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CHAPTER 1 INTRODUCTION AND MAIN FINDINGS

INTRODUCTION

This publication presents information on the supply and use of water in the Australian economy in 2008–09 in both physical (i.e. ML) and monetary terms. The previous release of these data were for the 2004–05 reference year and numerous comparisons between 2004–05 and 2008–09 are made within this publication. The *Water Account Australia* uses the *System of Integrated Environmental and Economic Accounting for Water* (SEEA–Water; UN 2006a) as the underlying conceptual framework. The SEEA-Water was adopted as an interim international statistical standard in 2007 and represents a specific branch of environmental-economic accounting that evolved from the SEEA (UN 2003a).

Figure 1.1 shows the relationship between the physical water flows in the economy and the environment, and is useful for understanding the scope of the *Water Account Australia* as well as providing an overview of key data. Details of the physical flows are outlined in Chapter 2, while monetary flows are found in Chapter 3. Additional data on other aspects of water are presented in two thematic chapters for the Water Supply, Sewerage and Drainage Services and Agriculture industries.

Climate

Water supply and use in the Australian economy needs to be viewed in the context of Australia's climate. Mean annual rainfall in Australia varies substantially across the continent. Large areas of Australia have a mean annual rainfall of 600–1500 mm, an amount comparable with most of Europe and North America. However, a key feature of Australia's climate is not the amount of rainfall but the variability in rainfall from year-to-year and season-to-season. Annual rainfall variability is greater for Australia than any other continental region (Smith 1998). Any assessment of water supply and use over time must take this variability into account, including comparisons between the Water Accounts for 2004–05 and 2008–09.

Rainfall in 2008–09 was significantly higher than in 2004–05. In 2008–09 the distribution of rainfall was highly variable with tropical northern Australia experiencing high levels of rainfall while much of south eastern Australia experienced below average rainfall. With many parts of Australia experiencing below average rainfall, this continued the drought conditions existing in some areas. Consequences of this included urban water restrictions and reduced availability of water for irrigators, particularly in south eastern Australia. Appendix 1 provides additional information on the climatic conditions in 2004–05 and 2008–09.

Data Quality and Comparability

The *Water Account Australia* has drawn on data from a large number of sources. It made use of surveys conducted by the ABS and others, as well as publicly available information found on websites, research papers, annual reports, etc. There are numerous references in the bibliography, providing an indication of the breadth of information used to compile the *Water Account Australia*. The data sources were of

Data Quality and Comparability continued

varying quality and the Explanatory Notes provide information on the degree of confidence, in qualitative terms, that can be placed in the estimates.

There have been a number of changes in the data used to compile the 2008–09 *Water Account Australia*. In particular, more data were obtained from ABS surveys in this edition of the *Water Account Australia* than previous editions. This, together with increased cooperation and assistance from State, Territory and Australian government agencies, as well as with the water providers, has led to some improvements in the quality of data.

While every care has been taken to ensure consistency between 2004–05 and 2008–09, the changes between the reference periods need to be interpreted with some caution owing to differences in climate, data sources, classifications and in particular the introduction of the *Australian New Zealand Standard Industry Classification* (or ANZSIC 2006). Extreme care should be taken when making comparisons to the data included in the first *Water Account Australia* in respect of the years 1993–94 to 1996–97.

MAIN FINDINGS

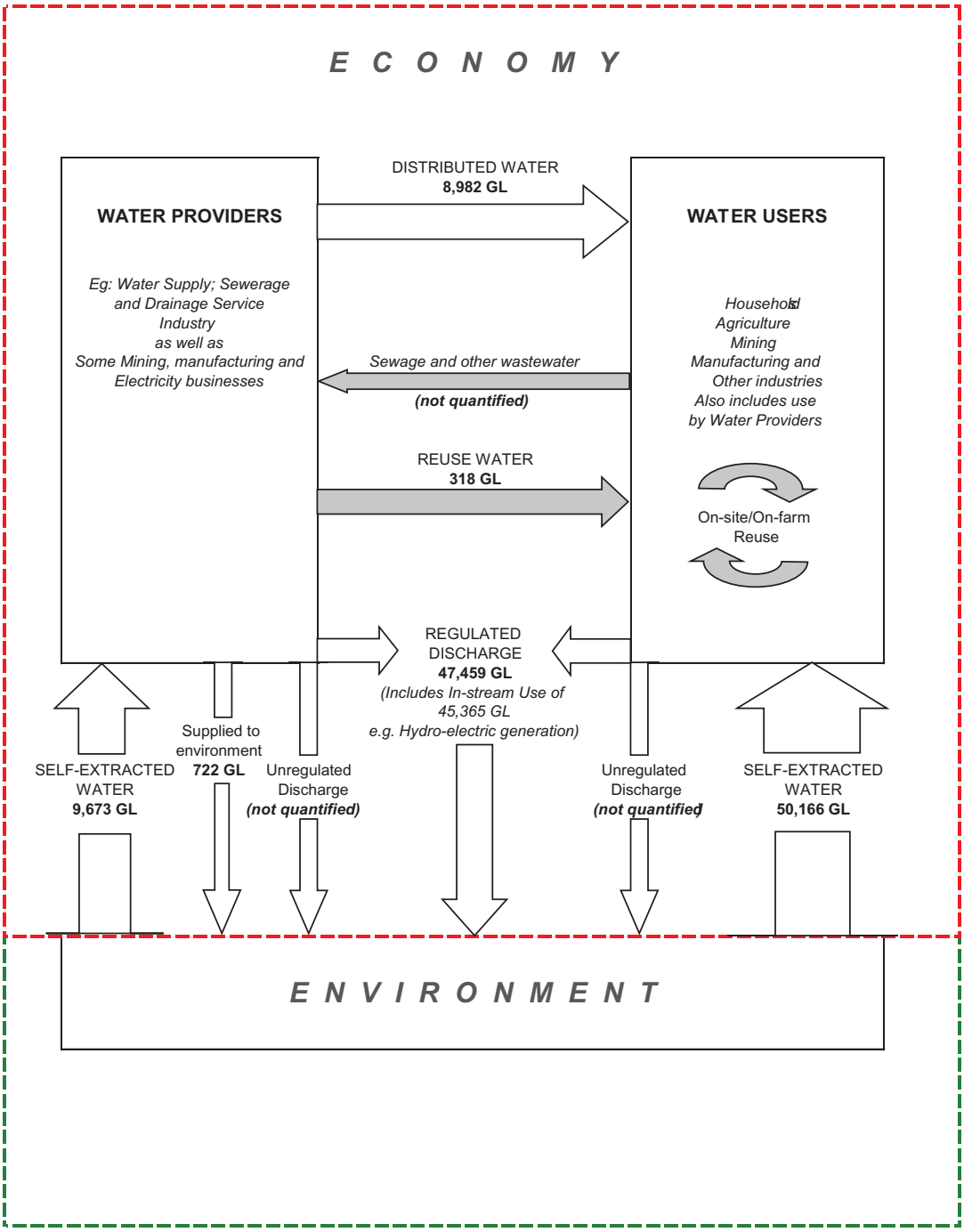
Figure 1.1 and Tables 1.2 through to 1.6 summarise much of the data contained in the *Water Account Australia*. The main findings include:

- In 2008–09, rainfall for Australia was 519 mm. Compared to 2004–05 and average levels of rainfall, 2008–09 was a wet year. However, below average rainfall and drought was experienced throughout much of Australia in 2008–09, specifically south eastern Australia.
- During 2008–09, 59, 839 GL of water was extracted from the environment and used within the Australian economy. Of this amount, 9,673 GL was extracted by water providers, while water users directly extracted 50,166 GL.
- Of the total volume extracted from the environment (59,839 GL), 47,459 GL was returned to the environment as regulated discharge. The majority of this regulated discharge (45,365 GL) was in-stream use, by the Electricity and Gas Supply industry for hydro-electric power generation (44,484 GL).
- Water consumption was 14,101 GL in 2008–09, a decrease of 25% from 2004–05 when it was 18,767 GL.
- The Agriculture industry (businesses with agriculture as their main activity) consumed the largest volume of water with 6,996 GL, representing 50% of water consumption in 2008–09. All agricultural activities accounted for 7,589 GL or 54% of total Australian water consumption in 2008–09. This is a decrease from 2004–05 when it was 12,191 GL and 65% of water consumption.
- Victoria showed the largest fall (40%) in water consumption from 4,993 GL in 2004–05 to 2,991 GL in 2008–09. This is mostly because of a 1,688 GL or 51% decrease in the consumption of water by agricultural activities in this state.
- In 2008–09, there were 401 water providers in Australia, supplying 9,673 GL of distributed water. This compares to 413 providers and 11,337 GL in 2004–05.
- Water providers in the Water Supply, Sewerage and Drainage Services industry supplied 9,369 GL or 97% of distributed water in 2008–09.
- Surface water made up 8,956 GL or 96% of the distributed water supplied by the Water Supply, Sewerage and Drainage Services industry in 2008–09.

MAIN FINDINGS
continued

- Reuse water made up 348 GL of total water supplied by water providers in 2008–09, compared to 425 GL in 2004–05. In both reference years it represented just under 4% of total water supplied by water providers.

1.1 WATER SUPPLY IN THE AUSTRALIAN ECONOMY—2008-09



- The decline in the use of reuse water between 2004–05 and 2008–09 is largely a reflection of the decrease in availability of water. The impact was mostly felt in agricultural activities with a decline from 280 GL in 2004–05 to 106 GL.
- Households experienced a slight increase in the use of reuse water (1,767 ML to 2,193 ML), however the volumes involved were relatively low.

MAIN FINDINGS *continued*

- Of the 9,673 GL of distributed water, 8,982 GL were supplied to industry and household users and 691 GL were distributed to the environment.
- Water consumption by households fell by 16% between 2004–05 (2,108 GL) and 2008–09 (1,768 GL).
- The Water Supply, Sewerage and Drainage Services industry had 29,000 employees as at 30 June 2009, a 32% increase since 2004–05.
- Sales and service income from the Water Supply, Sewerage and Drainage Services industry was $11.4 billion, a 53% increase since 2004–05.
- The Water Supply, Sewerage and Drainage Services industry spent $1.8 billion on wages and salaries in 2008–09 (an average of $63,000 per employee).
- The average price of distributed water supplied increased 95% from $0.40/kL in 2004-5 to $0.78/kL in 2008-09.
- There was large variation in the average price paid for distributed water with households paying $1.93/kL and agriculture $0.12/kL.
- Gross value added for the Water Supply, Sewerage and Drainage Services industry increased from $5,101 million to $6,983 million (37%) between 2004–05 and 2008–09.
- The gross value of irrigated agricultural production was $12.0 billion in 2008–09, a rise from $10.6 billion in 2004–05. (Note: Gross value is not a proxy for the highest value water use.).
- The Agriculture industry generated a total of $4 million of gross value added (on average) for every GL of water consumed in 2008–09. Industry gross value added for Agriculture increased by 16% (in chain volume terms) while the water consumption decreased by 41% since 2004–05.
- The Mining industry recorded a total of $226 million of gross value added per GL of water consumed. The gross value added per GL represents a 97% increase since 2004–05 reflecting a 23% increase in water consumption and a 142% increase in chain volume industry gross value added since 2004–05.
- The Manufacturing industry generated a total of $164 million of gross value added for every GL of water consumed. This is a 2% reduction in chain volume terms compared with the result in 2004–05.

1.2 WATER ACCOUNT SUMMARY STATISTICS—2004–05 and 2008–09

	AUSTRALIA		2008–09							
	2004–05	*2008–09*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*
Water consumption by industry (GL)(a)	16 659	12 333	4 026	2 649	3 043	1 046	1 045	387	115	21
Water consumption by households (GL)	2 108	1 768	536	342	308	122	326	69	39	27
Total water consumption (GL)	18 767	14 101	4 562	2 991	3 351	1 168	1 371	456	154	48
Gross State Product ($m)	1 116 248	1 255 241	394 980	287 619	250 573	77 407	180 008	22 247	16 658	25 748
Population ('000)	20 329	21 953	7 134	5 443	4 425	1 624	2 245	503	226	352
Gross State Product/Total water consumption	59	89	87	96	75	66	131	49	108	536
Gross State Product/Industry water consumption	67	102	98	109	82	74	172	57	145	1 251
Per capita/Total water consumption (kL)	923	642	639	549	757	719	611	906	681	137
Per capita/Household water consumption (kL)	104	81	75	63	70	75	145	136	173	78

(a) All industries i.e. Agriculture, Mining, Manufacturing

MAIN FINDINGS

continued

Total physical water supplied by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry in 2008–09 was 9,711 GL (Table 2.11). This included 3.5% reuse water. It also included 2,289 GL water loss and 557 GL water supplied to the environment (Tables 4.16 through to 4.23). The actual total volume of physical water distributed to the users (or net water supply) was 6,864 GL. Table 1.4 shows that $5,477 million of revenue was generated from supplying 6,864 GL of urban and rural distributed water by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry in 2008–09. In 2004–05, revenue earned by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry was $3,514 million for supplying 8,710 GL of distributed water (including reuse water). Since 2004–05, revenue has increased by 56% while the volume of distributed water supplied decreased by 21%.

1.3 WATER CONSUMPTION, by state—2000–01, 2004–05 and 2008–09

	AUSTRALIA			2008–09							
	2000–01	*2004–05*	*2008–09*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*
	GL	GL	GL	GL	GL	GL	GL	GL	GL	GL	GL
Agriculture	14 989	12 191	6 996	2 001	1 435	2 144	788	325	264	35	2
Forestry and fishing	40	47	101	1	1	6	2	89	3	—	—
Mining	321	413	508	66	6	118	22	257	18	21	—
Manufacturing	549	589	677	150	158	148	88	61	50	22	—
Electricity and gas	255	271	328	92	123	82	2	27	—	1	—
Water supply(a)(b)	2 165	2 083	2 396	1 329	558	297	64	111	22	9	7
Other industries(c)	1 106	1 063	1 327	387	367	249	79	176	30	27	11
Household	2 278	2 108	1 768	536	342	308	122	326	69	39	27
Total	**21 703**	**18 767**	**14 101**	**4 562**	**2 991**	**3 351**	**1 168**	**1 371**	**456**	**154**	**48**

— nil or rounded to zero (including null cells)

(a) Includes Sewerage and drainage services

(b) Includes water losses

(c) Includes aquaculture and services to agriculture

Note: This table presents an activity view for agriculture for 2000–01 and 2004–05 and an industry view for 2008–09.

MAIN FINDINGS *continued*

Table 1.5 shows net physical use of distributed (both urban and rural) water and related expenditure in 2008–09. Households consumed 1,596 GL (23% of the total net water use) and spent $3,074 million (56% of total expenditure) on distributed water. In contrast, the AGRICULTURE, FORESTRY AND FISHING industry has decreased by 38% (from 5,651 GL to 3,518 GL) and the expenditure has increased by 39% (from $291 million to $406 million). Total expenditure on distributed and reuse water for all industries increased by 73% (from $1,367 million to $2,361 million) while physical water use (both distributed and reuse) decreased by 21% (from 6,858 GL to 5,414 GL).

Water Supply

1.4 MONETARY AND PHYSICAL NET DISTRIBUTED WATER SUPPLY, by industry—2004–05 and 2008–09

	MONETARY UNITS	PHYSICAL UNITS
	Distributed water (Urban & rural) (a)	*Supply to other economic units*
	$m	GL
2008–09		
Agriculture, forestry and fishing	-	-
Mining	na	24
Manufacturing	na	14
Electricity and Gas supply	5	96
Water Supply, Sewerage and Drainage	5 477	6 864
All other industries	-	-
Total net supply	**5 482**	**6 997**
2004–05		
Agriculture, forestry and fishing	-	-
Mining	na	8
Manufacturing	na	5
Electricity and Gas supply	na	1
Water Supply, Sewerage and Drainage	3 514	8 710
All other industries	-	-
Total net supply	**3 514**	**8 724**

(a) Includes reuse water

Water Use

1.5 MONETARY AND PHYSICAL NET DISTRIBUTED WATER USE, by industry and households— 2004–05 and 2008–09

	EXPENDITURE ON DISTRIBUTED WATER(a)		PHYSICAL USE OF DISTRIBUTED WATER(a)	
	Distributed water	*Percent of total*	*Distributed water*	*Percent of total*
	$m	(%)	GL	(%)
2008–09				
Total consumption by industries(b)				
Agriculture, forestry & fishing	406	7	3 518	50
Mining	153	3	150	2
Manufacturing	490	9	367	5
Electricity , gas & waste services	77	1	237	3
Water supply, sewerage & drainage	6	—	107	2
All other service industries	1 229	22	1 034	15
Total	2 361	43	5 414	77
Actual final consumption by households	3 074	56	1 596	23
Actual final consumption by Governments	60	1	-	-
Total net use(c)	**5 495**	**100**	**7 010**	**100**
2004–05				
Total consumption by industries(b)				
Agriculture, forestry & fishing	291	8	5 651	65
Mining	53	2	79	1
Manufacturing	232	6	354	4
Electricity , gas & waste services	91	3	121	1
Water supply, sewerage & drainage	2	—	61	1
All other service industries	698	20	592	7
Total	1 367	39	6 858	79
Actual final consumption by households	2 147	61	1 876	21
Actual final consumption by Governments	-	-	-	-
Total net use(c)	**3 514**	**100**	**8 734**	**100**

— nil or rounded to zero (including null cells)

(a) Includes reuse water.

(b) Total consumption by industries = total intermediate consumption.

(c) Total net use = Total use less losses by Water Supply Industry and environmental provisions.

Gross Value Added

Table 1.6 gives the industry details for 2008–09 and 2004–05 relating to gross value added, physical water consumption and the ratio of industry gross value to industry water consumption. Physical water consumption in this table relates to consumption of all categories of water (Self-extracted, Distributed and Reuse). The relationship between level of water consumption and value added of the industry varies from industry to industry. The industry gross value added presented in this table are based on current prices while the percentage movements between 2004–05 and 2008–09 (outlined below) are based on chain volume measures of industry gross value added. Chain volume comparisons remove the effect of price changes and is the recommended method in the System of National Accounts (SNA) to compare financial information between years.

Table 1.6 shows that the AGRICULTURE, FORESTRY AND FISHING industry generated, on average, $4 million in gross value added for every GL of water consumed in 2008–09. Industry gross value added increased by 16% in chain volume terms while the water consumption decreased by 41% since 2004–05. The MINING industry recorded $226 million gross value for every GL consumed. This is a 97% increase since 2004–05, reflecting a 23% increase in water consumption and a 142% increase in chain volume industry gross value added

Gross Value Added continued

since 2004–05. The MANUFACTURING industry had $164 million gross value added per GL of water consumed. This is a 2% fall since 2004–05.

1.6 INDUSTRY GROSS VALUE ADDED FOR WATER USING INDUSTRIES—2004–05 and 2008–09

	Industry gross value added(a)	*Water consumption*	*Industry gross value added per GL of water consumed*
	$m	GL	$m/GL
2008–09			
Agriculture	27 739	7 158	4
Mining	114 580	508	226
Manufacturing	111 044	677	164
Electricity & gas	16 097	328	49
Water supply, sewerage & drainage	6 288	2 396	3
All other industries	897 496	1 265	709
Total	**1 173 244**	**12 333**	**95**
2004–05			
Agriculture	27 153	12 191	2
Mining	39 945	413	97
Manufacturing	97 769	589	166
Electricity & gas	14 933	271	55
Water supply, sewerage & drainage	5 101	2 083	2
All other industries	711 667	1 059	672
Total	**896 568**	**16 606**	**54**

(a) Current prices

BACKGROUND

Environmental-economic accounting is an evolving field of statistics. Since the publication of the first three editions of the *Water Account Australia*, advances have been made in both the theory and practice of water accounting nationally and overseas. Internationally, the United Nations Statistical Commission (UNSC) adopted the SEEA-Water as an interim international statistical standard in 2007. Australia was a leading contributor to the development of SEEA-Water, which builds on the SEEA 2003 (UN 2003a). The term "interim standard" was applied in acknowledgment that the overarching system, the SEEA, was not yet an international standard, although it is due for adoption in 2012.

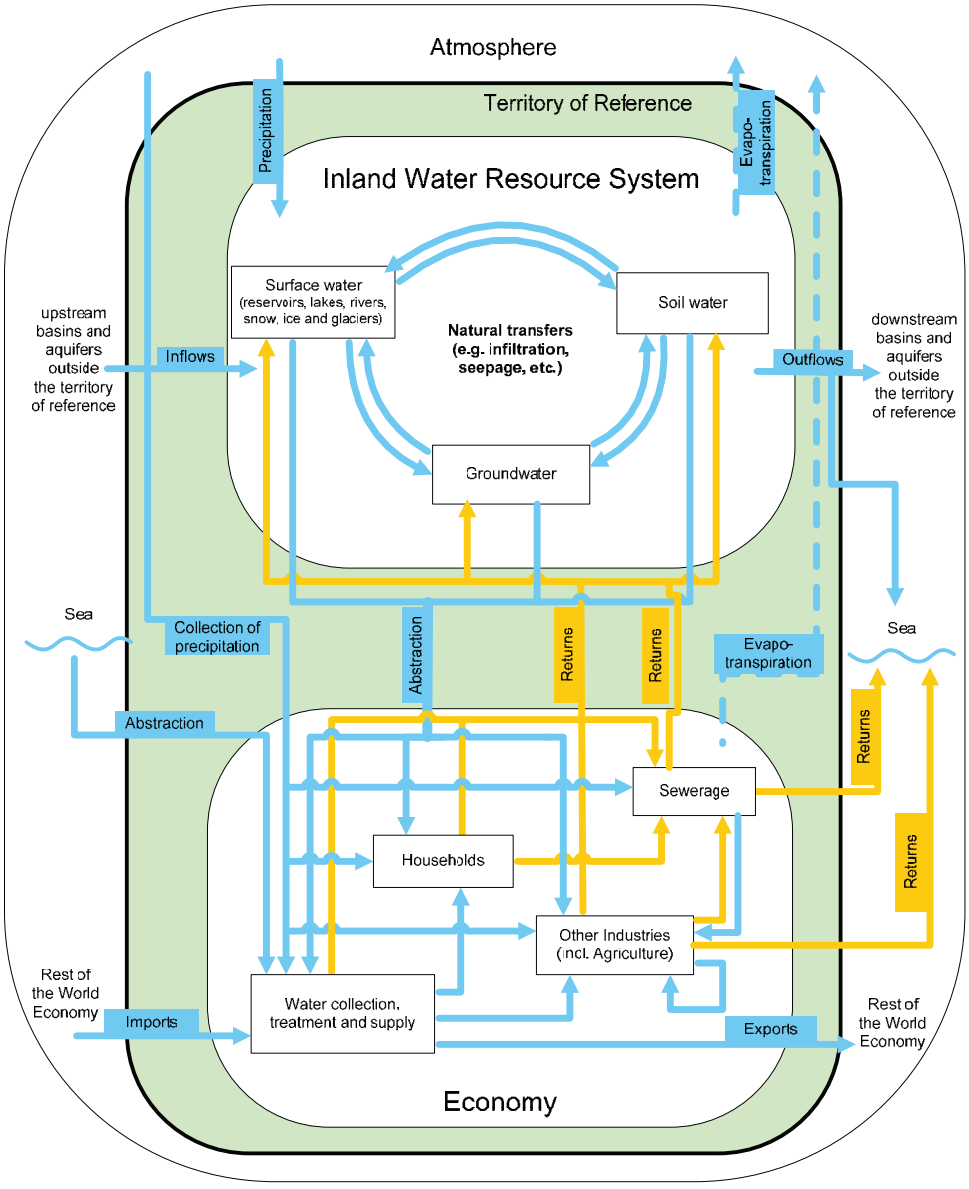
In 2010 the UNSC also adopted the *International Recommendations for Water Statistics* (IRWS). The IRWS further elaborates on the data items, concepts, sources and methods used in the SEEA-Water and in other international reporting formats (e.g. Food and Agriculture Organization). Together the SEEA-Water and the IRWS provide the conceptual framework as well as some of the practical guidance needed to compile water accounts and statistics.

A generalised view of the water system covered by SEEA-Water is found in Fig. 1.7. Water flows within the environment (i.e. rainfall, surface water, ground) and the economy are represented, in addition to the main flows between the environment and the economy. The water resources considered in the inland water resource system are rivers, lakes,

BACKGROUND *continued*

artificial reservoirs, snow, ice, groundwater and soil-water. The main natural inputs of water for any one of these resources are precipitation and natural inflows from other inland water resources. The main natural flows that can decrease the stocks of water for any one of these resources are evapotranspiration and outflows to other inland water sources. Human activities decrease and increase the water stocks through abstraction and returns.

1.7 MAIN FLOWS WITHIN THE AUSTRALIAN INLAND WATER RESOURCE SYSTEM AND THE ECONOMY



Source: SEEA-Water

BACKGROUND *continued*

The focus of the *Water Account Australia* is on the interactions between users within the economy and the environment. The economy is the system which abstracts water for consumption and production activities. The infrastructure to mobilise, store, treat, distribute and return water back to the environment forms part of the economy. The rounded box representing the economy shows the main economic agents related to water. Specifically identified are the water supply, sewerage and other industries, as well as households, which are identified only as final consumers.

Each business or household within the economy either abstracts water directly from the environment or receives it from other industries. Direct abstraction is via: inland water resources in the environment; precipitation which is either collected or used directly (e.g. rain-fed agriculture); sea water which can be either used directly (e.g. for cooling purposes) or after desalinisation.

Once water is used, it can either be discharged directly into the environment or supplied to a treatment facility (denoted by the box "Sewerage"), from where it is either supplied to other industries for further use (reused water), or returned back to the environment (to inland water resources and to the sea). During use or transportation, water can be lost through leakages or evaporation.

Water accounts can be prepared for any spatial boundary, whether they be administrative (e.g. nations, States and Territories) or physical (river basins and water catchments).

The SEEA-Water describes a series of tables and accounts covering the:

- physical supply and use of water
- monetary supply and use of water
- emission accounts (the pollution added to water)
- hybrid accounts (which combine physical and monetary supply and use with data from the national accounts)
- physical asset accounts
- water quality

While Australia has been one of the pioneers of water accounting, many countries are now using water accounts. According to the *Global Assessment of Water Statistics and Water Accounting* (UN 2008), the SEEA-Water and water accounting more generally is being practised by 44 countries around the world. The focus of water accounts of countries as well as the level of implementation and sophistication varies enormously. For example, in Europe the focus of water accounts tends to be on water pollution, whereas for drier countries, like Mexico, Turkey and Spain, the focus is on the amount of water available and the use of water for economic purposes.

In Australia, the Intergovernmental Agreement on a National Water Initiative (NWI; COAG 2004) made by Australia's governments has shaped the ongoing water management reform process and the provision of information to support this process. More specifically, the NWI mentioned water resource accounting and called for the annual compilation of water accounts.

As a component of this water reform process, the Australian Government passed the *Water Act 2007*, which charged the Bureau of Meteorology (BoM) with responsibility for compiling and delivering Australia's water information, including production of the *National Water Account*.

THE RELATIONSHIP BETWEEN THE BOM AND ABS WATER ACCOUNTS

The water accounts produced by the ABS and BoM will provide complementary information.

The BoM *National Water Account* will provide information on total water resource, the volume of water available for abstraction, the rights to abstract water, and the actual abstraction of water for economic, social, cultural, and environmental benefit. In general terms the BoM account will report on volumes of water traded, extracted and managed for economic, public and environmental purposes across Australia. These data are broadly represented in the top half of Fig 1.7 relating to natural flows within the inland water resource system and the interface between the environment and the economy.

The ABS *Water Account Australia* reports on the supply and use of water in the economy and related economic information from the SNA (the system which produces the statistics of Gross Domestic Product among many other things). These data are broadly represented in the bottom half of Fig 1.7 showing flows within the economy and the interface between the economy and the environment.

The BoM produced a *Pilot National Water Account* in 2009 to test methods and processes to be deployed in the production of future accounts and demonstrate what a *National Water Account* might look like. The first *National Water Account* will be published in 2011, for the 2009-10 year, covering the Adelaide, Canberra, Melbourne, Murray-Darling Basin, Ord, Perth, South-East Queensland and Sydney regions, with its preparation guided by first Australian Water Accounting Standard (WASB 2009b), which is currently in exposure draft form.

Both the BoM and the ABS water accounts are conceptually aligned with the SEEA-Water, although the degree of alignment is not complete. The ABS *Water Account Australia* is similar to the SEEA-Water physical and monetary supply and use tables and the hybrid account, while the BoM *National Water Account* has much in common with the SEEA-Water asset account.

Water consumption and water use

Calculating water use by industries is not straightforward. Water use can include self-extracted water, distributed water, or reuse water and sometimes a combination of all three sources are used. Calculating water use estimates for an industry or business is made more complicated when water is also supplied to other users, or when water is used in-stream (e.g. for cooling or hydro-power). As such simply adding self-extracted water, distributed water, and reuse water to derive a figure for total water use can be misleading.

In the *Water Account Australia*, volumes of water used and supplied by each industry have been balanced to derive 'water consumption'. This figure takes into account the different characteristics of water supply and use of industries and is a way of standardising water use, allowing for comparisons between industries. As such the following accounting identities have been used:

- Total water use is equal to the sum of Distributed water use, Self-extracted water use and Reuse water use;
- Water consumption is equal to the sum of Distributed water use, Self-extracted water use and Reuse water use less Water supplied to other users and less In-stream use. The use of Distributed water by the environment (Environmental Flows, see Explanatory Notes) is not included in total water consumption.

Water consumption and water use continued

For most industries, water use and water consumption are the same as most industries do not have any in-stream use or supply water to other users. However, water consumption will be considerably different for some industries, specifically the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry, ELECTRICITY AND GAS SUPPLY industry and MINING industry, where in-stream water use and water supply volumes are significant.

CHANGES TO THIS EDITION

Content

The core content of previous editions of the *Water Account Australia*, the physical supply and use tables found in Chapter 2, remain virtually unchanged (the exceptions are noted below). However, added are the monetary supply and use tables, which have twice previously been published separately as experimental estimates. The joint publication of the physical and monetary supply use tables enables a range of comparisons not previously available (see Tables 1.5 and 1.6).

The chapters providing data and commentary on the mining, manufacturing and electricity generating industries have been removed along with the chapters on households, water access entitlements, allocations, trading and water stocks. The data on water storage in large dams previously published in this publication can now be found on the BoM website (http://water.bom.gov.au/waterstorage/awris/index.html). Information on entitlements, allocations and trading are now also being compiled by the BoM as part of the *National Water Account*.

Additional data on household water use can be found in *Australia's Environment: People's Views and Practices March 2007* (ABS cat. no. 4602.0) and 2010 (ABS cat. no. 4602.0.55.003). This includes information on the number of households with rainwater tanks and water conservation practices among other topics.

As with the previous publication of the *Water Account Australia*, additional data will be progressively added to the ABS website. These data will include information on the Murray-Darling Basin as well as the construction of time series of water supply and use for 2000–01 to 2008–09. At present there are data for 1993–94 to 1996–97, 2000–01 and 2004–05.

Revisions to previously published results

Increased ABS survey resources, improved business reporting and greater access to State, Territory and Australian government data have led to improvements in data quality for the 2008–09 *Water Account Australia*. These data improvements have enabled a greater understanding of water supply and use relationships within the economy and the quality of data used in earlier releases of the *Water Account Australia*. Potential revisions to data released previously were identified during production of the statistics in this 2008–09 publication. Revisions to previous data have been delayed, pending further investigation of data, sources and methods. As such, the 2004–05 results presented in this publication are unchanged from the original 2004–05 publication. Revisions to estimates published in earlier editions of the *Water Account Australia* will be incorporated within a time series to be published in 2011 (see below under Future Plans).

Physical supply and use tables

Some changes to the physical supply and use tables have occurred. In particular, there has been some changes in the classification of industries owing to the introduction of ANZSIC 2006 and SNA 2008. For example, the WASTE COLLECTION, TREATMENT AND DISPOSAL industry has moved from OTHER industries and is now shown separately.

Physical supply and use tables continued

AGRICULTURE is now presented in a strict industry view in the main physical supply and use tables of Chapter 2 while the AGRICULTURE chapter contains the previously shown information of water use by activity. The presentation in the supply and use tables means that the AGRICULTURE industry data in the *Water Account Australia* can be directly compared to the data in the SNA as is done in Table 1.2 (water consumption and Industry Value Added by industry).

A change in accounting treatment has been applied to a water provider in New South Wales in 2008–09. This change has caused an increase in the volume of water categorised as distributed water supply in New South Wales in 2008–09 from 1,619 GL to 3,508 GL. This additional volume accounts for 54% of total distributed water use in New South Wales in 2008-09. The new treatment has been implemented in light of new information and increased understanding of regulatory and supply arrangements. The treatment has not been applied to the 2004–05 published results at this time, however a revision will be incorporated within the a time series from 2000–01 to 2008–09 to be published in 2011.

Some unusual events have also resulted in the application of uncommon treatments. For example an unplanned release of water was used to dilute polluted water to an acceptable concentration for release into the environment. In this the overflow was classified as a supply and use of distributed water but was also classified to be a part of in-stream use, so does not show up in consumption. This treatment is in accordance with definitions of in-stream use which specifically mention the dilution of waste.

Methods

A revised methodology for calculating the Gross Value of Irrigated Agricultural Production (GVIAP) has been implemented in the *Water Account Australia* 2008–09, following an internal methodological review in 2008. GVIAP refers to the gross value of agricultural commodities that are produced with the assistance of irrigation. Findings from the methodological review indicated that previous methods led to an underestimation of GVIAP. The information paper *Methods of estimating the Gross Value of Irrigated Agricultural Production* (ABS cat. no. 4610.0.55.006) discussed the review process and proposed an improved methodology for producing GVIAP estimates.

The extent of the underestimation of GVIAP based on the previous methodology varies by agricultural commodity. Users are directed to *Experimental Estimates of the Gross Value of Irrigated Agricultural Production 2000–01 to 2008–09* (ABS cat. no. 4610.0.55.008) for revised estimates and discussion on the impact of the revised methodology. The estimates presented in the 2008–09 *Water Account Australia* are based on the improved methodology.

Other methods used in the *Water Account Australia* 2008–09 have remained largely unchanged since the last edition.

Terminology

Every endeavour has been made to ensure the terminology used in the 2008–09 *Water Account Australia* is consistent with definitions found in the 2004–05 *Water Account Australia* and those used by Commonwealth, State and Territory water authorities. ABS continues to use the term "Distributed water" to reflect the terminology of SEEA-Water (UN 2006). Distributed water includes potable water, non-potable water and raw water (see Glossary).

Water quality

The ABS did not collect information relating to the quality of distributed water in either the 2004–05 or the 2008–09 publications of the *Water Account Australia*. The 2004–05 publication presented information on discharges of water to the environment by treatment level, however these data were not collected by the ABS in 2008–09. Ideally, the supply and use tables would include information on the quality of water used in the economy as well as the quality of the water returned to the environment.

FUTURE PLANS

ABS plans to produce annual water accounts from 2008–09 onwards. ABS has planned for comprehensive survey data to feed into the *Water Account Australia* every third year starting with this 2008–09 release. There will be reduced information on the supply and use of water from industries other than the Water Supply, Sewerage and Drainage Services and Agriculture industries during the intervening years (2009–10 and 2010–11). This may result in some reduced detail within published results during these intervening years. The next fully comprehensive *Water Account Australia* results are due for the 2011–12 reference year.

ABS is continuing to work with Federal, State and Territory organisations to reduce the burden of reporting entities by accessing existing data which can be used for *Water Account Australia*, instead of relying on direct survey collection.

ABS is planning to release a time series for the Supply and Use tables within the *Water Account Australia*, covering the years 2000–01 through to 2008–09. This publication is scheduled for release in the middle of 2011. The time series will include: data published on an ANZSIC 2006 basis; presentation of results more consistent with the recommendations of SEEA-Water; some revisions to previously released results, in light of new information obtained during production of the *Water Account Australia* 2008–09.

CHAPTER CONTENTS

This edition of the *Water Account Australia* consists of five Chapters, two Appendices, Explanatory notes, Glossary and Bibliography. Each chapter begins with an introduction and contains commentary to highlight key data and assist with interpretation of tables, which are interspersed within the chapter commentary. In some cases information and explanations are repeated so that chapters can stand alone as a source of information. Chapter 2 presents the supply and use (or flow) tables for 2008–09 only. Volumes of water supplied, used and discharged are presented by industry in these tables. Water use is split by self-extracted, distributed and reuse water.

Chapters 3 combines monetary information based on the Australian National Accounts and water price information, with the physical water flow information presented within Chapter 2.

Chapters 4 and 5 take a more detailed look at the supply and use of water in the Australian economy and include a range of additional information to help understand the data.

CHAPTER 2 PHYSICAL WATER SUPPLY AND USE

INTRODUCTION

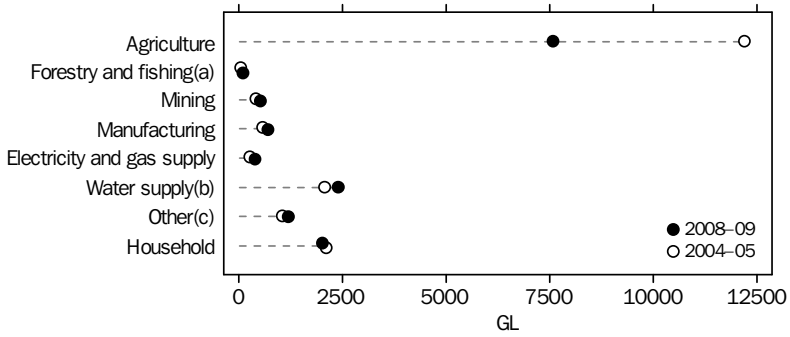
This chapter presents information on the volume of water supplied and used by industry and households within the Australian economy in 2008–09. Water consumption by the States and Territories is presented, as well as water consumption by main industry groups. The industry groups are based on the *Australian and New Zealand Standard Industrial Classification 2006* (ANZSIC) (ABS and Statistics New Zealand 2006).

WATER CONSUMPTION BY INDUSTRY

Calculating total water use and water consumption by industries is not straightforward. For many industries, total water use and water consumption are the same as they do not have any in-stream use or supply water to other users. However, total water use and water consumption will be different in industries where in-stream water use and water supply volumes are significant; specifically the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES, ELECTRICITY AND GAS SUPPLY, MINING, and the MANUFACTURING industries.

Graph 2.1 shows water consumption, by households and industry, for Australia in 2008–09 and 2004–05.

2.1 WATER CONSUMPTION, Australia—2004-05 to 2008-09



(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

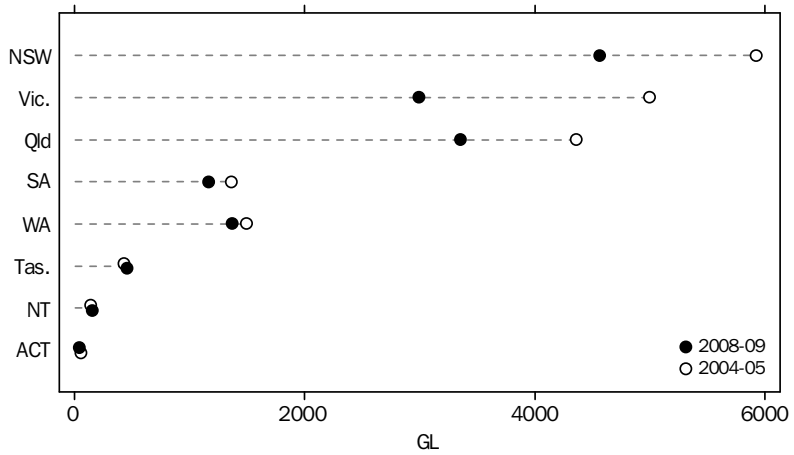
Note: This graph presents an activity view of agriculture rather than an industry view.

Water consumption in Australia for 2008–09 was 14,101 GL compared to 18,767 GL in 2004–05, a decrease of 25%. Agricultural activities had the highest water consumption in 2008–09, accounting for 7,589 GL (or 54% of the National total). The WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry was the next highest consumer of water in 2008–09, accounting for 2,396 GL, which is 17% of total water consumption. Consumptive water use by this industry is mostly attributable to losses in distribution. Households accounted for 1,768 GL or 13% of total water consumption. The MANUFACTURING industry consumed 677 GL of water in 2008–09 or 5% of total water consumption.

WATER CONSUMPTION BY INDUSTRY *continued*

Graph 2.2 shows water consumption by State and Territories. The share of water consumption is broadly aligned with state population and economic activities. Declines in water consumption by States and Territories from 2004–05 are indicative of reduced rainfall and drought conditions impacting on water availability. This is particularly the case in southern and eastern regions of Australia (see Appendix 1).

2.2 WATER CONSUMPTION, by states and territories—2004-05 and 2008-09



WATER CONSUMPTION BY STATE AND TERRITORY

Graphs 2.3 to 2.10 show water consumption by industry for each State and Territory for 2008–09 and 2004–05. These graphs illustrate the different patterns of water consumption by the main industry groups in the States and Territories.

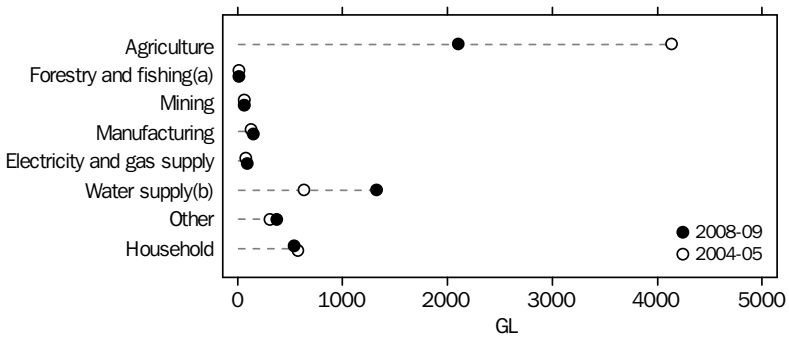
New South Wales

In New South Wales, water consumption was 4,562 GL during 2008–09 compared to 5,922 GL in 2004–05, a decrease of 23%. In 2008–09, 'agricultural activities' was the highest consumer with 2,106 GL or 46% of the total water consumption in New South Wales. This was followed by the Water Supply, Sewerage and Drainage Services industry which consumed 1,329 GL or 29%, the largest percentage of all the States and Territories. Households consumed 536 GL or 12% of total water consumption in New South Wales.

New South Wales

continued

2.3 WATER CONSUMPTION, New South Wales—2004–05 and 2008–09



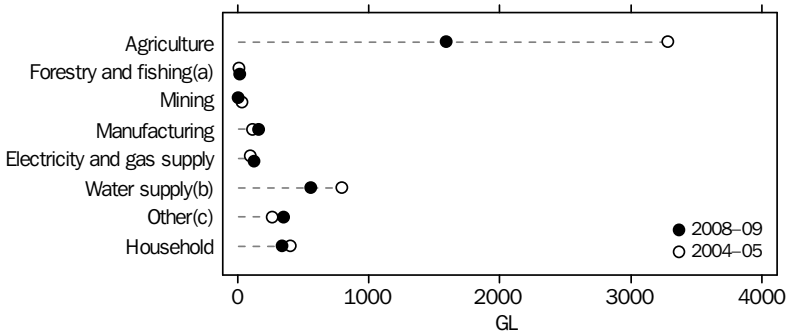
(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

Victoria

In Victoria, 2,991 GL of water was consumed in 2008–09 compared to 4,993 GL in 2004–05, a decrease of 40%. Agricultural activities were the highest consumer of water in Victoria in 2008–09, responsible for the consumption of 1,593 GL (or 53%) of the total water consumption in Victoria. The WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry was the next highest consumer of water, accounting for 558 GL (or 19%). OTHER industries consumed 351 GL or 12% of Victoria's total water consumption while households consumed 342 GL or 11%.

2.4 WATER CONSUMPTION, Victoria—2004–05 and 2008–09



(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

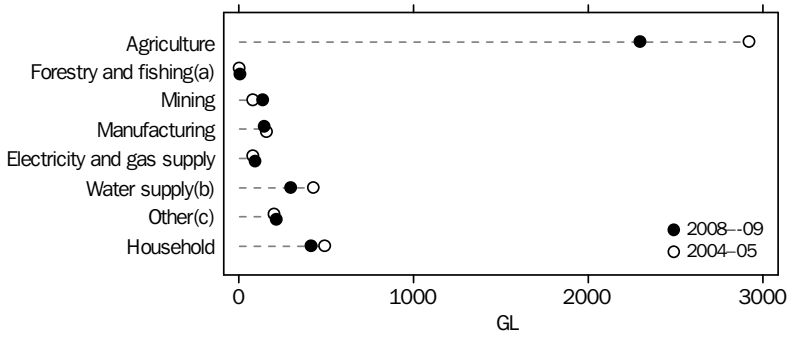
Note: This graph presents an activity view of agriculture rather than an industry view.

Queensland

In Queensland, 3,351 GL of water was consumed in 2008–09 compared to 4,361 GL in 2004–05, a decrease of 23%. Agricultural activities consumed the most water in 2008–09 with 2,296 GL or 69% of the total water consumption in Queensland. The next largest consumers in Queensland were households, with 308 GL or 9% followed by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry, with 297 GL or 9%.

Queensland continued

2.5 WATER CONSUMPTION, Queensland—2004–05 and 2008–09



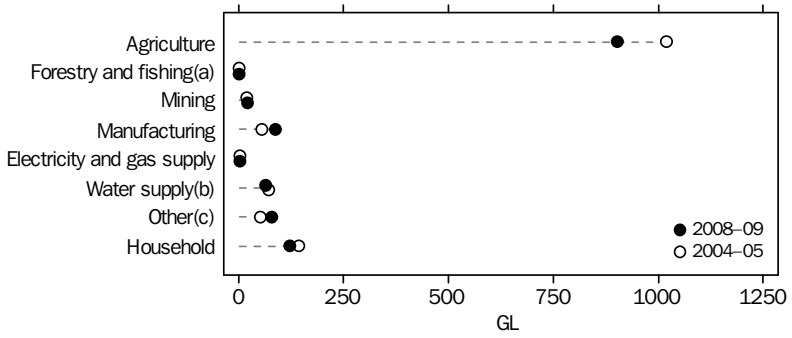
(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

South Australia

Water consumption in South Australia was 1,168 GL in 2008–09 compared to 1,365 GL in 2004–05, a decrease of 14%. Agricultural activities were the largest consumer of water in 2008–09, accounting for 902 GL or 77% of the total water consumption in South Australia. This proportion of water consumption by agricultural activities was the largest of all the States and Territories. Households consumed 122 GL or 10% of South Australia's total water consumption.

2.6 WATER CONSUMPTION, South Australia—2004–05 and 2008–09



(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

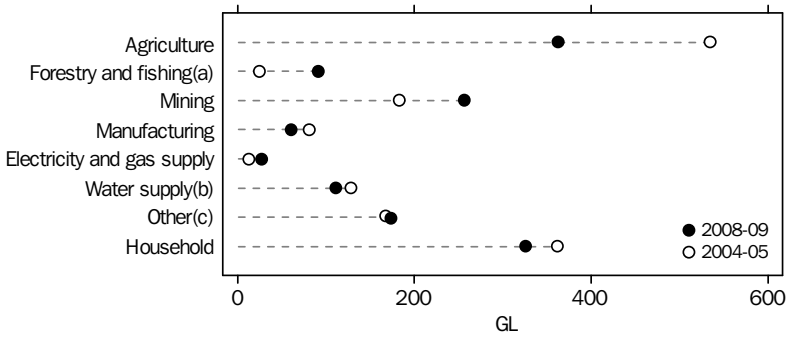
Western Australia

In Western Australia, 1,371 GL of water was consumed in 2008–09 compared to 1,495 GL in 2004–05, a decrease of 8%. In 2008–09, agricultural activities consumed the largest volume (363 GL or 26%) followed by households (326 GL or 24%). Consumption by the MINING industry was also substantial (257 GL or 19%), due to high level of mining activity in Western Australia compared to other States and Territories.

Western Australia

continued

2.7 WATER CONSUMPTION, Western Australia—2004–05 and 2008–09



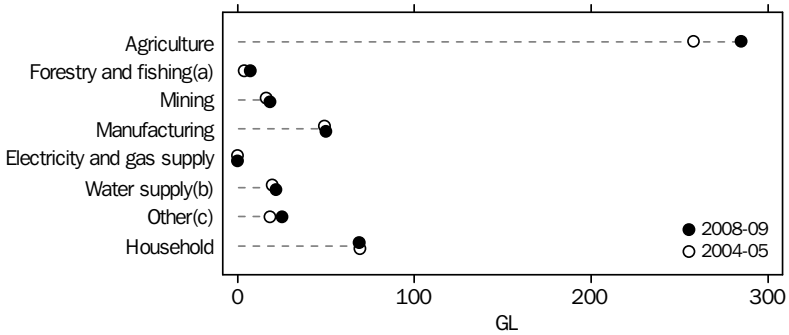
(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

Tasmania

Water consumption was 456 GL in Tasmania in 2008–09 compared to 434 GL in 2004–05, an increase of 5%. In 2008–09, agriculture activities were the largest consumer accounting for 285 GL or 63% of the total water consumption in the State. Households were also a major consumer of water in Tasmania, with 69 GL or 15%. The MANUFACTURING industry consumed 50 GL or 11%.

2.8 WATER CONSUMPTION, Tasmania—2004–05 and 2008–09



(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste Collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

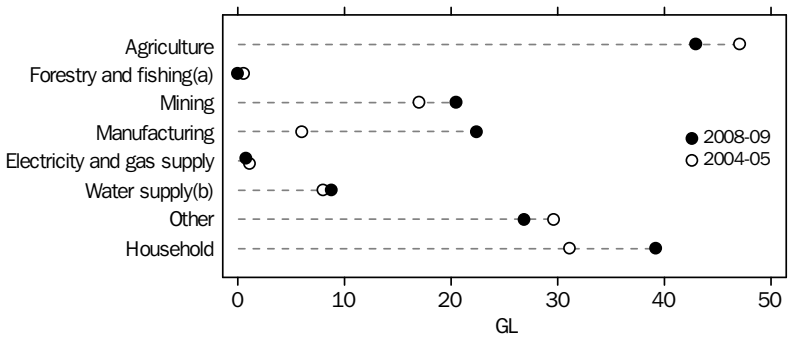
Northern Territory

In the Northern Territory, 154 GL of water was consumed in 2008–09 compared to 141 GL in 2004–05, an increase of 9%. In 2008–09, agricultural activities accounted for 43 GL (or 28%). The next highest consumer of water was households, consuming 39 GL (or 25%), followed by OTHER industries with 27 GL or 17%.

Northern Territory

continued

2.9 WATER CONSUMPTION, Northern Territory—2004–05 and 2008–09



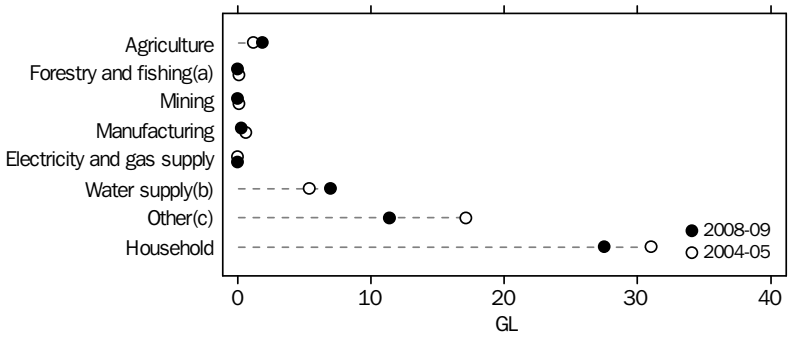
(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

Australian Capital Territory

In the Australian Capital Territory, 48 GL of water was consumed in 2008–09 compared to 56 GL in 2004–05, a decrease of 14%. In 2008–09, households accounted for 27 GL or 57% of the total water consumption in the territory. This is the largest proportion of household consumption in the States and Territories. The next highest consumer of water was OTHER industries, consuming 11 GL or 24%, followed by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry with 7 GL or 15%.

2.10 WATER CONSUMPTION, Australian Capital Territory—2004–05 and 2008–09



(a) Includes Services to agriculture; hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes Waste collection, treatment and disposal services.

Note: This graph presents an activity view of agriculture rather than an industry view.

2.11 WATER SUPPLY AND USE, Australia—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	441 411
Forestry and logging	—	—	—	na
Fishing, hunting and trapping	—	—	—	na
Agriculture, forestry and fishing support services	—	—	—	na
Mining				
Coal mining	—	9 057	na	57 099
Oil and gas extraction	—	777	na	72 265
Metal ore mining	—	np	na	150 549
Non-metallic mineral mining & quarrying	—	110	na	7 852
Exploration and other mining support services	—	np	na	24 353
Total	—	*23 539*	na	*312 118*
Manufacturing				
Food, beverage and tobacco product	—	5 554	na	62 031
Textile, leather, clothing and footwear	—	—	na	1 538
Wood, pulp, paper and converted paper product	—	—	na	66 276
Printing (incl the reproduction of recorded media)	—	—	na	155
Petroleum, coal, basic chemical and chemical product	—	np	na	20 585
Polymer, rubber and non-metallic mineral product	—	—	na	4 935
Primary metal, metal and fabricated metal product	—	np	na	65 141
Transport equipment, machinery and equipment	—	1	na	86
Furniture and other	—	—	na	9
Total	—	*13 791*	na	*220 755*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	266 558	6 505	44 706 235
Water supply, sewerage and drainage services(f)	—	9 369 147	341 463	1 778 772
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	59 839 438	—	—	—
Total	**59 839 438**	**9 673 034**	**347 968**	**47 459 291**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.11 WATER SUPPLY AND USE, Australia—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	21 867	30 503	6 120	—	58 490
Mushroom and vegetable growing	292 437	123 310	16 034	—	431 782
Fruit and tree nut growing	372 433	658 916	16 261	—	1 047 610
Sheep, beef cattle and grain farming	1 310 110	843 253	23 499	—	2 176 863
Other crop growing	944 831	932 006	24 026	—	1 900 863
Dairy cattle farming	622 736	625 633	14 513	—	1 262 883
Poultry farming	np	13 357	np	—	23 973
Deer farming	np	335	np	—	631
Other livestock farming	51 311	39 926	1 449	—	92 686
Total	*3 625 895*	*3 267 240*	*102 645*	—	*6 995 781*
Aquaculture	444 444	1 178	32	441 411	4 243
Forestry and logging	1 435	91 267	1 912	—	94 613
Fishing, hunting and trapping	439	1 584	—	—	2 024
Agriculture, forestry and fishing support services	9 489	51 980	246	—	61 715
Mining					
Coal mining	125 154	104 021	1 043	123 560	97 601
Oil and gas extraction	94 409	1 219	—	57 609	37 243
Metal ore mining	386 791	np	5 997	127 939	285 533
Non-metallic mineral mining & quarrying	40 113	3 826	9	2 341	41 497
Exploration and other mining support services	68 687	np	7	22 738	45 800
Total	*715 155*	*143 188*	*7 057*	*334 186*	*507 675*
Manufacturing					
Food, beverage and tobacco product	149 608	139 342	6 677	47	290 025
Textile, leather, clothing and footwear	1 001	10 204	975	1	12 178
Wood, pulp, paper and converted paper product	np	43 938	np	—	96 142
Printing (incl the reproduction of recorded media)	7	5 504	2	—	5 513
Petroleum, coal, basic chemical and chemical product	22 120	51 362	np	3 556	72 454
Polymer, rubber and non-metallic mineral product	np	20 864	468	np	31 318
Primary metal, metal and fabricated metal product	98 791	57 346	13 331	np	157 735
Transport equipment, machinery and equipment	769	9 804	277	—	10 848
Furniture and other	31	1 050	4	—	1 084
Total	*336 009*	*339 412*	*27 961*	*12 295*	*677 298*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	44 840 605	228 089	9 199	44 483 500	327 834
Water supply, sewerage and drainage services(g)	9 369 147	2 317 205	79 030	—	2 396 235
Waste collection, treatment and disposal services	5 208	2 304	1	—	7 512
Other industries(h)	319 520	944 355	87 260	93 326	1 257 810
Household	172 092	1 593 966	2 193	—	1 768 251
Environment	—	691 265	30 432	—	—
Total	**59 839 438**	**9 673 034**	**347 968**	**45 364 718**	**14 100 991**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.12 WATER SUPPLY AND USE, New South Wales—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	639
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	3 499	na	35 530
Oil and gas extraction	—	—	na	326
Metal ore mining	—	—	na	905
Non-metallic mineral mining & quarrying	—	—	na	8
Exploration and other mining support services	—	—	na	—
Total	—	*3 499*	na	*36 769*
Manufacturing				
Food, beverage and tobacco product	—	323	na	13 617
Textile, leather, clothing and footwear	—	—	na	385
Wood, pulp, paper and converted paper product	—	—	na	np
Printing (incl the reproduction of recorded media)	—	—	na	—
Petroleum, coal, basic chemical and chemical product	—	np	na	np
Polymer, rubber and non-metallic mineral product	—	—	na	75
Primary metal, metal and fabricated metal product	—	np	na	22 156
Transport equipment, machinery and equipment	—	1	na	12
Furniture and other	—	—	na	—
Total	—	*1 992*	na	*41 816*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	53 948	98	6 458 034
Water supply, sewerage and drainage services(f)	—	3 508 075	95 583	652 869
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	11 243 401	—	—	—
Total	**11 243 401**	**3 567 514**	**95 681**	**7 190 127**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.12 WATER SUPPLY AND USE, New South Wales—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	3 643	12 929	12	—	16 584
Mushroom and vegetable growing	42 940	25 904	1 158	—	70 001
Fruit and tree nut growing	61 898	167 938	109	—	229 944
Sheep, beef cattle and grain farming	488 353	349 843	10 558	—	848 754
Other crop growing	247 462	355 521	15 984	—	618 967
Dairy cattle farming	105 701	69 397	3 529	—	178 627
Poultry farming	np	np	np	—	11 297
Deer farming	np	np	np	—	13
Other livestock farming	19 428	7 161	686	—	27 275
Total	*972 911*	*995 840*	*32 710*	—	*2 001 462*
Aquaculture	686	55	32	639	134
Forestry and logging	26	312	—	—	338
Fishing, hunting and trapping	224	62	—	—	286
Agriculture, forestry and fishing support services	905	9 016	—	—	9 920
Mining					
Coal mining	64 576	3 004	932	26 294	38 719
Oil and gas extraction	326	154	—	326	154
Metal ore mining	15 807	6 373	3 609	—	25 789
Non-metallic mineral mining & quarrying	1 212	319	—	8	1 523
Exploration and other mining support services	—	38	2	—	40
Total	*81 921*	*9 887*	*4 543*	*26 628*	*66 225*
Manufacturing					
Food, beverage and tobacco product	35 922	40 766	1 523	46	77 841
Textile, leather, clothing and footwear	321	1 258	10	1	1 588
Wood, pulp, paper and converted paper product	np	np	np	—	10 593
Printing (incl the reproduction of recorded media)	2	2 675	2	—	2 680
Petroleum, coal, basic chemical and chemical product	2 072	18 659	np	—	21 280
Polymer, rubber and non-metallic mineral product	2 848	4 497	136	—	7 482
Primary metal, metal and fabricated metal product	np	np	6 558	2 522	24 772
Transport equipment, machinery and equipment	587	2 873	11	—	3 469
Furniture and other	—	255	—	—	256
Total	*57 533*	*87 552*	*9 436*	*2 569*	*149 960*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	6 526 537	67 982	941	6 449 332	92 180
Water supply, sewerage and drainage services(g)	3 508 075	1 303 476	25 318	—	1 328 794
Waste collection, treatment and disposal services	5 155	1 491	—	—	6 645
Other industries(h)	63 641	289 467	16 980	—	370 088
Household	25 787	508 388	1 704	—	535 879
Environment	—	293 985	4 016	—	—
Total	**11 243 401**	**3 567 514**	**95 681**	**6 479 168**	**4 561 913**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.13 WATER SUPPLY AND USE, Victoria 2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	400
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	—	na	—
Oil and gas extraction	—	—	na	31 313
Metal ore mining	—	—	na	1 870
Non-metallic mineral mining & quarrying	—	85	na	251
Exploration and other mining support services	—	—	na	735
Total	—	*85*	na	*34 169*
Manufacturing				
Food, beverage and tobacco product	—	np	na	20 057
Textile, leather, clothing and footwear	—	—	na	760
Wood, pulp, paper and converted paper product	—	—	na	np
Printing (incl the reproduction of recorded media)	—	—	na	155
Petroleum, coal, basic chemical and chemical product	—	np	na	np
Polymer, rubber and non-metallic mineral product	—	—	na	1 844
Primary metal, metal and fabricated metal product	—	—	na	2 794
Transport equipment, machinery and equipment	—	—	na	31
Furniture and other	—	—	na	—
Total	—	*2 470*	na	*41 212*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	115	3 733	2 774 808
Water supply, sewerage and drainage services(f)	—	2 424 493	112 535	447 950
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	5 738 122	—	—	—
Total	**5 738 122**	**2 427 162**	**116 268**	**3 298 539**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.13 WATER SUPPLY AND USE, Victoria 2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	2 201	10 109	2 034	—	14 345
Mushroom and vegetable growing	31 771	41 626	8 390	—	81 787
Fruit and tree nut growing	33 337	295 258	476	—	329 071
Sheep, beef cattle and grain farming	101 592	181 880	8 305	—	291 778
Other crop growing	3 250	14 027	48	—	17 324
Dairy cattle farming	190 776	472 134	9 776	—	672 686
Poultry farming	np	3 481	np	—	4 322
Deer farming	np	280	np	—	327
Other livestock farming	3 668	20 045	49	—	23 761
Total	*367 417*	*1 038 839*	*29 145*	—	*1 435 401*
Aquaculture	400	1	—	400	1
Forestry and logging	290	287	—	—	577
Fishing, hunting and trapping	—	124	—	—	124
Agriculture, forestry and fishing support services	1 743	13 857	1	—	15 601
Mining					
Coal mining	—	1	2	—	3
Oil and gas extraction	33 065	166	—	31 299	1 932
Metal ore mining	np	547	2 132	np	1 927
Non-metallic mineral mining & quarrying	np	978	—	np	946
Exploration and other mining support services	1 782	5	—	735	1 051
Total	*35 258*	*1 696*	*2 134*	*33 145*	*5 859*
Manufacturing					
Food, beverage and tobacco product	np	44 777	2 840	1	79 472
Textile, leather, clothing and footwear	196	5 211	275	1	5 683
Wood, pulp, paper and converted paper product	np	30 818	np	—	33 290
Printing (incl the reproduction of recorded media)	2	1 916	—	—	1 918
Petroleum, coal, basic chemical and chemical product	119	12 129	np	6	12 303
Polymer, rubber and non-metallic mineral product	5 844	7 682	49	1 092	12 483
Primary metal, metal and fabricated metal product	3 886	4 347	1 925	6	10 152
Transport equipment, machinery and equipment	67	2 392	228	—	2 686
Furniture and other	24	418	3	—	444
Total	*45 592*	*109 690*	*6 726*	*1 106*	*158 432*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	2 795 250	68 808	3 544	2 744 188	123 300
Water supply, sewerage and drainage services(g)	2 424 493	518 020	39 924	—	557 944
Waste collection, treatment and disposal services	46	287	1	—	334
Other industries(h)	53 175	264 723	33 587	—	351 485
Household	14 458	326 951	100	—	341 509
Environment	—	83 879	1 107	—	—
Total	**5 738 122**	**2 427 162**	**116 268**	**2 778 838**	**2 990 566**

— nil or rounded to zero (including null cells)

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(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.14 WATER SUPPLY AND USE, Queensland—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	2 422
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	3 566	na	14 267
Oil and gas extraction	—	751	na	7 155
Metal ore mining	—	3 887	na	23 702
Non-metallic mineral mining & quarrying	—	4	na	4 999
Exploration and other mining support services	—	—	na	1
Total	—	*8 208*	na	*50 124*
Manufacturing				
Food, beverage and tobacco product	—	2 882	na	24 410
Textile, leather, clothing and footwear	—	—	na	392
Wood, pulp, paper and converted paper product	—	—	na	207
Printing (incl the reproduction of recorded media)	—	—	na	—
Petroleum, coal, basic chemical and chemical product	—	—	na	6 577
Polymer, rubber and non-metallic mineral product	—	—	na	2 605
Primary metal, metal and fabricated metal product	—	2 743	na	14 055
Transport equipment, machinery and equipment	—	—	na	13
Furniture and other	—	—	na	—
Total	—	*5 624*	na	*48 259*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	104 755	801	1 055 464
Water supply, sewerage and drainage services(f)	—	2 092 277	43 463	400 808
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	4 629 876	—	—	—
Total	**4 629 876**	**2 210 863**	**44 264**	**1 557 077**

— nil or rounded to zero (including null cells)
na not available
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.14 WATER SUPPLY AND USE, Queensland—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	5 118	5 186	54	—	10 358
Mushroom and vegetable growing	61 755	26 068	55	—	87 878
Fruit and tree nut growing	78 642	68 015	718	—	147 374
Sheep, beef cattle and grain farming	310 206	226 198	2 939	—	539 343
Other crop growing	668 101	552 917	7 994	—	1 229 013
Dairy cattle farming	66 864	38 034	—	—	104 898
Poultry farming	2 440	2 099	—	—	4 538
Deer farming	—	—	—	—	—
Other livestock farming	11 428	9 277	92	—	20 798
Total	*1 204 555*	*927 793*	*11 853*	—	*2 144 201*
Aquaculture	2 422	11	—	2 422	11
Forestry and logging	423	2 577	1 912	—	4 912
Fishing, hunting and trapping	8	671	—	—	679
Agriculture, forestry and fishing support services	3 013	25 776	237	—	29 026
Mining					
Coal mining	48 518	100 843	102	91 032	54 866
Oil and gas extraction	18 083	175	—	6 648	10 858
Metal ore mining	54 829	11 862	1	22 909	39 896
Non-metallic mineral mining & quarrying	9 725	565	9	—	10 295
Exploration and other mining support services	1 814	253	—	1	2 066
Total	*132 969*	*113 698*	*112*	*120 590*	*117 981*
Manufacturing					
Food, beverage and tobacco product	41 520	34 928	676	—	74 241
Textile, leather, clothing and footwear	28	3 235	281	—	3 544
Wood, pulp, paper and converted paper product	np	2 875	np	—	3 434
Printing (incl the reproduction of recorded media)	—	226	—	—	226
Petroleum, coal, basic chemical and chemical product	np	13 496	np	—	16 204
Polymer, rubber and non-metallic mineral product	np	6 139	212	np	7 092
Primary metal, metal and fabricated metal product	np	24 338	2 599	np	41 318
Transport equipment, machinery and equipment	59	1 318	3	—	1 380
Furniture and other	—	214	—	—	215
Total	*66 447*	*86 769*	*5 095*	*5 033*	*147 654*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	1 050 909	83 326	4 171	951 526	82 124
Water supply, sewerage and drainage services(g)	2 092 277	290 312	6 345	—	296 657
Waste collection, treatment and disposal services	5	215	—	—	219
Other industries(h)	52 711	246 055	14 502	93 326	219 942
Household	24 138	283 863	37	—	308 037
Environment	—	149 799	—	—	—
Total	**4 629 876**	**2 210 863**	**44 264**	**1 172 898**	**3 351 443**

— nil or rounded to zero (including null cells)

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(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.15 WATER SUPPLY AND USE, South Australia—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	3 569
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	—	na	—
Oil and gas extraction	—	—	na	4 682
Metal ore mining	—	np	na	10
Non-metallic mineral mining & quarrying	—	—	na	100
Exploration and other mining support services	—	np	na	—
Total	—	*914*	na	*4 791*
Manufacturing				
Food, beverage and tobacco product	—	1	na	1 286
Textile, leather, clothing and footwear	—	—	na	—
Wood, pulp, paper and converted paper product	—	—	na	11 615
Printing (incl the reproduction of recorded media)	—	—	na	—
Petroleum, coal, basic chemical and chemical product	—	29	na	1 330
Polymer, rubber and non-metallic mineral product	—	—	na	11
Primary metal, metal and fabricated metal product	—	—	na	23 021
Transport equipment, machinery and equipment	—	—	na	29
Furniture and other	—	—	na	—
Total	—	*30*	na	*37 292*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	1	np	np
Water supply, sewerage and drainage services(f)	—	425 696	np	np
Waste collection, treatment and disposal services	—	—	—	—
Other industries(g)	—	—	—	—
Household	—	—	—	—
Environment	1 138 548	—	—	—
Total	**1 138 548**	**426 642**	**34 570**	**107 300**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.15 WATER SUPPLY AND USE, South Australia—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	2 402	1 139	278	—	3 819
Mushroom and vegetable growing	76 164	13 048	6 410	—	95 621
Fruit and tree nut growing	145 438	110 261	14 845	—	270 544
Sheep, beef cattle and grain farming	233 859	26 332	56	—	260 247
Other crop growing	17 528	120	—	—	17 648
Dairy cattle farming	118 804	5 858	362	—	125 023
Poultry farming	np	np	—	—	1 897
Deer farming	np	np	—	—	201
Other livestock farming	10 612	2 150	562	—	13 324
Total	*606 446*	*159 367*	*22 513*	—	*788 326*
Aquaculture	3 707	1 093	—	3 569	1 231
Forestry and logging	—	187	—	—	187
Fishing, hunting and trapping	44	124	—	—	168
Agriculture, forestry and fishing support services	131	118	—	—	249
Mining					
Coal mining	10	16	—	—	27
Oil and gas extraction	3 650	161	—	1 328	2 483
Metal ore mining	15 261	np	17	—	14 394
Non-metallic mineral mining & quarrying	424	628	—	—	1 052
Exploration and other mining support services	3 764	np	—	—	3 953
Total	*23 108*	*1 026*	*17*	*1 328*	*21 909*
Manufacturing					
Food, beverage and tobacco product	22 967	12 044	1 273	—	36 283
Textile, leather, clothing and footwear	9	180	409	—	598
Wood, pulp, paper and converted paper product	11 414	467	—	—	11 880
Printing (incl the reproduction of recorded media)	—	596	—	—	596
Petroleum, coal, basic chemical and chemical product	20	3 688	22	—	3 702
Polymer, rubber and non-metallic mineral product	559	1 305	68	—	1 932
Primary metal, metal and fabricated metal product	21 321	10 295	27	—	31 643
Transport equipment, machinery and equipment	17	1 321	2	—	1 340
Furniture and other	7	63	—	—	70
Total	*56 314*	*29 960*	*1 801*	—	*88 046*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	267	2 179	—	—	2 445
Water supply, sewerage and drainage services(g)	425 696	64 022	317	—	64 339
Waste collection, treatment and disposal services	3	141	—	—	144
Other industries(h)	18 136	51 340	9 569	—	79 046
Household	4 694	116 512	352	—	121 557
Environment	—	573	—	—	—
Total	**1 138 548**	**426 642**	**34 570**	**4 897**	**1 167 647**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.16 WATER SUPPLY AND USE, Western Australia—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	11 239
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	1 992	na	7 025
Oil and gas extraction	—	26	na	17 613
Metal ore mining	—	np	na	101 100
Non-metallic mineral mining & quarrying	—	—	na	2 473
Exploration and other mining support services	—	np	na	22 220
Total	—	*8 905*	na	*150 432*
Manufacturing				
Food, beverage and tobacco product	—	54	na	1 418
Textile, leather, clothing and footwear	—	—	na	—
Wood, pulp, paper and converted paper product	—	—	na	1
Printing (incl the reproduction of recorded media)	—	—	na	—
Petroleum, coal, basic chemical and chemical product	—	np	na	8 668
Polymer, rubber and non-metallic mineral product	—	—	na	1
Primary metal, metal and fabricated metal product	—	np	na	204
Transport equipment, machinery and equipment	—	—	na	1
Furniture and other	—	—	na	9
Total	—	*1 347*	na	*10 301*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	133	np	1 733 440
Water supply, sewerage and drainage services(f)	—	634 706	np	126 123
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	3 229 948	—	—	—
Total	**3 229 948**	**645 091**	**19 364**	**2 031 535**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.16 WATER SUPPLY AND USE, Western Australia—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	6 228	867	3 563	—	10 658
Mushroom and vegetable growing	48 269	13 129	—	—	61 397
Fruit and tree nut growing	38 901	16 595	96	—	55 592
Sheep, beef cattle and grain farming	65 856	47 053	55	—	112 964
Other crop growing	6 131	9 142	—	—	15 273
Dairy cattle farming	34 882	27 712	—	—	62 594
Poultry farming	np	np	—	—	1 497
Deer farming	np	np	—	—	52
Other livestock farming	3 721	962	60	—	4 744
Total	*205 355*	*115 642*	*3 774*	—	*324 771*
Aquaculture	11 296	6	—	11 239	63
Forestry and logging	696	87 809	—	—	88 505
Fishing, hunting and trapping	145	373	—	—	518
Agriculture, forestry and fishing support services	9	2 727	8	—	2 744
Mining					
Coal mining	10 681	155	6	5 977	2 873
Oil and gas extraction	28 045	563	—	8 666	19 917
Metal ore mining	250 616	np	237	90 238	169 155
Non-metallic mineral mining & quarrying	28 425	1 321	—	2 170	27 577
Exploration and other mining support services	58 397	np	4	20 605	37 182
Total	*376 164*	*16 852*	*249*	*127 655*	*256 704*
Manufacturing					
Food, beverage and tobacco product	3 704	4 226	272	—	8 148
Textile, leather, clothing and footwear	—	67	—	—	67
Wood, pulp, paper and converted paper product	726	237	7	—	970
Printing (incl the reproduction of recorded media)	1	28	—	—	29
Petroleum, coal, basic chemical and chemical product	np	2 933	2 264	3 550	17 909
Polymer, rubber and non-metallic mineral product	418	905	2	—	1 325
Primary metal, metal and fabricated metal product	np	4 304	2 030	36	30 097
Transport equipment, machinery and equipment	12	1 860	33	—	1 905
Furniture and other	—	89	—	—	89
Total	*46 216*	*14 648*	*4 609*	*3 586*	*60 539*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	1 753 519	5 714	543	1 732 751	26 893
Water supply, sewerage and drainage services(g)	634 706	109 122	1 777	—	110 899
Waste collection, treatment and disposal services	—	157	—	—	157
Other industries(h)	115 089	50 025	8 404	—	173 519
Household	86 753	239 285	—	—	326 038
Environment	—	2 731	—	—	—
Total	**3 229 948**	**645 091**	**19 364**	**1 875 231**	**1 371 349**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.17 WATER SUPPLY AND USE, Tasmania—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	419 015
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	—	na	278
Oil and gas extraction	—	—	na	—
Metal ore mining	—	np	na	18 046
Non-metallic mineral mining & quarrying	—	np	na	22
Exploration and other mining support services	—	—	na	—
Total	—	*376*	na	*18 346*
Manufacturing				
Food, beverage and tobacco product	—	—	na	1 240
Textile, leather, clothing and footwear	—	—	na	—
Wood, pulp, paper and converted paper product	—	—	na	np
Printing (incl the reproduction of recorded media)	—	—	na	—
Petroleum, coal, basic chemical and chemical product	—	—	na	np
Polymer, rubber and non-metallic mineral product	—	—	na	398
Primary metal, metal and fabricated metal product	—	—	na	388
Transport equipment, machinery and equipment	—	—	na	—
Furniture and other	—	—	na	—
Total	—	—	na	*39 122*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	107 607	—	32 684 402
Water supply, sewerage and drainage services(f)	—	176 618	6 456	49 858
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	33 643 455	—	—	—
Total	**33 643 455**	**284 601**	**6 456**	**33 210 743**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.17 WATER SUPPLY AND USE, Tasmania—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	1 002	135	113	—	1 249
Mushroom and vegetable growing	27 346	3 529	21	—	30 896
Fruit and tree nut growing	6 365	793	17	—	7 176
Sheep, beef cattle and grain farming	87 674	11 650	1 586	—	100 911
Other crop growing	1 743	246	—	—	1 989
Dairy cattle farming	105 703	12 498	846	—	119 048
Poultry farming	np	np	—	—	360
Deer farming	np	np	—	—	35
Other livestock farming	2 454	330	—	—	2 783
Total	*232 641*	*29 221*	*2 584*	—	*264 446*
Aquaculture	421 794	9	—	419 015	2 788
Forestry and logging	—	87	—	—	87
Fishing, hunting and trapping	18	228	—	—	246
Agriculture, forestry and fishing support services	3 689	483	—	—	4 171
Mining					
Coal mining	1 369	2	—	258	1 113
Oil and gas extraction	10	—	—	—	11
Metal ore mining	np	—	2	13 845	17 267
Non-metallic mineral mining & quarrying	np	9	—	—	78
Exploration and other mining support services	—	—	—	—	1
Total	*32 935*	*11*	*2*	*14 103*	*18 469*
Manufacturing					
Food, beverage and tobacco product	5 896	2 380	63	—	8 339
Textile, leather, clothing and footwear	446	80	—	—	526
Wood, pulp, paper and converted paper product	np	np	—	—	35 973
Printing (incl the reproduction of recorded media)	1	1	—	—	2
Petroleum, coal, basic chemical and chemical product	np	np	4	—	700
Polymer, rubber and non-metallic mineral product	590	44	—	—	635
Primary metal, metal and fabricated metal product	2 173	1 380	193	—	3 745
Transport equipment, machinery and equipment	27	17	—	—	44
Furniture and other	—	—	—	—	1
Total	*40 057*	*9 648*	*260*	—	*49 965*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	32 713 310	80	—	32 605 703	80
Water supply, sewerage and drainage services(g)	176 618	20 653	1 171	—	21 824
Waste collection, treatment and disposal services	—	3	—	—	3
Other industries(h)	13 904	9 065	2 439	—	25 409
Household	8 490	60 076	—	—	68 566
Environment	—	155 037	—	—	—
Total	**33 643 455**	**284 601**	**6 456**	**33 038 821**	**456 054**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes water extracted directly from the environment for use.

(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.

(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.

(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.

(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.

(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.

(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.

(h) For full list of other industries, see Glossary.

2.18 WATER SUPPLY AND USE, Northern Territory—2008–09

	SUPPLY			
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*Regulated discharge*(d)
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	4 127
Forestry and logging	—	—	—	—
Fishing, hunting and trapping	—	—	—	—
Agriculture, forestry and fishing support services	—	—	—	—
Mining				
Coal mining	—	np	na	np
Oil and gas extraction	—	np	na	np
Metal ore mining	—	np	na	np
Non-metallic mineral mining & quarrying	—	np	na	np
Exploration and other mining support services	—	np	na	np
Total	—	*1 552*	na	*17 487*
Manufacturing				
Food, beverage and tobacco product	—	np	na	np
Textile, leather, clothing and footwear	—	np	na	np
Wood, pulp, paper and converted paper product	—	np	na	np
Printing (incl the reproduction of recorded media)	—	np	na	np
Petroleum, coal, basic chemical and chemical product	—	np	na	np
Polymer, rubber and non-metallic mineral product	—	np	na	np
Primary metal, metal and fabricated metal product	—	np	na	np
Transport equipment, machinery and equipment	—	np	na	np
Furniture and other	—	np	na	np
Total	—	*2 328*	na	*2 750*
Electricity, gas, water and waste services				
Electricity and gas supply(e)	—	—	—	np
Water supply, sewerage and drainage services(f)	—	60 657	1 854	np
Waste collection, treatment and disposal services	—	—	na	na
Other industries(g)	—	—	na	na
Household	—	—	—	—
Environment	166 946	—	—	—
Total	**166 946**	**64 537**	**1 854**	**38 658**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery. Distributed water is a subset of the Self-extracted total.
(c) Refers to drainage, waste or storm water that may have been treated to some extent and supplied for use.
(d) Refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body.
(e) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(f) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(g) For full list of other industries, see Glossary.

2.18 WATER SUPPLY AND USE, Northern Territory—2008–09 *continued*

	USE				
	Self-extracted(a)	*Distributed*(b)	*Reuse*(c)	*In-stream use*(d)	*Consumption*(e)
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	np	np	—	—	373
Mushroom and vegetable growing	np	np	—	—	4 175
Fruit and tree nut growing	7 714	41	—	—	7 755
Sheep, beef cattle and grain farming	22 355	266	—	—	22 621
Other crop growing	np	np	—	—	417
Dairy cattle farming	np	—	—	—	np
Poultry farming	np	—	—	—	np
Deer farming	—	—	—	—	—
Other livestock farming	—	—	—	—	—
Total	*35 065*	*315*	—	—	*35 380*
Aquaculture	4 138	4	—	4 127	16
Forestry and logging	—	7	—	—	7
Fishing, hunting and trapping	—	2	—	—	2
Agriculture, forestry and fishing support services	—	2	—	—	2
Mining					
Coal mining	np	np	np	np	—
Oil and gas extraction	np	np	np	np	1 888
Metal ore mining	np	np	np	np	17 105
Non-metallic mineral mining & quarrying	np	np	np	np	23
Exploration and other mining support services	np	np	np	np	1 508
Total	*32 798*	*16*	—	*10 737*	*20 525*
Manufacturing					
Food, beverage and tobacco product	np	np	np	np	5 513
Textile, leather, clothing and footwear	np	np	np	np	173
Wood, pulp, paper and converted paper product	np	np	np	np	1
Printing (incl the reproduction of recorded media)	np	np	np	np	—
Petroleum, coal, basic chemical and chemical product	np	np	np	np	343
Polymer, rubber and non-metallic mineral product	np	np	np	np	310
Primary metal, metal and fabricated metal product	np	np	np	np	16 005
Transport equipment, machinery and equipment	np	np	np	np	13
Furniture and other	np	np	np	np	—
Total	*23 847*	*831*	*7*	—	*22 357*
Electricity, gas, water and waste services					
Electricity and gas supply(f)	813	—	—	—	812
Water supply, sewerage and drainage services(g)	60 657	8 479	300	—	8 779
Waste collection, treatment and disposal services	—	8	—	—	8
Other industries(h)	1 855	23 475	1 547	—	26 876
Household	7 774	31 398	—	—	39 171
Environment	—	—	—	—	—
Total	**166 946**	**64 537**	**1 854**	**14 864**	**153 936**

— nil or rounded to zero (including null cells)
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes water extracted directly from the environment for use.
(b) Includes water supplied to a user usually through a non-natural network (piped/open channel or other carrier) where an economic transaction has occurred for the exchange of water regardless of method of delivery.
(c) Refers to drainage, waste or storm water that may have been treated to some extent before being used. It excludes 'on-site' recycling.
(d) This is generally a subset of Self-extracted water use, however in some cases distributed water is used in-stream.
(e) Water consumption = Self-extracted use + Distributed water use + Reuse water use – In-stream water use – Distributed water supplied to other users and the environment.
(f) The majority of water used by this industry is 'in-stream' and is often used again downstream by other water users.
(g) Includes losses as well as water used by the Water supply, sewerage and drainage services industry.
(h) For full list of other industries, see Glossary.

2.19 WATER SUPPLY AND USE, Australian Capital Territory—2008–09

	SUPPLY			
	Self-extracted	*Distributed*	*Reuse*	*Regulated discharge*
	ML	ML	ML	ML
Agriculture, forestry and fishing				
Agriculture				
Nursery and floriculture production	—	—	—	na
Mushroom and vegetable growing	—	—	—	na
Fruit and tree nut growing	—	—	—	na
Sheep, beef cattle and grain farming	—	—	—	na
Other crop growing	—	—	—	na
Dairy cattle farming	—	—	—	na
Poultry farming	—	—	—	na
Deer farming	—	—	—	na
Other livestock farming	—	—	—	na
Total	—	—	—	na
Aquaculture	—	—	—	na
Forestry and logging	—	—	—	na
Fishing, hunting and trapping	—	—	—	na
Agriculture, forestry and fishing support services	—	—	—	na
Mining				
Coal mining	—	np	na	np
Oil and gas extraction	—	np	na	np
Metal ore mining	—	np	na	np
Non-metallic mineral mining & quarrying	—	np	na	np
Exploration and other mining support services	—	np	na	np
Total	—	—	na	—
Manufacturing				
Food, beverage and tobacco product	—	np	na	np
Textile, leather, clothing and footwear	—	np	na	np
Wood, pulp, paper and converted paper product	—	np	na	np
Printing (incl the reproduction of recorded media)	—	np	na	np
Petroleum, coal, basic chemical and chemical product	—	np	na	np
Polymer, rubber and non-metallic mineral product	—	np	na	np
Primary metal, metal and fabricated metal product	—	np	na	np
Transport equipment, machinery and equipment	—	np	na	np
Furniture and other	—	np	na	np
Total	—	—	na	*3*
Electricity, gas, water and waste services				
Electricity and gas supply	—	—	—	—
Water supply, sewerage and drainage services	—	46 625	29 511	25 309
Waste collection, treatment and disposal services	—	—	na	na
Other industries	—	—	na	na
Household	—	—	—	—
Environment	49 142	—	—	—
Total	**49 142**	**46 625**	**29 511**	**25 312**

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated

2.19 WATER SUPPLY AND USE, Australian Capital Territory—2008–09 *continued*

	USE				
	Self-extracted	*Distributed*	*Reuse*	*In-stream use*	*Consumption*
	ML	ML	ML	ML	ML
Agriculture, forestry and fishing					
Agriculture					
Nursery and floriculture production	np	np	66	—	1 104
Mushroom and vegetable growing	np	np	—	—	25
Fruit and tree nut growing	137	17	—	—	154
Sheep, beef cattle and grain farming	215	31	—	—	246
Other crop growing	np	np	—	—	233
Dairy cattle farming	np	—	—	—	np
Poultry farming	np	np	—	—	np
Deer farming	np	—	—	—	np
Other livestock farming	—	—	—	—	—
Total	*1 504*	*223*	*66*	—	*1 793*
Aquaculture	—	—	—	—	—
Forestry and logging	—	—	—	—	—
Fishing, hunting and trapping	—	—	—	—	—
Agriculture, forestry and fishing support services	—	1	—	—	1
Mining					
Coal mining	np	np	np	np	—
Oil and gas extraction	np	np	np	np	—
Metal ore mining	np	np	np	np	—
Non-metallic mineral mining & quarrying	np	np	np	np	4
Exploration and other mining support services	np	np	np	np	—
Total	*2*	*3*	—	—	*4*
Manufacturing					
Food, beverage and tobacco product	np	np	np	np	187
Textile, leather, clothing and footwear	np	np	np	np	—
Wood, pulp, paper and converted paper product	np	np	np	np	1
Printing (incl the reproduction of recorded media)	np	np	np	np	63
Petroleum, coal, basic chemical and chemical product	np	np	np	np	15
Polymer, rubber and non-metallic mineral product	np	np	np	np	59
Primary metal, metal and fabricated metal product	np	np	np	np	2
Transport equipment, machinery and equipment	np	np	np	np	9
Furniture and other	np	np	np	np	10
Total	*3*	*314*	*27*	—	*345*
Electricity, gas, water and waste services					
Electricity and gas supply	—	—	—	—	—
Water supply, sewerage and drainage services	46 625	3 121	3 877	—	6 998
Waste collection, treatment and disposal services	—	2	—	—	2
Other industries	1 008	10 205	232	—	11 445
Household	—	27 494	—	—	27 494
Environment	—	5 262	25 309	—	—
Total	**49 142**	**46 625**	**29 511**	—	**48 082**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

CHAPTER 3 MONETARY WATER SUPPLY AND USE

INTRODUCTION

This chapter presents the monetary supply and use tables for water related goods and services and other monetary information related to water supply. The Monetary water accounts presented by the Australian Bureau of Statistics (ABS) follow the SEEA-Water and the Supply-Use framework of the Australian National Accounts. This chapter covers the following:

- revenue earned by supply of distributed water and water related services in the economy by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry;
- expenditure on water and sewerage services by industries, households and governments; and
- industry gross value added and water consumption by industry.

The scope of the chapter is limited to distributed water, reuse water and waste water, sewerage and drainage services. Distributed water and reuse water are defined in the glossary. Distributed water is subdivided as follows:

- urban distributed water
- rural distributed water
- bulk water (both urban and rural).

Urban distributed water is water supplied to urban areas via mains water systems. Rural distributed water is water supplied via mains, open channels or natural water ways, carted untreated water/treated effluent supplied by water suppliers (including industries other than the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry) for irrigation and other rural use. Many businesses use self-extracted water for their own use, such as farms for irrigation or hydropower plants to generate electricity. Estimates for the value of self-extracted water are not included in this chapter due to lack of comprehensive data.

Monetary estimates of supply and use of distributed water and related services involved the use of a number of data sources and estimation methods (see the Explanatory Notes). Monetary data for the supply (sales) of distributed water by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry and monetary data for the use (purchase) of distributed water by industries, governments and households have been compiled. The results for 2008–09 are compared with 2004–05 which were published in *An Experimental Monetary Account For Australia, 2004–05* (ABS cat.no. 4610.0.55.005).

It is difficult to separately identify the revenue from reuse water with that from distributed mains supply. Therefore, estimates on revenue and expenditure on distributed water include those of reuse water as well.

Net water supply and use

Water supply and use are presented as net of water losses and water supplied to the environment in these monetary supply and use tables. This is termed net water supply and net water use. Net supply and use are used as there are no matching monetary transactions for the physical losses or the supply to the environment.

Net water supply and use continued

There are minor discrepancies between monetary supply and use tables. For example, in total net monetary water supply ($11,430 million) and total net monetary water use ($11,449 million). The discrepancies are caused by rounding and the allocation of taxes and subsidies.

MAIN FINDINGS

The following compares the 2008–09 data with 2004–05:

- Revenue earned by the Water Supply, Sewerage and Drainage Services industry from sales of distributed water (including reuse and bulk water sales) rose from $3,958 million to $6,398 million (62% increase - excluding taxes and subsidies).
- The revenue from sales of water by industries such as Mining, Manufacturing and Electricity generation came to $5 million in 2008–09.
- Expenditure on total water use in all sectors rose from $3,958 million to $6,416 million (62% increase) while physical water use fell from 10,756 GL to 9,299 GL (14% decrease).
- Both households and the Agriculture, Forestry and Fishing industry increased expenditure on water use but reduced physical water use since 2004–05.
- Net use of distributed and reuse water by households fell from 1,876 GL to 1,596 GL (15% fall) while corresponding expenditure rose from $2,147 million to $3,074 million (43% rise).
- Net use of distributed and reuse water by Agriculture, Forestry and Fishing industry fell from 5,651 GL to 3,518 GL (38% fall) and corresponding expenditure rose from $291 million to $406 million (39% rise).
- New South Wales households recorded the highest expenditure ($1,002 million) on urban distributed water. New South Wales households also recorded the highest net use of urban distributed and reuse water (510 GL).
- Australian Capital Territory recorded the highest average water price of $2.60 per kL in 2008-09 in the household sector. This was a 95% increase since 2004-05.
- In 2004–05, Queensland households had the lowest average water price ($0.97 per kL) however, in 2008–09 Queensland households had the second highest average water price of $2.32 per kL.

RESULTS

Net water supply

3.1 REVENUE FROM NET WATER SALES AND SERVICES(a)—2008–09

	DISTRIBUTED WATER(b)		BULK WATER			
	Urban	*Rural*	*Urban*	*Rural*	*Services(c)*	*Total revenue earned*
	$m	$m	$m	$m	$m	$m
NSW	1 561	102	238	28	1 471	3 399
Vic.	914	157	251	28	1 342	2 692
Qld	1 198	59	312	7	1 059	2 634
SA	542	65	—	—	370	977
WA	576	20	—	1	582	1 179
Tas.	93	7	57	—	81	238
NT	64	—	—	—	35	98
ACT	120	—	—	—	92	213
Total net supply	**5 068**	**409**	**857**	**64**	**5 032**	**11 430**

— nil or rounded to zero (including null cells)

(a) These data are for the Water Supply, Sewerage and Drainage services industry only.

(b) Includes reuse water.

(c) Includes wastewater, sewerage and drainage.

Table 3.1 presents revenue earned by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry by supplying distributed water and water related services for 2008–09. New South Wales recorded $1,561 million, the highest revenue from sales of urban distributed water and related services. Queensland recorded the second highest revenue from urban distributed water sales ($1,198 million) followed by Victoria ($914 million). Victoria had the second highest revenue from sales of waste water, sewerage and drainage services ($1,342 million).

Strict water restrictions in Victoria were the reason for the relatively lower revenue from urban distributed water sales compared to waste water, sewerage and drainage services (NWC, WSAA & NWI 2010; Annual reports 2008–09). Higher revenue from urban distributed water sales in Queensland is attributed to higher water prices and increased consumption following easing of water restrictions (annual reports 2008–09; WSAA 2007 and 2008; NWC, WSAA & NWI 2010).

All States and Territories, with the exception of Western Australia, showed an increase in revenue earned from rural distributed water sales despite a reduction in the physical quantity of rural distributed water supplied. Western Australia showed a 22% fall in revenue from rural distributed water since 2004–05. This was mainly due to the significant decrease in use of rural distributed water (the AGRICULTURE industry used 263 GL of distributed rural water in 2004–05 and 116 GL in 2008–09). An increase in the supply of reuse water was also responsible for lower revenue from rural distributed water sales in Western Australia (in the AGRICULTURE industry, 54 ML in 2004–05 and 3,774 ML in 2008–09) because of lower prices for reuse water compared to distributed water.

Net water supply continued

Revenue from urban bulk water supply showed a significant increase since 2004–05 in New South Wales, Victoria, Queensland and Tasmania. Queensland showed the largest increase (246%) due to the new water reforms and resulting increased water prices. Revenue from rural bulk water has also increased since 2004–05, with New South Wales showing the largest increase (85%).

Net water use

3.2 EXPENDITURE ON WATER SUPPLY AND SERVICES(a)—2008–09

	Urban distributed water(b)	*Rural distributed water*(b)	*Bulk water (urban and rural)*	*Waste water & Sewerage*	*Total*
	$m	$m	$m	$m	$m
Industry consumption(c)					
Agriculture, forestry & fishing	2	404	—	3	409
Mining	153	—	—	21	174
Manufacturing	483	7	—	208	698
Electricity, gas and waste	80	3	921	13	1 017
Electricity, gas & waste services	74	3	—	6	83
Water supply, sewerage & drainage	6	—	921	7	934
Other industries	1 229	—	—	1 406	2 635
Total industry consumption	*1 947*	*414*	*921*	*1 651*	*4 933*
Final consumption					
Final consumption by households	3 074	—	—	3 316	6 390
Final consumption by Government	60	—	—	66	126
Total final consumption	*3 134*	—	—	*3 382*	*6 516*
Exports	—	—	—	—	—
Total net use	**5 081**	**414**	**921**	**5 033**	**11 449**

— nil or rounded to zero (including null cells)
(a) These data are for the Water Supply, Sewerage and Drainage services industry only.
(b) Includes reuse water.
(c) Industry consumption is equivalent to intermediate consumption in this table.

Table 3.2 shows expenditure on urban and rural distributed water, bulk water and waste water, sewerage and drainage services for the period 2008–09 by industries, households and governments. Actual final consumption expenditure by the household sector (including social benefits received in kind) on urban distributed water was $3,074 million. Households were the main users of urban distributed water, representing 60% of total expenditure on urban distributed water and 48% of total expenditure on distributed water used by all sectors.

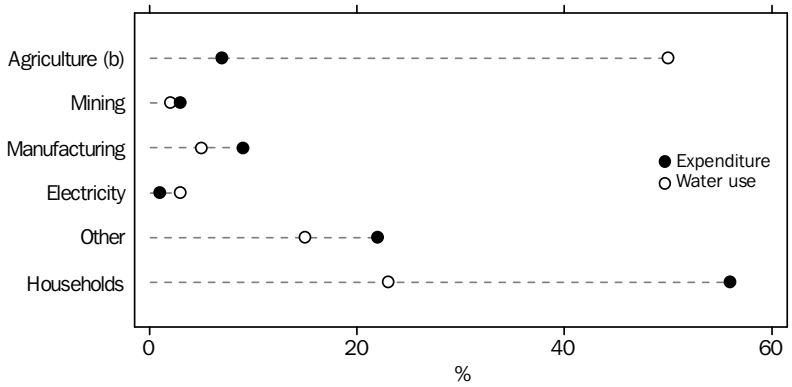
Table 1.5 and Figure 3.3 compare percentages of physical distributed water use in physical terms and corresponding expenditure terms. The AGRICULTURE, FORESTRY AND FISHING industry used 50% of total distributed water, while households accounted for 23% of total distributed water. Total expenditure on distributed water by the AGRICULTURE, FORESTRY AND FISHING industry was only 7%, compared to 56% for households. This difference in physical water use and corresponding expenditure is partly reflected by different costs of storage, treatment and delivery of water used by urban and rural users.

Net water use continued

Compared to 2004–05, both households and the AGRICULTURE, FORESTRY AND FISHING industry showed a fall (15% and 38% respectively) in physical use of distributed water. However, the expenditure for both sectors showed an increase (43% and 39% respectively).

The volume and value of the water supplied within the economy in shown in Table 1.5. The total value of water supplied increased by 56% from $3,514 million in 2004-05 to $5,495 million in 2008-09. The average price of distributed water supplied increased 95% from $0.40/kL in 2004-5 to $0.78/kL in 2008-09. There was large variation in the average price paid for distributed water with households paying $1.93/kL and agriculture $0.12/kL (see Table 1.5).

3.3 EXPENDITURE AND PHYSICAL USE OF DISTRIBUTED (a) WATER, by household and industry—2008–09



(a) Includes reuse water.
(b) Agriculture, forestry and fishing (industry view).

3.4 HOUSEHOLD EXPENDITURE ON URBAN DISTRIBUTED WATER, by state—2008–09

	EXPENDITURE ON URBAN DISTRIBUTED WATER(a)			POPULATION	HOUSEHOLDS	WATER USE	URBAN WATER USAGE
	Total	*Per capita*	*Per household*	*30-Jun-09*	*30-Jun-09*	*2008–09*	*2008–09*
	$m	$	$	'000	'000	GL	$/kL
NSW	1 002	140	376	7 134	2 665	510	1.96
Vic.	580	107	284	5 443	2 038	327	1.77
Qld	659	149	403	4 425	1 633	284	2.32
SA	268	165	411	1 624	654	117	2.30
WA	391	174	467	2 245	839	239	1.64
Tas.	64	127	315	503	203	60	1.07
NT	38	166	540	226	69	31	1.19
ACT	72	203	536	352	133	27	2.60
Total	**3 074**	**154**	**417**	**21 953**	**8 236**	**1 596**	**1.93**

(a) Includes reuse water

Net water use continued

Table 3.4 gives the State/Territory breakdown of the expenditure on urban distributed water by households, for 2008–09. New South Wales households recorded the highest expenditure ($1,002 million), which was one third (33%) of national expenditure by households. New South Wales households also recorded the highest physical use of urban distributed water (510 GL or 32% of total water use by households). Although Queensland households recorded the third highest physical urban distributed water use (284 GL), it had the second highest expenditure ($659 million). This was because of water reforms and new tariff structures applied in Queensland.

New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory showed reduced physical distributed water use by households in 2008–09 compared to 2004–05. Queensland showed the largest fall (49%) in physical water use from 458 GL to 284 GL however, expenditure rose by 48%. South Australia showed an 18% decrease in physical water use (from 142 GL to 117 GL) and 75% increase in expenditure since 2004–05. The Australian Capital Territory showed the largest percentage increase in expenditure (76%) since 2004–05 (from $41 million to $72 million) while having a 13% fall in physical water use (from 31 GL to 27 GL).

The Australian Capital Territory had the highest per capita household expenditure ($203) and an average water price ($2.60 per kL) in Australia. In 2004–05 period Queensland showed the lowest water price ($0.97 per kL) however in 2008–09 Queensland recorded the second highest average water price ($2.32 per kL).

Net water use continued

3.5 INDUSTRY GROSS VALUE ADDED FOR WATER USING INDUSTRIES—2008–09

	Industry gross value added(a)	*Water consumption*	*Industry gross value added per GL of water consumed*
	$m	GL	$m/GL
Agriculture, forestry and fishing			
Agriculture	23 297	6 996	3
Aquaculture, forestry, fishing	4 442	163	27
Total Agriculture, forestry & fishing	*27 739*	*7 158*	*4*
Mining			
Coal mining	45 114	98	462
Oil & gas extraction	21 797	37	585
Other mining(b)	40 885	327	125
Exploration & mining support services	6 784	46	148
Total mining	*114 580*	*508*	*226*
Manufacturing			
Food, beverages & tobacco	22 240	290	77
Textile, clothing & footware	2 902	12	238
Wood & paper products	7 180	96	75
Printing, publishing & record media	4 682	6	849
Petroleum, coal, chemical & associated products	20 523	72	283
Non-metallic, mineral products	5 768	31	184
Metal products	23 765	158	151
Machinary & equipment	21 164	11	1 951
Other manufacturing (includes furniture)	2 820	1	2 600
Total manufacturing	*111 044*	*677*	*164*
Electricity & gas	16 097	328	49
Water supply, sewerage & drainage	6 288	2 396	3
All other industries	897 496	1 265	709
Total	**1 173 244**	**12 333**	**95**

(a) 2008-09 current prices.
(b) Includes services to mining.

Comparisons between industries and changes over time in the average gross value added per GL of water use is complicated by the impact of prices, particularly for agriculture and mining, where commodity prices can vary substantially from year to year. The statistics in Table 3.5 present industry gross value added and industry gross value added per GL of water consumed in current prices, i.e. reflecting prices received in 2008-09 (Table 3.5 expands on the detail at the information displayed in Table 1.6). This is relevant for analyses of incomes generated per GL of water consumed in a given year. However, for analysing changes over time in the water intensity of production, it is preferable to use chain volume measures (constant dollar) of industry gross value added as the numerator. For this reason, the percentage change movements in industry gross value added per GL of water consumed between 2004–05 and 2008–09 referred to below have been calculated using chain volume measures of industry gross value. It should also be noted that the data represent industry averages. Changes over time in the mix of commodities produced by a broad level industry such as agriculture or mining could result in significant changes in the average water use.

Net water use continued

Table 3.5 shows that the AGRICULTURE industry generated, on average, $3 million in gross value added for every GL of water consumed in 2008–09. Industry gross value added increased by 15% (in chain volume terms) while water consumption decreased by 43% since 2004–05.

The MINING industry recorded $226 million gross value added per GL of water consumed. This is a 97% increase since 2004–05, reflecting a 23% increase in water consumption and a 142% increase in industry gross value added (chain volume terms). OIL AND GAS EXTRACTION recorded $585 million in gross value added per GL of water consumed. In 2004–05 this was $1,196 million per GL resulting in a 33% decrease in chain volume terms. Industry gross value added has increased by 107% (in chain volume terms) while water consumption has increased by 210%. In COAL MINING, industry gross value added was $462 million per GL compared to $86 million per GL in 2004–05. This was a 284% increase (chain volume terms) since 2004–05 in industry gross value added and a 17% decrease in water consumption.

The MANUFACTURING industry had $164 million gross value added per GL of water consumed. This is a 2% fall since 2004–05. FOOD, BEVERAGES AND TOBACCO industry which had the highest water consumption among all manufacturing industries showed a 19% decrease in industry gross value added (chain volume terms) and a 10% increase in water consumption.

All industries require water to a greater or lesser extent however, for some industries, such as AGRICULTURE, the availability of water is a critical factor in determining the output and value added of the industry. The relationship between water consumption and industry gross value added is dependent upon the nature of the production process taking place within each industry. It should be noted that the water usage by industries in Table 3.5 is direct water usage. It does not show the water embodied in the inputs of each industry. For example, businesses engaged in manufacturing food, beverage and tobacco products generated on average $77 million in industry gross value added per GL of water consumed. However, this ignores the embodied water content of the various inputs to these manufacturing processes and therefore does not show, for example, the cumulative water consumption associated with the manufacturing of food, beverage and tobacco products - this would involve input-output modelling.

CHAPTER 4 WATER SUPPLY SEWERAGE AND DRAINAGE

INTRODUCTION

This chapter presents information on the WATER SUPPLY, SEWERAGE AND DRAINAGE industry (here after shortened to the WATER SUPPLY industry). The water supplied and used by this industry is divided into distributed and reuse water. Data are also presented on distribution losses, regulated discharges, bulk water supplied, number of water providers and the origins of distributed (i.e. surface water, groundwater) and reuse water (i.e. waste water, drainage water and storm water).

MAIN FINDINGS

The main findings in this chapter are:

- In 2008–09 there were 401 water providers in Australia, collectively supplying 9,673 GL of distributed water. This volume was 15% lower than in 2004–05.
- Nearly all (9,369 GL or 97%) of the distributed water was supplied by the WATER SUPPLY industry. Of this, more than half (5,558 GL or 59%) was supplied by irrigation/rural water suppliers and close to a third (2,627 GL or 28%) by major urban water service providers.
- Surface water is by far the greatest source of water for the WATER SUPPLY industry, with 8,956 GL or 96% of total distributed water being derived from this source in 2008–09. Groundwater was 380 GL.
- In 2008–09, the highest volume of distributed water sourced from groundwater was in Western Australia (184 GL or 29%).
- In 2008–09, desalination provided 33 GL of water for distributed supply, a large increase from less than one GL in 2004–05.
- Overall, the supply of reuse water by water service providers decreased from 425 GL to 348 GL (18%) between 2004–05 and 2008–09. The decrease is mainly due to reduced availability of drainage water as a source of reuse water. Urban reuse increased from 208 GL in 2004–05 to 263 GL in 2008–09.
- The WATER SUPPLY industry discharged 1,779 GL of water in 2008–09. Most of this discharge was in New South Wales (653 GL or 37%) followed by Victoria (448 GL or 25%).

Table 4.1 presents the key statistics for the WATER SUPPLY industry. The information is sourced from *Australian Industry* (ABS cat. no. 8155.0). The industry recorded 29,000 employees as at 30 June 2009, a 32% increase from 2004–05. Sales and service income from this industry was $11.7 billion, an increase of about 52% from 2004–05. The industry spent $1.8 billion on wages and salaries in 2008–09, giving an average of $63,000 wages and salaries per employee. Gross value added in current prices increased from $5,101 million to $6,983 million (37%) between 2004–05 and 2008–09.

MAIN FINDINGS

continued

4.1 KEY ECONOMIC STATISTICS, Water supply industry, sewerage and drainage services industry—2004–05 to 2008–09

	Employment at end of June	*Wages and salaries*	*Sales and service income*	*Operating profit before tax*	*Industry gross value added*	*Wages and salaries per person employed*	*Industry gross value added per person employed*
	'000	$m	$m	$m	$m	$'000	$'000
2008–09	29	1 814	11 685	2 745	6 983	63	241
2007–08	27	1 636	10 958	2 770	6 855	61	254
2006–07	26	1 627	9 446	2 653	5 843	63	225
2005–06	25	1 524	9 033	2 866	5 517	61	221
2004–05	22	1 285	7 703	2 405	5 101	58	230

Water Supply Industry

In 2008–09, there were 401 water service providers in Australia (Table 4.2). Distributed water was supplied by 303 providers and sewerage services were supplied by 190 providers. Reuse water was supplied by 120 water providers, bulk distributed by 70, bulk reuse water by 8, and irrigation drainage services by 20.

Since 2004–05, there has been a decrease in the number of water providers in Australia, from 413 in 2004–05 to 401. This is due to amalgamations occurring in the WATER SUPPLY industry, particularly in Queensland and Tasmania.

4.2 WATER PROVIDERS(a), by type of service provided—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	no.	no.	no.	no.	no.	no.	no.	no.	no.
Distributed supply(b)	110	18	96	34	10	33	1	1	303
Bulk distributed supply	35	11	9	2	1	11	—	1	70
Reuse supply	43	18	32	3	16	6	1	1	120
Bulk reuse supply	2	3	2	—	—	—	—	1	8
Sewerage services	62	17	70	4	20	15	1	1	190
Drainage services	2	—	16	2	—	—	—	—	20
Total water service providers	**121**	**19**	**154**	**43**	**28**	**34**	**1**	**1**	**401**

— nil or rounded to zero (including null cells)

(a) Water providers may provide more than one type of service.

(b) Excluding bulk services.

Water service providers are classified into 5 groups; major urban (greater than 50,000 connections), non-major urban (between 10,000 and 50,000 connections), minor urban (less than 10,000 connections), irrigation/rural (businesses that supply predominantly to AGRICULTURE). The distribution of water service providers according to this classification is presented in Table 4.3.

Water Supply Industry continued

4.3 WATER PROVIDERS, by type of water provider—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	no.	no.	no.	no.	no.	no.	no.	no.	no.
2008–09									
Major urban	5	9	11	1	1	3	1	1	32
Non-major urban	26	8	9	—	2	6	—	—	51
Minor urban	80	—	62	8	21	23	—	—	194
Irrigation/rural	10	2	56	34	4	2	—	—	108
Other(a)	—	—	16	—	—	—	—	—	16
Total	**121**	**19**	**154**	**43**	**28**	**34**	**1**	**1**	**401**
2004–05									
Major urban	5	9	8	1	1	3	1	1	29
Non-major urban	25	8	18	—	5	5	—	—	61
Minor urban	72	2	131	3	4	23	—	—	235
Irrigation/rural	9	3	33	8	4	2	—	—	59
Other(a)	3	4	10	3	7	—	2	—	29
Total	**114**	**26**	**200**	**15**	**21**	**33**	**3**	**1**	**413**

— nil or rounded to zero (including null cells)

(a) Includes water supplied by other industries including the Mining, Manufacturing and Electricity and gas supply industries.

In 2008–09, water providers in Australia supplied 9,673 GL of distributed water (Table 4.4). Of this 9,369 GL (97%) was supplied by the WATER SUPPLY industry, a decrease of 16% from 11,160 GL in 2004–05 (Table 4.5). Collectively, other industries such as MINING, MANUFACTURING, AND ELECTRICITY AND GAS SUPPLY supplied 304 GL (or 3%) of all distributed water in 2008-09.

4.4 WATER SUPPLY, by water type—2000–01, 2004–05 and 2008–09

	NSW(a)	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*(a)	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Self-extracted(b)	11 243 401	5 738 122	4 629 876	1 138 548	3 229 948	33 643 455	166 946	49 142	59 839 438
Distributed	3 567 514	2 427 162	2 210 863	426 642	645 091	284 601	64 537	46 625	9 673 034
Reuse	95 681	116 268	44 264	34 570	19 364	6 456	1 854	29 511	347 968
2004–05									
Self-extracted(b)	16 528 356	11 212 653	7 964 348	1 352 255	3 452 284	39 080 691	144 982	83 611	79 819 179
Distributed	3 111 812	4 003 891	2 651 558	461 157	736 268	229 102	66 091	77 112	11 336 992
Reuse	193 866	130 574	51 582	22 186	17 508	4 858	1 852	2 189	424 615
2000–01									
Self-extracted(b)	16 704 779	11 448 221	5 739 474	1 260 165	3 089 153	38 169 476	137 080	—	76 508 754
Distributed	4 832 019	4 268 425	2 377 937	517 128	764 904	118 542	55 351	—	12 934 306
Reuse	266 964	186 712	23 818	17 572	9 152	1 551	1 154	—	506 923

— nil or rounded to zero (including null cells)

(a) NSW and ACT were combined for 2000–01.

(b) Total water self-extracted by all industries.

4.5 DISTRIBUTED WATER SUPPLY, by industry—2000–01, 2004–05 and 2008–09

	NSW(a)	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*(a)	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Water supply industry(b)	3 508 075	2 424 493	2 092 277	425 696	634 706	176 618	60 657	46 625	9 369 147
Other industries(c)	59 439	2 669	118 587	945	10 385	107 983	3 880	—	303 887
Total	**3 567 514**	**2 427 162**	**2 210 863**	**426 642**	**645 091**	**284 601**	**64 537**	**46 625**	**9 673 034**
2004–05									
Water supply industry(b)	3 073 847	4 003 846	2 641 619	461 155	726 384	112 325	63 520	77 112	11 159 809
Other industries(c)	37 965	45	9 939	2	9 884	116 777	2 571	—	177 183
Total	**3 111 812**	**4 003 891**	**2 651 558**	**461 157**	**736 268**	**229 102**	**66 091**	**77 112**	**11 336 992**
2000–01									
Water supply industry(b)	4 823 032	4 268 289	2 372 496	516 766	762 757	118 542	53 522	—	12 915 404
Other Industries(c)	8 987	136	5 441	362	2 147	—	1 829	—	18 902
Total	**4 832 019**	**4 268 425**	**2 377 937**	**517 128**	**764 904**	**118 542**	**55 351**	—	**12 934 306**

— nil or rounded to zero (including null cells)
(a) NSW and ACT were combined for 2000–01.
(b) Includes Sewerage and drainage services.
(c) Other industries include the Mining, Manufacturing and Electricity and gas supply industries.
Note: Sums may not necessarily equal totals due to rounding.

Water Supply Industry continued

Distributed water represented 16% of self-extracted water in Australia in 2008–09 (Table 4.4). The percentage varied between States and Territories from less than 1% in Tasmania to 95% in the Australian Capital Territory. In 2008–09 over a third (3,267 GL or 34%) of the total distributed water in Australia was supplied to the AGRICULTURE industryand nearly a quarter (2,317 GL or 24%) was lost in distribution or used by the WATER SUPPLY industry for their operations. Households used 16% (1,594 GL) of the total water distributed while 7% or 691 GL was specifically supplied for environmental benefits (Table 4.6).

4.6 USE OF DISTRIBUTED WATER, by industry—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Agriculture	995 840	1 038 839	927 793	159 367	115 642	29 221	315	223	3 267 240
Forestry and fishing(a)	430	412	3 259	1 404	88 188	324	13	—	94 029
Mining	9 887	1 696	113 698	1 026	16 852	11	16	3	143 188
Manufacturing	87 552	109 690	86 769	29 960	14 648	9 648	831	314	339 412
Electricity and gas supply	67 982	68 808	83 326	2 179	5 714	80	—	—	228 089
Water supply(b)(c)	1 303 476	518 020	290 312	64 022	109 122	20 653	8 479	3 121	2 317 205
Other industries(d)	299 973	278 868	272 045	51 599	52 909	9 551	23 485	10 208	998 639
Household	508 388	326 951	283 863	116 512	239 285	60 076	31 398	27 494	1 593 966
Environment	293 985	83 879	149 799	573	2 731	155 037	—	5 262	691 265
Total	**3 567 514**	**2 427 162**	**2 210 863**	**426 642**	**645 091**	**284 601**	**64 537**	**46 625**	**9 673 034**
2004–05									
Agriculture	1 584 192	2 228 353	1 044 275	194 820	262 698	14 674	—	—	5 329 012
Forestry and fishing(a)	6 446	721	302	29	15 444	1 408	91	33	24 474
Mining	6 586	3 742	42 015	756	15 783	24	3 297	—	72 203
Manufacturing	103 971	102 769	69 303	23 960	28 343	11 617	724	621	341 308
Electricity and gas supply	7 839	21 759	77 459	1 036	6 511	102	14	—	114 720
Water supply(b)(c)	621 052	777 848	419 673	71 331	125 212	17 666	8 026	3 720	2 044 529
Other industries(d)	139 314	105 779	157 008	26 232	56 107	7 989	27 441	11 549	531 419
Household	545 423	388 991	457 916	142 279	226 151	56 905	25 396	30 989	1 874 050
Environment	96 990	373 929	383 606	713	18	118 718	1 103	30 200	1 005 277
Total	**3 111 812**	**4 003 891**	**2 651 558**	**461 157**	**736 268**	**229 102**	**66 091**	**77 112**	**11 336 992**

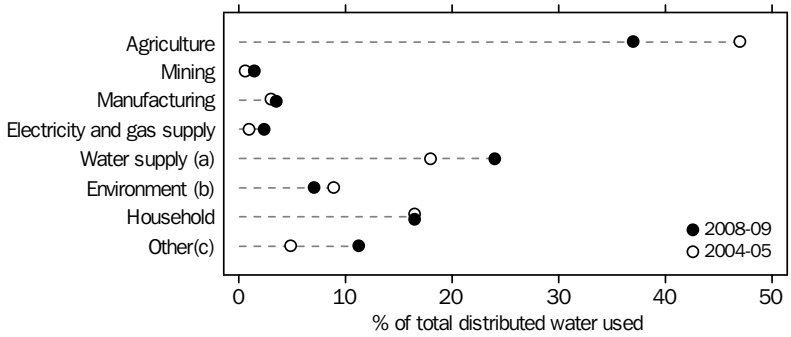
— nil or rounded to zero (including null cells)
(a) Includes hunting, trapping and aquaculture.
(b) Includes Sewerage and drainage services.
(c) Includes water losses.
(d) Includes mainly Services to agriculture and administrative industries.
Note: This table presents an agriculture industry view for 2008–09 and activity view for 2004–05. Use caution when making comparisons.

Water Supply Industry continued

The overall quantity of distributed water supplied in Australia decreased by 1,664 GL (15%) between 2004–05 and 2008–09 (Graph 4.7, Table 4.6). Significant periods of below average rainfall and drought have occurred over this time, causing a reduction in allocations to irrigation/rural water providers, therefore reducing the quantity of water available for supply.

Water Supply Industry continued

4.7 DISTRIBUTED WATER USE, Australia—2004–05 and 2008–09



(a) Water supply, sewerage and drainage services industry.
(b) Environmental provisions made by Water supply and Other industries.
(c) Includes forestry and fishing, services, administrative industries and aquaculture.

Note: This graph presents an activity view of agriculture rather than an industry view.

Despite the overall decrease in the supply of distributed water between 2004–05 and 2008–09, some industries reported increases. The use of distributed water by the WATER SUPPLY industry increased from 2,044 GL to 2,317 GL (13%), an increase mostly made up of losses in distribution (2,289 GL) (Table 4.6).

Origin of distributed water

The origin of distributed water supplied by the WATER SUPPLY industry is presented in Table 4.8 and Graph 4.9. Surface water (e.g. river systems, dams) constitutes the majority of all water extracted from the environment by the WATER SUPPLY industry. This amounted to 8,956 GL (96%) in 2008–09 with groundwater accounting for 380 GL and desalination making up the remainder (33 GL). Surface water accounted for about two-thirds of the water distributed in Western Australia with groundwater comprising about a third (29%).

4.8 ORIGIN OF DISTRIBUTED WATER(a)—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Surface water	3 439 160	2 399 929	2 024 913	410 235	417 854	np	np	46 625	8 955 501
Groundwater	68 915	24 564	67 364	15 461	183 582	np	np	—	380 376
Desalinated water(b)	—	—	na	na	33 270	—	—	—	33 270
Total	3 508 075	2 424 493	2 092 277	425 688	634 706	176 618	60 657	46 625	9 369 147
2004–05									
Surface water	3 012 717	3 994 520	2 532 418	444 240	496 838	111 882	42 182	77 112	10 711 910
Groundwater	61 130	9 326	109 116	16 854	229 461	443	21 338	—	447 668
Desalinated water	—	—	85	61	85	—	—	—	231
Total	3 073 847	4 003 846	2 641 619	461 155	726 384	112 325	63 520	77 112	11 159 809

— nil or rounded to zero (including null cells)
na not available
np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Water supply, sewerage and drainage industry only, excludes water provided by other industries.
(b) Includes sea water only.

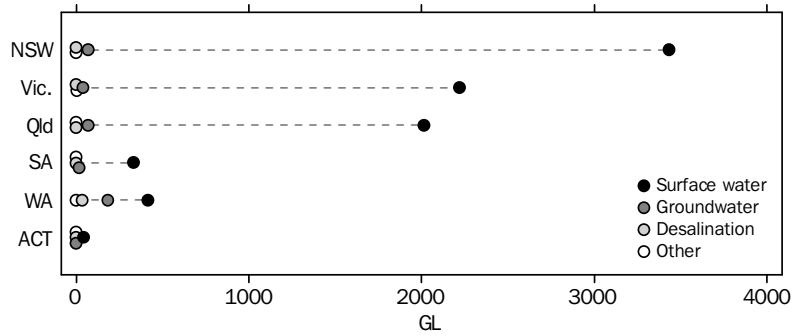
Desalination is a process where salt is removed from water, usually sea water or brackish surface water (also saline groundwater), to make it suitable for human consumption. The percentage of distributed water obtained via desalination is relatively low in Australia (less than one percent), however volumes have increased significantly from 0.2 GL in

Origin of distributed water continued

2004–05 to 33.3 GL in 2008–09 (Table 4.8). Small volumes of desalinated water were reported directly to the ABS in surveys in respect of 2004–05. This desalinated water was mostly used to supply remote communities in Queensland, South Australia and Western Australia. However, the administrative data sources used in the compilation of data for 2008–09 did not cover this low volume activity. The administrative data did capture the significant new desalination activity in 2008-09 in Western Australia.

A number of major desalination plants were being constructed between 2004–05 and 2008–09 but only major plants in Western Australia were fully operational in 2008–09. Additional major desalination plants in New South Wales, Victoria, Queensland and South Australia become operational in 2009–10 or are expected to become operational in coming years.

4.9 ORIGIN OF DISTRIBUTED WATER(a)—2008–09



(a) For Water supply, sewerage and drainage services industry only.

Note: Tasmania and Northern Territory data not published due to confidentiality reasons.

Reuse water

Reuse or recycled water is an important option for securing water supply into the future (AWA 2005). There is an increasing investment in infrastructure related to the supply of reuse water, and as such there is considerable interest in the volumes of reuse water supplied and used. Reuse or recycled water is provided for purposes including: agricultural irrigation; 'third pipe' systems in newly developed urban uses; watering of community sports grounds and parks; supply to industry. In addition, water management authorities are interested in whether reuse water is reducing the demand for distributed water or self-extracted water.

4.10 REUSE WATER SUPPLY, by industry—2000–01, 2004–05 and 2008–09

	NSW(a)	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*(a)	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Water supply industry(b)	95 583	112 535	43 463	33 413	18 648	6 456	1 854	29 511	341 463
Other industries(c)	98	3 733	801	1 157	716	—	—	—	6 505
Total	**95 681**	**116 268**	**44 264**	**34 570**	**19 364**	**6 456**	**1 854**	**29 511**	**347 968**
2004–05									
Water supply industry	192 951	130 029	46 461	20 497	15 278	4 858	1 852	2 189	414 115
Other industries(c)	915	545	5 121	1 689	2 230	—	—	—	10 500
Total	**193 866**	**130 574**	**51 582**	**22 186**	**17 508**	**4 858**	**1 852**	**2 189**	**424 615**
2000–01									
Water supply industry(b)	266 964	183 967	23 818	15 675	8 568	1 551	1 154	—	501 697
Other industries(c)	—	2 745	—	1 897	584	—	—	—	5 226
Total	**266 964**	**186 712**	**23 818**	**17 572**	**9 152**	**1 551**	**1 154**	—	**506 923**

— nil or rounded to zero (including null cells)
(a) NSW and ACT were combined for 2000–01.
(b) Includes Sewerage and drainage services.
(c) Other industries include the Mining, Manufacturing and Electricity and gas supply industries.

4.11 USE OF REUSE WATER, by industry—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Agriculture	32 710	29 145	11 853	22 513	3 774	2 584	—	66	102 645
Forestry and fishing	32	—	1 912	—	—	—	—	—	1 944
Mining	4 543	2 134	112	17	249	2	—	—	7 057
Manufacturing	9 436	6 726	5 095	1 801	4 609	260	7	27	27 961
Electricity and gas supply	941	3 544	4 171	—	543	—	—	—	9 199
Water supply(a)	25 318	39 924	6 345	317	1 777	1 171	300	3 877	79 030
Other industries(b)	16 981	33 588	14 739	9 569	8 412	2 440	1 547	232	87 507
Household	1 704	100	37	352	—	—	—	—	2 193
Environment	4 016	1 107	—	—	—	—	—	25 309	30 432
Total	**95 681**	**116 268**	**44 264**	**34 570**	**19 364**	**6 456**	**1 854**	**29 511**	**347 968**
2004–05									
Agriculture	160 103	86 855	12 318	18 139	54	1 904	552	—	279 925
Forestry and fishing	3 219	5 869	2 106	32	5 946	110	200	—	17 483
Mining	6 098	—	1 142	—	29	—	—	—	7 268
Manufacturing	169	—	8 567	1 196	3 102	—	—	—	13 035
Electricity and gas supply	1 318	—	3 361	1 223	100	—	—	—	6 002
Water supply(a)	10 311	15 370	6 418	—	2 825	1 956	—	1 634	38 514
Other industries(b)	10 882	22 480	17 670	1 596	5 452	888	1 100	555	60 621
Household	1 767	—	—	—	—	—	—	—	1 767
Environment	na	na	na	na	na	na	na	na	na
Total	**193 866**	**130 574**	**51 582**	**22 186**	**17 508**	**4 858**	**1 852**	**2 189**	**424 615**

— nil or rounded to zero (including null cells)
na not available
(a) Includes Sewerage and drainage services.
(b) Includes mainly Services and Administrative industries.
Note: This table presents an industry view of agriculture in 2008–09 and an activity view for 2004–05.

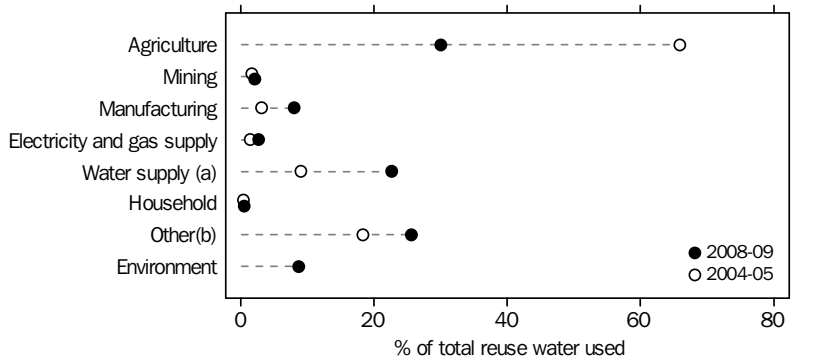
Reuse water continued

Between 2004–05 and 2008–09, the total supply of reuse water decreased by 18% from 425 GL to 348 GL (Table 4.10). The decrease was largely due to the decrease in collection of drainage water (supplied as reuse water by irrigation/rural water providers) owing to below average levels of rainfall. Industries affected by the drought and low rainfall were AGRICULTURE, and forestry and fishing (Table 4.11 and Graph 4.12).

Some industries, however, reported increases during the period. These are the MANUFACTURING industry, which more than doubled its usage from 13 GL to 28 GL, the WATER SUPPLY industry, which increased from 39 GL to 79 GL and the ELECTRICITY AND GAS SUPPLY, which increased from 6 GL to 9 GL. OTHER industries also reported an increase during the period from 61 GL to 87 GL while household usage was at the same level as in 2004–05 (2 GL). Use of reuse water in households was highest in New South Wales at almost 2 GL.

In 2008–09, the AGRICULTURE industry remained the largest user of reuse water across all industries in Australia (30% of total reuse water) followed by OTHER industries (25%) and WATER SUPPLY industry (23%). These industries were also the top three users of reuse water in 2004–05. OTHER Industries includes industries relating to the operation and maintenance of parks, gardens and sporting fields.

4.12 USE OF REUSE WATER, Australia—2004–05 and 2008–09



(a) Water supply, sewerage and drainage services industry.
(b) Includes forestry and fishing, services, administrative industries and aquaculture
Note: This graph presents an activity view of agriculture rather than an industry view.

Table 4.13 presents the distribution of reuse water by the water providers in urban localities. It shows that urban reuse increased by 26% between 2004–05 and 2008–09 with increases in usage by the Water Supply industry (from 38 GL to 86 GL), OTHER industries (from 7 GL to 25 GL) and parks and gardens (from 60 GL to 70 GL). The WATER SUPPLY industry (33%), parks and gardens (27%) and AGRICULTURE (24%) were the major users of urban reuse water in 2008–09; households only accounted for less than one percent. The amount of urban reuse water used by AGRICULTURE, however, decreased by 15% between 2004–05 and 2008–09.

Reuse water continued

4.13 URBAN USE OF REUSE WATER(a)—2004–05 and 2008–09

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Agriculture	11 845	14 836	12 088	18 929	3 967	2 592	—	—	64 257
Forestry	—	—	1 911	—	—	—	—	—	1 911
Mining	4 934	874	—	—	—	—	—	—	5 808
Manufacturing	—	2 853	3 887	—	—	—	—	—	6 740
Water supply(b)	25 318	45 095	6 318	317	1 777	3 345	300	3 877	86 348
Household	1 704	100	37	352	—	—	—	—	2 193
Parks etc.(c)	11 689	32 875	8 600	5 293	9 366	519	1 554	322	70 217
Other(d)	6 878	1 219	9 713	4 096	3 538	—	—	3	25 447
Total	**62 368**	**97 852**	**42 554**	**28 987**	**18 648**	**6 456**	**1 854**	**4 202**	**262 921**
2004–05									
Agriculture	19 204	25 945	10 232	18 139	54	1 846	276	—	75 696
Forestry	1 639	2 860	650	23	3 749	28	243	—	9 192
Mining	5 695	—	—	—	26	—	—	—	5 721
Manufacturing	410	509	7 589	—	1 887	—	—	—	10 395
Water supply(b)	10 080	15 370	6 418	—	2 825	1 956	—	1 634	38 283
Household	1 370	—	—	—	—	—	—	—	1 370
Parks etc.(c)	9 756	24 295	15 669	1 484	6 621	451	1 333	555	60 164
Other(d)	1 594	672	4 189	845	101	1	—	—	7 402
Total	**49 748**	**69 651**	**44 747**	**20 491**	**15 263**	**4 282**	**1 852**	**2 189**	**208 223**

— nil or rounded to zero (including null cells)

(a) Includes reuse supplied or used by Major, Non-major and Minor urban water providers.

(b) Includes Sewerage and drainage services.

(c) Includes gardens, race tracks, sporting fields.

(d) Includes electricity generation, construction, aquaculture, firefighting, education activities.

Origin of Reuse water

There are a variety of water sources that may be supplied as reuse water, including waste water (from sewerage systems), drainage water, storm water or other water providers (i.e. a 'bulk' reuse water supply). Sewerage systems collect and treat waste water which may be treated to primary, secondary or tertiary levels. Storm water may also be collected using infrastructure separate to sewerage systems and, depending on its intended use, may or may not be treated before being supplied as reuse water. Drainage water is also collected in regional collection drains managed by irrigation/rural water providers. This water may be supplied as reuse water to customers or discharged to the environment. This process is analogous to urban reuse systems, however the water is typically treated in urban systems before it is supplied.

Table 4.14 presents reuse water supply by type of water supplier in 2008–09. Of the total 341 GL of reuse water collected, 86% (292 GL) came from wastewater with the remainder coming from drainage and stormwater. It is likely that drainage water from irrigation/rural water providers makes a significant contribution to reuse water supply, but this is mostly unmeasured. Hence, the amount reported as collected (341 GL) is less than the amount supplied (348 GL). In some cases, distributed water can also be mixed with reuse water. In States and Territories, reuse water supply from wastewater was highest in Victoria (99 GL or 34%), followed by New South Wales (66 GL, 23%).

Origin of Reuse water continued

4.14 WASTE, STORM AND DRAINAGE WATER COLLECTED FOR REUSE(a)—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
Waste water									
Major urban	37 305	83 778	24 412	np	np	—	1 854	29 511	222 246
Non-major urban	19 684	15 181	14 592	—	314	4 488	—	—	54 259
Minor urban	9 125	—	np	np	np	1 968	—	—	15 535
Irrigation/rural	—	—	—	—	—	—	—	—	—
Total	66 114	98 959	np	np	np	6 456	1 854	29 511	292 040
Stormwater									
Major urban	—	—	—	—	—	—	—	—	—
Non-major urban	—	—	—	—	—	—	—	—	—
Minor urban	270	—	np	1 147	np	—	—	—	1 637
Irrigation/rural	np	—	—	—	—	—	—	—	np
Total	np	—	np	1 147	np	—	—	—	np
Drainage water									
Major urban	—	—	—	—	—	—	—	—	—
Non-major urban	—	—	—	—	—	—	—	—	—
Minor urban	—	—	—	—	—	—	—	—	—
Irrigation/rural	np	13 576	np	np	—	—	—	—	np
Total	np	13 576	np	np	—	—	—	—	np
Total									
Major urban	37 305	83 778	24 412	np	np	—	1 854	29 511	222 246
Non-major urban	19 684	15 181	14 592	—	314	4 488	—	—	54 259
Minor urban	9 395	—	np	np	np	1 968	—	—	17 172
Irrigation/rural	29 199	13 576	np	np	—	—	—	—	47 786
Total	**95 583**	**112 535**	**43 463**	np	np	**6 456**	**1 854**	**29 511**	**341 463**

— nil or rounded to zero (including null cells)
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Reuse collected may be either supplied to customers or used by the Water supply industry.

Table 4.15 describes the supply of distributed water and reuse water by water providers. More than half (57%) of the distributed water in Australia was supplied by irrigation/rural water providers, more than a quarter by major urban water providers. In New South Wales, 70% of all distributed water in the state was supplied by irrigation/rural water providers. In contrast nearly two thirds (64%) of reuse water in Australia was supplied by major urban water providers, and only 14% by the irrigation/rural water providers.

4.15 TOTAL DISTRIBUTED AND REUSE WATER SUPPLY(a)(b), by type of water provider—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
Distributed water									
Major urban	726 190	772 661	398 099	259 671	349 931	13 202	60 657	46 625	2 627 036
Non-major urban	151 850	459 374	126 505	—	11 157	48 105	—	—	796 992
Minor urban	119 866	—	231 282	2 291	207	33 781	—	—	387 428
Irrigation/rural	2 510 169	1 192 458	1 336 390	163 734	273 411	81 530	—	—	5 557 692
Other (c)	59 439	2 669	118 587	945	10 385	107 983	3 880	—	303 887
Total	3 567 514	2 427 162	2 210 863	426 642	645 091	284 601	64 537	46 625	9 673 034
Reuse water									
Major urban	37 305	83 778	24 412	np	np	—	1 854	29 511	222 246
Non-major urban	19 684	15 181	np	—	np	4 488	—	—	54 259
Minor urban	9 395	—	3 874	np	np	1 968	—	—	17 172
Irrigation/rural	29 199	13 576	np	np	—	—	—	—	47 786
Other (c)	98	3 733	801	np	np	—	—	—	6 505
Total	95 681	116 268	44 264	34 570	19 364	6 456	1 854	29 511	347 968
Total									
Major urban	763 495	856 439	422 511	—	—	13 202	62 511	76 136	2 849 282
Non-major urban	171 534	474 555	—	—	—	52 594	—	—	851 251
Minor urban	129 261	—	235 157	—	—	35 749	—	—	404 600
Irrigation/rural	2 539 368	1 206 034	—	—	273 411	81 530	—	—	5 605 478
Other (c)	59 537	6 402	119 388	—	—	107 983	3 880	—	310 392
Total	**3 663 195**	**2 543 430**	**2 255 127**	**461 212**	**664 455**	**291 058**	**66 391**	**76 136**	**10 021 002**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Data represents gross water supply including water supplied to to other water providers and customers, losses, own use by water providers, and environmental provisions.

(b) Water supplied from one water provider to another is recorded against the original water provider. See commentary in Chapter 3 for more information.

(c) Includes water supplied by other industries including the Mining, Manufacturing and Electricity and gas supply industries.

Bulk Water

Bulk water is water supplied from one water provider to another and can include either potable, reuse, or raw water. These bulk supplies are typically 'wholesale supply' arrangements between water providers, with the recipient then distributing to final customers according to a 'retail supply' arrangement.

In 2008–09, 2,571 GL of bulk distributed water was supplied by 70 water providers. Bulk water distribution was largest in New South Wales accounting for 47% of Australian total (Table 4.16).

The supply of bulk reuse water is relatively small, but is a developing activity in Australia. In 2008–09, eight water service providers reported this service for a total of 25 GL. Victoria accounted for 87% of total bulk reuse water in Australia.

4.16 BULK WATER SUPPLIED(a), by water type—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Distributed	1 219 003	455 734	np	np	288 647	87 065	—	3 639	2 570 593
Reuse	7	22 099	np	np	—	—	—	5	25 277
Total	**1 219 010**	**477 833**	**519 395**	**276**	**288 647**	**87 065**	—	**3 644**	**2 595 870**
2004–05									
Distributed	565 967	536 592	805 611	5 514	318 845	66 538	—	4 235	2 303 302
Reuse	705	2 267	—	16	10	—	—	—	2 998
Total	**566 672**	**538 859**	**805 611**	**5 530**	**318 855**	**66 538**	—	**4 235**	**2 306 300**

— nil or rounded to zero (including null cells)
np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Water supplied from one water provider to another.

Water Losses

Water losses are difficult to measure and consequently the estimation of losses by water suppliers is problematic. There was considerable variation in the reporting of water losses in 2008–09 and the range of information presented in Table 4.17 is less than was available in 2004–05. Industry guidelines have been established for estimating losses and it is hoped that over time estimation of losses will improve.

In 2008–09, the total volume of water reported lost from the water delivery infrastructure and metering errors in Australia was 2,289 GL which is about 24% of total distributed water (Table 4.17 and Graph 4.18) . These losses are calculated using the denominator of gross water supply including bulk transfers to other water provider types. In this, water supplied from one water provider to another is recorded against the original water provider. Net Water Supply (Table 4.19) records the water against the final provider and only records the water supplied to customers. Losses may also be calculated as a proportion of Net Water Supply.

The increase in water losses for New South Wales from 614 GL in 2004–05 to 1,295 GL in 2008–09 is attributable to different treatment of bulk and distributed water supply, increasing total water supply and total losses in 2008–09 compared to the respective result in 2004–05. This treatment will be applied to previous published results producing a consistent time series, which will be published separately in 2011. The quality of water loss information for Tasmania and Queensland in 2008–09 is not suitable for publication of specific volumes at this time, but these are likely to be released with the full time series in 2011.

Of the States and Territories, New South Wales reported the highest percentage loss against distributed water (36%), followed by Victoria (21%) and Western Australia (16%).

4.17 DISTRIBUTION LOSSES, by type of water provider—2004–05 and 2008–09

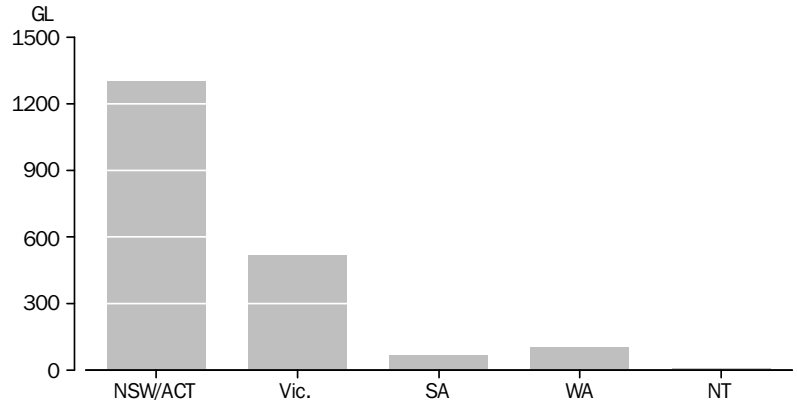
	AUSTRALIA		2008–09							
	2004–05	*2008–09*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*
Volume of losses										
Urban water providers (ML)	521 926	401 347	141 961	91 868	na	31 870	52 358	na	7 365	3 080
Irrigation/rural water providers (ML)	1 500 142	1 887 573	1 153 505	423 032	na	32 019	51 519	na	—	—
Total (ML)	**2 022 068**	**2 288 919**	**1 295 466**	**514 900**	na	**63 888**	**103 877**	na	**7 365**	**3 080**
Losses as proportion of distributed water supply(a)										
Urban water providers (%)	11	10	13	7	na	12	14	na	11	7
Irrigation/rural water providers (%)	23	34	46	35	na	20	19	na	—	—
Total (%)	**18**	**24**	**36**	**21**	na	**15**	**16**	na	**11**	**7**

— nil or rounded to zero (including null cells)
na not available

(a) Calculated against gross water supply including water supplied to other water provider and customers, losses, own use by water providers, and environmental provisions. See commentary in Chapter 3 for more information.

Water Losses continued

4.18 DISTRIBUTION LOSSES(a)—2008–09



(a) Water supply, sewerage and drainage services industry only.

Net Water Supply

Net water supply is the quantity of water actually supplied to users in the economy. In the supply and use tables presented in Chapter 2, the distributed water supplied by the WATER SUPPLY industry excludes bulk transfers between water suppliers. However, the supply use tables do include water supplied to the environment, and attribute the water used directly by the WATER SUPPLY industry as well as distribution water losses to the WATER SUPPLY industry. Net water supply therefore equates to total distributed water less bulk water, losses, environmental provisions and own use by the WATER SUPPLY industry.

Table 4.19 presents the total net water supply account across Australia in 2008–09, both for distributed water and reuse water. Net distributed water supply was 6,490 GL while net distributed reuse water was 231 GL.

4.19 NET DISTRIBUTED AND REUSE WATER SUPPLY(a), by type of water provider—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
Distributed water									
Major urban	524 204	456 692	300 188	227 500	291 314	7 085	52 178	38 242	1 897 402
Non-major urban	130 550	429 710	80 164	—	9 587	44 777	—	—	694 788
Minor urban	97 196	—	146 692	1 889	159	29 574	—	—	275 510
Irrigation/rural	1 212 311	769 399	1 121 358	131 713	221 892	26 080	—	—	3 482 754
Other (b)	5 792	2 587	114 578	945	10 286	1 396	3 880	—	139 463
Total	1 970 052	1 658 388	1 762 981	362 048	533 238	108 912	56 058	38 242	6 489 918
Reuse water									
Major urban	18 867	42 419	17 962	np	np	—	1 554	325	124 589
Non-major urban	12 904	10 338	np	—	np	1 767	—	—	39 826
Minor urban	5 279	—	3 702	np	np	1 344	—	—	12 158
Irrigation/rural	29 199	13 576	np	np	—	—	—	—	47 786
Other (b)	98	3 733	1 098	np	np	—	—	—	6 802
Total	66 347	70 066	37 918	34 253	17 587	3 111	1 554	325	231 161
Total									
Major urban	543 070	499 111	318 150	np	np	7 085	53 732	38 567	2 021 991
Non-major urban	143 455	440 048	np	—	np	46 544	—	—	734 615
Minor urban	102 475	—	150 394	np	np	30 918	—	—	287 668
Irrigation/rural	1 241 510	782 975	np	np	221 892	26 080	—	—	3 530 540
Other (b)	5 890	6 320	115 676	np	np	1 396	3 880	—	146 265
Total	**2 036 400**	**1 728 453**	**1 800 899**	**396 300**	**550 825**	**112 023**	**57 612**	**38 567**	**6 721 079**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Net water supply includes all water supplied to customers, but excludes transfers of water between water providers, losses, own use by water providers, and environmental provisions.

(b) Includes water supplied by other industries including the Mining, Manufacturing and Electricity and gas supply industries.

Water Discharges

The water discharged from the economy to the environment may be regulated or unregulated. Regulated discharge refers to water discharged after use where that discharge does not match the natural flow regime of the receiving water body. For example, the waste water discharged by sewerage service providers is a regulated discharge. The water discharged by the ELECTRICITY AND GAS SUPPLY industry after use in hydro-electric power generation is also regulated discharge.

The water discharged by households and other industries to sewerage or drainage systems, however, is not a regulated discharge as the water is not discharged directly to the environment. This does, however, become a regulated discharge, after it has been treated by the SEWERAGE industry and released back to the environment. Discharges from non-point sources, such as those from the AGRICULTURE industry, are not included in this publication and are therefore represented in the supply and use tables as "not available".

In Australia, the total regulated discharge of water to the environment in 2008–09 was 47,459 GL (Table 2.11). The ELECTRICITY AND GAS SUPPLY industry discharged about 95% of this total or 44,706 GL due mainly to the large amount of water used in hydro-electric power generation. The WATER SUPPLY industry accounted for nearly 4% (1,779 GL) of the total water discharges. Of these discharges, 37% (653 GL) occurred in New South Wales, 25% (448 GL) were in Victoria and 23% (401 GL) were in Queensland.

Water Discharges continued

Table 4.20 and Graph 4.21 show water discharges made by the WATER SUPPLY industry to various water bodies. Of the total 1,779 GL of water discharged by the industry in 2008–09, about 65% was discharged to the sea, 34% to inland surface water and 1% to groundwater.

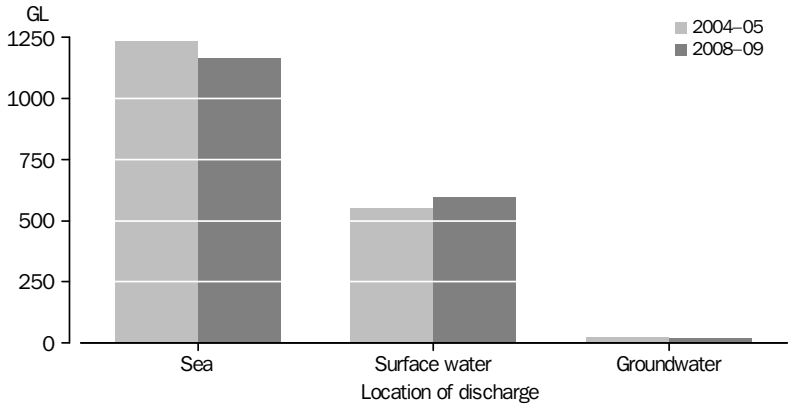
4.20 REGULATED DISCHARGE(a), Water Supply industry(b)—by receiving body—2004–05 and 2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Aust.*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Surface water	157 578	162 106	np	np	3 211	17 662	1 652	25 309	597 891
Groundwater	8 263	—	np	np	5 189	—	—	—	18 048
Sea water	487 028	285 844	170 642	np	117 723	32 196	np	—	1 162 833
Total	**652 869**	**447 950**	**400 808**	np	**126 123**	**49 858**	np	**25 309**	**1 778 772**
2004–05									
Surface water	172 960	176 768	137 548	3 137	10 141	21 491	4 023	27 293	553 361
Groundwater	5 194	6 441	3 145	780	7 928	7	—	—	23 495
Sea water	481 914	344 891	168 765	80 398	112 785	36 105	7 118	—	1 231 976
Total	**660 068**	**528 100**	**309 458**	**84 315**	**130 854**	**57 603**	**11 141**	**27 293**	**1 808 832**

— nil or rounded to zero (including null cells)
np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Includes waste and drainage water discharged.
(b) Water supply, sewerage and drainage industry only.

4.21 REGULATED DISCHARGE(a), Water supply industry, by receiving body—2004–05 and 2008–09



(a) Includes waste and drainage water discharged.

Environmental Water Flows

Almost all of the water supplied to the environment is provided by the WATER SUPPLY and ELECTRICITY and GAS SUPPLY industries as regulated discharge. These are not environmental flows and are presented in the supply and use tables as regulated discharge.

The concept of environmental flows or provisions was formally introduced in 1994 when the Council of Australian Governments (COAG) developed a *Water Reform Framework* requiring State, Territory and Commonwealth Governments to give priority to determining allocations or entitlements to water, including the environment. The National Water Initiative (NWI) further required the States and Territories to establish specific water management plans for balancing environmental water needs with the

Environmental Water Flows continued

consumptive use of water by the broader community. Comprehensive descriptions of environmental water arrangements for each NWI Party (the State, Territory and Commonwealth Governments) can be found in Australian environmental water management report 2010 (NWC; to be released in December 2010).

While the legal definition of environmental water differs between jurisdictions (including the Commonwealth), environmental flows are described by the National Water Commission (NWC) as 'sources of supply and delivery of water to sustain the health of water-dependant ecosystems' (NWC 2009a). The ABS definition of environmental flows is 'water delivered (released) for the purpose of the environment in accordance with a specific plan, prepared in conjunction with and/or approved by the appropriate environmental (resource) regulator' (see Glossary). The ABS definition is closely aligned with the NWI definition.

Key Commonwealth, State and Territory water agencies recognise two forms of environmental water:

i. Planned (rules-based) environmental water relates to statutory requirements to maintain specific water regimes (e.g. particular levels, flow rates, aquifer pressures).
ii. Held (entitlement-based) environmental water relates to specific entitlements, which accrue annual allocations of water that can be extracted (or left in-stream) for environmental purposes.

The data on environmental flows presented in *Water Account Australia* are primarily based on flows of 'held environmental water' as these are volumetric based (i.e. ML) and are reported by water suppliers. However, rules-based environmental water flows are not always recorded in volume terms, therefore they may not always be included within reporting of total environmental water flows.

The extent to which environmental flows reported to ABS and other Commonwealth, State and Territory water agencies includes planned environmental flows (in addition to held environmental water) is uncertain at this stage and is under investigation. The estimates of environmental flows presented in the *Water Account Australia* are likely to be an underestimate and should be used with caution.

In 2008–09, the total amount of water released by water providers for environmental purposes was 722 GL, more than three quarters (77%) of which comes from the Water Supply industry (Table 4.22). Environmental flows were highest in New South Wales (41% of the total flows) followed by Tasmania and Queensland (21%).

4.22 ENVIRONMENTAL FLOWS, by industry—2000–01, 2004–05 and 2008–09

	NSW(a)	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*(a)	*Australia*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
2008–09									
Water supply industry(b)	244 354	84 903	145 790	573	2 632	48 450	—	30 571	557 273
Other industries(c)	53 647	83	4 009	—	99	106 587	—	—	164 424
Total	**298 001**	**84 986**	**149 799**	**573**	**2 731**	**155 037**	—	**30 571**	**721 697**
2004–05									
Water supply industry(b)	60 165	370 347	377 779	713	18	1 941	1 103	30 200	842 266
Other industries(c)	36 825	3 582	5 827	—	—	116 777	—	—	163 011
Total	**96 990**	**373 929**	**383 606**	**713**	**18**	**118 718**	**1 103**	**30 200**	**1 005 277**
2000–01									
Total	**200 528**	**253 172**	**4 462**	**873**	—	**358**	—	—	**459 393**

— nil or rounded to zero (including null cells)
(a) NSW and ACT were combined for 2000–01.
(b) Includes Sewerage and drainage services.
(c) Other industries including the Mining, Manufacturing and Electricity and gas supply industries.

Environmental Water Flows continued

At the National level, there was a 28% decrease in the volume of water released for specific environmental purposes between 2004–05 (1,005 GL) and 2008–09 (722 GL). In contrast to the overall level for Australia, some States and Territories recorded increases in environmental flows, including: New South Wales (increased by 201GL); Tasmania (36 GL); Western Australia (3 GL). The overall decrease in environmental flows is attributable to drought related reductions in total water availability, particularly in Victoria (environmental flow decrease of 289 GL or 77%) and Queensland (decrease of 234 GL or 61%).

CHAPTER 5 AGRICULTURE

INTRODUCTION

This chapter examines the consumption of water by the AGRICULTURE industry and by agricultural activities in Australia. Water used in agriculture includes water applied through the irrigation of crops and pastures, or fed to livestock. Water can be be directly extracted from the environment by farmers (e.g. from bores, on-farm dams, rivers) or supplied by water providers (e.g. irrigation authorities). The consumption of direct rainfall water is not included in this chapter. Since agriculture does not use water in-stream, or supply water to other users, total water use is equal to water consumption.

Two different views of agriculture are provided in this chapter: an industry view and an activity view. In an industry view all businesses are coded to an industry according to the *Australian and New Zealand Standard Industrial Classification* (ANZSIC 2006). An industry view provides direct links to the economic information in the System of National Accounts. This enables data such as industry value added to be compared to water consumption (see Table 1.6).

The AGRICULTURE industry view presents only the agricultural activity that occurs in businesses where the primary income producing activity of the business is agricultural production. Businesses which undertake some agricultural activity but for which other activities provide most of the income are excluded from the AGRICULTURE industry view. For example, a business which generates most of its income from transporting agricultural produce, but also grows some agricultural commodities, would be classified to the TRANSPORT, POSTAL AND WAREHOUSING industry. The agricultural production is still counted but is attributed to the TRANSPORT, POSTAL AND WAREHOUSING industry. As such the industry view of AGRICULTURE shows a lower level of water consumption than the agricultural activity view.

The Physical and Monetary Supply and Use Tables presented in Chapters 2 and 3 present the AGRICULTURE industry view. Previous editions of the *Water Account Australia* presented an activity view of agriculture and are directly comparable to the data in Table 5.4.

To calculate the amount of water consumed by the AGRICULTURE industry, the ABS has used data on water supplied to agriculture from the ABS Water Supply and Sewerage Services Survey 2008–09, data on water consumption, irrigated area and livestock numbers from the ABS 2008–09 Agricultural Survey, as well as information available from State and Territory agricultural departments and research institutions. Additional detail on the methodology is found in the Explanatory Notes. The data presented in this publication are similar but slightly different to those data presented in *Water Use on Australian Farms, 2008–09* (ABS cat. no. 4618.0). The difference is because of the multiple data sources used in the 2008–09 *Water Account Australia*, compared to the single source of ABS survey data used for *Water Use on Australian Farms, 2008–09*.

MAIN FINDINGS

The main findings of this chapter are:

- Water consumption by all agricultural activities was 7,589 GL in 2008–09, a 32% decrease from 2004–05 when it was 12,191 GL.
- Water consumption by businesses with agriculture as their main activity (i.e. the Agriculture industry) was 6,996 GL in 2008–09, representing 92% of total agricultural water consumption (7,589 GL).
- All agricultural activities accounted for 54% of total Australian water consumption in 2008–09, which is less than in 2004–05, when they accounted for 65%.
- The Agriculture industry accounted for 50% of total Australian water consumption in 2008–09.
- Sheep, beef cattle and grain farming (2,177 GL or 31%) had the highest water consumption of the ANZSIC groups within the Agriculture industry in 2008–09, followed by Other crop growing (1,901 GL or 27%), Dairy cattle farming (1,263 GL or 18%) and Fruit and tree nut growing (1,048 GL or 15%).
- Cotton growing (880 GL or 12%) was the agricultural activity with the highest water consumption in 2008–09, followed by cereal crops for grain or seed growing (829 GL or 11%).
- Self-extracted water consumption by the Agriculture industry in 2008–09 was 3,626 GL, distributed water consumption (e.g. supplied by irrigation authorities) was 3,267 GL, and reuse water consumption was 103 GL.
- The area of irrigated agricultural land in 2008–09 was 1.8 million hectares, a 27% decrease from 2004–05 when it was 2.4 million hectares. Irrigated land represented 0.4% of all agricultural land in 2008–09.
- The gross value of irrigated agricultural production was $12.0 billion in 2008–09, a rise from $10.6 billion in 2004–05. (Note: Gross value is not a proxy for the highest value water use).
- Irrigated agricultural production contributed 29% of the total gross value of agricultural commodities produced in 2008–09.

AGRICULTURE

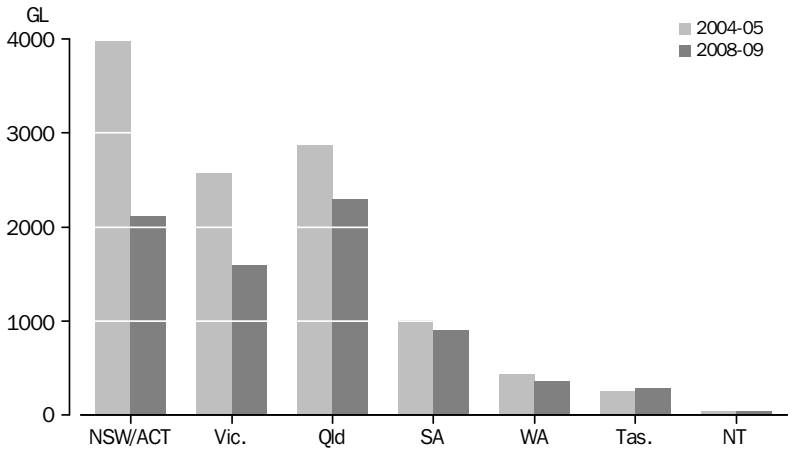
Water Consumption

Water consumption by the Agriculture industry was 6,996 GL in 2008–09 (Table 5.2), accounting for 50% of total water consumption in Australia during that period. Water consumption varied between crops and between States and Territories. Queensland had the highest water consumption for the Agriculture industry in 2008–09, with 2,144 GL or 31% of total agricultural water consumption for Australia (Graph 5.1), followed by New South Wales (2,001 GL or 29%) and Victoria (1,435 GL or 21%).

Water Consumption

continued

5.1 WATER CONSUMPTION, Agriculture, all activities—2004–05 and 2008–09



In 2008–09, the SHEEP, BEEF CATTLE AND GRAIN FARMING industry group had the highest water consumption within the AGRICULTURE industry, with 2,177 GL (or 31%). This was followed by OTHER CROP GROWING (1,901 GL or 27%), DAIRY CATTLE FARMING (1,263 GL or 18%) and FRUIT AND TREE NUT GROWING (1,047 GL or 15%) (Table 5.2).

5.2 WATER CONSUMPTION(a), Agriculture industry—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Aust.*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
Nursery and floriculture production	16 584	14 345	10 358	3 819	10 658	1 249	373	1 104	58 490
Mushroom and vegetable growing	70 001	81 787	87 878	95 621	61 397	30 896	4 175	26	431 782
Fruit and tree nut growing	229 944	329 071	147 374	270 544	55 592	7 176	7 755	154	1 047 610
Sheep, beef cattle and grain farming	848 754	291 778	539 343	260 247	112 964	100 911	22 621	246	2 176 863
Other crop growing	618 967	17 324	1 229 013	17 648	15 273	1 989	417	233	1 900 863
Dairy cattle farming	178 627	672 686	104 898	125 023	62 594	119 048	-	3	1 262 879
Poultry farming	11 297	4 322	4 538	1 897	1 497	360	4	26	23 940
Deer farming	13	327	—	201	52	35	-	-	630
Other livestock farming	27 275	23 761	20 798	13 324	4 744	2 783	36	2	92 724
Total	**2 001 462**	**1 435 401**	**2 144 201**	**788 326**	**324 771**	**264 446**	**35 380**	**1 793**	**6 995 781**

— nil or rounded to zero (including null cells)

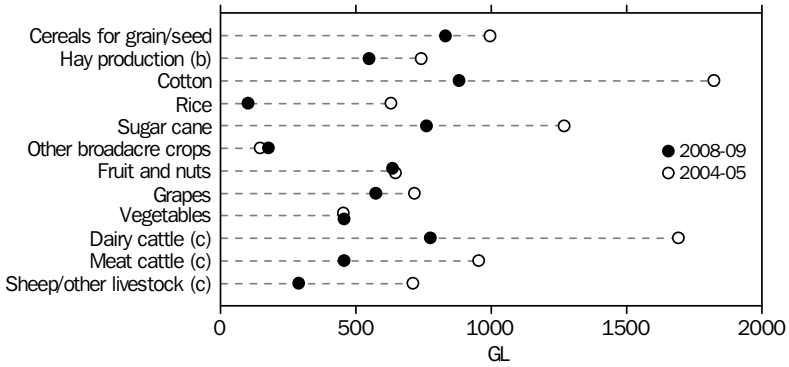
(a) Excludes water consumption by businesses conducting agricultural activities where agriculture is not the business' main activity. See explanatory notes 20 for more details.

The agricultural activity with the highest water consumption in 2008–09 was cotton growing (880 GL or 12%), followed by cereal crops for grain or seed growing (829 GL or 11%), 'other' agricultural water use (825 GL or 11%) and dairy cattle grazing (774 GL or 10%) (Graph 5.3 and Table 5.4). Dairy cattle grazing includes all water used for the irrigation of grazing land for dairy cattle, but excludes stock drinking and dairy washdown. 'Other' agricultural water includes livestock drinking water and dairy and piggeries washdown.

Water Consumption

continued

5.3 WATER CONSUMPTION, Agriculture, by activity (a)—2004–05 and 2008–09



(a) See Table 5.4 for complete list of activities.
(b) Includes pasture for silage
(c) Irrigated land used for grazing

5.4 WATER CONSUMPTION, Agriculture—by activity—2004–05 and 2008–09

	AUSTRALIA		2008–09							
Commodity groups	*2004–05*	*2008–09*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*
	ML	ML	ML	ML	ML	ML	ML	ML	ML	ML
Cereals for grain/seed	995 215	829 495	450 120	30 055	323 155	11 865	8 649	5 649	—	3
Hay production(a)	738 009	547 790	160 852	152 819	113 022	84 312	10 830	21 906	3 816	233
Pastures for seed	121 012	182 055	22 858	14 694	8 755	128 679	np	np	—	—
Cotton	1 821 509	880 003	465 833	—	414 170	—	—	—	—	—
Rice	630 872	101 474	101 474	—	—	—	—	—	—	—
Sugar cane	1 269 012	761 086	—	—	761 086	—	—	—	—	—
Other broadacre crops	146 556	147 042	54 100	5 518	50 288	9 094	11 998	16 044	—	—
Fruit and nuts	647 662	635 103	120 659	190 219	119 060	131 280	54 587	9 448	9 825	24
Grapes	717 047	575 095	166 792	182 202	15 906	188 369	18 288	1 177	2 229	131
Vegetables for human consumption and seed	455 373	457 348	61 330	101 170	93 440	88 605	64 112	44 658	3 998	36
Nurseries, cut flowers and cultivated turf	55 865	69 377	20 753	13 584	15 808	np	14 309	np	397	1 130
Dairy cattle(b)	1 687 631	773 545	84 770	473 262	38 485	61 789	31 578	83 660	—	—
Meat cattle(b)	950 181	455 937	98 443	174 743	70 179	45 900	30 109	34 985	1 578	—
Sheep/other livestock(b)	707 835	289 041	90 239	80 091	4 528	68 851	11 750	33 464	np	—
Other agricultural water use(c)	1 201 355	824 909	197 763	166 396	237 211	74 419	105 118	22 634	21 062	307
Total(d)	**12 191 372**	**7 588 682**	**2 106 240**	**1 592 723**	**2 295 681**	**901 649**	**362 572**	**284 930**	**43 023**	**1 863**

— nil or rounded to zero (including null cells)
np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Includes pasture for silage.
(b) Irrigated land used for grazing.
(c) Includes livestock drinking water and dairy and piggeries cleaning.
(d) Total includes pastures or crops not classified elsewhere.

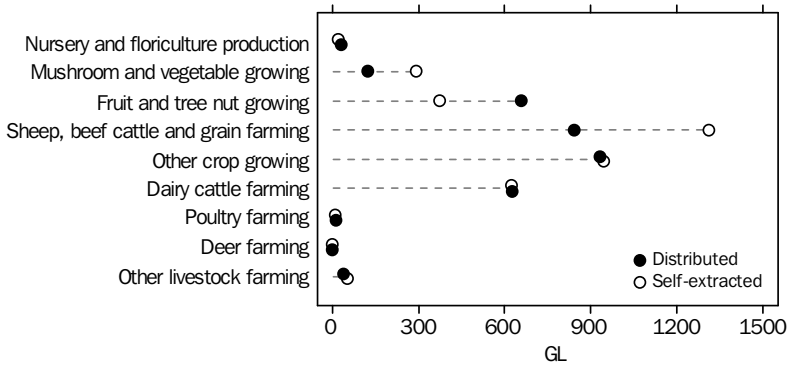
The activities with the largest percentage decreases in water consumption from 2004–05 to 2008–09 were rice growing (84%), grazing for sheep and other livestock (59%), dairy cattle (54%) and meat cattle (52%), and cotton growing (52%) (Table 5.4).

Water Source

The majority of the water consumed by the AGRICULTURE industry in 2008–09 was self-extracted water (3,626 GL or 52%) and distributed water (3,267 GL or 47%), with reuse water (103 GL or 1%) accounting for the remainder (Graph 5.5 and Table 5.6).

The highest self-extracted water consumption within the AGRICULTURE industry in 2008–09 was by SHEEP, BEEF CATTLE AND GRAIN FARMING (1,310 GL) and in OTHER CROP GROWING (945 GL) (Graph 5.5 and Table 5.6). The industry groups that consumed more distributed water than self-extracted water included FRUIT AND TREE NUT GROWING, NURSERY AND FLORICULTURE PRODUCTION, POULTRY FARMING, DAIRY FARMING and DEER FARMING.

5.5 WATER CONSUMPTION, Agriculture industry (a), by water type (b)—2008–09



(a) Excludes water consumption by businesses conducting agricultural activities where agriculture is not the business' main activity. See Explanatory Note 20 for more details.
(b) Excludes reuse water.

5.6 WATER CONSUMPTION, Agriculture—by water type and industry(a)—2008–09

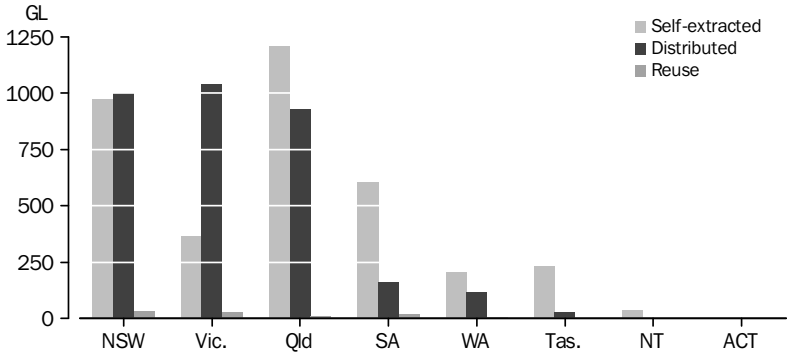
	Self-extracted	*Distributed*	*Reuse*	*Total*
	ML	ML	ML	ML
Nursery and floriculture production	21 867	30 503	6 120	58 490
Mushroom and vegetable growing	292 437	123 310	16 034	431 782
Fruit and tree nut growing	372 433	658 916	16 261	1 047 610
Sheep, beef cattle and grain farming	1 310 110	843 253	23 499	2 176 863
Other crop growing	944 831	932 006	24 026	1 900 863
Dairy cattle farming	622 733	625 633	14 513	1 262 879
Poultry farming	9 843	13 357	741	23 940
Deer farming	293	335	1	630
Other livestock farming	51 349	39 926	1 449	92 724
Total	**3 625 895**	**3 267 240**	**102 645**	**6 995 781**

(a) Excludes water use by businesses conducting agricultural activities where agriculture is not the business' main activity. See explanatory notes 20 for more details.

Self-extracted water consumption was higher than distributed water consumption for the AGRICULTURE industry in every State and Territory in 2008–09, with the exception of Victoria and New South Wales (Graph 5.7). Queensland (1,205 GL) had the highest self-extracted water consumption, followed by New South Wales (973 GL) and South Australia (606 GL) (Table 5.8). Victoria had the highest distributed water consumption, with 1,039 GL.

Water Source continued

5.7 WATER CONSUMPTION, Agriculture industry (a), by water type—2008–09



(a) Excludes water consumption by businesses conducting agriculture activities where agriculture is not the business' main activity. See Explanatory Note 20 for more details.

Note: ACT and NT figures too low to appear on graph. See Table 5.8.

5.8 WATER CONSUMPTION, Agriculture industry(a)—by water type—2008–09

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Aust*
	ML	ML	ML	ML	ML	ML	ML	ML	ML
Self-extracted	972 911	367 417	1 204 555	606 446	205 355	232 641	35 065	1 504	3 625 895
Distributed	995 840	1 038 839	927 793	159 367	115 642	29 221	315	223	3 267 240
Reuse	32 710	29 145	11 853	22 513	3 774	2 584	—	66	102 645
Total	**2 001 462**	**1 435 401**	**2 144 201**	**788 326**	**324 771**	**264 446**	**35 380**	**1 793**	**6 995 781**

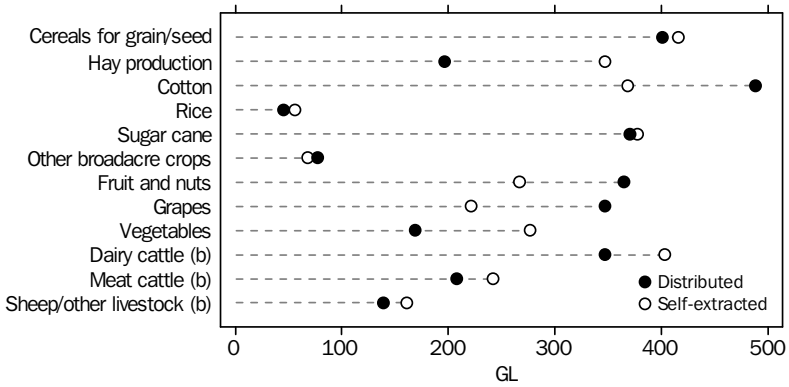
— nil or rounded to zero (including null cells)

(a) Excludes water use by businesses conducting agricultural activities where agriculture is not the business' main activity. See explanatory notes 20 for more details.

The agricultural activities with the highest self-extracted water consumption in 2008–09 were 'other' agricultural water use (which includes livestock drinking water and dairy and piggeries cleaning) (448 GL), cereals for grain/seed growing (416 GL) and dairy cattle grazing (403 GL) (Graph 5.9 and Table 5.10). The activity with the highest distributed water consumption was cotton (489 GL). Cotton was one of the few activities that consumed more distributed water than self-extracted, the others being fruit and nut growing, grape growing and nurseries, cut flowers and cultivated turf growing.

Water Source continued

5.9 WATER CONSUMPTION, Agriculture, by activity and water type(a)—2008–09



(a) Excludes reuse water.
(b) Irrigated land used for grazing.

5.10 WATER CONSUMPTION, Agriculture—by activity and water type—2008–09

	Self-extracted	*Distributed*	*Reuse*	*Total*
	ML	ML	ML	ML
Commodity groups				
Cereals for grain/seed	416 269	400 985	12 241	829 495
Hay production(a)	346 929	196 603	4 258	547 790
Pastures for seed	158 007	23 599	449	182 055
Cotton	368 520	488 631	22 853	880 003
Rice	55 879	45 389	206	101 474
Sugar cane	377 721	370 988	12 376	761 086
Other broadacre crops	77 005	67 921	2 117	147 042
Fruit and nuts	267 257	364 674	3 172	635 103
Grapes	221 208	346 881	7 005	575 095
Vegetables for human consumption and seed	276 979	168 767	11 602	457 348
Nurseries, cut flowers and cultivated turf	31 842	33 918	3 617	69 377
Dairy cattle(b)	403 169	347 076	9 015	759 261
Meat cattle(b)	241 902	208 246	5 409	455 557
Sheep/other livestock(b)	161 268	138 831	3 606	303 704
Other crops	30 912	23 665	4 807	59 383
Other agricultural water use(c)	447 711	373 719	3 479	824 909
Total volume applied(d)	**3 882 576**	**3 599 893**	**106 212**	**7 588 682**

(a) Includes pasture for silage.
(b) Irrigated land used for grazing.
(c) Includes livestock drinking water and dairy and piggeries cleaning.
(d) Total includes pastures or crops not classified elsewhere.

Reuse Water

Reuse water consumption by the AGRICULTURE industry in 2008–09 was 103 GL, or 1.5% of total water consumption in the AGRICULTURE industry (Table 5.8).

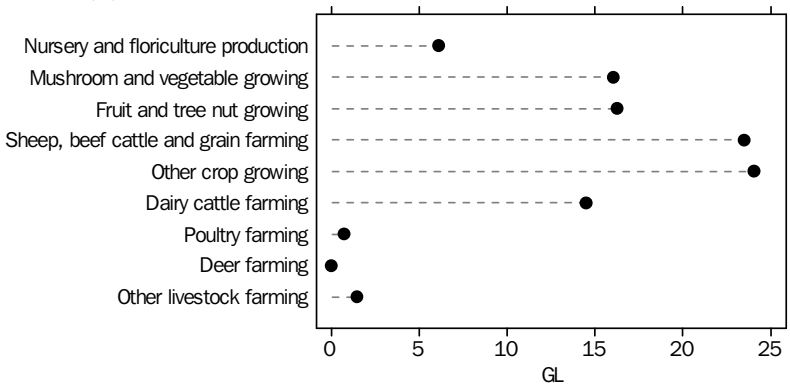
Reuse water accounted for 4% of total agricultural water consumption in the Australia Capital Territory, and 3% in South Australia (Table 5.8). Consumption of reuse water by the AGRICULTURE industry includes water from regional reuse schemes, but does not include on-farm reuse or recycling. The highest consumption of reuse water within the AGRICULTURE industry in 2008–09 was by OTHER CROP GROWING (24 GL), followed by SHEEP,

Reuse Water continued

BEEF CATTLE AND GRAIN FARMING (23 GL), FRUIT AND TREE NUT GROWING (16 GL) and MUSHROOM AND VEGETABLE GROWING (16 GL) (Graph 5.11 and Table 5.6).

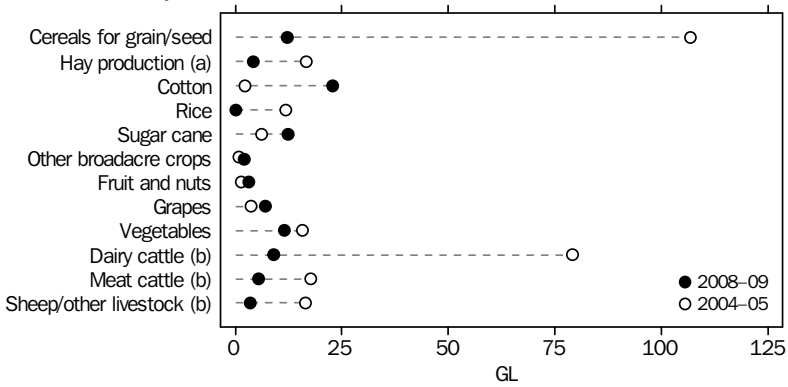
Reuse water consumption for all agricultural activities in 2008–09 was 106 GL (Table 5.10), which is lower than 2004–05, when reuse water consumption was 280 GL. The agricultural activities consuming the most reuse water were cotton growing (23 GL), sugar cane growing (12 GL) and cereals for grain or seed growing (12 GL) (Graph 5.12). There were large decreases in the consumption of reuse water for cereals for grain/seed growing (95 GL) and dairy cattle grazing (70 GL) between 2004–05 and 2008–09 (Graph 5.12).

5.11 REUSE WATER CONSUMPTION, Agriculture industry (a)—2008–09



(a) Excludes water consumption by businesses conducting agricultural activities where agriculture is not the business' main activity. See Explanatory Note 20 for more details.

5.12 REUSE WATER CONSUMPTION, Agriculture, by activity—2004–05 and 2008–09



(a) Includes pastures for silage.
(b) Irrigated land used for grazing.

Origin of Water

The majority of water consumption (distributed and self-extracted) by the AGRICULTURE industry in 2008–09 originated from surface water (63%), while groundwater accounted for 35% (Table 5.13). The States and Territories with the largest percentage of water consumption extracted from groundwater sources were the Northern Territory (79%), South Australia (62%) and Western Australia (54%). Surface water accounted for a large

Origin of Water continued

percentage of agricultural water consumption in the Australia Capital Territory (94%), Tasmania (87%), Victoria (75%) and Queensland (73%).

5.13 ORIGIN OF AGRICULTURAL WATER—2008–2009

	Surface water	*Groundwater*	*Reuse*	*Total all sources*(a)
	%	%	%	ML
NSW	56.6	41.8	1.6	2,001,462
Vic.	75.5	22.5	2.0	1,435,401
Qld	73.1	26.3	0.6	2,144,201
SA	34.7	62.4	2.9	788,326
WA	45.2	53.6	1.2	324,771
Tas.	86.9	12.2	1.0	264,446
NT	21.0	79.1	0.0	35,380
ACT	94.0	2.3	3.7	1,793
Aust.	63.5	35.0	1.5	6,995,781

(a) Excludes water use by businesses conducting agricultural activities where agriculture is not the business' main activity. See explanatory notes 20 for more details.

Irrigated Land

The area of irrigated land decreased by 27%, from 2.4 million hectares in 2004–05 to 1.8 million hectares in 2008–09 (Table 5.14). There were increases in the area irrigated for pastures for seed, grapes and fruit and nuts and decreases in the area irrigated across all other commodity groups. The largest absolute increase in the area of irrigated land was in grape growing, from 146,663 hectares in 2004–05 to 172,344 hectares in 2008–09. The largest absolute decrease in the area of land irrigated was in grazing land for sheep and other livestock, from 247,357 hectares in 2004–05 to 88,670 hectares in 2008–09. In percentage terms, the largest decrease was 86% in the area of irrigated rice, from 51,216 hectares to 7,194 hectares.

5.14 AREA IRRIGATED CROPS AND PASTURES—by activity—2004–05 and 2008–09

	AUSTRALIA		2008–09							
Commodity groups	*2004–05* '000 ha	*2008–09* '000 ha	*NSW* '000 ha	*Vic.* '000 ha	*Qld* '000 ha	*SA* '000 ha	*WA* '000 ha	*Tas.* '000 ha	*NT* '000 ha	*ACT* '000 ha
Cereals for grain/seed	309.2	292.7	164.8	16.3	100.5	5.7	1.8	3.6	—	—
Hay production	183.7	156.5	46.0	48.2	32.1	21.0	1.7	6.7	0.8	0.1
Pastures for seed	32.7	39.7	9.0	4.0	3.0	21.0	np	np	—	—
Cotton	269.7	141.9	70.3	—	71.6	—	—	—	—	—
Rice	51.2	7.2	7.2	—	—	—	—	—	—	—
Sugar cane	213.1	191.9	—	—	191.9	—	—	—	—	—
Other broadacre crops	63.0	51.8	18.3	2.2	20.7	3.0	1.4	6.1	—	—
Fruit and nuts	121.8	128.0	24.8	35.0	34.9	18.0	8.5	3.3	3.6	—
Grapes	146.7	172.3	41.1	36.6	3.1	77.7	12.5	1.1	0.3	0.1
Vegetables for human consumption and seed	114.4	104.6	13.4	24.7	29.4	14.5	8.5	13.0	0.9	—
Nurseries, cut flowers and cultivated turf	14.0	12.9	3.8	2.7	3.9	np	1.4	0.3	0.1	0.1
Dairy cattle(a)	339.7	221.7	50.4	99.5	24.7	16.7	5.9	24.3	0.3	—
Meat cattle(a)	273.6	133.0	30.3	59.7	14.8	10.0	3.5	14.6	0.2	—
Sheep/other livestock(a)	247.4	88.7	20.2	39.8	9.9	6.7	2.3	9.7	0.1	—
Total irrigated land(b)	**2 404.9**	**1 760.8**	**503.4**	**371.0**	**547.9**	**196.2**	**47.8**	**88.0**	**6.2**	**0.3**
Total agricultural land(c)	445 148.8	409 028.7	57 267.4	12 090.7	141 209.8	49 126.1	93 645.9	1 630.4	54 016.4	42.0

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Irrigated land used for grazing.

(b) Total includes pastures or crops not classified elsewhere.

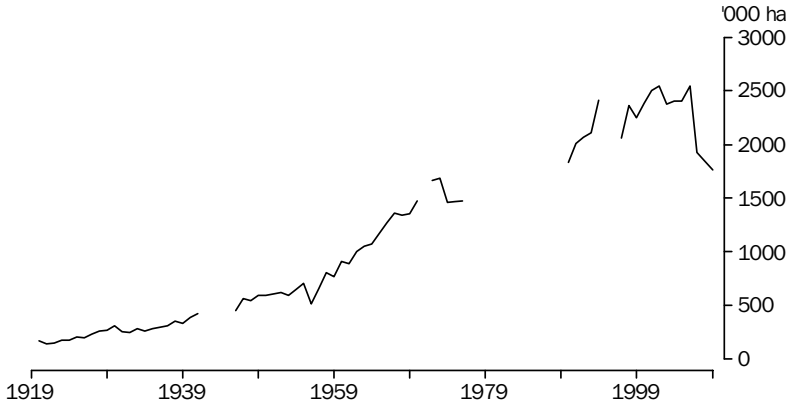
(c) Total area of all agricultural holdings. Note that not all land on agricultural holdings is used for agricultural purposes.

Irrigated Land continued

Graph 5.15 shows historically the increases in area irrigated in Australia from 1920 to 2009. There are some gaps in the data series, however it can be seen that the area irrigated increased steadily from 1955 to 2006. There is a noticeable decrease from 2007 due to the effects of the drought leading to a lack in water availability.

Irrigated Land continued

5.15 AREA IRRIGATED, Australia—1920–2009



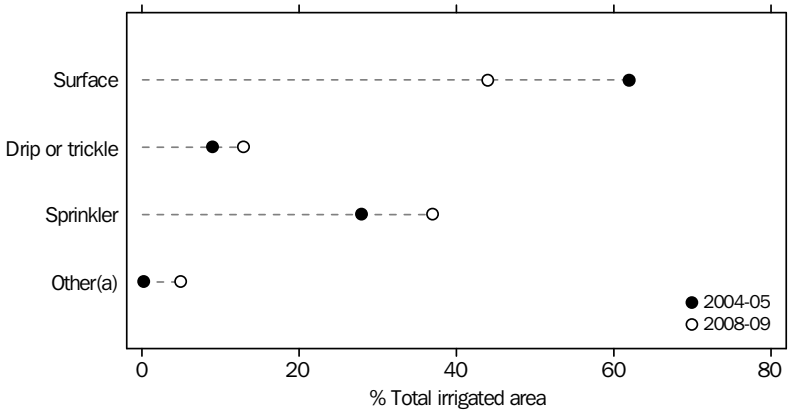
Source: ABS unpublished data

Irrigation Methods

Graph 5.16 shows the different types of irrigation methods used by percent of area irrigated for the years 2004–05 and 2008–09. A State and Territory breakdown on irrigation methods is shown in Table 5.17. Surface irrigation refers to the controlled flooding of paddocks or irrigation bays, whereas sprinkler irrigation is applied from various forms of overhead sprays. Drip (or trickle) irrigation refers to the technique of applying water directly to individual plants or rows of crops.

Between 2004–05 and 2008–09, there was a continued shift towards the use of more efficient irrigation methods. Surface irrigation remained the most preferred method of irrigation with 44% of irrigated area irrigated by this means in 2008–09, however this was down from 62% in 2004–05. Sprinkler systems, which include microspray, portable and hose irrigators, large mobile machines and solid set, were the next preferred method in 2008–09 (37%), up from 28% of area irrigated by these means in 2004–05.

5.16 IRRIGATION METHODS, Area irrigated, by method—2004–05 and 2008–09



Source: ABS 2010

5.17 IRRIGATION METHODS(a)—2004–05 and 2008–09

	AUSTRALIA		2008–09						
	2004–05	*2008–09*	*NSW*(b)	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*
Surface	62	44	60	51	46	^9	^27	*4	14
Drip or trickle									
Above ground	8	12	^9	13	4	40	^33	3	14
Subsurface	^1	1	^1	*2	2	*1	^2	-	-
Sprinkler									
Microspray	3	5	2	^6	5	^7	10	2	43
Portable irrigators	4	4	^4	^4	^4	^1	^2	*17	-
Hose irrigators	9	12	^7	^5	^21	*4	* -	*32	-
Large mobile machines	9	14	^10	^11	^11	^30	^12	^31	14
Solid set	3	3	^1	^4	^3	^4	8	^2	14
Other	^<1	5	6	^5	^4	^6	^8	9	-
Total Area ('000 ha)	**2 382**	**1 825**	**514**	**389**	**568**	**200**	**52**	**94**	**7**

(a) Areas may be irrigated by more than one method and are shown against each method reported. As such total area may be greater than total area irrigated.

(b) Includes the Australian Capital Territory.

Note: ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

Note: * estimate has a relative standard error of 25% to 50% and should be used with caution

Gross Value of Irrigated Agricultural Production

Estimating the value of agricultural production that results from irrigation is difficult. This is because water consumed by crops comes from a variety of sources. In particular, rainwater, which is not included in the *Water Account Australia*, is usually a component of the water consumed by irrigated crops, and the timing and location of rainfalls affect the amount of irrigation water required. Other factors such as evaporation also affect irrigation water requirements. These factors contribute to regional and temporal variations in the consumption of water for irrigation.

In addition, water is not the only input to agricultural production from irrigated land. Land, fertiliser, labour, machinery and other inputs are also used. To separate the contribution that these factors make to total production is practically impossible with current data. Therefore, the estimates of the Gross Value of Irrigated Agricultural Production (GVIAP) presented in Table 5.18 attribute all of the gross value of production from irrigated land to irrigated agricultural production. GVIAP should not be used as a proxy for determining the highest value water uses.

GVIAP estimates for 2008–09 were derived from the ABS Agricultural Survey and Vineyards Survey, which collected information that included area and production of crops, livestock numbers and products, area of crops/pastures irrigated and volume of water applied. The ABS also collects and publishes data on the value of agricultural commodities produced (see *Value of Agricultural Commodities Produced, Australia, 2008–09* (ABS cat no. 7503.0). Further details on the methods used to derive the estimates are presented in the Explanatory Notes and in the information paper *Methods of estimating the Gross Value of Irrigated Agricultural Production* (ABS cat. no. 4610.0.55.006).

Gross Value of Irrigated Agricultural Production continued

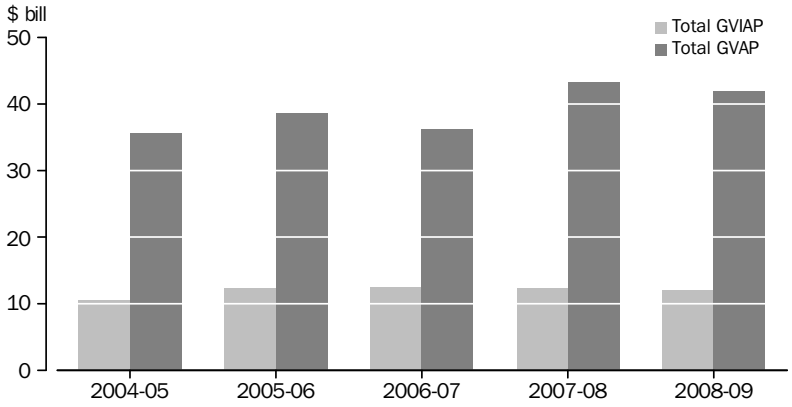
The total gross value of irrigated agricultural production in 2008–09 was $12.0 billion compared to $10.6 billion in 2004–05 (Table 5.19). The greatest increases in GVIAP from 2004–05 to 2008–09 occurred in Queensland, from $2.6 billion to $3.3 billion, and Western Australia, from $0.5 billion to $0.8 billion. Between 2004–05 and 2008–09 there were significant reductions in the GVIAP of cotton (from $908 million to $620 million) production of meat cattle (from $811 million to $455 million), grapes (from $1,362 million to $1,200 million) and rice (from $101 million to $35 million).

Irrigated production contributed 29% to the total gross value of agricultural commodities produced in 2008–09, down slightly from 30% in 2004–05. Vegetables were the largest contributor to the value ($2,625 million or 22%), followed by fruit and nuts ($2,390 million or 20%) and dairy production ($2,274 million or 19%).

GVIAP, as a proportion of total agricultural production (Gross Value of Agricultural Production or GVAP), has decreased since 2006–07, from 35% to 29% (Graph 5.18).

Note that estimates of GVIAP and GVAP are given in current prices; that is, estimates are valued at the commodity prices of the period to which the observation relates.

5.18 TOTAL GVIAP AND GVAP (a), Australia: **2004-05 to 2008-09**



(a) Gross value in current prices

5.19 GROSS VALUE OF IRRIGATED AGRICULTURAL PRODUCTION—2004–05 and 2008–09

	AUSTRALIA		2008–09							
	2004–05	*2008–09*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*
	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)
Cereals for grain and seed	207	317	179	9	119	3	np	5	—	np
Hay production										
Cereals for hay	17	21	4	10	4	2	—	1	—	—
Pastures for hay	205	149	50	40	38	14	2	5	np	np
Total	222	170	53	51	42	16	2	5	np	np
Pastures for seed	45	60	9	10	4	29	np	np	—	—
Cotton	908	620	310	—	311	—	—	—	—	—
Rice	101	35	35	—	—	—	—	—	—	—
Sugar cane	460	537	—	—	537	—	—	—	—	—
Other broadacre crops	72	87	17	5	23	4	np	np	—	—
Fruit and nuts	1 949	2 390	334	719	735	307	194	75	np	np
Grapes	1 362	1 200	223	355	23	503	79	14	3	—
Vegetables for human consumption and seed	1 741	2 625	252	543	831	456	297	217	np	np
Nurseries, cut flowers and cultivated turf	651	983	242	250	254	41	155	27	10	4
Dairy production	1 803	2 274	387	1 159	194	185	np	254	np	—
Production from meat cattle	811	455	88	102	180	34	17	30	4	—
Production from sheep and other livestock	239	201	53	63	2	58	np	22	np	—
Total GVIAP	**10 570**	**11 953**	**2 181**	**3 266**	**3 255**	**1 635**	**846**	**693**	**73**	**4**

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

Gross Value of Irrigated Agricultural Production continued

For a full time series of GVIAP data from 2000–01 to 2008–09 (for all States and Territories), plus Murray-Darling Basin and Natural Resource Management (NRM) region data from 2005–06 to 2008–09, see the ABS publication *Experimental Estimates of the Gross Value of Irrigated Agricultural Production, 2000–01 to 2008–09* (cat. no. 4610.0.55.008).

EXPLANATORY NOTES

INTRODUCTION

1 The ABS *Water Account Australia* is one of the physical accounts produced by the ABS as part of an environmental accounting system. It consists of supply and use tables (collectively referred to as flow tables) for both physical and monetary volumes. The aim of the *Water Account Australia* is to integrate data from different sources into a consolidated information set making it possible to link physical data on water to economic data, such as that in Australia's National Accounts.

2 Environmental-Economic accounts can facilitate the understanding of a range of issues that include:

- a broader assessment of the consequences of economic growth;
- the contribution of sectors to particular environmental problems; and
- implications of environmental policy measures across sectors (for example, regulation, charges and incentives).

3 One advantage of environmental-accounts is that by linking together physical and economic data in a consistent framework it is possible to undertake scenario modelling. Issues that can be modelled include future water demand, assessing relative efficiencies in interactions between different sectors of the economy and the environment, and resource implications of structural change.

4 When the ABS produced the 1993–94 to 1996–97 and 2000–01 Water Accounts, any readily available data on water resources from various government and non-government organisations was used and aggregated. This tied together industry, regional and State data into a single system showing the supply and use of water within the Australian economy.

5 To produce the 2004–05 and 2008–09 Water Accounts, an ABS survey of water providers was undertaken and supplementary questions were added to several existing ABS surveys. This approach simplified compilation of the account as well as reducing the time required to produce the account. The survey approach also helped to improve the comparability and consistency of data, allowing analysis and evaluation over time. As with previous Water Accounts, data from other sources was also used to fill gaps, as well as for data consistency and checking. The survey activity undertaken by the ABS for 2008–09 collected comprehensive data on all organisations supplying water in the water supply industry in Australia and more detailed information on water use from across the economy.

ENVIRONMENTAL ACCOUNTING FRAMEWORK

6 The *Water Account Australia* was developed using the *System of Integrated Environmental and Economic Accounting* (SEEA) and the SEEA-Water (UN 2006a). SEEA was first published by the United Nations (UN) in 1993 (UN 1993a), and revised in 2003 (UN 2003a). SEEA is a supplementary account to the System of National Accounts 1993 (UN 1993b). Environmental accounts extend the boundaries of the System of National Accounts (SNA) framework to include environmental resources, which occur outside the economic production and asset boundaries measured by the SNA.

RELATIONSHIP BETWEEN THE WATER ACCOUNTS AND NATIONAL ACCOUNTS

7 Water supply and use tables provide a framework to link core components of the National Accounts to physical information. These tables are a component of physical input-output (I-O) tables and allow comparison of physical and monetary information through interactions between the economy and environment. Physical data are presented in supply and use tables while some linkages to economic data are also made.

PHYSICAL SUPPLY AND USE

Scope

8 Chapter 2 aggregates all available physical data (megalitres) in terms of the supply and use of water within the Australian economy for the financial year 2008–09. Supply and use tables include: self-extracted, distributed, and regulated discharge (including in-stream use) and effluent reuse.

9 The use of saline water (including water from estuaries) for power generation and other industrial uses, although measurable and reported, is not included in the supply and use tables. This is because the scope of the *Water Account Australia* is fresh water only.

Coverage

10 Coverage for both supply and use tables includes the following:

- individuals and companies that directly extract water from surface water and groundwater sources for their own use (e.g. domestic, industrial, agricultural or other uses);
- individuals and companies that use water supplied by water providers for domestic, industrial, agricultural or other uses;
- water providers that extract water from surface water, groundwater and sea water for desalination, and supply it to customers for use (e.g. households, industrial, or other use). The majority of water providers are categorised in WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry (ANZSIC 281) but the MINING, MANUFACTURING and ELECTRICITY, GAS, WATER AND WASTE SERVICES industries also supply a small amount of water; and
- water providers that provide reuse water to their customers; other large organisations who treat water and make it available for subsequent reuse; other large organisations who discharge water directly to the environment (e.g. power stations, mines); and major in-stream water users, for example aquaculture and hydro-electricity generation, where this information was available.

11 Items not covered by the supply and use tables include:

- the reuse/recycling of water on-farm or on-site (i.e. within homes or businesses);
- non-point/diffuse discharges;
- the impact of storm water infiltration into the sewerage reticulation system.

Data Sources

12 Data have come from a range of ABS surveys as well as State, Territory and Local Government agencies, water authorities and industry organisations.

13 The main ABS surveys used were:

- 2008–09 Water Supply and Sewerage Services Survey
- 2008–09 Agricultural Survey
- 2008–09 Energy, Water and Environment Survey
- 2008–09 Electricity Generators Survey of Water Use

14 State and Territory government agencies and major businesses from which data was used in this publication include:

- In New South Wales, State Water Corporation and the NSW Office of Water. In particular, the *2008–09 NSW Water Supply and Sewerage Benchmarking Report* (DECCW 2010a).
- In Victoria, the Department of Sustainability and Environment. In particular, the 2008–09 Victorian Water Accounts, (DSE 2010a).
- In Queensland, the Queensland Statewide Water Information Management (SWIM) under arrangements with the Queensland Water Directorate.
- In South Australia, SA Water.
- In Western Australia, the Department of Water, the Economic Regulatory Authority and WA Water Corporation.
- In Tasmania, the Department of Primary Industries, Parks, Water and Environment.
- In the Northern Territory, the Power and Water Corporation.
- In the Australian Capital Territory, ACTEW.

Data Sources continued

15 Surveys conducted by other government agencies, industry associations, as well as annual reports of water providers were used. These include:

- National Water Commission (NWC) and Water Services Association Australia (WSAA) 2008–09 National Performance Report – Urban Water Utilities (NWC, WSAA & NWI 2010).
- National Water Commission (NWC) National Performance Report 2008–2009: Rural Water Service Providers (NWC 2009).
- Annual/environmental reports for 2008–09 for various water providers (lists of those that provided a water supply or sewerage service were collected from State agencies and industry contacts).

Methods for Calculating Water Supply and Use

16 These notes are intended as a general guide to the method of calculating estimates of water supply and use. For more detail on the methods please contact the Director, Environmental Accounts and Water (EAW), Australian Bureau of Statistics.

17 Supply and use tables integrate data from a wide range of sources. Some of the water supply and use data are from decentralised sources as most water distribution is managed by local governments or privatised water authorities. The data collected from these sources were collated to a uniform standard and aggregated to a State and Territory level.

18 A complete list of water providers in 2008–09 was compiled from information supplied by State and Territory regulatory departments, industry bodies, and other water data providers. All water providers identified were surveyed in the ABS 2008–09 Water Supply and Sewerage Services Survey.

19 Water providers provided information on:

- Volume of water extracted from the environment and/or the volume of water received from other water providers (this information was used to reconcile total supplies and to avoid double counting of water volumes).
- Volumes of water supplied to particular industries (e.g. AGRICULTURE, MINING and MANUFACTURING) and for household use. This information was reconciled with water use as reported by water users. It also enabled the calculation of coefficients (e.g. ML/employee) for industries for which there was little or no data on water use.
- The amount of water used by the water supply organisation (including mains flushing and water used on parks and gardens operated by councils that supplied water).
- Volume of water lost from the supply system (including customer meter errors and system water losses).
- Volume of water discharged by location.
- Volumes of reuse water supplied to particular industries (e.g. agriculture, mining and manufacturing) and for household use. Water reuse volumes were not imputed where water providers did not provide reuse water volumes.
- Distributed water supplied to households and the number of connections served by water supply and sewerage services. Where information was not available for distributed water supplied to households, neighbouring or matched Local Government Area (LGA) coefficients based on average megalitre use per connection were used.
- The amount of water released for environmental flows. This only includes those environmental flows released in accordance with a specific plan prepared in conjunction and/or approved by the appropriate environmental (resource) regulator (see Explanatory Note 25).

20 For agriculture;

- Distributed water consumption was the amount supplied to the AGRICULTURE industry by water providers.

Methods for Calculating Water Supply and Use continued

- Total water consumption by AGRICULTURE was sourced from the 2008–09 ABS Agriculture Survey. The amount of distributed water consumed was subtracted from total water consumed, the remainder was assumed to be self-extracted water. Note that self-extracted water for the AGRICULTURE industry includes all groundwater that is extracted by AGRICULTURE businesses.
- Reuse water usage includes water used from regional reuse schemes.
- Data for Victoria were supplemented by the *Victorian Water Register* (Department of Sustainability and Environment, State Government Victoria, 2010).
- The data presented in this publication are similar but slightly different to those data presented in *Water Use on Australian Farms, 2008–09* (ABS cat. no. 4618.0) (ABS 2010). This is because of the multiple data sources used in the *2008–09 Water Account Australia*, compared to the single source of ABS survey data used for *Water Use on Australian Farms, 2008–09*. The main difference between the two publications is the total water consumption estimates for Victoria and Western Australia, which are slightly higher in the *Water Account Australia*, for the reasons described above. Similar differences occur between the 2004–05 edition of *Water Use on Australian Farms* and the 2004–05 *Water Account Australia*. Note that 2004–05 estimates presented in the 2008–09 *Water Account Australia* are the same as those presented in the 2004–05 *Water Account Australia*.
- Two different views of agriculture are provided in the *2008–09 Water Account Australia*: an industry view and an activity view. In an industry view all businesses are coded to an industry according to the *Australian and New Zealand Standard Industrial Classification* (ANZSIC 2006). An industry view provides direct links to the economic information in the System of National Accounts. This enables data such as industry value added to be compared to water consumption.
- The AGRICULTURE industry view presents only the agricultural activity that occurs in businesses where the primary income producing activity (i.e. the activity with value added that exceeds the value added of any other activity carried out by the same business) of the business is agricultural production. Businesses which undertake some agricultural activity but for which other activities provide most of the income are excluded from the AGRICULTURE industry view. For example, a business which generates most of its income from transporting agricultural produce, but also grows some agricultural commodities would be classified to the industry TRANSPORT, POSTAL AND WAREHOUSING. The agricultural production is still counted but is attributed to the TRANSPORT, POSTAL AND WAREHOUSING industry. As such the industry view of AGRICULTURE shows a lower level of water consumption than the agricultural activity view.
- Note that consumption for the AGRICULTURE industry (i.e. businesses with agriculture as their main activity) in 2008–09 was 6,996 GL compared to 7,589 GL for all agricultural activities. This difference of 593 GL can be split into self-extracted (249 GL), distributed (339 GL) and reuse (4 GL).
- In the Physical and Monetary Supply and Use Tables presented in Chapters 2 and 3 these distributed and reuse components were redistributed amongst the other industries according to the non-agricultural ANZSIC classification of the business undertaking the agricultural activity, as follows:
  - AGRICULTURE, FORESTRY AND FISHING SUPPORT SERVICES - 51 GL
  - MANUFACTURING - 49 GL
  - MINING - 4 GL
  - FORESTRY AND LOGGING - 3 GL
  - FISHING, HUNTING AND TRAPPING - 1 GL
  - AQUACULTURE - < 1 GL
  - OTHER industries (see Glossary for complete list of industries) - 237 GL

Methods for Calculating Water Supply and Use continued

- Some of the tables and graphs presented in this publication present an industry view for agriculture, while others present an activity view. Note that the Physical Supply and Use Tables presented in Chapter 2 present the industry view, whereas previous editions of the *Water Account Australia* presented an activity view, so care must be taken when comparing the two sets of estimates.

21 For MINING and MANUFACTURING;

- Distributed water use was the amount supplied to the MINING and MANUFACTURING industries by water providers.
- Reuse water use was the amount supplied to the MINING and MANUFACTURING industries by water providers.
- Self extracted water use, regulated discharge and distributed water supplied to other businesses/households were sourced from the 2008–09 Energy, Water and Environment Survey, supplemented with information from company websites and annual/environmental reports. Note that the amount of reuse water supplied to other businesses/households was not collected on the 2008–09 Energy, Water and Environment Survey and are displayed as 'not available' in the Physical Supply and Use Tables in Chapter 2 (some of this reuse water supplied to other businesses/households may have been reported by MINING and MANUFACTURING businesses as distributed water supplied, however the volumes are assumed to be relatively small).
- Note that self-extracted water for the MINING and MANUFACTURING industries includes all groundwater that is extracted by MINING and MANUFACTURING businesses.
- Mine dewatering was assumed to be self-extracted in-stream use by the MINING industry in all States. This is because the water is usually discharged soon after extraction.

22 For electricity and gas;

- Distributed, self extracted and in-stream water use, as well as regulated discharge and distributed water supplied to other businesses/households by the ELECTRICITY, GAS, WATER AND WASTE SERVICES industry were sourced from the ABS 2008–09 Electricity Generators Survey of Water Use.

23 For OTHER industries (see Glossary for list of industries) estimates of water use were sourced from the ABS 2008–09 Energy, Water and Environment Survey and information supplied by water providers, as well as the application of industry specific coefficients. Data on bore water use for parks and gardens in Western Australia was provided by Western Australia's Department of Water.

24 For household water use;

- Distributed water use was the amount supplied to households by water providers.
- Self-extracted water use by households was calculated by applying average State kilolitre use per connection coefficients and applying this to the households known not to be served by water providers (estimated by subtracting the connections served by water providers from the total number of households in each State and Territory). Data on domestic bore water use in Western Australia was provided by Western Australia's Department of Water.

Environmental Flows

25 Key Commonwealth, State and Territory water agencies recognise two forms of water used for environmental flows:

- Planned (rules-based) environmental water relates to statutory requirements to maintain specific water regimes (e.g. particular levels, flow rates, aquifer pressures).
- Held (entitlement-based) environmental water relates to specific entitlements, which accrue annual allocations of water that can be extracted (or left in-stream) for environmental purposes.

Environmental Flows continued

26 Note that the Physical Supply and Use Tables presented in Chapter 2, show water supplied to the environment as Environmental Flows are included on the supply side of the tables in the Distributed column and on the use side of the tables in the Environment row in both the Distributed and Reuse columns. Note that for the 2004–05 *Water Account Australia* there were no data available for 'reuse' Environmental Flows.

27 Environmental Flows data presented in the 2008–09 *Water Account Australia* are primarily based on flows of 'held environmental water' as these are volumetric based (i.e. ML) and are reported by water suppliers. Rules-based environmental flows are not always recorded in volume terms and may not always be included within reporting of total environmental water flows. Therefore the estimates of environmental flows presented in the *Water Account Australia* are likely to be an underestimate and should be used with caution.

Data Quality and Reliability

28 Data for the *Water Account Australia* are from a range of sources with variable degrees of consistency and reliability.

29 All water supply, distributed water use and reuse water information was collected by the ABS and checked for coherance with other data sources. This information can be used with a high degree of confidence.

30 Data on self-extracted use was compiled from a range of sources. The degree of confidence that can be attached to these estimates is variable.

- WATER SUPPLY and ELECTRICITY, GAS, WATER AND WASTE SERVICES estimates were based on the ABS 2008–09 Water Supply and Sewerage Services Survey and the 2008–09 Electricity Generators Survey of Water Use and can be used with a high degree of confidence.
- MINING and MANUFACTURING industries estimates were based on the ABS 2008–09 Energy, Water and Environment Survey and can be used with a moderate degree of confidence at the ANZSIC Division level (i.e. total MANUFACTURING and total MINING); however, at the ANZSIC subdivision level MINING and MANUFACTURING estimates should be used with a low degree of confidence.
- AGRICULTURE industry estimates were based on the ABS 2008–09 Agriculture Survey, and can be used with a high degree of confidence.
- Only a limited amount of survey data was available for OTHER industries and estimates were mostly based on coefficients of water use. These estimates can be used with a low degree of confidence.
- For households, self-extracted water use was based on coefficients of water use and can be used with a moderate degree of confidence.

MONETARY SUPPLY AND USE

Scope

31 Chapter 3 aggregates all available monetary data (dollars) in terms of the supply and use of water within the Australian economy for the financial year 2008–09. Supply and use tables illustrate the economic transactions associated with the use of water and the provisions of sewerage, waste water and drainage services.

Coverage

32 This chapter covers the following:

- supply of distributed water and water related services in the economy by WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry;
- expenditure on water and sewerage services by industries, households and governments; and
- value added to the economy for the major industries related to water.

33 The scope of the chapter is limited to "net distributed water" which in this context, is defined as water that has been supplied from one economic unit to another for a fee, creating a measurable economic transaction. The net distributed water excludes distribution losses and supply to the environment for which there is no matching economic transaction.

Coverage continued

34 Many businesses and households use self-extracted water for their own use, such as farms for irrigation or hydro power plants to generate electricity. Estimates for the value of self-extracted water have not been included in this chapter due to lack of data.

Data Sources

35 Data presented in this chapter are drawn from a variety of sources including those used by the physical supply and use chapter. In addition to these sources, the following ABS data were used:

- Consumer Price Index (CPI) (ABS cat. no. 6401.0)
- Australian Industry (ABS cat. no. 8155.0)
- Australian Demographic Statistics (ABS cat. no. 3101.0)
- Households and Family Projections (ABS cat. no. 3236.0)
- National Accounts supply-use benchmarks

36 Administrative sources of data used in the monetary accounts:

- Water suppliers' annual financial reports
- Public administration and finance data

Methods for Calculating Monetary Supply and Use

37 The data collected from these sources were collated to a uniform standard and aggregated to a State and Territory level.

38 Output and value added

- These are compiled by the ABS for the Water Supply, Sewerage and Drainage Services industry and are published in Electricity, Gas, Water and Sewerage Operations (ABS cat. no. 8226.0), Australian Industry (ABS cat. no. 8155.0) and the Australian System of National Accounts (ABS cat. no. 5204.0) and reproduced in this publication.

39 For households

- Expenditure on water was calculated using estimates from state and territory percentage of total water revenue relating to households. This was supplemented with financial information for all major urban water suppliers from the *National Performance Report* (NWC, WSAA & NWI 2010), including the number of residential properties receiving water supply services and the average revenue per property.

40 For governments

- Government expenditure and social transfers in kind monetary data were obtained from ABS Australian System of National Accounts, 2008–09 (unpublished data).

41 For other industries

- Expenditure was estimated using financial data sourced from ABS 2008–09 Energy, Water and Environment Survey, 2008-09 Agriculture Commodity Survey and 2008–09 Electricity Generators Survey of Water Use.

Data Quality and Reliability

42 At the most aggregated level, such as for the total revenue from sales of water and water related services by the Water Supply, Sewerage and Drainage Services industry (i.e. the supply side estimates), are of high quality. There is less confidence in the estimates of revenue from sales of rural distributed water in some states due to lack of information.

43 Use side estimates for industries and governments were based on several ABS surveys and National Accounts data. There is a lack of information on expenditure on water and related services by industries and governments. Therefore, compared to the supply side, there is less confidence in these estimates.

GROSS VALUE OF IRRIGATED AGRICULTURAL PRODUCTION - CHAPTER 5

Data Sources

44 The Gross Value of Irrigated Agricultural Production (GVIAP) was estimated using data from the ABS 2008–09 Agricultural Survey (see Agricultural Commodities, 2008–09, Australia (ABS cat. no. 7121.0), and Water Use on Australian Farms, 2008–09, (ABS cat. no. 4618.0), the ABS 2009 Vineyards survey (see Vineyards Estimates, Australia, 2008–09, (ABS cat. no. 1329.0.55.002) as well as other ABS collections and administrative data used to calculate the value of agricultural commodities produced (see *V*alue of Principal Agricultural Commodities Produced, 2008–09, Australia, (ABS cat. no. 7503.0)).

Method of Calculation

45 The ABS methodology for calculating GVIAP is described in the information paper *Methods of estimating the Gross Value of Irrigated Agricultural Production* (ABS cat. no. 4610.0.55.006). The GVIAP statistics presented in the 2008–09 *Water Account Australia* and the publication *Experimental Estimates of the Gross Value of Irrigated Agricultural Production, 2000–01 to 2008–09* (ABS cat. no. 4610.0.55.008) are derived using this method. This method is different from that used in previous editions of the *Water Account Australia* and the resulting GVIAP estimates are not directly comparable.

46 The ABS 2008–09 Agricultural Survey and 2009 Vineyards survey collected information that included area and production of crops, livestock numbers and products, area of crops/pastures irrigated and volume of water applied. The ABS also collects and publishes data on the value of agricultural commodities produced (see ABS cat. no. 7503.0). By using these primary data sources, estimates of the gross value of irrigated agricultural production were made.

47 Different methods were used for different commodities, with the method used dependent on the nature of the commodity and the availability of data. For rice, 100% of the gross value of agricultural production was attributed to irrigation. For cotton, sugar and grapes, the volume of the production from irrigated land was collected directly via the ABS 2008–09 Agricultural Survey. The volumes (in kg/tonnes) were then applied to the unit price values of these commodities in the respective states and territories.

48 Note that for dairy production, GVIAP refers to the value of milk produced from cattle grazing on irrigated land. For dairy production an assumption was made that if there was any irrigation of grazing land on a farm that was involved in any dairy production, then all dairy production on that farm is classified as irrigated.

49 For meat cattle, sheep and other livestock, GVIAP refers to the value of cattle, calves, sheep, lambs and other grazing livestock slaughtered, as well as the value of wool, from livestock grazing on irrigated land. GVIAP for meat cattle, sheep and other livestock was estimated by taking the average of two other methods:

- calculate the ratio of the area of irrigated grazing land to the total area of grazing land and multiply this ratio by the total production for the commodity group (this is referred to as the “area formula”);
- if the farm has any irrigation of grazing land then assume that all livestock production on the farm is irrigated.

50 For all other commodities a yield formula was developed to account for the difference in production that results from irrigation. It uses an estimated ratio of irrigated to non-irrigated yield for each commodity. This ratio is referred to as the "yield difference factor". GVIAP is calculated at the unit (farm) level, using three simple rules:

a. If the area of the commodity group irrigated = the total area of the commodity group grown/sown, then GVIAP = GVAP for that commodity group;

b. If the area of the commodity group irrigated is greater than zero but less than the total area of the commodity group grown/sown, then a “yield formula” is applied, with a “yield difference factor”, to calculate GVIAP for the irrigated area of the commodity group;

c. If the area of the commodity group irrigated = 0, then GVIAP = 0 for that commodity group.

Method of Calculation continued

51 It is important to note that the majority of cases follow rules 1 and 3; that is, the commodity group on a particular farm is either 100% irrigated or not irrigated at all. For example, in 2004–05, 90% of total GVAP came from commodity groups that were totally irrigated or not irrigated at all. Therefore, only 10% of GVAP had to be "split" into either "irrigated" or "non-irrigated" using the “yield formula” (described below). The yield formula is explained in full in the information paper Methods of estimating the Gross Value of Irrigated Agricultural Production (ABS cat. no. 4610.0.55.006).

52 Yield difference factors are the estimated ratio of irrigated to non-irrigated yield for a given commodity group. They are calculated for a particular commodity group by taking the yield (production per hectare sown/grown) of all farms that fully irrigated the commodity group and dividing this "irrigated" yield by the yield of all farms that did not irrigate the commodity group. The yield difference factors used here were determined by analysing data from 2000–01 to 2005–06 and are reported for each commodity group in Appendix 1 of the information paper *Methods of estimating the Gross Value of Irrigated Agricultural Production* (ABS cat. no. 4610.0.55.006). It is anticipated that the yield difference factors will be reviewed following release of data from the 2010–11 Agricultural Census.

Data Quality and Reliability

53 Calculation of the gross value of irrigated production is based on several assumptions so these estimates should be used and interpreted cautiously.

NEXT EDITION

54 The next release of the *Water Account Australia*, in respect of 2009–10, is scheduled for November 2011. A separate release containing physical and monetary supply and use data for 2000-01 to 2008-09 inclusive is scheduled for 2011. This will include the updates to ANZSIC classifications and address methodological issues enabling better comparisons between water accounts.

ABBREVIATIONS

'000	thousand
$m	million dollars
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ANZSIC	Australian and New Zealand Standard Industrial Classification
Aust.	Australia
AWA	Australian Water Association
BE	bulk entitlement
BoM	Bureau of Meteorology
COAG	Council of Australian Governments
CRB	collector record book
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DECCW	Department of Environment, Climate Change and Water
EAW	Environmental Accounts and Water
EFG	Environmental Flow Guidelines
FAO	Family Assistance Office
FAO	Food and Agriculture Organization
GL	gigalitre
GVAP	gross value of agricultural production
GVIAP	gross value of irrigated agricultural production
GWh	gigawatt hour
ha	hectare
I-O	input-output
IGVA	industry gross value added
IRWS	International Recommendations for Water Statistics
IVA	industry value added
kg	kilogram
kL	kilolitre
km²	square kilometre
LGA	local government area
mg	milligram
mm	millimetre
MAR	mean annual run-off
ML	megalitre
nec	not elsewhere classified
no.	number
NPR	National Performance Report
NSW	New South Wales
NT	Northern Territory
NWC	National Water Commission
NWI	National Water Initiative

Qld	Queensland
SA	South Australia
SEEA	System of Integrated Environmental and Economic Accounting
SNA	System of National Accounts
SWIM	Statewide Water Information Management
Tas.	Tasmania
UN	United Nations
Vic.	Victoria
WA	Western Australia
WASB	Water Accounting Standards Board
WSAA	Water Services Association of Australia
yr	year

APPENDIX 1 CLIMATE CONDITIONS

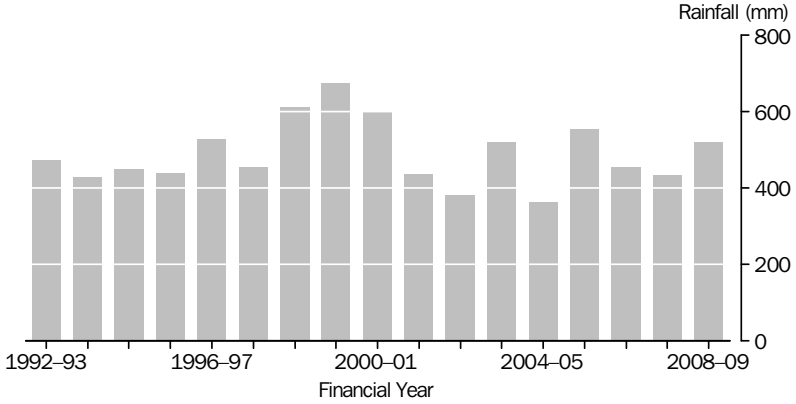
INTRODUCTION

The supply and use of water in Australia needs to be seen in the context of climate. In particular, rainfall in the years preceding the *Water Account Australia* reference periods (i.e. 2004–05 and 2008–09) is important as this plays a large part in determining the amount of water available in the environment as surface and groundwater as well as in dams and other water storages.

COMPARISON OF 2004–05 TO 2008–09

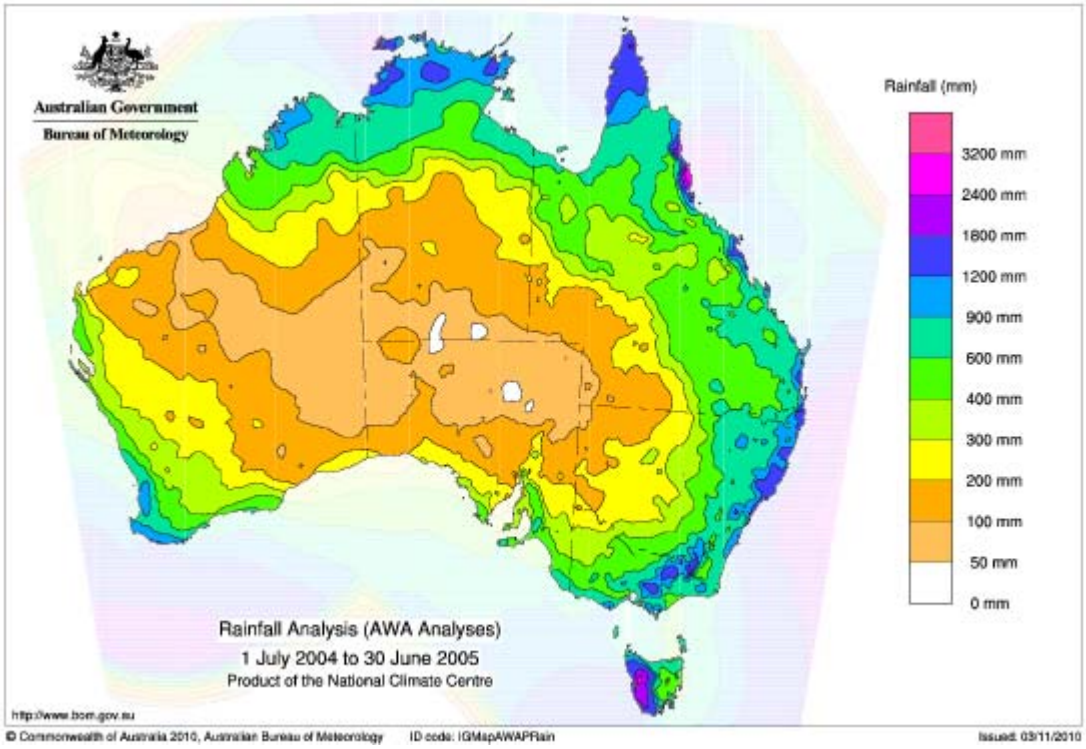
Average annual rainfall in Australia increased by 157mm from 362mm in 2004–05 to 519mm in 2008–09. Graph A1.1 shows 2004–05 having very low rainfall levels in comparison to the proceeding years leading to 2008–09. Maps A1.2 to A1.6 highlight the spatial difference in rainfall patterns in 2004–05 compared to 2008–09.

A1.1 ANNUAL RAINFALL 1992-93 TO 2008-09

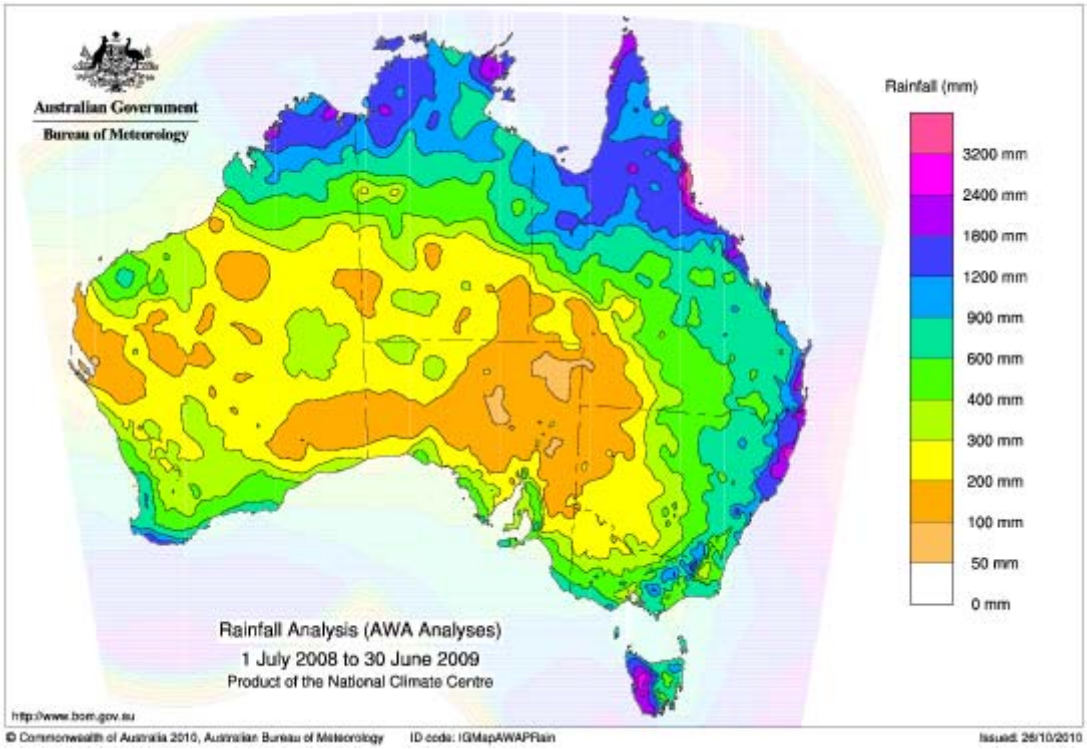


Source: Bureau of Meteorology 2009

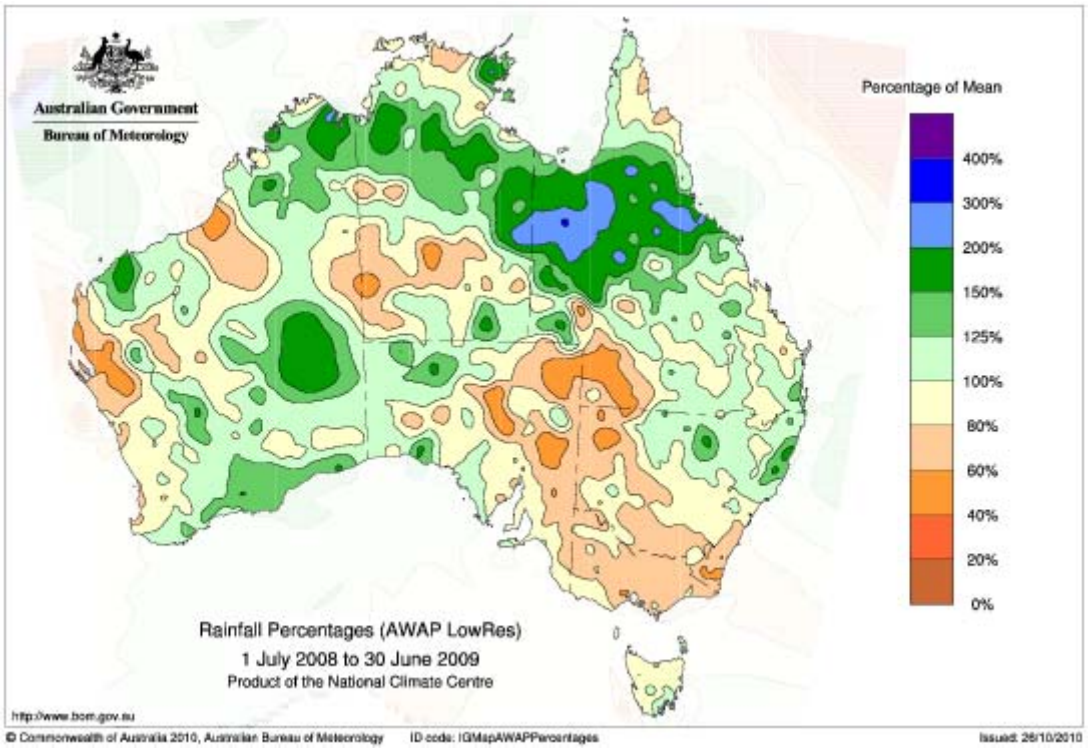
A1.2 TOTAL RAINFALL, Australia—2004-05



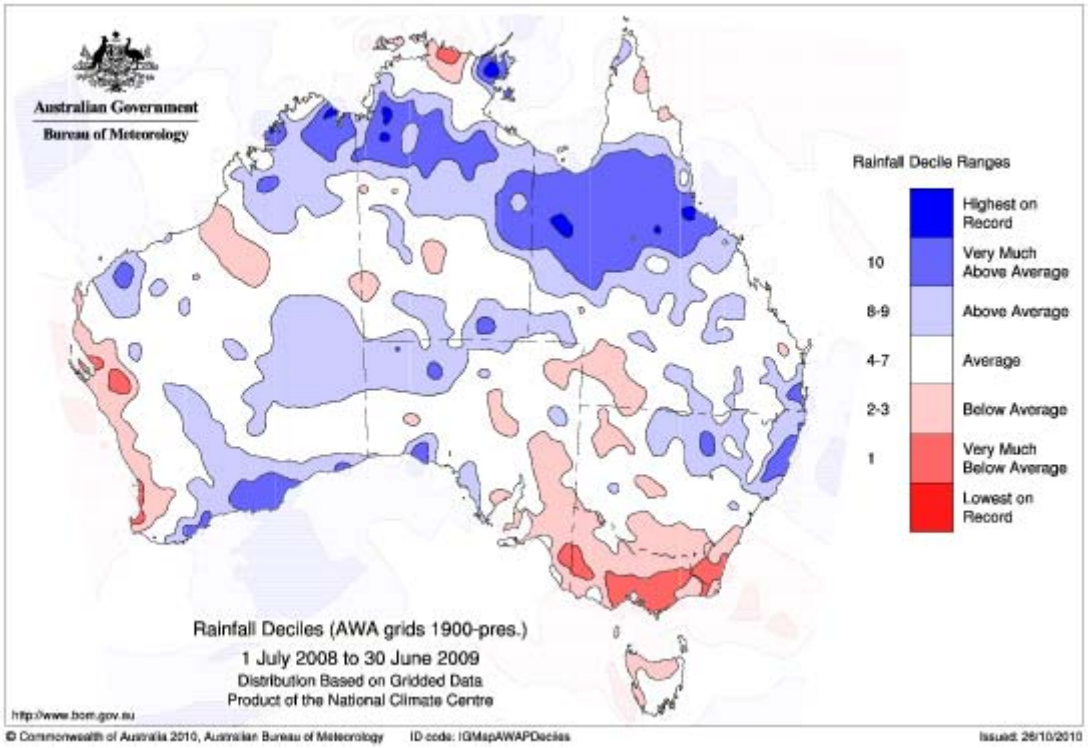
A1.3 TOTAL RAINFALL, Australia—2008-09



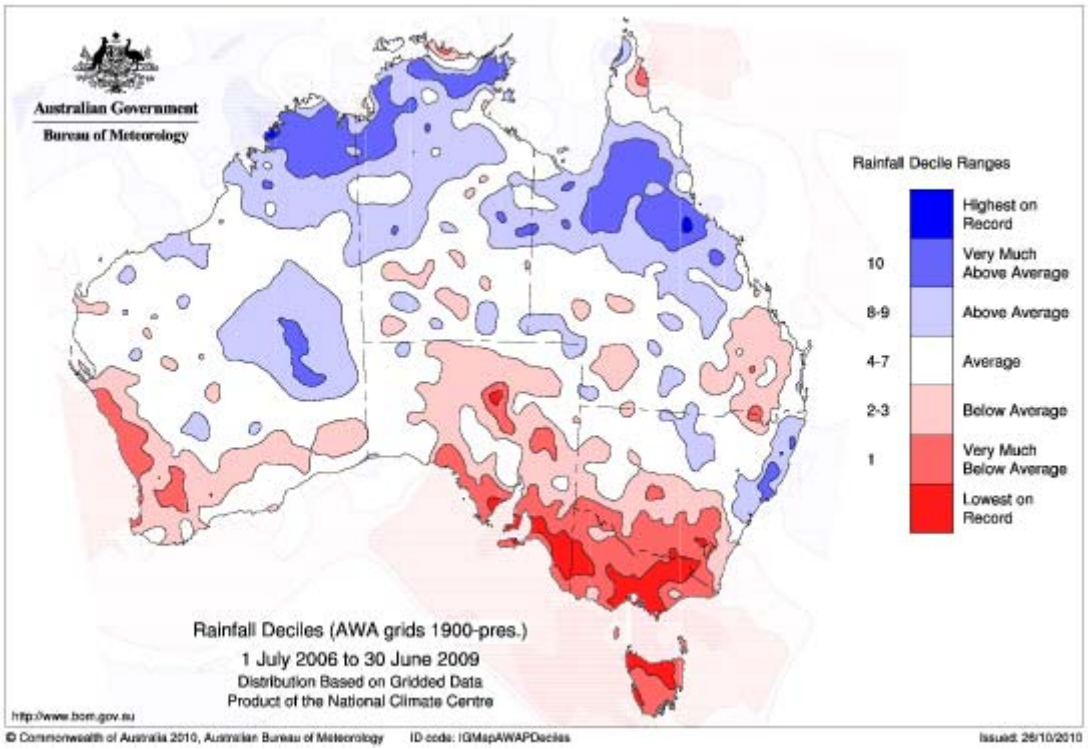
A1.4 PERCENTAGE OF MEAN ANNUAL RAINFALL—2008-09



A1.5 RAINFALL DECILES—2008-09



A1.6 RAINFALL DECILES—2006-09



CONDITIONS FOR 2008–09

The period from July 2008 to June 2009 saw high levels of rainfall for northern tropical Australia and below average rainfalls in south-eastern Australia.

57% of Australia had above average rainfall, while the remaining 43% had below average rainfall for the 12-month period, making it the 89th driest (or 21st wettest) July-June in 109 years of records (Map A1.4; 2008-09 rainfall map). The national area rainfall was 522 mm, 11% above the average for 1961 to 1990.

Four States and Territories, Queensland (25%), Northern Territory (13%), Tasmania (11%) and Western Australia (7%) recorded above average rainfall in 2008–09. The most significant contributor to the above average rainfalls in 2008–09 was a strong monsoon trough over summer causing tropical cyclones and widespread flooding in northern Australia. Rainfall was consistently high in the tropics, especially in Queensland which had its sixth-wettest summer on record (49% above normal). The month of November also contributed significantly above-normal rainfall, 72% above the (1961–90) national average, with South Australia (154% above average) and Western Australia (121% above average) receiving especially high levels or rain.

However, to highlight the variability of rainfall in Australia, Victoria had very low rainfall, having its 9th driest July-June in 109 years. The period included an exceptional summer heatwave for south-eastern Australia. The heatwave caused a number of climate records with Tasmania (42.2°C) and Victoria (48.8°C) reaching their highest temperatures on record. Melbourne endured three successive days above 43 degrees for the first time in recorded history. The last time Melbourne's annual rainfall was above average was 1996.

Mean temperatures during 2008–09 were slightly warmer than normal, 0.37°C above the 1961 to 1990 mean.

During September and October daytime maximum temperature anomalies in the 1°C to 2°C range occurred across the majority of Australia, with south-eastern Australia recording its equal warmest October on record (1.65°C above normal). Overnight minimums were elevated by 1°C to 2°C during this time.

CONDITIONS FOR 2008–09 *continued*

August 2008 was significantly cooler than normal, with all States and Territories except Tasmania recording lower than average maximum and minimum temperatures. Australia had its lowest August maximum temperature anomaly since 1989 and minimum since 1994.

There were large regional variances across Australia during the year, most notably during January 2009. New South Wales, Victoria and South Australia had maximum temperatures 2°C-3°C warmer than average, while Queensland and the Northern Territory were 1.5°C to 2.5°C cooler than average during the month.

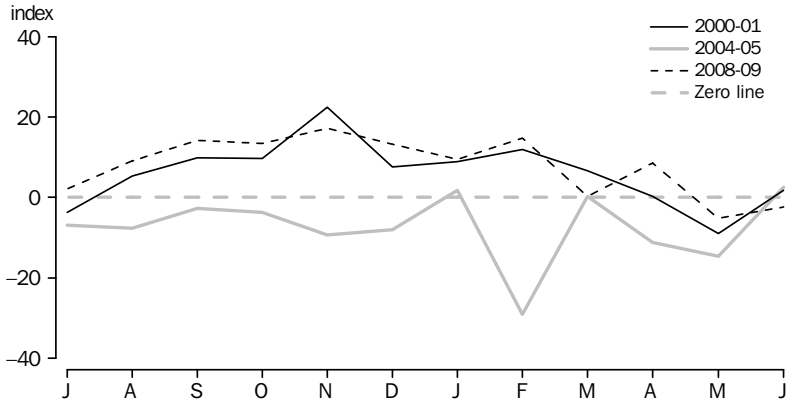
EL NINO / LA NINA PHENOMENA

The Southern Oscillation Index (SOI) calculates the air pressure difference between Tahiti and Darwin. The SOI in conjunction with the Walker Circulation gives an indication of the stage of El Niño or La Niña events in the Pacific Ocean.

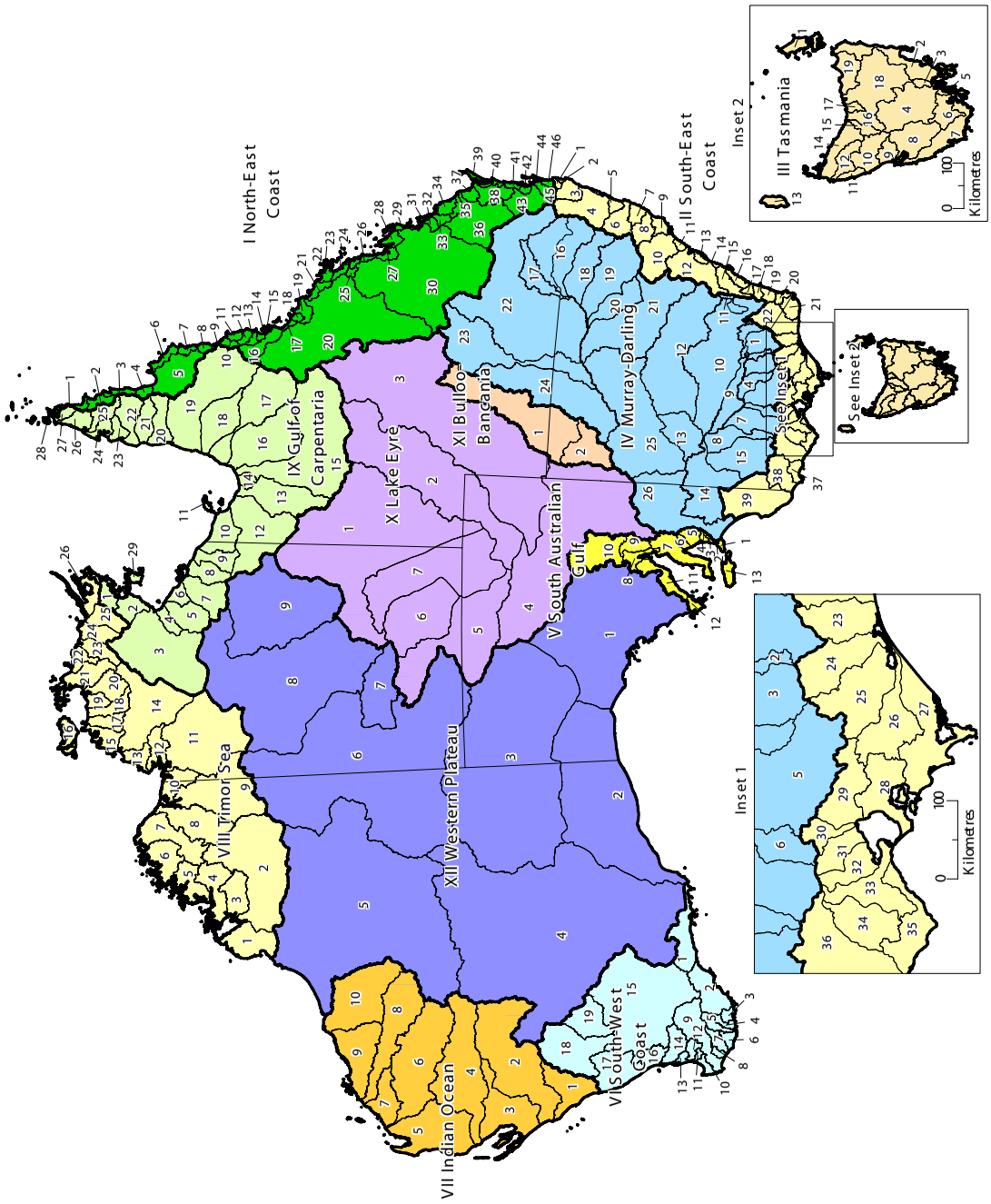
A strongly negative SOI (below -10) is characteristic of El Niño, which is often associated with below average winter and spring rainfall over eastern Australia, and a weaker than normal monsoon in the north. A strongly positive SOI (above +10) is characteristic of La Niña, which is often associated with above average winter and spring rainfall over eastern Australia, and an earlier than normal start to the northern monsoon season with above-average rainfall during the tropical wet season.

In 2008–09 Australia (particularly northern Australia), experienced weather patterns consistent with La Nina with large areas receiving above average rainfall. Many areas of Australia had a wet year, particularly in the north of the continent due to a strong monsoonal trough. In comparison, for much of 2004–05 Australia was under the influence of El Niño. Consistent with the weather patterns associated with El Niño, many areas of Australia had below average rainfall, particularly in the southern part of the country, with a weak monsoon influencing climate in the tropical areas.

A1.7 SOUTHERN OSCILLATION INDEX, July to June—2000–01, 2004–05 and 2008–09



Source: Bureau of Meteorology 2009


I North-East Coast
II South-East Coast
III Tasmania
IV Murray-Darling
V South Australian Gulf
VI South-West Coast
VII Indian Ocean
VIII Timor Sea
IX Gulf of Carpentaria
X Lake Eyre
XI Bulloo-Bancania
XII Western Plateau
Inset 1
Inset 2
See Inset 1
See Inset 2
0 100 Kilometres

I North-East Coast

1 Jacky Jacky Creek
2 Olive-Pascoe Rivers
3 Lockhart River
4 Stewart River
5 Normanby River
6 Jeannie River
7 Endeavour River
8 Daintree River
9 Mossman River
10 Barron River
11 Mulgrave-Russell Rivers
12 Johnstone River
13 Tully River
14 Murray River (QLD)
15 Hinchinbrook Island
16 Herbert River
17 Black River
18 Ross River
19 Haughton River
20 Burdekin River
21 Don River
22 Proserpine River
23 Whitsunday Island
24 O'Connell River
25 Pioneer River
26 Plane Creek
27 Styx River
28 Shoalwater Creek
29 Water Park Creek
30 Fitzroy River (QLD)
31 Curtis Island
32 Calliope River
33 Boyne River
34 Baffle creek
35 Kolan River
36 Burnett River
37 Burrum River
38 Mary River (QLD)
39 Fraser Island
40 Noosa River
41 Maroochy River
42 Pine River
43 Brisbane River
44 Stradbroke Island
45 Logan-Albert Rivers
46 South Coast

II South-East Coast

1 Tweed River
2 Brunswick River
3 Richmond River
4 Clarence River
5 Bellinger River
6 Macleay River
7 Hastings River
8 Manning River
9 Karuah River
10 Hunter River
11 Macquarie-Tuggerah Lakes
12 Hawkesbury River
13 Sydney Coast-Georges River
14 Wollongong Coast
15 Shoalhaven River
16 Clyde River-Jervis Bay
17 Moruya River
18 Tuross River
19 Bega River
20 Towamba River
21 East Gippsland
22 Snowy River
23 Tambo River
24 Mitchell River (VIC)
25 Thomson River
26 Latrobe River
27 South Gippsland
28 Bunyip River
29 Yarra River
30 Maribyrnong River
31 Werribee River
32 Moorabool River
33 Barwon River
34 Lake Corangamite
35 Otway Coast
36 Hopkins River
37 Portland Coast
38 Glenelg River
39 Millicent Coast

III Tasmania

1 Flinders-Cape Barren Islands
2 East Coast
3 Coal River
4 Derwent River
5 Kingston Coast
6 Huon River
7 South-West Coast
8 Gordon River
9 King-Henty Rivers
10 Pieman River
11 Sandy Cape Coast
12 Arthur River
13 King Island
14 Smithton-Burnie Coast
15 Forth River
16 Mersey River
17 Rubicon River
18 Tamar River
19 Piper-Ringarooma Rivers

IV Murray-Darling

1 Upper Murray River
2 Kiewa River
3 Ovens River
4 Broken River
5 Goulburn River
6 Campaspe River
7 Loddon River
8 Avoca River
9 Murray-Riverina
10 Murrumbidgee River
11 Lake George
12 Lachlan River
13 Benanee
14 Mallee
15 Wimmera-Avon Rivers
16 Border Rivers
17 Moonie River
18 Gwydir River
19 Namoi River
20 Castlereagh River
21 Macquarie-Bogan Rivers
22 Condamine-Culgoa Rivers
23 Warrego River
24 Paroo River
25 Darling River
26 Lower Murray River

V South Australian Gulf

1 Fleurieu Peninsula
2 Myponga River
3 Onkaparinga River
4 Torrens River
5 Gawler River
6 Wakefield River
7 Broughton River
8 Mambray Coast
9 Willochra Creek
10 Lake Torrens
11 Spencer Gulf
12 Eyre Peninsula
13 Kangaroo Island

VI South-West Coast

1 Esperance Coast
2 Albany Coast
3 Denmark River
4 Kent River
5 Frankland River
6 Shannon River
7 Warren River
8 Donnelly River
9 Blackwood River
10 Busselton Coast
11 Preston River
12 Collie River
13 Harvey River
14 Murray River (WA)
15 Avon River
16 Swan Coast
17 Moore-Hill Rivers
18 Yarra Yarra Lakes
19 Ninghan

VII Indian Ocean

1 Greenough River
2 Murchison River
3 Wooramel River
4 Gascoyne River
5 Lyndon-Minilya Rivers
6 Ashburton River
7 Onslow Coast
8 Fortescue River
9 Port Hedland Coast
10 De Grey River

VIII Timor Sea

1 Cape Leveque Coast
2 Fitzroy River (WA)
3 Lennard River
4 Isdell River
5 Prince Regent River
6 King Edward River
7 Drysdale River
8 Pentecost River
9 Ord River
10 Keep River
11 Victoria River
12 Fitzmaurice River
13 Moyle River
14 Daly River
15 Finniss River
16 Bathurst and Melville Islands
17 Adelaide River
18 Mary River (NT)
19 Wildman River
20 South Alligator River
21 East Alligator River
22 Goomadeer River
23 Liverpool River
24 Blyth River
25 Goyder River
26 Buckingham River

IX Gulf of Carpentaria

1 Koolatong River
2 Walker River
3 Roper River
4 Towns River
5 Limmen Bight River
6 Rosie River
7 McArthur River
8 Robinson River
9 Calvert River
10 Settlement Creek
11 Mornington Island
12 Nicholson River
13 Leichhardt River
14 Morning Inlet
15 Flinders River
16 Norman River
17 Gilbert River
18 Staaten River
19 Mitchell River (QLD)
20 Coleman River
21 Holroyd River
22 Archer River
23 Watson River
24 Embley River
25 Wenlock River
26 Ducie River
27 Jardine River
28 Torres Strait Islands
29 Groote Eylandt

X Lake Eyre

1 Georgina River
2 Diamantina River
3 Cooper Creek
4 Lake Frome
5 Finke River
6 Todd River
7 Hay River

XI Bulloo-Bancannia

1 Bulloo River
2 Lake Bancannia

XII Western Plateau

1 Gairdner
2 Nullarbor
3 Warburton
4 Salt Lake
5 Sandy Desert
6 Mackay
7 Burt
8 Wiso
9 Barkly

Source: Geoscience Australia 2004

GLOSSARY

ANZSIC The Australian and New Zealand Standard Industrial Classification (ANZSIC) is the standard classification used in Australia and New Zealand for the collection, compilation, and publication of statistics by industry.

Aquifer A geologic formation which is capable of holding water and through which water can percolate. Aquifers are capable of yielding quantities of groundwater for economic activities.

Australian Water Resources 2005 (AWR 2005) Australian Water Resources 2005 is the baseline assessment of water resources for the National Water Initiative.

Bulk water Water supplied by a water provider to another water provider.

Bulk entitlement A type of water access entitlement in Victoria, issued to rural and regional water authorities, who then distribute the water to their rural and urban customers, to some electricity generating companies and to the State Minister for Environment.

Catchment The area of land determined by topographic features, within which rainfall will contribute to run-off at a particular point. The catchment for a major river and its tributaries is usually referred to as a River basin.

Chain Volume Measures Annually-reweighted chain Laspeyres volume indexes referenced to the current price values in a chosen reference year (i.e. the year when the quarterly chain volume measures sum to the current price annual values). Chain Laspeyres volume measures are compiled by linking together (compounding) movements in volumes, calculated using the average prices of the previous financial year, and applying the compounded movements to the current price estimates of the reference year.

Consumptive use The use of water for private benefit consumptive purposes including irrigation, industry, urban and stock and domestic use (NWI definition). This is different to the definition of water consumption used in this publication.

Cooling water Water used for cooling purposes (e.g., for electricity generation).

Current Prices Estimates are valued at the prices of the period to which the observation relates. For example, estimates for 2004–05 are valued using 2004–05 prices. This contrasts to chain volume measures where the prices used in valuation refer to the prices of the previous year.

Desalination A process where salt is removed from water with a high salt content (usually seawater but sometimes other brackish water) to make it suitable for domestic or industrial use.

Discharge The transfer of water or waste water (of any treatment level) from the control of a water supplier or user to the environment.

Distributed water Distributed water is water supplied to a user including through a natural (e.g. river) or non-natural network (piped or open channel), and where an economic transaction has occurred for the exchange of this water. The majority of distributed water is supplied by the WATER SUPPLY, SEWERAGE AND DRAINAGE SERVICES industry (ANZSIC Division 28). The water supply component consists of units mainly engaged in storage, purification or distribution of water by pipeline or carrier. It also includes the operation of irrigation systems that supply water to a farm and the supply of steam and hot water. Distributed water can include potable, mains and raw water but does not include reuse or bulk water.

Domestic or residential water supply	Water supplied primarily to domestic or residential customers. In rural areas this includes water supplied for stock and domestic uses.
Drainage services	The collection of water through a regional network of surface and/or subsurface drains. This water may be reused or discharged to the environment.
Drainage water	Excess surface or subsurface water collected and conveyed from irrigated lands. It may be captured for reuse or conveyed for downstream demands.
Effluent discharge	The discharge of used water by an organisation into the environment, with its associated quality characteristics, including, for example, the temperature of the discharge.
Environmental allocation	An amount of water allocated for environmental purposes and released to meet the environmental needs of a given area, e.g. a forest.
Environmental flow	This is a general term that can have a variety of meanings, however the 2000-01, 2004–05 and 2008–09 editions of Water Account Australia and the ABS 2004–05 Water Supply Survey defined environmental flows to be: water delivered (released) for the purpose of the environment in accordance with a specific plan prepared in conjunction with and/or approved by the appropriate environmental (resource) regulator. Note that environmental flows can be either Planned (rules-based) or Held (entitlement-based) - see Explanatory Notes for more details.
Evapotranspiration	Process of moisture loss from the Earth's land surface to the atmosphere by evaporation and plant transpiration.
Gigalitre	One thousand million litres.
Gross State Products (GSP)	GSP is defined equivalently to gross domestic product. It is the total market value of goods and services produced in a state within a given period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital.
Gross Value	Refers to the gross value of commodities produced. It is the value placed on recorded production at the wholesale prices realised in the market place.
Gross value of irrigated agricultural production (GVIAP)	Refers to the gross value of agricultural commodities that are produced with the assistance of irrigation.
Groundwater	Water occurring below the ground's surface. Note that in the Physical Supply and Use Tables presented in Chapter 2 all ground water is included in self-extracted water.
Industry Gross Value Added (IGVA)	The value of an industry's output at basic prices, minus the value of goods and services consumed as inputs during the process of production. Basic prices valuation of output removes the distortion caused by variations in commodity taxes and subsidies across the output of individual industries.
In-stream use	The use of freshwater in situ (e.g. within a river or stream). Can include recreation, tourism, scientific and cultural uses, ecosystem maintenance, hydro-electricity and commercial activities, and dilution of waste. The volume of water required for most in-stream uses cannot be quantified, with the exception of hydro-electricity generation. In-stream use is usually a subset of Self-extracted use, however in some instances in-stream can be a subset of Distributed water, for example where an unplanned release of Distributed water is used to dilute polluted water to an acceptable concentration for release into the environment..
Inland surface water	All waters on the surface of the earth, excluding sea water. Includes lakes, rivers, dams, wetlands, snow and ice.
Irrigation	Water artificially applied to soils (i.e., does not include precipitation/rainfall).

Irrigation/Rural water provider — A water provider undertaking the supply of retail irrigation water in rural areas. Functions of irrigation/rural water providers include the delivery of water for the purpose of irrigation and the collection of drainage off agricultural land through surface or sub-surface drainage systems. In addition most supply water for stock and domestic purposes and either bulk or reticulated water to service rural towns. Delivery systems can range from channel/canal to pipes to carriers and natural streams/water courses.

Kilolitre — One thousand litres.

Major urban water provider (Metropolitan) — An urban water provider servicing >50,000 water or sewerage connections. A connection corresponds to a water meter or sewerage connection regardless of the type of customer.

Megalitre — One million litres.

Minor urban water provider — An urban water provider servicing <10,000 water or sewerage connections. A connection corresponds to a water meter or sewerage connection regardless of the type of customer.

National Water Initiative (NWI) — An intergovernmental agreement on water reform created in June 2004.

Net water supply — The quantity of water supplied to customers of the water provider. This comprises the distributed water supply less: losses, water provided for environmental benefits, and, water used directly by the industry.

Non-major urban water provider — An urban water provider servicing between 10,000 and 50,000 water or sewerage connections. A connection corresponds to a water meter or sewerage connection regardless of the type of customer.

Other industries — In the Physical Supply and Use Tables presented in Chapter 2, OTHER industries refers to the following list of industries, according to the *Australian and New Zealand Standard Industrial Classification* (ANZSIC):

- Construction
- Wholesale Trade
- Retail Trade
- Accommodation and Food services
- Transport, Postal and Warehousing
- Information Media and Telecommunications
- financial and Insurance Services
- Rental, Hiring and Real Estate Services
- Professional, Scientific and Technical Services
- Administrative and Support Services
- Public Administration and Safety
- Education and Training
- Health Care and Social Assistance
- Arts and Recreation Services
- Other services

Other water provider — An organisation that supplies water but whose main activity is in an industry other than the Water Supply, Sewerage and Drainage services industry (eg. Mining and Manufacturing).

Potable water — Treated water that is suitable for human consumption, e.g. drinking water.

Process water — Water used in the production of goods or the provision of services. For example, water use in the production of food, cleaning in industrial production, or water used in laundry facilities.

Raw water — Water extracted from the environment that has not been treated.

Recycled water — Recycled water is any water that is reused by the same organisation on-site after it has been used once, or water that would normally go down the drain but is used for another purpose.

Regulated discharge	Water discharged to the environment after use where that discharge does not match the natural flow regime of the receiving water body. For example, wastewater discharged into a river, ocean or land outfall by a sewerage service provider is considered a regulated discharge. Water discharged from a household is not considered to be a regulated discharge because it is usually discharged into a sewerage system, rather than directly to the environment.
Residential connections	Number of residential connections was collected in the National Performance Report (Water Services Association of Australia and the National Water Commission), and in the Water Supply and Sewerage Services Survey by the ABS. In both cases, a residential connection is a residential unit, or dwelling, usually separately metered.
Reuse water	Drainage, waste or storm water that has been used again without first being discharged to the environment. It may have been treated to some extent. It excludes "on-site" recycling.
River basin	The 245 River basins in Australia are defined by the area drained by a stream and its tributaries where surface run-off collects. In an area of uncoordinated drainage, drainage patterns define a basin. A map of Australian River basins is included in Appendix 3 (Geoscience Australia 2004)
Run-off	The part of precipitation in a given area and period of time that appears as stream flow.
SEEA	SEEA is the System for Integrated Environmental and Economic Accounting. It is a framework used to develop environmental accounts by integrating environmental information into an accounting framework. The SEEA publication provides the conceptual basis for developing a framework to describe the interrelationship between the natural environment and the economy.
SEEA-Water	The International System for Environmental-Economic Accounting for Water. It is an elaboration of the SEEA and provides a conceptual framework for organising hydrological and economic information in a coherent and consistent framework. It was adopted as an interim international statistical standard by the United Nations in 2007.
Self extracted water	Water extracted directly from the environment for use (including rivers, lakes, groundwater and other bodies). Some of this water may be then distributed via water providers to others. Excludes water supplied by water suppliers via regulated systems.
Sewerage	Infrastructure used to remove sewage (waste water).
Storm water	Rainfall that is collected after it has run off urban surfaces.
Supply Use Framework	Physical supply and use tables (Chapter 2) provide information on the volumes of water abstracted, supplied within the economy and discharged back into the environment by economic activity and households
Surface water	Water flowing or held in streams, rivers and other wetlands in the landscape.
System of National Accounts (SNA)	The System of National Accounts (SNA) is an international framework which can be used to develop a comprehensive, consistent and flexible set of macro-economic accounts.
Total water use	Total water use is equal to distributed water use plus self-extracted water use plus reuse water use.
Urban water provider	Includes major, non-major and minor urban water provider.
Waste water	Any water that has been used once and cannot be used again without treatment, for example untreated effluent, sewage water and trade waste.
Water consumption	Water consumption is equal to distributed water use plus self-extracted water use plus reuse water use minus in-stream water use minus distributed water supplied to other users minus water supplied to the environment as 'environmental flows'. Note that in the Physical Supply and Use Tables presented in Chapter 2, volumes of water supplied to the environment as 'environmental flows' are included on the supply side of the tables in the

Water consumption *continued*	Distributed column and on the use side of the tables in the Environment row in both the Distributed and Reuse columns.
Water losses	Water that enters the water distribution system of a water provider that does not reach the end users/customers. Water losses can be attributed to seepage, leakage, evaporation(excluding evaporation from water storages), meter inaccuracies and theft.
Water provider	A business or organisation that provides a reticulated water supply, irrigation water, reuse/recycle water and/or bulk water supply service. Water providers may be government or private and often operate water storage, purification and supply services.They may also provide sewerage or drainage services.
Water stocks	Surface and groundwater resources available in Australia for economic and environmental use.
Water system	A system that is hydrologically connected and described at the level desired for management purposes (eg sub-catchment, catchment, basin or drainage division and/or groundwater management unit, sub-aquifer, aquifer, groundwater basin).
Water treatment plant	An individual location receiving raw or partially treated water for treatment and ultimate delivery to customers. There may be more than one water treatment plant at an individual facility. Secondary or booster disinfection plants are not included, even where they have pH treatment. Water treatment plants that provide fluoridation only should be classified as disinfection only.

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