

*Dumaresq-Barwon  
Border Rivers Commission*



*Annual Statistics  
1999-00*

# Foreword

## From the Chairman

This document provides a summary of the annual statistics associated with the activities currently overseen by the Dumaresq-Barwon Border Rivers Commission along the Queensland-New South Wales border.

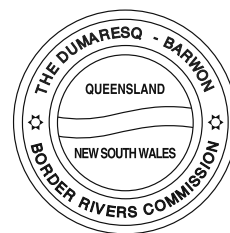
This is the second Annual Statistics Report produced by the Commission. The first was produced last year and it contained statistics for 1997-1999. The feedback we have received in relation to the first report has been very encouraging. I feel certain these reports will provide valuable reference material for persons interested in water related information in both Queensland and New South Wales.

Generally the statistics contained in this report are based on the "hydrologic" water year and the water year used for the Border Rivers irrigation projects. Both of these water years commence on 1 October and finish 30 September. For ease of reference the report contains statistics for the year just finished as well as the previous water year i.e. 1998/99.

I am well aware of the considerable effort involved in collecting and collating the information contained in this report. My sincere thanks go to the staff from the Queensland Department of Natural Resources, the new corporation in Queensland, SunWater, the New South Wales Department of Land & Water Conservation and also the NSW Department's commercial water service provider group, State Water, for their contribution to the production of this report.



B.A. Cummings  
CHAIRMAN





# Dumaresq-Barwon Border Rivers Commission 1999 / 2000 Annual Statistics

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# Water Infrastructure

**Table 1 - Key Features of Border Rivers Work**

Name	Stream	AMTD (km)	Nearest Town/s	Description	F.S.L. above Bed (EL)	Storage Capacity (ML)	Date Completed
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## DAMS

Glenlyon Dam	Pike Creek	6.4	Stanthorpe Tenterfield Texas	Earth & Rockfill	47.4	254,000	1976
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## WEIRS

Boggabilla Weir	Macintyre River	283.5	Boggabilla Goondiwindi	Reinforced Concrete and Earthfill	8.5	5,850	1991
Boomi Weir	Macintyre River	184.3	Boomi	Steel Sheetpiling	4.1	354	1960
Bonshaw Weir	Dumaresq River	126.7	Texas	Steel Sheetpiling	2.9	617	1953/58
Coomonga Weir	Coomonga Creek		Toobeah	Steel Sheetpiling			1986
Cunningham Weir	Dumaresq River	67.9	Texas	Timber Piled (Written-off)	4.6	543	1954
Glenarbon Weir	Dumaresq River	5.7	Yelarbon	Steel Sheetpiling	2.7	353	1959
Goondiwindi Weir	Macintyre River	268.8	Goondiwindi	Timber Crib (Fish ladder added)	2.8	1,800	1942
Mungindi Weir	Barwon River	4.8	Mungindi	Steel Sheetpiling	3.6	730	1936/65

## REGULATORS

Boomi Regulator	Boomi River		Boomi	Steel Sheetpiling with Hardwood Dropboards			1960
Newinga Regulator	Barwon to Weir River flood channel		Talwood	Reinforced Concrete with Aluminium Dropboards			1993
Regulator No 1	Balonne Minor	163.5	Dirranbandi	Steel Sheetpiling with rock protection			1974
	Culgoa River	162.6	Dirranbandi	Steel Sheetpiling with rock protection			1974
Regulator No 2	Balonne Minor	128.9	Dirranbandi	Steel Sheetpiling with rock protection			1974
	Donnegri River	14.9	Dirranbandi	Steel Sheetpiling with rock protection			1974
Regulator No 3	Ballandool River	91.4	Dirranbandi	Steel Sheetpiling with rock protection			1974
	Bokhara River	79.8	Dirranbandi	Steel Sheetpiling with rock protection			1974
Regulator No 4	Birrie River	274.7	Goodooga	Steel Sheetpiling with rock protection			1974
	Bokhara River	276.2	Goodooga	Steel Sheetpiling with rock protection			1974

## OTHER

Little Weir River Diversion	Barwon River		Mungindi	Excavated Channel and Box Culverts			1986
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**Table 2 - Glenlyon Dam Monthly Storage Volumes (megalitres)**

End of Month	1998 / 1999	1999 / 2000
September	254,000	214,177
October	254,000	240,304
November	254,000	253,963
December	243,642	249,328
January	215,095	229,649
February	213,277	210,090
March	226,409	209,780
April	225,809	207,765
May	224,750	206,233
June	223,291	205,009
July	223,024	204,550
August	221,424	195,465
September	214,253	150,056

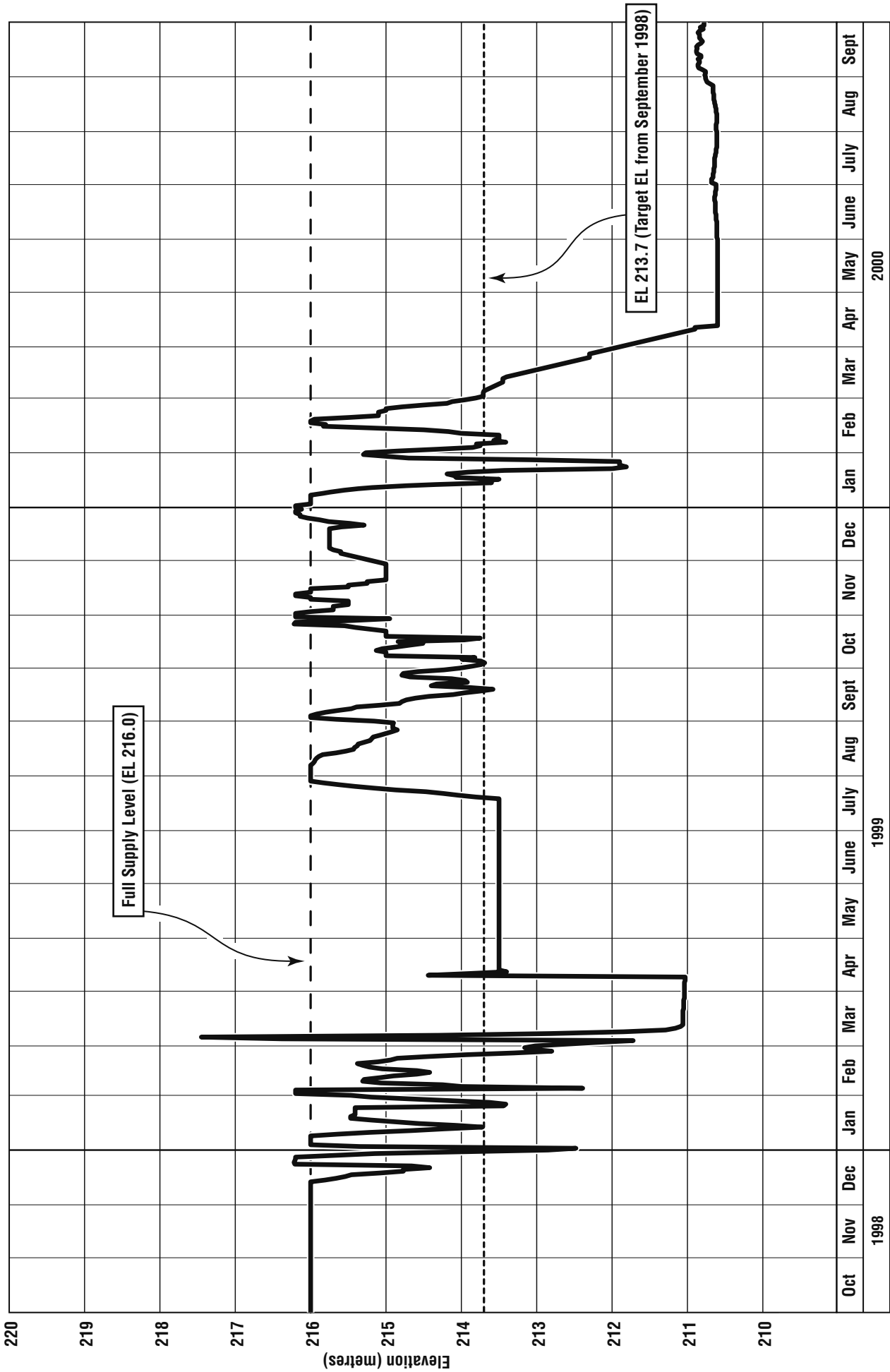
**Table 3 - Glenlyon Dam Monthly Releases / Spillway Flows (megalitres)**

Month	1998 / 1999		1999 / 2000	
	Release	Spillway Flows	Release	Spillway Flows
October	168	2,366	2,179	0
November	120	1,190	120	0
December	9,454	152	3,217	12,493
January	25,346	0	16,438	0
February	1,743	0	16,954	0
March	129	0	1,036	0
April	120	0	155	0
May	124	0	353	0
June	120	0	150	0
July	124	0	155	0
August	1,090	0	8,079	0
September	6,116	0	40,499	0

**Table 4 - Recreation Statistics - Glenlyon Dam**

1998 / 1999		1999 / 2000	
Number of Visitors	Number of Camper Days	Number of Visitors	Number of Camper Days
49,749	7,670	38,200	8,100

Figure 1 - Boggabilla Weir Storage Levels



# Resource Allocation, Sharing and Use

**Table 5 - Irrigation Licences - Border Rivers Catchment Upstream of Mingoola**

	Number of Licences		
	New South Wales	Queensland	Total
Dumaresq River and Tributaries above Mingoola (excluding licences on Glenlyon Dam or Pike Creek downstream of Glenlyon Dam)	102	369	471

**Table 6 - Irrigation, Off-Allocation, Waterharvesting, Industrial & Town Water Licences and Offstream Storages - Border Rivers (Regulated Section)**

	Number of Licences		Allocations (Megalitres)		Off-stream Storages (ML) (Number of Storages)	
	NSW	QLD	NSW	QLD	NSW	QLD
Pike Creek and Dumaresq River from Glenlyon Dam to Bonshaw Weir	25	32	7,144	6,658	0	0
Dumaresq River from Bonshaw Weir to Cunningham Weir (excluding Texas town)	19	26	5,723	7,463	0	0
Texas Town		1		270		
Dumaresq River from Cunningham Weir to Macintyre River junction (excluding Yelarbon town)	15	36	4,939	6,883	400 (1)	4,300 (4)
Yelarbon Town		1		106		
Macintyre River from Dumaresq River junction to Goondiwindi Weir (excluding Goondiwindi & Boggabilla towns)	11	48	58,060	32,519	25,700 (5)	76,075 (24)
Boggabilla Town	1		320			
Goondiwindi Town		1		1,800		
Macintyre River from Goondiwindi Weir to Boomi Weir	16	21	105,191	9,240	71,960 (16)	28,720 (10)
Macintyre River and Barwon River from Boomi Weir to Mungindi Weir (excluding Mungindi town)	19	41	61,590	21,570	45,650 (8)	77,560 (28)
Mungindi Town	1		320			
<b>Totals</b>	<b>107</b>	<b>207</b>	<b>243,287</b>	<b>86,509</b>	<b>143,710</b>	<b>186,655</b>



**Table 7 - Water Use from the Border Rivers 1998 / 1999**

	On-allocation			Off-allocation		
	NSW	QLD	Total	NSW	QLD	Total
Pike Creek and Dumaresq River from Glenlyon Dam to Bonshaw Weir	1,016	1,149	2,165	897	552	1,449
Dumaresq River from Bonshaw Weir to Cunningham Weir (excluding Texas town)	1,621	1,784	3,405	1,252	602	1,854
Texas Town		127	127			
Dumaresq River from Cunningham Weir to Macintyre River junction (excluding Yelarbon town)	329	1,443	1,772	118	564	682
Yelarbon Town		58	58			
Macintyre River from Dumaresq River junction to Goondiwindi Weir (excluding Goondiwindi & Boggabilla towns)	25,409	7,984	33,393	9,887	25,684	35,571
Boggabilla Town	132		132			
Goondiwindi Town		1,254	1,254			
Macintyre River from Goondiwindi Weir to Boomi Weir	40,540	5,270	45,810	20,176	11,686	31,862
Macintyre River and Barwon River from Boomi Weir to Mungindi Weir (excluding Mungindi town)	24,063	5,023	29,086	32,788	18,468	51,256
Mungindi Town	221		221			
<b>Totals</b>	<b>93,331</b>	<b>24,092</b>	<b>117,423</b>	<b>65,118</b>	<b>55,838</b>	<b>120,956</b>

*Note that the above water use statistics includes the use of water released into the Border Rivers from Pindari Dam which is owned and operated by the State of New South Wales and Coolmunda Dam which is owned and operated by the State of Queensland.*

**Table 8 - Water Use from the Border Rivers 1999 / 2000**

	On-allocation			Off-allocation		
	NSW	QLD	Total	NSW	QLD	Total
Pike Creek and Dumaresq River from Glenlyon Dam to Bonshaw Weir	1,722	2,089	3,811	773	584	1,407
Dumaresq River from Bonshaw Weir to Cunningham Weir (excluding Texas town)	1,645	3,670	5,315	866	79	945
Texas Town		141	141			
Dumaresq River from Cunningham Weir to Macintyre River junction (excluding Yelarbon town)	621	789	1,410	338	447	2,834
Yelarbon Town		87	87			
Macintyre River from Dumaresq River junction to Goondiwindi Weir (excluding Goondiwindi & Boggabilla towns)	31,135	23,924	55,059	12,861	30,639	34,026
Boggabilla Town	159		159			
Goondiwindi Town		1,338	1,338			
Macintyre River from Goondiwindi Weir to Boomi Weir	44,271	3,430	47,701	29,395	7,140	39,772
Macintyre River and Barwon River from Boomi Weir to Mungindi Weir (excluding Mungindi town)	30,601	8,084	38,685	14,837	20,418	35,258
Mungindi Town	240		240			
<b>Totals</b>	<b>110,394</b>	<b>43,552</b>	<b>153,946</b>	<b>59,070</b>	<b>59,307</b>	<b>114,242</b>

*Note that the above water use statistics includes the use of water released into the Border Rivers from Pindari Dam which is owned and operated by the State of New South Wales and Coolmunda Dam which is owned and operated by the State of Queensland.*

**Table 9 - Sharing of Regulated Border Rivers Water Resources (megalitres)**

	1998 / 1999			1999 / 2000		
	NSW	Qld	Total	NSW	Qld	Total
Carry-over allowed from previous water year.	0	7,820		0	17,187 (1)	
Share of resource available at commencement of water year (1 October)	92,357	69,673		87,515	73,036	
Additional share made available during water year	0	0		9,300	0 (2)	
Total share available during water year	92,357	77,493	169,850	96,815	73,036	169,850
Gross volume used from regulated flows during water year along Border Rivers	93,331	24,092		110,394	43,492 (3)	
Net volume released into the Border Rivers from States own Dams	27,050	6,240		35,400	8,500	
Volume of regulated "Border Rivers" resources used during the water year	66,281	17,852	75,495	74,994	34,992	109,986
Share available to carry-over to next water year		39,970		21,821	38,044	

(1) Carry-Over allowed will be subject to rules about maximum permissible share to each State.

(2) Carry-Over cancelled by internal spill when Dam spilled in November 1999.

(3) Slight discrepancy between total 1999/2000 Qld use figure provided for resource sharing calculation and final figure provided in Table 8.

**Table 10 - Access Opportunities to Unregulated Flows - Border Rivers**

Month	Number of Days			
	1998 / 1999		1999 / 2000	
	Glenlyon to Goondiwindi	Goondiwindi to Mungindi	Glenlyon to Goondiwindi	Goondiwindi to Mungindi
October	Note (1)	Note (2)	4	4
November	Note (1)	Note (2)	30	30
December	Note (1)	Note (2)	8	8
January	2			
February		2		
March	Note (3)	Note (4)	1	1
April	Note (3)	Note (4)		
May	Note (3)	Note (4)		
June	Note (3)	Note (4)		
July	Note (3)	Note (4)		
August				
September				

(1) Unrestricted access to unregulated flows permitted from 20/7/98 – 14/12/99 i.e. 146 days.

(2) Unrestricted access to unregulated flows permitted from 27/7/98 – 14/12/98 i.e. 139 days.

(3) Unrestricted access to unregulated flows permitted from 4/3/99 – 20/7/99 i.e. 138 days.

(4) Unrestricted access to unregulated flows permitted from 2/3/99 – 20/7/99 i.e. 140 days.

**Table 11 - Production - Border Rivers (hectares)**

Crop	1998 / 1999			1999 / 2000		
	NSW	Qld	TOTAL	NSW	Qld	TOTAL
Cotton	34,600	22,482	57,082	36,172	25,573	61,745
Lucerne	480	369	849	580	517	1,097
Cereals	1,120	1,248	2,368	1,450	1,694	3,144
Fodder Crops	890	887	1,777	900	519	1,419
Horticultural Crops	300	164	464	75	371	446
Other	775	8	783	750	8	758

**Table 12 - Distribution of Groundwater Licences (Border Rivers Groundwater Area)**

	NSW	Qld
Issued Allocation	22,670	14,191
Issued Allocation (100% surface water allocation)	14,538	-
Issued Allocation (0% surface water allocation)	22,670	-
Allocation Issued, bores constructed	11,595	11,749
Allocation Issued, bores not constructed	11,075	2,442
Number of Licences	65	39
Number of Bores Constructed	24(Monitored)	27
Number of Applications Outstanding	0	12

**Table 13 - Groundwater Water Use - Border Rivers Groundwater Area (megalitres)**

1998 / 1999		1999 / 2000	
NSW	Qld	NSW	Qld
1,687	3,100	2,575	3,996

# Resource Management

**Table 14 - Compensation Inflow, Storage and Releases (Beardmore Dam)**

Month	1998 / 1999			1999 / 2000		
	Inflow (ML)	Release (ML)	Storage at End of Month (ML)	Inflow (ML)	Release (ML)	Storage at End of Month (ML)
June	3,780	2,680	1,100	2,960	2,960	0
July	1,910	3,080	0	1,833	0	1,641
August	21,780	21,780	0	5,913	0	7,451
September	21,900	21,900	0	0	0	0
October	21,250	21,250	0	0	0	0
November	7,660	4,660	2,930	18,049	24,421	0
December	14,260	0	16,701	16,191	16,191	0
January	15,460	31,420	10	21,262	21,262	0
February	20,440	20,440	0	13,751	13,751	0
March	22,630	22,630	0	4,450	4,450	0
April	12,400	12,720	0	0	0	0
May	4,700	4,460	0	0	0	0
June	2,960	2,960	0	0	0	0
<b>Totals</b>	<b>171,130</b>	<b>169,980</b>		<b>81,449</b>	<b>80,075</b>	

## Report on Water Quality Monitoring

The Commission's water quality monitoring network currently consists of 15 sites in the Border Rivers, including Glenlyon Dam, and six sites on the Intersecting Streams. Other sites in the basin, including Pindari Dam and Coolmunda Dam, are sampled by the States or local government under other water quality monitoring programs.

Water quality samples from the sites in the Border Rivers are collected each month. In the Intersecting Streams samples are taken less regularly due to the intermittent nature of flow. Most Intersecting Streams sites were sampled on seven or eight occasions (generally monthly), with the exception of the Birrie, which could only be sampled on three occasions (November, December and January).

Water samples were analysed for electrical conductivity, total phosphorus, total nitrogen, turbidity, total suspended solids and, in some cases, algal levels. The summary information presented in this report includes data on electrical conductivity, total phosphorous, total nitrogen and turbidity.

Salinity is commonly measured in terms of electrical conductivity, which, in turn, is a measure of the salts (or ions) present in a water body. A high concentration of salts (or ions) in a water body will therefore result in a high electrical conductivity reading. High levels of salinity can have a detrimental effect on the environment and on the usability of water for irrigation, drinking and domestic purposes. The ANZECC water quality guidelines (1992) have identified 1500 $\mu$ S/cm as the upper limit for sustaining ecosystem health. Furthermore, the guidelines have also identified the range for medium salinity water as being 280 - 800 $\mu$ S/cm which, is the range in which, crop stress would start to occur.

Phosphorous and nitrogen are essential for plant and algal growth. However, in high concentrations, both nutrients can result in the excessive growth of some plant and algal species resulting in nuisance levels. The ANZECC (1992) water quality guidelines have set an upper desirable limit for phosphorous of 0.1 mg/L and 0.75 mg/L for nitrogen.

Turbidity is a measure of the light scattering and absorption properties of water (i.e. it's clarity or muddiness). It indicates the level of suspended particles in water, such as clay, sand, phytoplankton and detritus (dead matter). Turbidity is commonly measured in Nephelometric Turbidity Units (NTU). High turbidity limits plant growth, impacts on ecological function and effects drinking water.

### **Border Rivers (1999/2000)**

Electrical conductivity throughout the 1999/00 period in the Border Rivers was within the ANZECC (1992) guidelines for the protection of aquatic ecosystems (1500  $\mu$ S/cm). Median electrical conductivity was in the low to medium range for irrigation at all sites. At Oaky Creek at Texas and Macintyre Brook at Booba Sands, electrical conductivity exceeded 800  $\mu$ S/cm on one occasion. In comparison to the 1998/99 results, electrical conductivity had risen slightly, however, detailed analysis of the flow variations and trends over a number of years would be required to assess the significance of this rise.

Total phosphorus concentrations in the Border Rivers catchment were high, being within or exceeding the indicative values known to cause eutrophication problems in rivers and streams (ANZECC 1992). Concentrations tended to increase with distance downstream. Weir River at Talwood and the Macintyre River at Boomi Weir recorded the highest median concentrations. Comparisons with 1998/99 results show a slight drop in total phosphorus levels at most sites.

Median total nitrogen concentrations at many sites were moderate to high, but generally within the indicative range given by ANZECC (1992) where water quality deterioration due to excess nutrients are known to have occurred. Weir River at Talwood had the highest median total nitrogen concentration of 1.20 mg/L, however there was no obvious downstream trend in total nitrogen concentrations.

Turbidity during 1999/2000 in the Border Rivers increased down the catchments, with the highest median values recorded at Weir River at Talwood and Macintyre River at Boomi Weir. Both of these sites also exceeded the environmental guideline of 50 NTU. Turbidity levels in Tenterfield Creek and

Pike Creek met the desirable limit for drinking water. Median turbidity at all sites except Weir River at Talwood were lower than 1998/99 results, however the 90th percentiles at Macintyre River at Boomi Weir had increased noticeably over the 1998/99 results.

The Weir River at Talwood continues to show the highest phosphorus, nitrogen and turbidity levels of all sites in the Border Rivers. Further monitoring in the Weir River catchment is warranted to identify threatening land or river management issues. Electrical conductivities at Oaky Creek at Texas and Macintyre Brook at Booba Sands should also trigger further investigation into the source of the salts at these sites.

### Intersecting Streams 1999/00

Throughout 1999/2000 all sites on the Intersecting Streams had electrical conductivity levels well below the upper limit for aquatic ecosystem health (ANZECC, 1992). Furthermore, electrical conductivity levels were also below the medium salinity water range identified by ANZECC (1992) as being the range in which, crop stress would start to occur.

In comparison to last years results the median electrical conductivity levels on the Bokhara, Birrie and Narran Rivers were slightly higher. The remaining three sites (the Warrego, Paroo and Culgoa) experienced median electrical conductivity levels lower than those experienced during the 1998/99 sampling period. As alluded to above, the differences experienced between the 1998/99 and 1999/00 sampling periods were only minor and could therefore be attributed to the natural temporal variation.

The upper desirable limit for phosphorous was exceeded at all six sites throughout the 1999/00 sampling period. Median phosphorous levels during the 1999/00 sampling period were substantially higher than the levels experienced in the 1998/99 sampling period.

Nitrogen concentrations on the intersecting streams fell within the acceptable range set by the ANZECC (1999) water quality guidelines, ie 0.1-0.75 mg/L. Nitrogen levels during 1999/00 period were substantially lower than those experienced in 1998/99.

Turbidity levels during 1999/00 exceeded the desirable limit for drinking water (ie 5 NTU) at all six sites. Turbidity levels throughout the 1999/00 period were lower than the levels experienced throughout 1998/99.

The results of testing for blue green algae in the Intersecting Streams during 1999/200 are provided in Table 17.

<b>Table 15 - Published Water Quality Guidelines</b>			
<b>Water Quality Indicator</b>	<b>Reference</b>	<b>Value</b>	<b>Purpose</b>
Turbidity	ANZECC (1992)	Site Specific	Untreated drinking water; environmental requirements
	SPCC (1990)	5 NTU 50 NTU	Untreated Drinking Water Environmental requirements
Salinity (measured as electrical conductivity)	ANZECC (1992)	0-280 $\mu$ S/cm      LOW 280-800 $\mu$ S/cm      MEDIUM 800-2300 $\mu$ S/cm      HIGH 2300-5500 $\mu$ S/cm      VERY HIGH >5500 $\mu$ S/cm      EXTREME	Categories for irrigation uses Taste threshold: 1500 $\mu$ S/cm
Nutrients	ANZECC (1992)	<b>Total Phosphorus</b> Streams:      0.01-0.10 mg/L Lakes:        0.005-0.05 mg/L <b>Total Nitrogen</b> Streams:      0.10-0.75 mg/L Lakes:        0.10-0.5 mg/L	Levels at or above which excessive algal growth known to occur

**Table 16 - Summary of Water Quality 1998 / 1999**

Basin	Site No.	Location	Electrical Conductivity $\mu\text{S/cm}$				Total Phosphorus (mg/L)				Total Nitrogen (mg/L)				Turbidity (NTU)			
			N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile
Dumaresq Tributaries	416003	Tenterfield Creek, Clifton	12	142	207	300	12	0.04	0.08	0.12	12	0.60	0.70	1.09	12	3.0	13.0	24.9
	416310	Severn River at Farnbro	12	139	174	192	12	0.03	0.05	0.06	12	0.66	0.85	1.00	12	5.0	11.0	21.0
	416303	Pike Creek U/S Glenlyon Dam	12	12	254	296	11	0.02	0.04	0.05	11	0.45	0.55	0.70	12	3.9	8.7	26.0
	416309	Pike Creek at Glenlyon Dam TW	11	11	170	182	9	0.03	0.05	0.09	9	0.50	0.70	0.71	11	6.7	11.0	15.0
	416032	Mole River, Donaldson	12	12	167	285	12	0.03	0.04	0.06	12	0.35	0.45	0.89	12	2.1	13.0	23.6
	416008	Beardy River, Haystack No. 4	12	104	135	184	12	0.03	0.05	0.22	12	0.41	0.65	2.86	12	14.2	31.0	44.6
	416312	Oaky Creek at Texas	12	401	507	657	12	0.03	0.04	0.05	12	0.20	0.35	0.55	12	10.2	25.0	49.5
	416415	Macintyre Brook, Booba Sands	12	211	355	509	12	0.05	0.08	0.11	12	0.51	0.85	1.19	12	12.6	39.5	79.5
Dumaresq	416007	Bonshaw Weir	12	164	177	210	12	0.04	0.05	0.06	12	0.40	0.55	0.79	12	14.1	19.0	30.3
	416049	Mauro	12	162	184	218	12	0.04	0.05	0.08	12	0.41	0.55	0.83	12	17.0	22.5	44.5
Macintyre	416012	Holdfast	12	160	274	394	12	0.08	0.12	0.18	12	0.36	0.63	1.09	12	13.0	27.0	84.5
	416201	Goondiwindi	12	188	248	291	10	0.07	0.09	0.12	10	0.44	0.50	0.75	12	21.6	35.5	86.5
	416043	Boomi Weir	7	226	250	299	5	0.10	0.13	0.14	5	0.44	0.75	0.81	7	44.4	85.0	131
Weir	416202	Talwood	7	121	178	203	7	0.12	0.17	0.25	7	0.90	1.30	1.66	7	316	390	450
Intersecting Streams	424002	Willara Crossing on Paroo	10	41	83	151	10	0.12	0.18	0.25	10	0.53	0.90	1.22	10	397	600	810
	423002	Fords Bridge Bywash on Warrego	10	82	108	155	10	0.15	0.19	0.26	10	0.53	0.70	0.95	10	352	650	895
	422015	Culgoa River at Brenda	10	133	192	210	10	0.19	0.23	0.36	10	0.74	0.83	1.35	10	235	390	503
	422014	Bokhara River at Goodooga	10	134	178	240	10	0.22	0.27	0.29	10	0.85	0.98	1.10	10	267	350	505
	422013	Birrie River near Goodooga	7	124	163	209	7	0.25	0.26	0.30	7	0.80	0.95	1.10	7	268	400	510
	422012	Narran River at New Angledool	10	90	155	191	10	0.18	0.26	0.29	10	0.59	0.78	1.21	10	188	315	590
Storages	416315	Glenlyon 1: Top																
		Glenlyon 1: Middle																
		Glenlyon 1: Bottom																

NOTE: The tables attached provides information on the median value (middle value), the 10<sup>th</sup> percentile (10% of the samples are below this value) and the 90<sup>th</sup> percentile (90% of the samples are below this value; vv 10% of the samples are greater than this value).

**Table 17 - Summary of Water Quality 1999 / 2000**

Basin	Site No.	Location	Electrical Conductivity $\mu\text{S/cm}$				Total Phosphorus (mg/L)				Total Nitrogen (mg/L)				Turbidity (NTU)				Total Blue Green Algae (cells/mL)				
			N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	N	10th %ile	Med	90th %ile	
Dumaresq Tributaries	416003	Tenterfield Creek, Clifton	13	204	285	369	13	0.02	0.06	0.11	13	0.35	0.45	0.79	13	2	3	7					
	416310	Severn River at Farnbro	10	169	188	210	10	0.01	0.02	0.06	10	0.35	0.53	0.86	10	3	6	12					
	416303	Pike Creek U/S Glenlyon Dam	11	182	269	517	11	0.01	0.02	0.05	11	0.20	0.35	0.75	11	1	3	10					
	416309	Pike Creek at Glenlyon Dam TW	12	176	187	201	10	0.02	0.03	0.10	10	0.50	0.60	0.75	12	2	2	8					
	416032	Mole River, Donaldson	12	147	189	269	12	0.02	0.03	0.05	12	0.31	0.40	0.64	12	3	9	15					
	416008	Beardy River, Haystack No. 4	12	118	191	285	12	0.02	0.04	0.06	12	0.31	0.40	0.64	12	8	12	48					
	416312	Oaky Creek at Texas	12	517	642	786	12	0.02	0.04	0.06	12	0.31	0.40	0.64	12	8	12	48					
	416415	Macintyre Brook, Booba Sands	12	267	417	819	12	0.04	0.05	0.07	12	0.46	0.63	0.80	12	8	16	174					
Dumaresq	416007	Bonshaw Weir	12	176	204	233	12	0.03	0.04	0.05	12	0.31	0.43	0.79	12	5	10	17					
	416049	Mauro	12	192	230	250	12	0.03	0.03	0.06	12	0.30	0.40	0.54	12	6	9	22					
Macintyre	416012	Holdfast	12	207	316	464	12	0.05	0.07	0.14	12	0.30	0.53	0.92	12	8	20	72					
	416201	Goondiwindi	12	22	274	384	12	0.05	0.08	0.10	12	0.31	0.53	0.73	12	12	26	50					
	416043	Boomi Weir	11	175	267	380	9	0.06	0.10	0.14	9	0.34	0.45	0.89	11	32	55	240					
Weir	416202	Talwood	10	158	192	214	10	0.13	0.19	0.21	9	0.87	1.20	1.52	10	331	575	770					
Intersecting Streams	424002	Willara Crossing on Paroo	8	53	82	115	8	0.53	0.75	0.94	8	0.11	0.12	0.19	8	256	330	560	8	0	0	333	
	423002	Fords Bridge Bywash on Warrego	8	84	95	116	8	0.50	0.60	0.81	8	0.16	0.20	0.26	8	236	400	2160	8	0	0	42	
	422015	Culgoa River at Brenda	7	155	161	245	7	0.50	0.65	0.84	7	0.11	0.16	0.22	7	286	330	426	7	0	0	0	
	422014	Bokhara River at Goodooga	7	165	190	239	7	0.66	0.91	1.01	7	0.12	0.21	0.30	7	418	460	600	7	0	0	197	
	422013	Birrie River near Goodooga	3	168	206	268	3	0.86	0.90	0.94	3	0.10	0.21	0.25	3	460	500	852	2	0	0	0	
	422012	Narran River at New Angledool	7	163	191	228	7	0.52	0.75	0.83	7	0.07	0.19	0.22	7	218	300	670	7	0	141	2226	
Storages	416315	Glenlyon 1: Top																					
		Glenlyon 1: Middle																					
		Glenlyon 1: Bottom																					

NOTE: The tables attached provides information on the median value (middle value), the 10<sup>th</sup> percentile (10% of the samples are below this value) and the 90<sup>th</sup> percentile (90% of the samples are below this value; vv 10% of the samples are greater than this value).



**Table 18 - Stream Gauging Stations (Border Rivers)**

AWRC No	Stream	Station	Equipment (See Note)	Telemetry	Established Date	Maintained by	98/99 Total Flow (MLx10 <sup>6</sup> )	99/00 Total Flow (MLx10 <sup>6</sup> )	Historical Annual Totals & (Year) (MLx10 <sup>6</sup> )		
									Min.	Max.	Median
416001	Barwon River	Mungindi	AR	Yes	1889	DLWC	422	208	21 (94/95)	3,288 (55/56)	433
416002	Macintyre River	Boggabilla	AR	Yes	1895	DLWC	630	536	59 (01/02)	5393 (89/90)	741
416003	Tenterfield Creek	Clifton	AR	Yes	1921	DLWC	30	38	4 (94/95)	305 (49/50)	36
416006	Severn River	Ashford	AR	Yes	1970	DLWC	95	119	30 (94/95)	695 (77/78)	195
416007	Dumaresq River	Bonshaw Weir	AR	Yes	1934	DLWC	258	338	49 (93/94)	1200 (75/76)	284
416008	Beardy River	Haystack	AR	Yes	1970	DLWC	30	34	7 (71/72)	184 (95/96)	50
416010	Macintyre River	Wallangra	AR	Yes	1973	DLWC	91	92	9 (94/95)	371 (83/84)	91
416011	Dumaresq River	Roseneath	AR	Yes	1972	DLWC	209	319	35 (93/94)	1978 (55/56)	279
416012	Macintyre River	Holdfast	AR	Yes	1951	DLWC	190	218	53 (60/61)	1865 (55/56)	311
416020	Ottleys Creek	Coolatai	AR	Yes	1967	DLWC	11	9	1 (92/93)	54 (95/95)	8
416032	Mole River	Donaldson	AR	Yes	1969	DLWC	72	64	12 (93/94)	442 (75/76)	78
416037	Boomi River	Offtake	AR	Yes	1973	DLWC	35	Unavailable	3 (94/95)	125 (83/84)	39
416040	Dumaresq River	Glenarbon Weir	AR	Yes	1996	DLWC	261	316	261 (98/99)	819 (97/98)	283
416043	Macintyre River	Boomi Weir	AR	Yes	1976	DLWC	286	197	36 (93/94)	371 (95/96)	163
416047	Macintyre River	Terrewah	AR	Yes	1985	DLWC	407	345	70 (93/94)	1274 (97/98)	329
416048	Macintyre River	Kanowna	AR	Yes	1988	DLWC	300	183	50 (93/94)	536 (89/90)	181
416060	Macintyre River	Boggabilla Weir D/S	AR	Yes	1997	DLWC	Unavailable	Unavailable	49 (93/94)	536 (89/90)	Unavailable
416201A	Macintyre River	Goondiwindi	AR	Yes	1917	DNR	541	498	61 (94/95)	4,488 (55/56)	737
416201B	Macintyre River	Goondiwindi Weir	AR	Yes	1997	DNR	515	454	515 (98/99)	1,625 (97/98)	536
416202A	Weir River	Talwood	AR	Yes	1949	DNR	164	26	1 (79/80)	688 (95/96)	56
416305B	Brush Creek	Beebo	AR	Yes	1950	DNR	4	0.3	0 (Several)	55 (95/96)	4
416309B	Pike Creek	Glenlyon Dam TW	AR	Yes	1973	DNR	50	108	3 (76/77)	173 (90/91)	80
416310A	Dumaresq River	Farnbro	AR	Yes	1962	DNR	34	65	2 (93/94)	407 (75/76)	63
416312A	Oakey Creek	Texas	AR	Yes	1969	DNR	4	5	0 (73/74)	100 (95/96)	7
416315A	Pike Creek	Glenlyon Dam HW	AR	Yes	1977	DNR	3	15	0 (Several)	178 (83/84)	0
416402C	Macintyre Brook	Inglewood	AR	Yes	1953	DNR	82	60	8 (94/95)	549 (95/96)	54
416415A	Macintyre Brook	Booba Sands	AR	Yes	1987	DNR	89	58	4 (94/95)	637 (95/96)	57

Note: AR = Automatic Recorder; SG = Staff Gauge, Established Date = HYDSYS Period of Record (from which all long term calculations are made).

**Table 19 - Stream Gauging Stations (Intersecting Streams)**

AWRC No	Stream	Station	Equipment (See Note)	Telemetry	Established Date	Maintained by	98/99 Total Flow (MLx10 <sup>3</sup> )	99/00 Total Flow (MLx10 <sup>3</sup> )	Historical Annual Totals & (Year) (MLx10 <sup>3</sup> )		
									Min.	Max.	Median
417001	Moonie River	Gundablouie	AR	Yes	1945	DLWC	104	154	0 (51/52)	628 (82/83)	68
417204A	Moonie River	Fenton	AR	Yes	1971	DNR	116		0 (79/80)	669 (75/76)	72
422005	Bokhara River	Goodwin's	AR	Yes	1944	DLWC	Unavailable	Unavailable	0 (64/65)	771 (55/56)	23
422006	Culgoa River	D/S Collierina (Kenebree)	SG	No	1944	DLWC	466	Unavailable	5 (79/80)	2337 (82/83)	314
422010	Birrie River	Talawanta	SG	No	1964	DLWC	Unavailable	Unavailable	0 (68/69)	380 (75/76)	30
422011	Culgoa River	U/S Collierina (Mundiwa)	AR	Yes	1964	DLWC	Unavailable	Unavailable	112 (94/95)	1009 (70/71)	213
422012	Narran River	Angledool	SG	No	1959	DLWC	Unavailable	Unavailable	0 (92/93)	627 (82/83)	114
422013	Birrie River	Near Goodooga	SG	No	1964	DLWC	79	Unavailable	0 (92/93)	659 (82/83)	32
422014	Bokhara River	Goodooga	SG	No	1915	DLWC	Unavailable	Unavailable	0 (92/93)	442 (82/83)	23
422015	Culgoa River	Brenda	AR	Yes	1960	DLWC	307	Unavailable	0 (92/93)	2409 (82/83)	280
422016	Narran River	Wilby Wilby	SG	No	1964	DLWC	194	Unavailable	0 (79/80)	558 (82/83)	116
422017	Culgoa River	Weilmoringle	SG	No	1964	DLWC	Unavailable	Unavailable	0 (92/93)	946 (83/84)	244
422204A	Culgoa River	Whyenbah	AR	Yes	1965	DNR	421	85	2 (92/93)	1,822 (82/83)	365
422206A	Narran River	Dirranbandi-Hebel Road	AR	Yes	1965	DNR	170	16	0 (92/93)	1,063 (82/83)	149
422207A	Ballandool River	Hebel-Bollon Road	AR	Yes	1965	DNR	50	8	0 (92/93)	532 (82/83)	19
422209A	Bokhara River	Hebel	AR	Yes	1967	DNR	53	8	1 (92/93)	367 (82/83)	41
422211A	Briarie Creek	Woolerbilli-Hebel Road	AR	Yes	1992	DNR	81	1	0	701 (82/83)	12
423001	Warrego River	Fords Bridge	AR	No	1921	DLWC	3	58	1 (97/98)	328 (89/90)	9
423002	Warrego River	Fords Bridge (Bywash)	AR	No	1921	DLWC	39	70	0 (57/58)	315 (55/56)	37
423202C	Warrego River	Cunnamulla Weir	AR	Yes	1992	DNR	131	33	41 (94/95)	1,587 (96/97)	158
424002	Paroo River	Willara Crossing	AR	No	1975	DLWC	82	672	16 (84/85)	2071 (75/76)	300
424201A	Paroo River	Caiwarro	AR	Yes	1967	DNR	142	890	26 (84/85)	2,037 (89/90)	412
011202	Bulloo River	Autumnvale	AR	Yes	1967	DNR	497	928	48 (79/80)	2,298 (88/89)	420

Note: AR = Automatic Recorder; SG = Staff Gauge, Est. Date = HYDSYS Period of Record (from which all long term calculations are made).

**Table 20 - Groundwater Monitoring Network**

Bore No	Location	State	Piezometer	Depth (m)	Automatic W.L. Recorder (Yes/No)	Year Installed	Depth to WL 1998 / 1999		Depth to WL 1999 / 2000	
							Max. (m)	Min. (m)	Max. (m)	Min. (m)
41640001	Keetah Crossing	Q	A	87.3	No	1985	-2.52	-2.84	-2.87	-2.8
41640001	Keetah Crossing	Q	B	46.8	No	1985	-4.41	-4.86	-4.86	-4.82
41640002	Keetah Crossing	Q	A	17.8	No	1985	-6.66	-7.83	-7.83	-7.63
41640003	Yelarbon Desert	Q	A	92.4	No	1985	-2.04	-2.33	-2.33	-2.32
41640003	Yelarbon Desert	Q	B	47.9	No	1985	-3.37	-3.95	-4.03	-3.37
41630053	'Tranquil' – Val Lennon	Q	A	13.0	No	1958				
41630009	Glenarbon	Q	A	93	No	1996	-15.17	-24.89	-24.68	-15.58
41630042	David Muggleton	Q	A	13.3	No	1959	-6.47	-6.72	-6.65	-6.52
41630039	'Eldorado' – Harley Girle	Q	A	16.7	No	1959	-4.04	-5.17	-5.17	-4.83
41630072	Cunningham Weir	Q	A	90.4	Yes	1985	-16.63	-27.62	-25.07	-16.63
41630072	Cunningham Weir	Q	B	41.4	Yes	1985	-15.43	-24.84	-23.22	-15.83
41630072	Cunningham Weir	Q	C	10.4	Yes	1985	-4.37	-5.31	-5.31	-5.22
41630064	Texas	Q	A	52.5	No	1985	-9.11	-15.12	-15.33	-10.91
41630064	Texas	Q	B	28.5	No	1985	-7.90	-12.26	-11.02	-9.20
41630066	Bill & Tater	Q	A	90.4	Yes	1985	-8.11	-12.59	-9.69	-9.00
41630066	Bill & Tater	Q	B	45.9	Yes	1985	-7.58	-12.44	-9.26	-8.46
41630067	Bill & Tater	Q	A	12.2	Yes	1985	-3.22	-4.13	-4.13	-3.99
41630063	Finlay's	Q	A	100.6	No	1983	-3.64	-7.92	-12.60	-4.94
41630063	Finlay's	Q	B	64.6	No	1983	-3.62	-7.75	-12.85	-4.89
41630062	Finlay's	Q	A	17.4	No	1985	-3.12	-4.22	-4.28	-3.87
41630071	Finlay's	Q	A	48.2	No	1985	-2.72	-5.30	-6.08	-3.74
41630071	Finlay's	Q	B	41.2	No	1985	-2.75	-5.19	-5.78	-3.81
41630059	John Moore	Q	A	101.7	No	1985	-5.53	-5.96	-6.10	-5.84
41630069	John Moore	Q	A	92	No	1985	-6.43	-13.17	-14.20	-6.43
41630069	John Moore	Q	B	35.9	No	1985	-6.07	-12.92	-13.88	-6.07
41630069	John Moore	Q	C	15.4	No	1985	-5.13	-5.88	-6.23	-5.67
41630060	John Moore	Q	A	12.1	No	1985	-7.13	-7.85	-7.85	-7.78
41630058	John Moore	Q	A	10.6	No	1985	-6.15	-6.83	-6.83	-6.76
41630070	Phillip Harpham	Q	A	9.2	No	1985	-3.91	-4.79	-4.79	-4.69
41630004-A	V and E Sattolo	Q	A	11.8	No	1960	-6.41	-8.03	-8.03	-7.79
41630003	V and E Sattolo	Q	A	27.1	No	1961	-7.46	-8.66	-8.17	-8.17

**Table 20 - Groundwater Monitoring Network (Continued)**

Bore No	Location	State	Piezometer	Depth (m)	Automatic W.L. Recorder (Yes/No)	Year Installed	Depth to WL 1998 / 1999		Depth to WL 1999 / 2000	
							Max (m)	Min (m)	Max (m)	Min (m)
41630002	V and E Sattolo	Q	A	29.9	No	1961	-6.32	-7.26	-7.26	-7.05
GW036697	Keetah Bridge	NSW	1	20	No	1987	-8.64	-5.62	-8.7	-8.51
GW036697	Keetah Bridge	NSW	2	64	No	1987	-5.86	-5.81	-5.9	-5.75
GW036697	Keetah Bridge	NSW	3	83.5	No	1987	-2.92	-1.08	-3.51	-2.85
GW040635	Smithfield Section	NSW	1	15.9	No	1960	-8.19	-6.95	-8.38	-7.86
GW040636	Smithfield Section	NSW	1	11.3	No	1960	-7.05	-5.07	-7.44	-6.88
GW040637	Smithfield Section	NSW	1	7.9	No	1960	-5.46	-4.17	-5.83	-5.45
GW040638	Smithfield Section	NSW	1	11.9	No	1960	-9.32	-8.80	-9.2	-8.71
GW040639	Smithfield Section	NSW	1		No	1960	-8.44	-8.44	-8.45	-8.45
GW040640	Smithfield Section	NSW	1	10.2	No	1960				
GW40771	Smithfield Section	NSW	1	30	Yes	1994			-18.2	-20.98
GW40771	Smithfield Section	NSW	2	37	Yes	1994			-22.71	-22.71
GW40771	Smithfield Section	NSW	3	50	No	1994	-21.32	-20.53	-25.69	-20.53
GW40771	Smithfield Section	NSW	4	69	Yes	1994				
GW040641	Riverstone Section	NSW	1	35	No	1960	-8.85	-7.3	-16.5	-7.65
GW040642	Riverstone Section	NSW	1	9.7	No	1960				
GW040644	Riverstone Section	NSW	1	9.5	No	1960	-7.79	-7.30	-8.5	-7.79
GW040645	Riverstone Section	NSW	1	7.5	No	1960				
GW040646	Riverstone Section	NSW	1	7.7	No	1960	-6.12	-5.21	-7.35	-6.12
GW040647	Hopwood Section	NSW	1	12.8	No	1959	-9.28	-8.54	-9.41	-9.08
GW040648	Hopwood Section	NSW	1	10.1	No	1959				
GW040649	Hopwood Section	NSW	1	28.9	No	1959	-7.25	-6.94	-7.48	-7.01
GW040650	Hopwood Section	NSW	1	11.4	No	1959				
GW040652	Hopwood Section	NSW	1	12.2	No	1959				
GW040653	Hopwood Section	NSW	1	10.3	No	1959				
GW40829	Lochiel Section	NSW	1	12	No	1996	-8.34	-7.52	-8.64	-8.34
GW40829	Lochiel Section	NSW	2	42	Yes	1996				
GW40830	Lochiel Section	NSW	1	27	No	1996	-8.03	-7.91	-8.28	-8.01
GW40831	Lochiel Section	NSW	1	44	No	1996	-25.03	-17.18	-28.68	-17.10
GW40831	Lochiel Section	NSW	2	96	Yes	1996				

# Notes

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