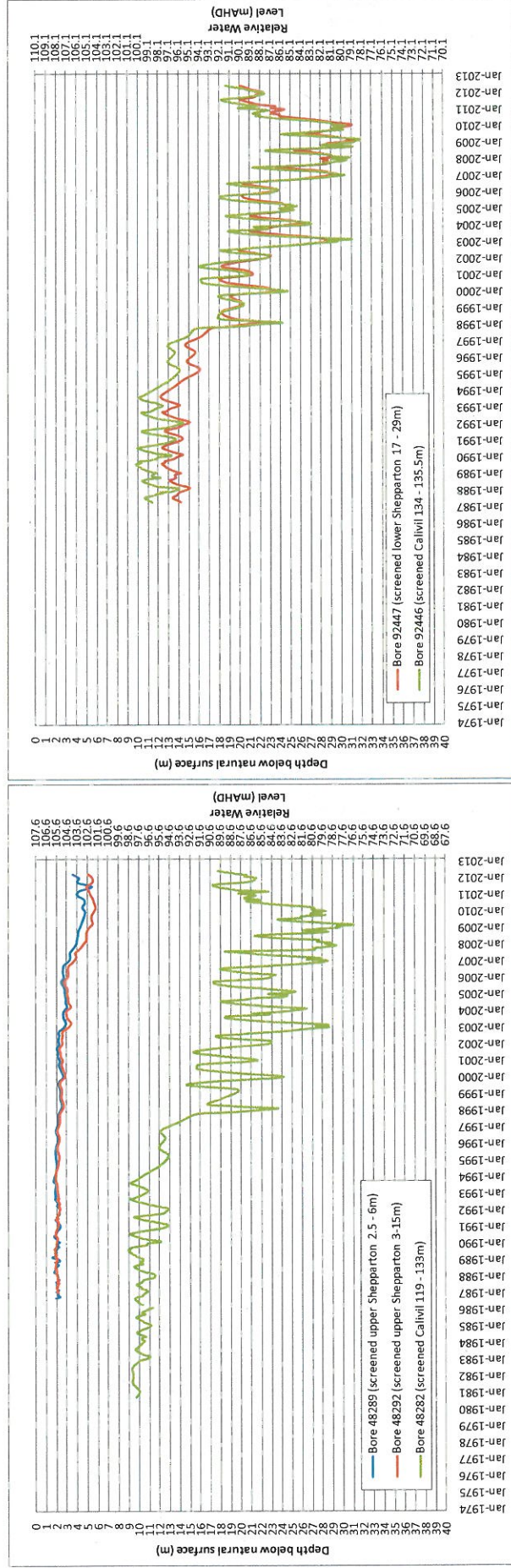
Acknowledging this uncertainty, it has been agreed that the process to amend the Plan should not commence until outcomes of the Murray-Darling Basin Plan are clearly understood. As a result, the process to amend the Plan is unlikely to commence before early 2013.

Appendix 1 – Representative Hydrographs

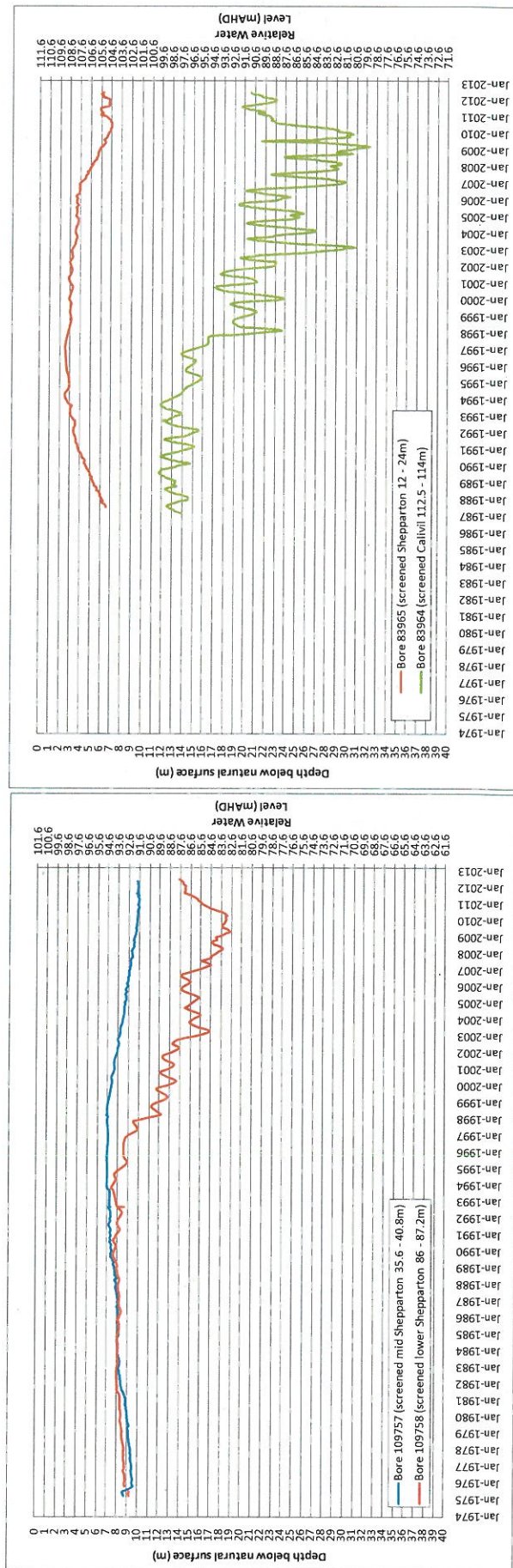
a) Zone 1061



b) Zone 1062



Zone 1062 cont...



c) Zone 1063

