2013-14 QUEENSLAND MURRAY-DARLING BASIN WATER REPORT

1 Introduction

The purpose of this report is to meet Queensland's reporting obligations under Schedule E and section 71 of the *Water Act 2007 (Cth)*, subject to any transitional arrangements agreed with the Murray-Darling Basin Authority (MDBA).

The report includes:

1. Information on entitlements, estimates of water use (where data are available), water availability, trading, and compliance with transitional Sustainable Diversion Limit (SDL) targets. This is provided in the attached spreadsheet and is similar to data provided in previous Schedule E reporting.
2. Information on current policy, regulatory frameworks and water management strategies supporting SDL implementation.

2 Water Availability and Stream Flow

2.1 Surface water

The 2013/14 water year has seen the Queensland section of the Murray-Darling Basin (QMDB) move to a significantly dry phase. This is in marked contrast to the much wetter seasons which have characterised recent years. Total flows for the year have been well below the long term average in all valleys, as illustrated in the following table.

River and gauging station location	Average annual flow (GL)	Total volume 2013-2014 (GL)	Percentage of average
Condamine and Balonne catchment			
Condamine River @ Chinchilla	583	147	25
Condamine River @ Cotswold	750	191	25
Balonne River @ Weribone	1261	353	28
Maranoa River @ Cashmere	163	0	0
Balonne River @ St George	1249	176	14
Border Rivers catchment			
Macintyre River @ Goondiwindi	958	295	31
Weir River @ Talwood	156	15	10
Barwon River @ Mungindi	600	78	13
Moonie catchment			
Moonie River @ Fenton	162	16	10
Warrego catchment			
Warrego River @ Cunnamulla	509	0	0
Paroo catchment			
Paroo River @ Caiwarro	542	134	25

River and gauging station location	Average annual flow (GL)	Total volume 2013-2014 (GL)	Percentage of average
Nebine catchment			
Nebine Creek @ Roseleigh Crossing	30	1	3

Major storages started the year at better than 90% capacity with the only exception being Leslie Dam in the Upper Condamine Water Supply Scheme at 74% capacity. The storm season in spring and early summer failed to materialise and the trend continued in the Condamine-Balonne and Maranoa catchments for the remainder of the summer, with no significant rain events and very little or no recorded runoff at the gauging stations. In streams where base flows normally persist, these receded to low levels or no flow by the time summer had passed. The only significant flow in the Condamine and Balonne catchment was a moderate flow event at the end of March 2014 as a result of Cyclone Ita. This carried enough volume to re-fill Beardmore Dam from its pre-flow event level of 10% and to enable minor to moderate flooding to extend to the lower Balonne distributary, resulting in the opportunity for limited water harvesting. In the Maranoa, the stream had stopped flowing at Mitchell by early October 2013 and remained dry for the rest of the year, whilst at Cashmere, upstream of Beardmore Dam, there was one small event in February 2014.

In the Moonie catchment, the late March rain also resulted in a moderate flow event at Nindigully which attenuated as it moved downstream. Yearly volumes were also well below the long term average. The meagre flow pattern of the previous year was repeated in the Warrego River with zero flow passing Cunnamulla for the first time since the current gauging station was installed in 1992.

The Nebine had just over 1 GL of flow for the year.

The Paroo River saw more runoff than the previous year; however, the volume was only about 25% of the average annual flow.

The Border Rivers area saw very little natural runoff, and flows at Goondiwindi were bolstered by significant releases from storages upstream. For example, the 150 GL of flow at Glenlyon Dam Tailwater was all release flows from the dam. This constituted the fifth highest volume in over 40 years of record at the site with no contribution from natural runoff. Glenlyon Dam finished the year at just under 40% capacity.

2.2 Groundwater

While this year has tended toward being significantly drier than the recent few years of above average rainfall, the more connected groundwater systems continue to benefit from the recharge and other inflow received previously. While the rapid rise in water levels which resulted in record highs in many cases has peaked and are now falling, most aquifer systems remain at or close to full in terms of aquifer storage.

As a result the majority of aquifers and management areas were able to take 100% of their nominal entitlements. The more closely managed Central Condamine Alluvium Groundwater Management Area (GMA) is an exception with the majority of licensees in this area limited to 50% of their entitlements with most of the rest limited to 70%. The Oakey Creek Alluvium GMA was limited to 80% in three subareas with one subarea limited to 65%.

The diversion of water taken under licensed entitlements for 2013/14 is 172GL from a combination of metered and estimated use. A further 22.6 GL of water is estimated (using a methodology tailored specifically for this purpose) to have been taken for stock and domestic purposes.

3 Water planning and management overview

3.1 Surface water

Surface water in the Queensland Murray-Darling Basin is divided into four separate SDL resource units, Warrego-Paroo-Nebine, Condamine-Balonne, Moonie, and Queensland Border Rivers water resource plan areas. The Basin Plan requires local reductions in the Queensland Border Rivers and the Condamine-Balonne water resource plan areas, with a gap of 8 GL and 100 GL respectively identified in the Plan. The Commonwealth's Water for the Future initiatives of Healthy Headwaters (to provide infrastructure related investment) and Buyback continue to target water in these catchments with the in-catchment reduction almost met in the Queensland Border Rivers and half of the in-catchment reduction bridged in the Condamine-Balonne.

The following sections describe the management strategies and annual reporting for surface water in terms of the categories of take listed in the Baseline Diversion Limit (BDL) in the Basin Plan.

3.1.1 The take of water from watercourses under an entitlement and by floodplain harvesting

Queensland has transitional water resource plans in place for the management of overland flows and water in watercourses, lakes and springs within all catchments in the Queensland section of the Murray-Darling Basin. These water resource plans are taken to have been accredited under the Commonwealth Water Act and are to be replaced by 2019.

Take of water from watercourses is managed through limits stated on entitlements and by water sharing rules in resource operations plans (which implement the provisions of Queensland's water resource plans). The take of overland flow water (including floodplain harvesting) is managed through a combination of regulation of works and limits on entitlements.

The works of the major water users in the QMDB have been metered to improve reliability in monitoring use. The installation of instruments to measure offstream storage levels in the Lower Balonne was completed in the 2012/13 water year. Combined with measurement of direct take from the watercourse, this will inform estimates of floodplain harvesting take in the area. A combination of estimates and measurement of water use are provided for all watercourse take and significant areas of floodplain harvesting.

Annual permitted take from watercourses under an entitlement is determined using a hydrologic model with permitted take under entitlements held by the Commonwealth Environmental Water Holder excluded from the total. Annual permitted take by floodplain harvesting is not able to be modelled with any confidence and so is based on estimated take supported by storage measurement in the Lower Balonne.

Diversion in the QMDB is generally characterised by much greater volumes of unsupplemented water compared to supplemented water (water provided through water supply schemes). As a result of good availability of supplemented water coming into the year and poor waterharvesting opportunity, the take of supplemented water in 2013/14 was 26%, of the total take, take of unsupplemented water was 47% and overland flow (predominantly made up of floodplain harvesting) 27%.

Diversions reached 98% of the water permitted to be taken for the Condamine and Balonne catchment, 98% for the Border Rivers, 86% for the Moonie, 17% for the Warrego, 61% for the Paroo and 0% for the Nebine catchment for the 2013/14 water year.

3.1.2 The take of water from watercourses under basic rights

The take of water from a watercourse, lake or spring for basic rights (i.e. stock and domestic purposes) by the owner of the land adjoining the water source is permitted under the *Water Act 2000 (Qld)*. Potential increase in take is limited due to the right to take water being limited to properties with riparian access to water. Water taken from watercourses under basic rights is not

measured and not included in annual estimates of take, nor is this element of take included in the calculation of annual permitted take.

3.1.3 The take of water by runoff dams (including take under basic rights)

The take of overland flow water for basic rights by an owner of the land on which the water collects is permitted (within limits) under the Queensland regulatory framework. Any increase in take for basic rights will be related to rural population growth and/or an increase in stock numbers.

Under water resource plan provisions, no increase in overland flow take is permitted for uses other than basic rights, except for certain limited cases such as where capture of overland flow water is necessary to satisfy the requirements of an environmental authority.

Water taken by runoff dams is not measured and not included in annual estimates of take, nor is this category of take included in the calculation of annual permitted take, except in the Granite Belt of the Border Rivers catchment.

3.1.4 The take of water by commercial plantations

In Queensland, the take of water by commercial plantations is not regulated under any legislation. There are limited commercial plantations in the Queensland Murray-Darling Basin.

No estimate of take is provided for this category. It is not included in the calculation of annual permitted take.

3.2 Groundwater

In the Queensland section of the Murray-Darling Basin, groundwater managed under the Basin Plan includes water in formations above and below the Great Artesian Basin (GAB). Water in aquifers in the GAB is managed separately to those in the Basin Plan and in Queensland they are managed under the Water Resource (Great Artesian Basin) Plan 2006. Management of groundwater under the Basin Plan is now divided into 15 resource units based on groundwater aquifers that underlie various surface water catchments. These units more comprehensively cover the QMDB area and consequently there has been an increase in the reported areas since 2011/12.

The current focus for Queensland's groundwater systems in the MDB is to meet the Basin Plan SDL in 2019. There are two key groundwater systems (Central Condamine Alluvium and the Condamine Tributary Alluviums) where the SDL is below the BDL, requiring water to be recovered through buyback of entitlements. Trading (relocation) of water licences has occurred during the year in the Central Condamine Alluvium (CCA) area, and the Federal Government has released two tender rounds seeking interest from entitlement holders. Discussions regarding trading (relocation) of water licences have commenced in the Dalrymple Creek and Oakey Creek groundwater areas as a first step toward enabling the buyback of entitlements.

In ensuring ongoing sustainable management of the groundwater systems in line with the Basin Plan, various other management tools have been implemented. These include the amendment of Water Sharing Rules for all QMDB groundwater systems to facilitate transition to the BDL, implementation of moratoriums to restrict the growth in the take of groundwater, and amendment of various legislative instruments to facilitate the water recovery program.

3.2.1 The take of water from aquifers under an entitlement

It is anticipated that all groundwater systems will be incorporated into a water resource plan prior to the implementation of the Basin Plan in 2019. A planning process is currently underway to include the aquifers under the Warrego, Paroo, Bulloo and Nebine area in the second generation water planning process. The Central Condamine Alluvium has a Water Management Plan which is considered to be an Interim Water Resource Plan under the Commonwealth Water Act. The Condamine and Balonne, Border Rivers and Moonie water resource plans are currently under amendment to include arrangements for the management of the remaining groundwater systems not

connected to the Great Artesian Basin. This provides a transitionary step towards meeting the accreditation requirements of the Basin Plan.

Entitlements to take water from aquifers in the QMDB are in the form of water licences (or water permits) and these include conditions that identify the nominal volume (limit) and the particular aquifer (source).

Access to the nominal volume for any entitlement holder can be limited through "announced entitlement" under section 66 of the *Water Regulation 2002* and/or limitations on use under section 25 of the *Water Act 2000*. These provisions are implemented when the groundwater systems are under stress/decline either longer-term (e.g. the CCA) or seasonally (e.g. tributary catchments).

In many highly developed groundwater systems, the works of entitlement holders have been metered to improve the reliability in monitoring use. In those systems that are unmetered, the nominal volume, adjusted for any limitations, is considered to represent the actual use. These use data are combined with the metered data to provide a picture of the total water use.

Diversion of groundwater in the QMDB in 2013/14 was within BDL (permitted take) as required for all resource units. Additionally, diversion for all but one resource unit was also within the respective SDLs, as will be required from 2019. Diversions in the key Central Condamine Alluvium (GS64a) were measured at 134% of SDL for water access excluding stock and domestic. This was achieved by limiting take to 50% and 70 % of nominal entitlement. Diversions in this system should move into alignment with the SDL as buyback progresses. Queensland's other three most developed systems ranged from 85% to 90% of SDL.

3.2.2 The take of water from aquifers under basic rights

The take of water from an aquifer for stock and domestic purposes by the owner of the land overlying the aquifer is managed under the *Water Act 2000*. Access for these purposes can be limited under the Act as has been enacted (by moratorium) in the Upper Condamine Basalts and the Upper Condamine Alluvium (both Central Condamine and Tributaries) to restrict growth of groundwater use in the expanding peri-urban areas.

Queensland does not require these types of works or take for this purpose to be metered. Accordingly, use volumes have been estimated.

3.2.3 Other activities related to groundwater.

The MDBA in conjunction with Queensland have recently engaged in several projects to gain a better understanding of various aspects of groundwater systems in the QMDB. The projects commenced in 2012/13 with an expected completion date by late 2014. The Upper Condamine Alluvium project is ongoing and will continue until 2016. Stages 1 and 2 have been completed and it is proposed that Stages 3 and 4 will commence early 2015.

These projects have primarily focussed on the more heavily utilised and lesser known groundwater systems to improve collective knowledge and assist in future management directions. Three of the projects have involved the Upper Condamine Alluvium and Upper Condamine Basalts. Improved modelling of the Central Condamine Alluvium will help to inform the longer term sustainable capacity of the system and look at potential changes in the system as Buyback recovers entitlements. Data gathering has also been conducted to gain an understanding of the ability and complexity of incorporating the tributary alluvial systems into the Central Condamine Alluvium model. The tributary systems feed into the CCA and as such, impact on how the CCA operates longer-term.

As mentioned in section 2.2.2, there are various levels of extraction of groundwater for stock and domestic use in the groundwater systems. In the more populated areas of the Upper Condamine (Alluvium and Basalts), there is significant pressure (hence the moratorium) on the resource from peri-urban development. To better understand this use, levels of current extraction and the implications of this use into the future, a project was conducted into the purposes and volumes of

extraction for various users with a specific focus on stock and domestic extraction. The outcomes of the report reaffirm the department's extension of the moratorium in June 2012 to incorporate restrictions on the extraction of water in peri-urban areas. The report also allows for an improved understanding of the total quantum of water extracted from these groundwater systems for stock and domestic purposes in reporting under the Basin Plan.

A project was also commenced to look at the current fractured rock (granite) groundwater system surrounding Stanthorpe. This groundwater system is included as part of the Basin Plan under the Border Rivers and is an undeclared area in Queensland. The extraction of groundwater is not currently managed (partly due to the low system storage capacity and consequential self-limiting nature). However work is underway to look at the risk this may pose to Basin SDL and the possible future management arrangements to match the assessed risk.

Queensland has put forward additional project proposals for 2014/15 to allow for further work to be undertaken on various groundwater systems to improve knowledge and inform future refinement of Basin Plan SDLs.

4 Issues relating to Cap and/or SDL implementation

There are categories of take defined in the BDL for which Queensland is not able to provide estimates of the take of water with any confidence. These include:

- Take from watercourses under basic rights;
- Take from runoff dams;
- Take by commercial plantations.

Queensland acknowledges the work of the Murray-Darling Basin Authority in attempting to make an estimate of use under these categories of take, but given the level of uncertainty involved, doesn't support further use of these estimates in annual reporting.

Management and monitoring of related infrastructure is recommended as an alternative approach. Infrastructure based management strategies are already in place to limit the take of water in those categories where there is a high risk of growth in take compromising diversion limits. For example, water resource plans limit the purposes for which a new runoff dam can be constructed and a moratorium limits new stock and domestic bores in the Upper Condamine. Infrastructure growth in other areas of take will be monitored over time and management strategies only introduced where there is an identified need. This is already occurring, with a risk assessment for the Warrego, Paroo and Nebine carried out in 2012 as part of its ten year review and amendment process. This risk assessment will form part of the information provided to meet accreditation requirements under the Commonwealth Water Act for the Warrego, Paroo, Bulloo and Nebine Water Resource Plan.

Similar risk assessment processes will be carried out in the lead up to 2019 to inform the review and development of the next generation water resource plans for the remaining valleys of the QMDB.

5 Diversions summary

2013/14 Snapshot of Water Diversions in the QMDB

Resource	Diversion 2013/14 (GL)	Permitted (GL)	Diversion 2012/13 (GL)
Surface water	770	793	1420
Groundwater	194	228	155