



Upper Ovens River Water Supply Protection Area Water Management Plan

Annual report for period
11 January 2012 – 30 June 2012

Foreword

This is the first annual report for the Water Management Plan (the Plan) for the Upper Ovens River Water Supply Protection Area (WSPA), covering the period 11 January to 30 June 2012. The report summarises the Plan's performance over the 6 month period since its approval, including a review of groundwater and surface water use, licence transfers, groundwater levels, surface water flow as well as compliance and metering activity.

The Plan's water sharing arrangements formally commenced on the 1 July 2012. The time from the Plan's approval to this date allowed Goulburn-Murray Water adequate time to implement the prescriptions within the Plan. This annual report focuses on implementation of the Plan's prescriptions in preparation for the commencement of the water sharing arrangements described in the Plan.

The Plan aims to strike a balance between the competing needs for water in the WSPA and to ensure that the environmental, social and economic benefits which the water resources provide are not only maintained, but also enhanced.

The continued wet conditions over the last 12 months has resulted in low demand for both groundwater and surface water, and has resulted in higher than the long term average flows within the Ovens River and its tributaries. Groundwater levels have also remained steady due to the favourable recharge conditions and reduced demand.

This annual report will be submitted to the Minister for Water and a notice of report availability will also be published in the Myrtleford Times. A copy of this report will be available for inspection at Goulburn-Murray Water's Tatura and Wangaratta offices, online at www.g-mwater.com.au, or upon request.

I encourage all groundwater users in the Upper Ovens River WSPA to take the time to read this report.

Signed:



Gavin Hanlon
MANAGING DIRECTOR

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1 Description of the Upper Ovens Water Supply Protection Area

1.1 Boundary

The Upper Ovens River Water Supply Protection Area (WSPA) covers an area of approximately 1,580 km² of the catchment of the Upper Ovens River upstream of its confluence with the Buffalo River near Myrtleford in north east Victoria as shown in Figure 1. The Upper Ovens Water Supply Protection Area was declared on the 2 October 2008 under section 27(1) of the *Water Act 1989* (the Act).

1.2 Geology

The regional geology in the Upper Ovens River catchment is dominated by marine sedimentary rock (Pinnak Sandstone) that was formed in the Ordovician period 500 million years ago. Approximately 100 million years later (Devonian period) volcanic activity saw several mountains push through the sedimentary rock. Weathering (alluvial processes) has eroded the sedimentary rock, creating deep, narrow sided valleys. The softer tops of the volcanos have also eroded leaving the hard granites that exist today (e.g. Mount Buffalo). The eroded materials (unconsolidated alluvial and colluvial sediments) have been deposited into the valleys.

1.3 Hydrology

The Upper Ovens River is an unregulated river without a large dam to regulate its flows. It provides important unregulated stream flows to the environmentally valued and heritage listed Lower Ovens River and the River Murray. From its junction with the Buffalo River it extends upstream for approximately 70 km in a south easterly direction. In its most upper reaches, above Harrietville, the Upper Ovens River comprises two fast flowing mountain streams, the east and west branches. The major tributaries of the river include Barwidgee Creek, Buckland River, Buffalo Creek, Happy Valley Creek, Morses Creek, Roberts Creek, Myrtle Creek, Two Mile Creek, Eurobin Creek and Snowy Creek.

1.4 Groundwater and Surface water processes

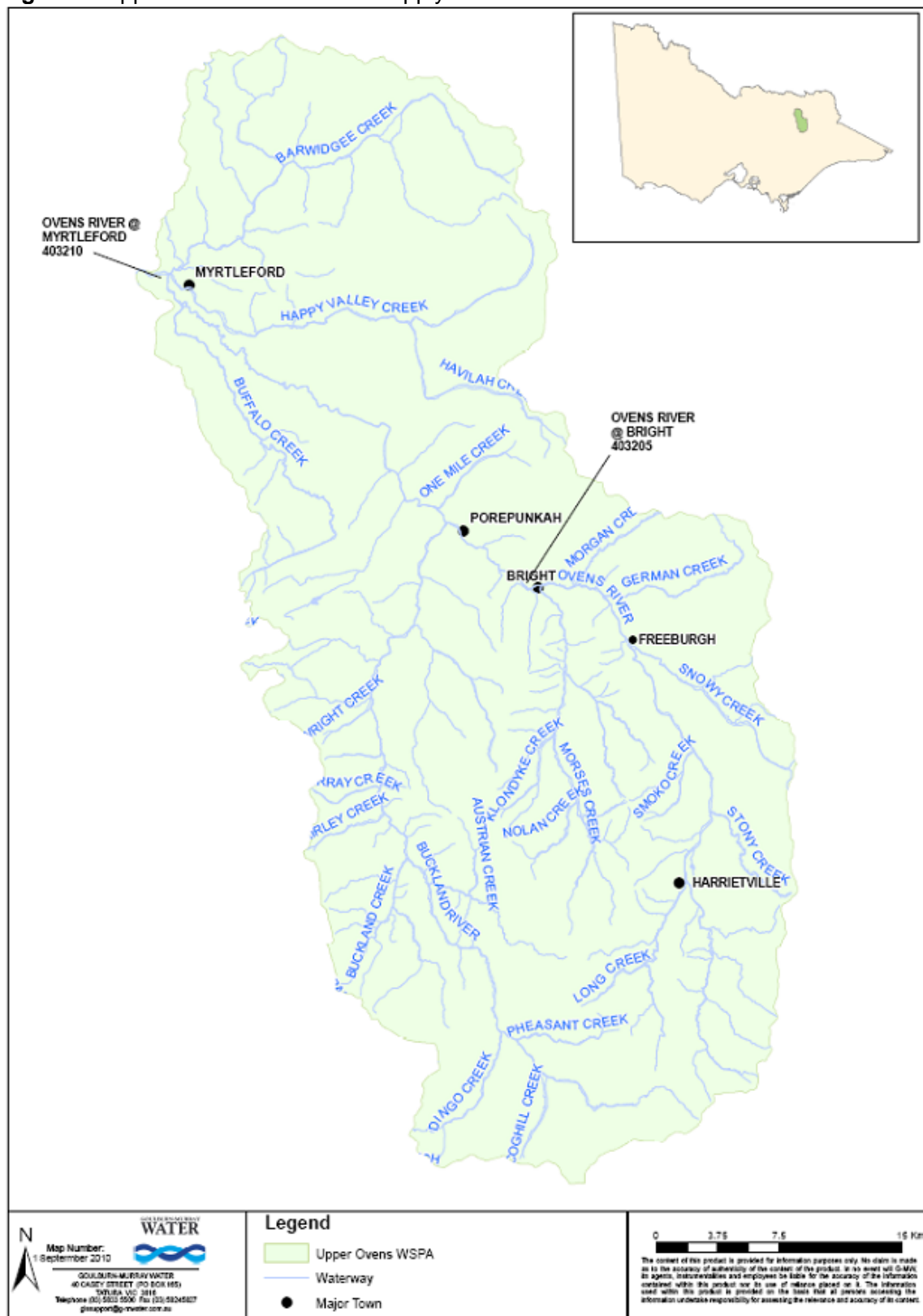
Groundwater levels loosely follow topographic contours and groundwater flows follow these gradients with groundwater flowing from the higher parts of the catchment to the lower parts all influenced by rainfall. Fractured rock aquifers comprise the largest groundwater flow systems in the catchment however relatively little is known about groundwater movement and behaviour. It has been estimated that over 27,000 ML/yr of groundwater flows from the fractured rock aquifers into the unconsolidated sedimentary aquifer both directly and via the colluvial deposits.

The unconsolidated sedimentary aquifer is hydraulically connected to the Ovens River via a continuous saturated zone and studies have shown a strong hydraulic connection between the Ovens River and that aquifer. The Ovens River will gain or lose water from or to groundwater depending on the gradient between the water table (groundwater level) and the height of water in the river.

1.5 Land use

The primary land use in the area is agriculture followed by plantation forestry. Grazing and dryland farming predominate. However, there is significant irrigation development along the floodplain of the Upper Ovens River and its major tributaries. Both surface water and groundwater are used for irrigation of horticulture including nuts, berries, wine grapes, hops and apples.

Figure 1. Upper Ovens River Water Supply Protection Area



2 Purpose of the Water Management Plan

In 2004, the Upper Ovens River was identified as a priority unregulated river, requiring the development of a Stream Flow Management Plan. Further work has since been conducted that has demonstrated high connectivity between groundwater and surface water. Consequently, the *Northern Region Sustainable Water Strategy 2009* endorsed the development of an integrated water management plan for the Upper Ovens River catchment, the first plan of its kind in Victoria. The Upper Ovens WSPA Water Management Plan (the Plan) was approved by the Minister for Water on 11 January 2012. The Plan is scheduled for review every five years, with the first review due in 2016/17.

The overall objective of the Plan, as set out in section 32A of the Act, is to make sure that the water resources of the WSPA are managed in an equitable manner and to ensure the long-term sustainability of those resources.

Specific objectives of the Plan are to:

- facilitate the integrated management of the surface water and groundwater resources of the WSPA;
- provide for essential water use, comprising domestic and stock, environmental, and human needs;
- manage the impact of groundwater extraction on stream flows and of stream extraction on groundwater levels, particularly during low-flow periods;
- maximise opportunities for all water users to adapt their operations so as to maintain or improve productive outcomes;
- provide enhanced opportunities for licensed water entitlements to be utilised for the most productive and environmentally beneficial uses;
- provide for the protection and improvement of water dependent ecosystems within the WSPA;
- prevent the occurrence of extraction-induced (i.e. unnatural) cease-to-flow events in the Upper Ovens River and its tributaries;
- maintain and protect sufficient natural variability of the flow regime to provide for the beneficial uses and environmental values of water resources within the WSPA and downstream;
- recognise and provide for non-consumptive beneficial uses of the river system (e.g. social, community, recreation, tourism);
- achieve community understanding of groundwater and surface water management issues through effective communication, consultation and engagement; and,
- develop measures of the effectiveness of the management plan against these objectives.

3 Plan implementation

Implementation of the Plan began immediately after approval from the Minister for Water.

Implementation of the Plan has required:

- advising all licence holders of new management zones;
- updating the administrative system (i.e. Water Register) with new groundwater and surface water transfer rules; and,
- meter selection surveys for metering of groundwater users with licences volumes from 10 to 19 ML/yr.

Further implementation requirements to meet the prescriptions within the Plan are addressed in Appendix 1.

3.1 Management Zones

The Management Plan establishes two management zones, which are based on interaction between groundwater and surface water in the catchment. Each management zone is based on the level of risk that groundwater extractions may reduce flows in the Ovens River and its tributaries during low flow periods.

As part of the implementation of the Plan, licensed groundwater bores were subject to a technical assessment and assigned to one of the management zones. As shown in Table 1, 108 licences within the WSPA were assessed; 82 licences were defined as accessing the unconsolidated alluvial aquifer (Zone 1), and 26 were defined as accessing the bedrock aquifer (Zone 2). The technical identification of the bores was completed using bore construction reports, the State Groundwater Management System (GMS) database and spatial geological layers which show approximate depth of the unconsolidated sedimentary aquifer within the WSPA.

Table 1. Groundwater and surface water licences in each management zone

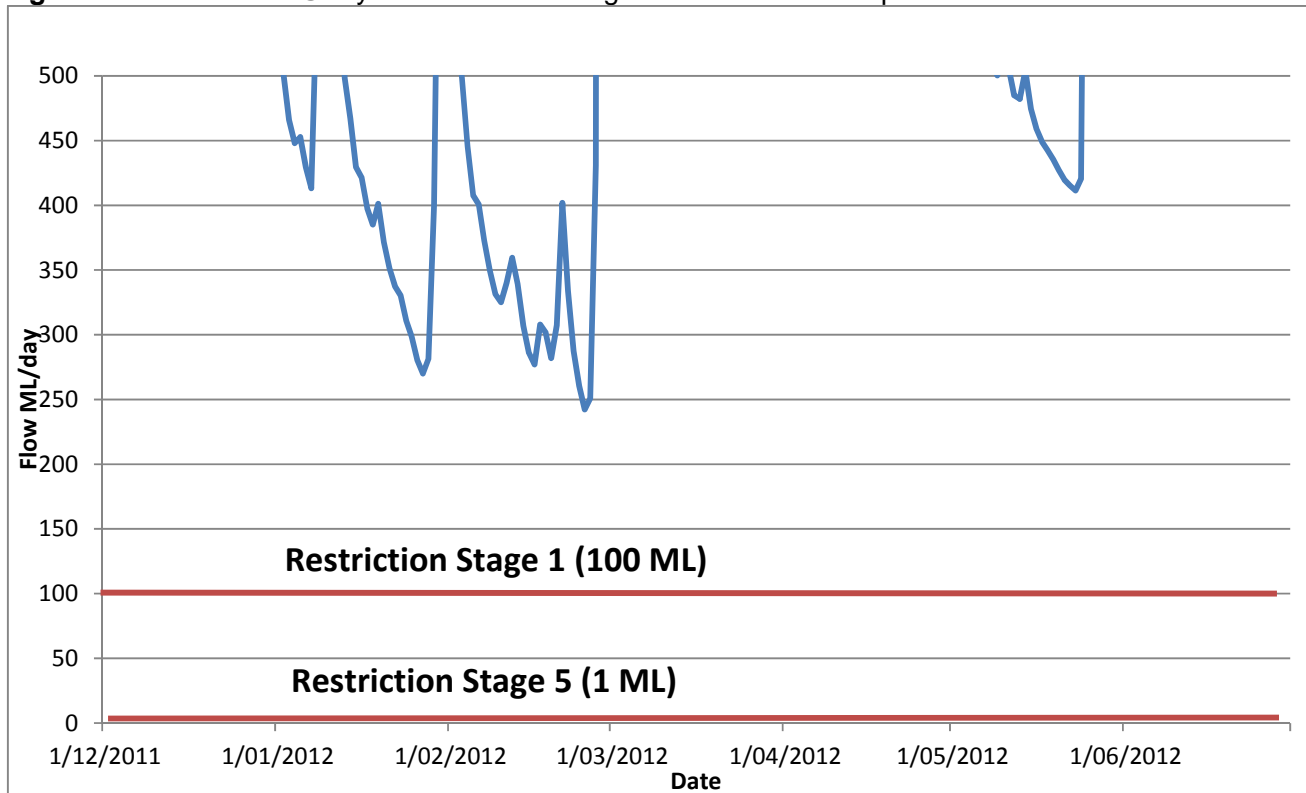
Management Zone	No. Licences	Volume ML/yr
Zone 1 Surface Water (181)	552	10,747
Zone 1 Groundwater (1085)	82 ¹	2,844
Zone 2 Groundwater (1086)	26	799
Total	660	14,390

3.2 Restrictions on Taking Water

The water sharing regime prescribed by the Plan will commence on 1 July 2012, the first financial year following approval of the Plan. The water sharing regime comprises five stages of restriction in which a share of entitlement available for use is reduced with each stage. The water sharing regime applies to all-year licence holders in Management Zone 1 who normally take water during summer months. The regime is activated when flows in the Ovens River at Myrtleford falls below specified trigger levels.

Had the Plan been fully implemented for 2011/12, the water sharing regime would not have taken effect within the Upper Ovens River as flows remained above the Stage 1 trigger. Figure 2 shows the flows in the Ovens River at Myrtleford during the 2011/12 summer period not falling below 200 ML/day.

¹ Two licensed bores are currently undergoing further assessment as a review of G-MW's decision was requested.

Figure 2. Ovens River @ Myrtleford flows during 2011/2012 summer period.

3.3 Usage

3.3.1 Groundwater usage

The majority of licensed bores in the WSPA are metered, with only licences having entitlement of 19 ML/yr or less not currently metered as per State policy. As part of the Plan's implementation, licensed groundwater users with a licence above 10 ML will be metered. Meter selection surveys have been completed for these licensed users and meters will be installed upon finalisation of funding with the Department of Sustainability and Environment.

The metered groundwater usage for the 2011/12 season was 308.1 ML (Table 2).

Table 2. Groundwater usage in 2011/12 compared to the previous two years

Parameter	2009/10	2010/11	2011/12
Number of groundwater licences ²	93	106	108
Total licence entitlement volume	3,314.8 ML	3,730.0 ML	3,643.0 ML
Number of metered bores	~	44	55
Total metered volume used	410.5 ML	172.6 ML	308.1 ML
Total metered usage as a percentage of total licence entitlement volume	12%	5%	8%
<i>Total usage</i>	<i>410.5 ML</i>	<i>172.6 ML</i>	<i>308.1 ML</i>

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

3.3.2 Surface water usage

The majority of licensed surface water users in the WSPA are metered, with only licences having entitlement of 9 ML/yr or less not being metered as per State policy. The metered usage for the 2011/12 season was 864 ML (Table 3).

Table 3. Surface water usage in 2011/12 compared to the previous year

Parameter	2010/11	2011/12
Number of surface water licences ³	552	551
Total licence entitlement volume	10,815 ML	10,747 ⁴ ML
Number of metered service points	187	55
Total metered volume used	632.0 ML	864.0 ML
Total metered usage as a percentage of total licence entitlement volume	6%	8%
<i>Total usage</i>	<i>632.0 ML</i>	<i>864.0 ML</i>

3.3.3 Total water usage for both groundwater and surface water

The total of metered usage within the WSPA including both groundwater and surface water licence is 1,172.1 ML (Table 4).

Table 4. Total water usage in 2011/12 compared to the previous year

Parameter	2010/11	2011/12
Upper Ovens ground water	172.6 ML	308.1 ML
Upper Ovens surface water	632.0 ML	864.0 ML
<i>Total water usage</i>	<i>804.6 ML</i>	<i>1,172.1 ML</i>

3.3.4 Factors affecting usage

Groundwater and surface water usage in the 2011/12 season was the second lowest recorded since annual meter reading began in 2008/09. The relatively low usage is the result of above average rainfall during the 2011/12 season, which reduced irrigation demand. Table 5 shows rainfall distribution during the 2011/12 season, with heavy rainfall recorded in January and February 2012. The average annual rainfall at Eurobin is 1,149 mm/year.

Table 5. Rainfall distribution patterns for the last four irrigation seasons (July to June) recorded at Bureau of Meteorology station at Eurobin (BOM site 083010).

Season	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
2008/09	198.0	127.6	49.0	12.4	140.2	85.0	42.6	10.4	29.4	88.6	39.2	119.0	941.4
2009/10	152.4	99.2	128.8	82.4	111.6	29.0	73.2	119.8	121.8	70.6	51.8	94.6	1,135.2
2010/11	92.2	190.8	106.6	202.2	142.8	172.6	116.2	311.2	94.4	69.4	63.2	89.0	1,650.6
2011/12	130.6	106.4	99.4	47.2	153.8	36.6	79.6	120.8	196.8	44.4	82.8	68.8	1,167.2

Figure 3 shows annual metered groundwater usage over the last four seasons with corresponding annual rainfall for each season. As shown in Figure 4, the high rainfall in 2011/12 occurred throughout the beginning and middle of the irrigation season.

³ Sole private rights and Domestic & Stock use is not included in this number

⁴ Reduction of entitlement due to permanent trade

Figure 3. Metered seasonal groundwater usage for the Upper Owens River WSPA compared with total season rainfall (1 July to 30 June) recorded at Bureau of Meteorology station at Eurobin (BOM site 083010)

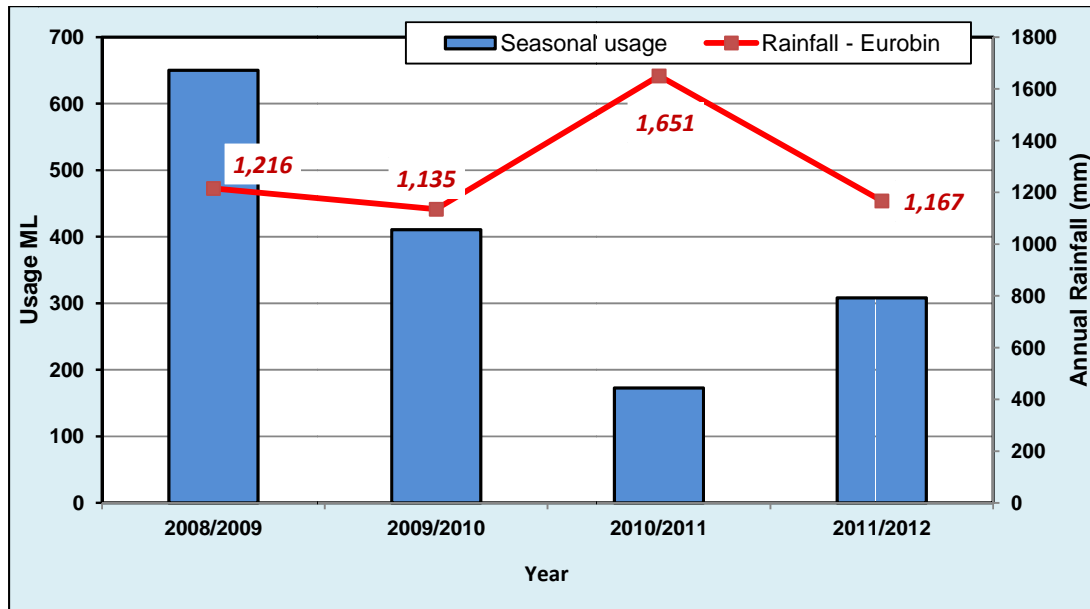
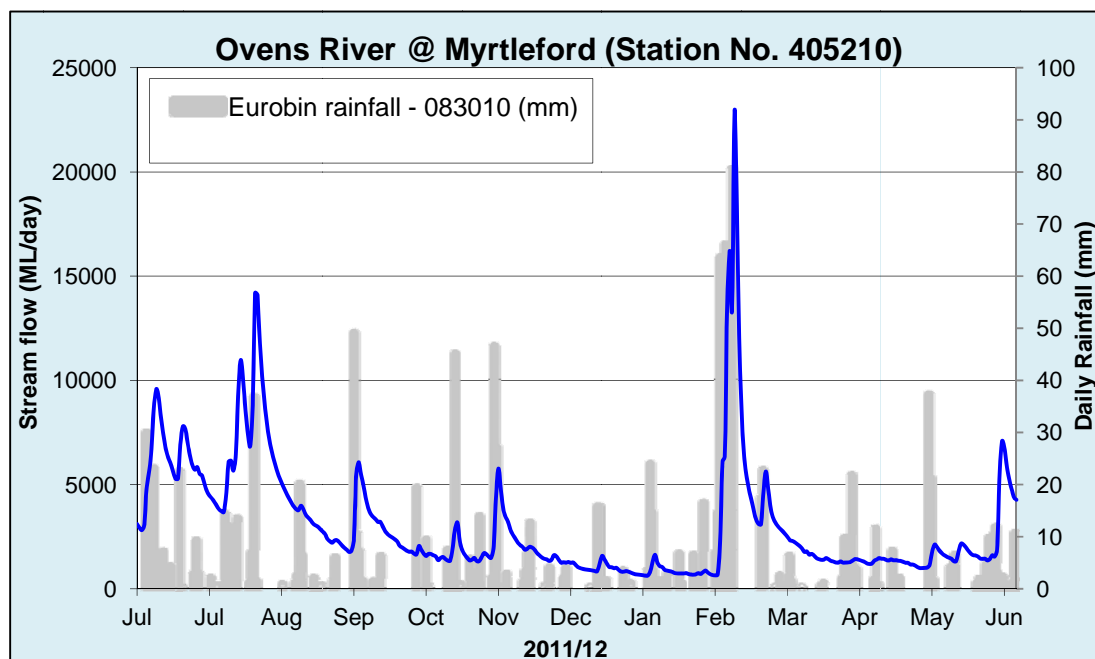


Figure 4. Daily stream flow of the Owens River at Myrtleford (stream gauge site 083010) compared with daily rainfall (1 July 2011 to 30 June 2012) recorded at Bureau of Meteorology station at Eurobin (BOM site 083010).



3.3.5 Licence Compliance

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

No compliance issues relating to use in excess of licence entitlement were reported with the Upper Ovens WSPA.

3.4 Groundwater levels

Groundwater levels across the WSPA are regularly measured in a network of observation bores. Hydrographs of water levels in key bores in the various zones are presented in *Appendix 2*.

Representative Groundwater Hydrographs. Bores presented in Appendix 2 can be located on the map of monitoring bores in Figure 5.

3.5 Licences issued, converted and transferred

3.5.1 Temporary transfers

Allowing licences to be temporarily transferred allows individuals to more flexibly manage businesses depending on individual needs and circumstances. Temporary transfers are allowed providing that requirements of Prescriptions 27 to 34 of the Plan are met.

There were three groundwater temporary trades in the 2011/12 season for a total volume of 70 ML.

3.5.2 Permanent trading

Permanent licence transfers enable new licences to be issued without establishing new entitlement. Permanent transfers are allowed provided requirements of Prescriptions 27 to 34 of the Plan are met.

The total volume of entitlement permanently transferred during 2011/12 was 68 ML (one transfer). This permanent transfer was the first surface water licence (in Management Zone 1) to be transferred and be reissued as a groundwater licence (in Management Zone 2) under Prescription 29 of the Plan.

3.5.3 Licensing activities

Licensing activities undertaken in 2011/12 are summarised in Table 6.

Table 6. Groundwater licensing activity summary for 2011/12

Licensing activity	No.
New licences issued	4 ⁵
Licences renewed	3
Licences revoked	0
Licences cancelled	0
Licences amalgamated	0

⁵ New licences issued due to transfers

3.6 Implementation of the metering program

3.6.1 Meter Readings

The collection, storage and analysis of water usage data is an important part of improving water resource management.

Within five years of the Plan being approved, G-MW must ensure that a meter is fitted to all operational works that are used to take water (other than a registration licence) and are authorised to extract 10 ML/yr or more of groundwater. The implementation of this metering program has not yet begun.

Meters are required to be read at frequencies necessary to ensure compliance with licence entitlements, and also to maintain operational and planning requirements of the Plan. Prescription 44 of the Plan states that G-MW must undertake two meter readings each year and at other times as it sees fit.

3.6.2 Meter installation and maintenance

The condition of meters is noted when readings are taken in January and June of each year. Some form of maintenance (including minor repairs) was required at 22 meters in 2011/12. Four meters were replaced, and 17 new meters were installed during 2011/12 season (Table 6).

Table 6. Meter installation and maintenance activities 2010/11 – 2011/12

Activity	Total at 30 June 2011	Total at 30 June 2012
Number of new meters installed	0	17
Meters requiring maintenance	6	22
Meters replaced	1	4

3.7 Groundwater and surface water monitoring

3.7.1 Monitoring sites

Monitoring of groundwater levels and surface water flows provides information to enable sustainable allocation and management of the resource. Monitoring provides 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 and surface water;
- monitor stream flows on tributaries and the main stem;
- provide information for future resource assessments; and,
- assess potential or emerging management issues.

The Plan requires groundwater levels to be monitored across the WSPA and identifies five State Observation Bores which give a good representation of the groundwater and surface water interactions throughout the WSPA.

The Plan requires surface water monitoring of both the Owens River and its tributaries from gauging stations across the WSPA. It identifies the Owens River @ Myrtleford (Station No. 403210) as the key gauging station to which restrictions level triggers are related.

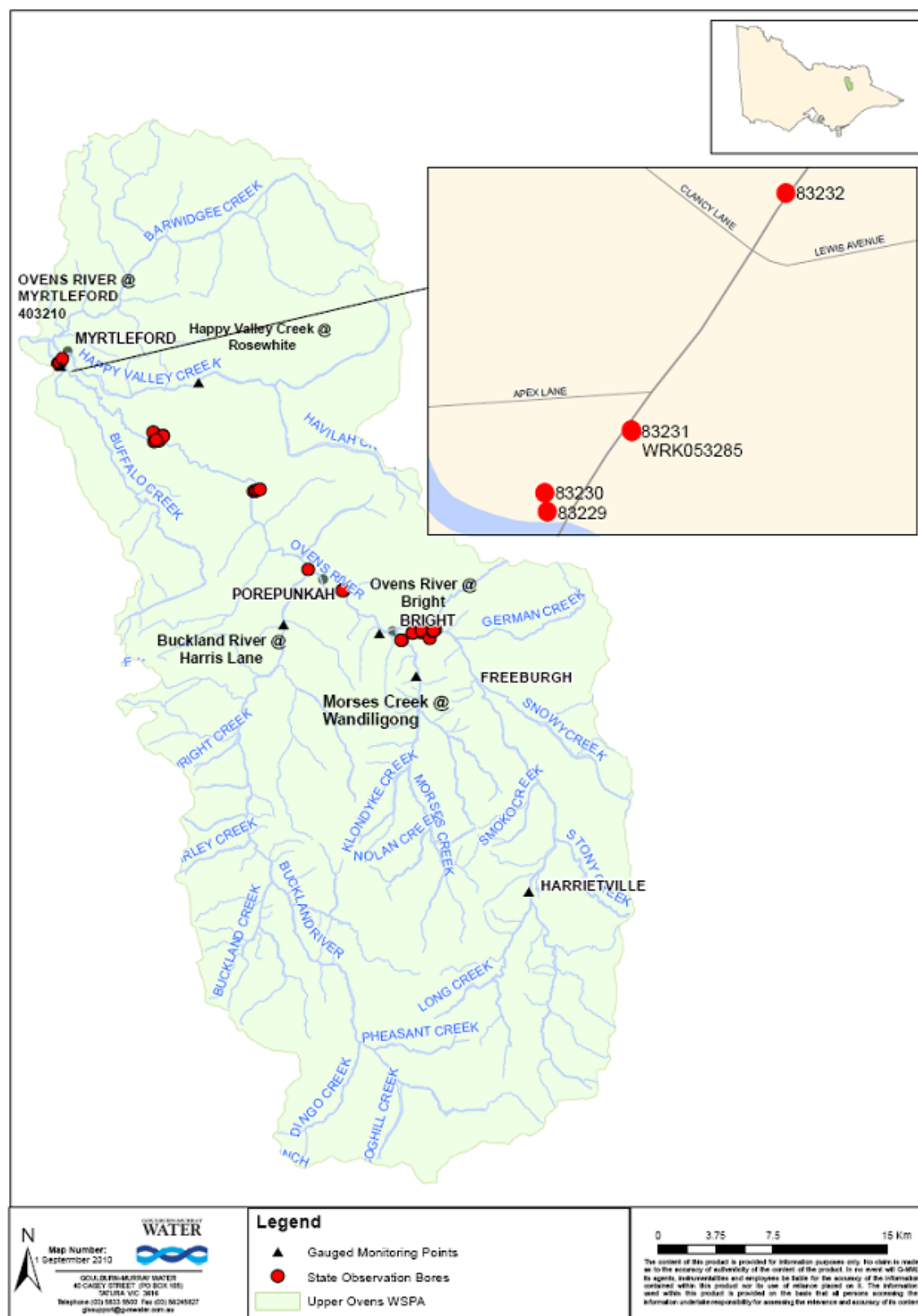
The locations of the monitoring bores and surface water gauges are shown in Figure 5.

3.7.2 Level readings

The monitoring data shows that groundwater levels (groundwater pressure heads) demonstrate strong seasonal variation in response to climate. Groundwater levels (Appendix 2) were at their highest between August and September 2011 and their lowest around April 2012. This trend was similar in both the unconsolidated sedimentary aquifer and fractured bedrock aquifers. The data does not show discernable impacts on groundwater levels due to licensed groundwater pumping.

The surface water data taken from the Owens River @ Myrtleford gauge (Appendix 3) show that flows were generally consistent with low summer flow and high winter flow patterns. However, flows were highly responsive to high rainfall periods, with a particularly high rainfall event in early February producing river flows upward of 20,000 ML/day.

Figure 5. Location of monitoring bores



Appendix 1. Plan Implementation Compliance Summary**Management Zones**

Plan Requirement	Activity	Complies
1. Prescriptions that apply to the taking of groundwater in Management Zone 1 apply to the taking of groundwater from all bores in the Protection Area unless the bore is only capable of extracting groundwater from the fractured rock aquifer.	All groundwater licences have been identified as either being located in Management Zone 1 or 2. Two licences are currently under review in responses to requests from licence holders.	Yes

Prescriptions on Taking water in Management Zone 1

Plan Prescription Number/ Requirement	Activity	Complies
2-11. Management of restrictions for Management Zone 1. Prescription to begin from 1 July 2012.	Restrictions in accordance with the Plan will begin from 1 July 2012	Yes

Restrictions and prohibitions on issuing take and use licences

Plan Prescription Number/ Requirement	Activity	Complies
18 to 25	One new licence was created due to a permanent transfer from Zone 1 to Zone in accordance with the Plan. No licences were surrendered.	Yes

Transfers between Management Zone 1 and 2

Plan Prescription Number/ Requirement	Activity	Complies
29. The Corporation may approve an application for the transfer of a licence from Management Zone 1 to Management Zone 2 without any change to the licence volume of the licence being transferred.	One permanent transfer was completed within plan prescriptions. Transfer was from a surface water licence (Management Zone 1) to a groundwater licence (in Management Zone 2).	Yes
30. The Corporation must refuse an application for the transfer of a licence from Management Zone 2 to Management Zone 1 unless the transfer results in the issue of a winter-take licence.		

Meter Installation

Plan Prescription Number/ Requirement	Activity	Complies
43. Within five years from the time the Plan is approved, the Corporation must ensure that a meter is fitted to every operational works used to take water under a surface water or a groundwater licence, other than a registration licence, that authorises the extraction of 10 ML/yr or more.	Site inspections have been undertaken for groundwater licence holders above 10 ML but less than 20ML for the purposes of meter installation. A site appraisal has been completed based on active use and identifies the meter type needed.	Yes

Meter Reading and Account for Use

Plan Prescription Number/ Requirement	Activity	Complies
44. The Corporation must - (a) read each meter at least twice every year; and (b) determine the volume of water taken each year under the relevant licence.	All meters for both groundwater and surface water were read twice during the 2011/2012 season. Meter reads were completed in January and June 2012.	Yes
45. If for any reason the Corporation is unable to determine the volume of water by means of a meter it must estimate the volume of water taken.		Yes
46. If water is taken under a licence for irrigation use and is not metered, the Corporation must - a. prior to the commencement of each irrigation season determine the area to be irrigated for that season; b. inspect each place at which water is taken as frequently as it inspects meters; and c. estimate the volume of water taken each year.		Yes
47. The Corporation must, within 30 days after a meter is read		Yes

or an estimate of the amount of water taken is made, record the amount of water taken in a database		
48. If the Corporation requests the Licensee to read a meter or to estimate the amount of water used, the Licensee must comply with the request.		Yes

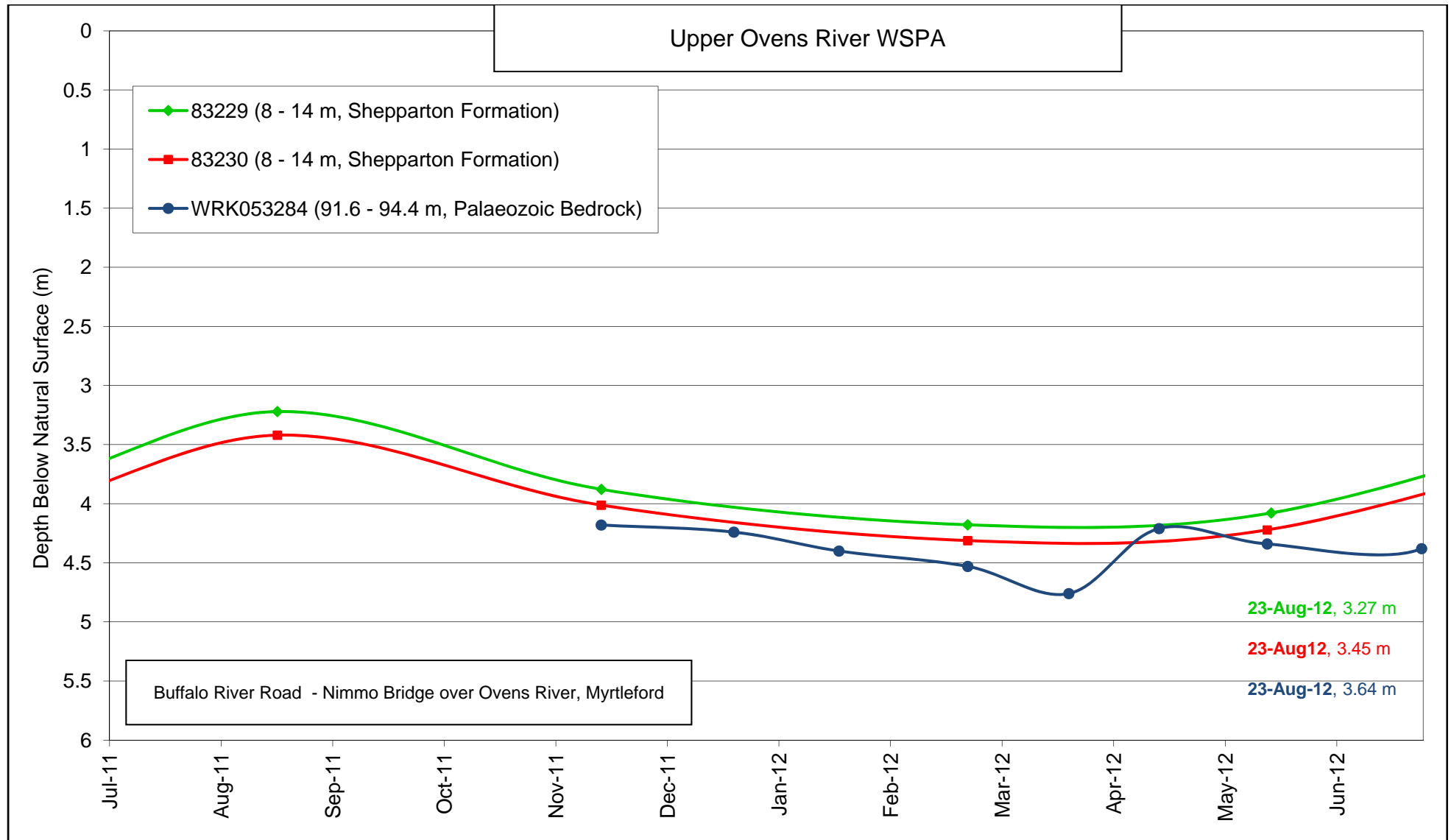
Monitoring

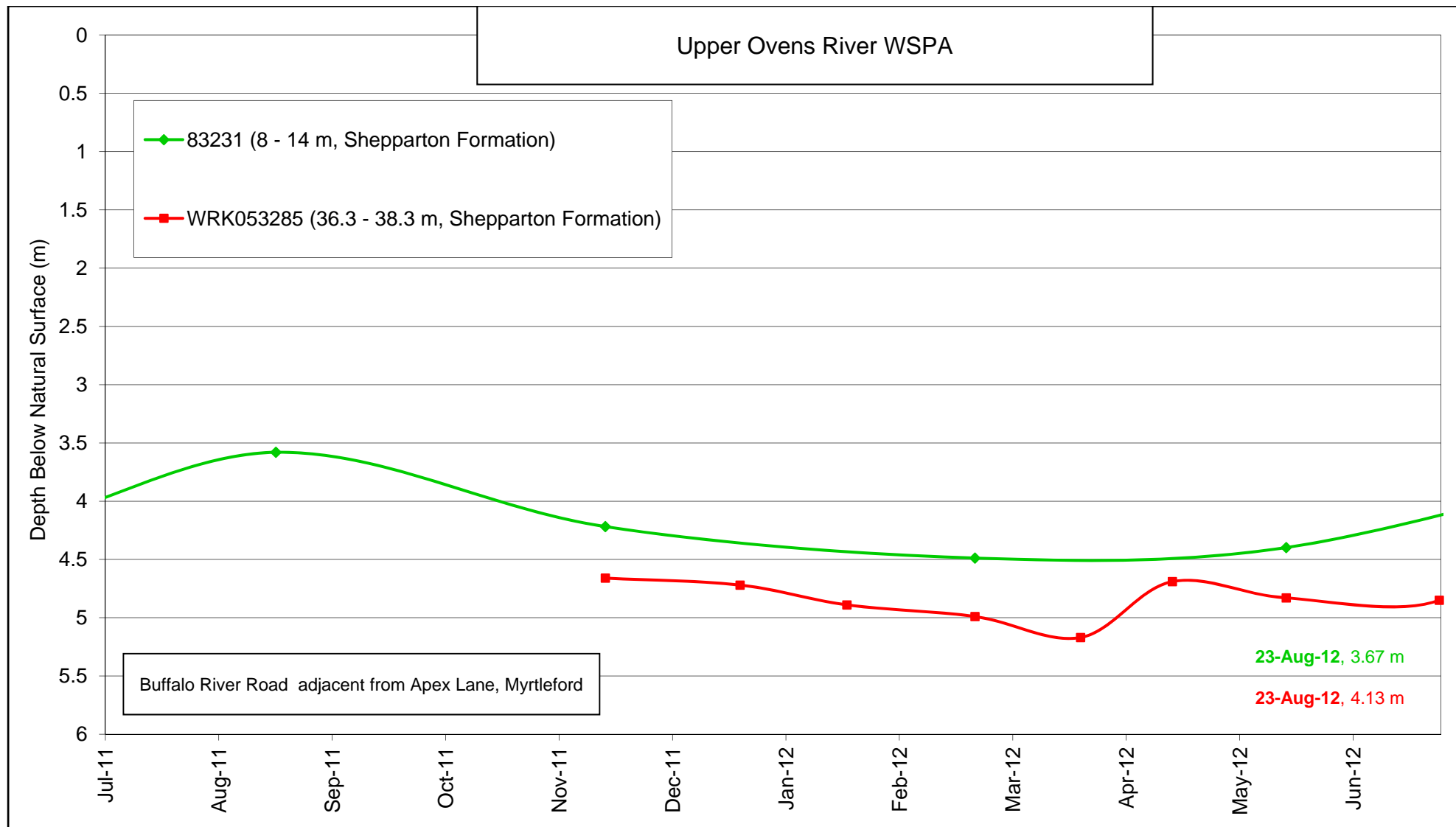
Plan Prescription Number/ Requirement	Activity	Complies
49. The Corporation must ensure that an appropriate monitoring program is undertaken to ensure that: <ul style="list-style-type: none"> a. the flows in the Ovens River at Myrtleford are continuously recorded; b. the flows in key tributaries are recorded or estimated in low flow periods; c. the water levels in observation bores at Myrtleford are continuously recorded; d. the water sharing regime is able to be implemented; and the relationship between groundwater levels and stream levels can be observed. 	<p>Groundwater levels are monitored under the State Observation Bore Network, which is managed by DSE.</p> <p>River flows are monitored under the Victorian Regional Monitoring Partnership.</p>	Yes

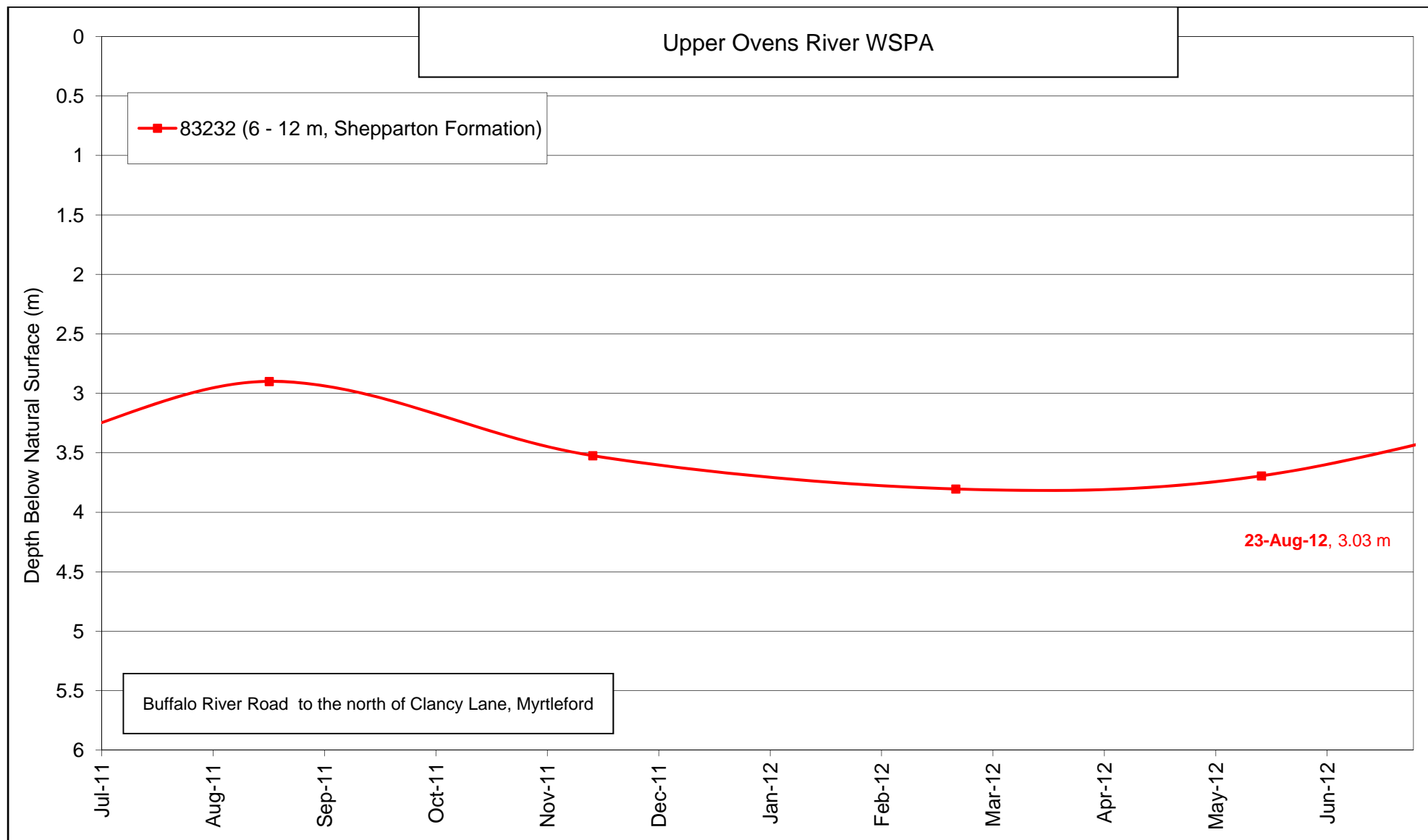
Revocation of the Permissible Consumptive Volume

Plan Prescription Number/ Requirement	Activity	Complies
50. Within three months of the approval of the Plan, the Corporation must request the Minister revoke the permissible consumptive volume of 4,010 ML in place for groundwater in the Protection Area.	G-MW has applied to the Minister for Water to revoke of the PCV. This request is currently with DSE and is being incorporated into a draft PCV order.	Partially – A request for PCV revocation has been made, however this request has occurred after three months of the Plan's approval and included in a single draft Order proposing other PCV changes (for reasons of process efficiency)

Appendix 2. Representative Groundwater Hydrographs







Appendix 3. Representative surface water hydrograph with rainfall

