

Appendix C

Potential Sources of Non-potable Water

Table of Contents

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Potential Sources of Non-potable Water	C
1.1 Lower Molonglo Water Quality Control Centre	C-3
1.2 Fyshwick Sewage Treatment Plant	C-5
1.3 Stormwater reuse schemes	C-6

List of Tables

Table 1	LMWQCC effluent pollutant concentrations, loads and targets	C-3
Table 2	Median concentrations comparison	C-5
Table 3	Summary of sewage treatment plants [ActewAGL, 2010a]	C-6
Table 4	Existing ponds and lakes with potential for stormwater harvesting	C-6
Table 5	Proposed ponds and lakes with potential for stormwater harvesting	C-6

List of Figures

Figure 1	Total Nitrogen Load in LMWQCC Effluent [ActewAGL, 2010a]	C-3
Figure 2	Total Phosphorus Load in LMWQCC Effluent [ActewAGL, 2010a]	C-4
Figure 3	Total Dissolved Solids Concentration in LMWQCC Effluent [ActewAGL, 2010a]	C-4
Figure 4	Water balance for Fyshwick (2006-2008)	C-5

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1.1 Lower Molonglo Water Quality Control Centre

The targets and performance for treated wastewater discharges for the LMWQCC are summarised below and in Table 1, Figure 1, Figure 2 and Figure 3.

- LMWQCC has a current EPA license limit for total nitrogen of 2,100 kg/day based on a 3 month rolling average. The plant has recently been upgraded with further works scheduled. The plant is able to meet current limits and is expected to meet more stringent limits of 1,800 kg/d of total nitrogen, see Figure 1.
- The plant currently meets the total phosphorus concentration and load limits, see Figure 2.
- Total Dissolved Solids concentrations are close to the 50th and 90th percentile limits of 500 mg/L and 550 mg/L respectively and are increasing over time due to declining sewage flow rates, see Figure 3. There is also an average daily load limit of 60,000 kg/day which is easily achieved.
- Total Nitrogen and Total Phosphorus concentrations are substantially higher than those for natural waterways as indicated by ANZECC Guidelines. These can potentially lead to algal growth and blooms.

Table 1 LMWQCC effluent pollutant concentrations, loads and targets

Parameter	Concentration (mg/L) 50 th percentile		Concentration (mg/L) 90 th percentile	Average daily load limit (kg/d)
	Target	2004-2009	Target	Target
Biochemical oxygen demand (5 day)	4	-	8	450
Suspended solids	5	-	10	500
Total phosphorus	0.3	0.2	0.4	25
Total nitrogen	-	15	-	2,100
Total dissolved solids	500	490	550	60,000
Thermotolerant coliforms (cfu/100mL)	60	-	100 (80 th percentile)	-

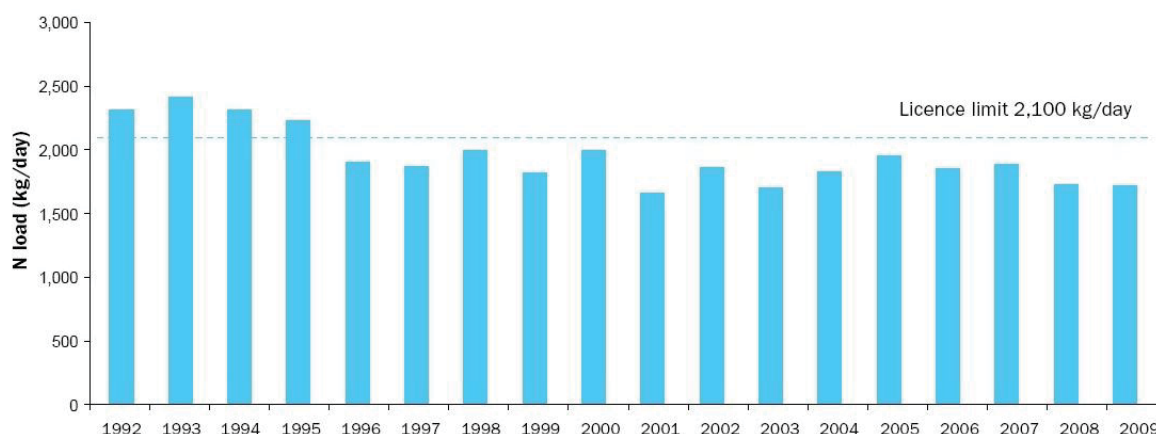


Figure 1 Total Nitrogen Load in LMWQCC Effluent [ActewAGL, 2010a]

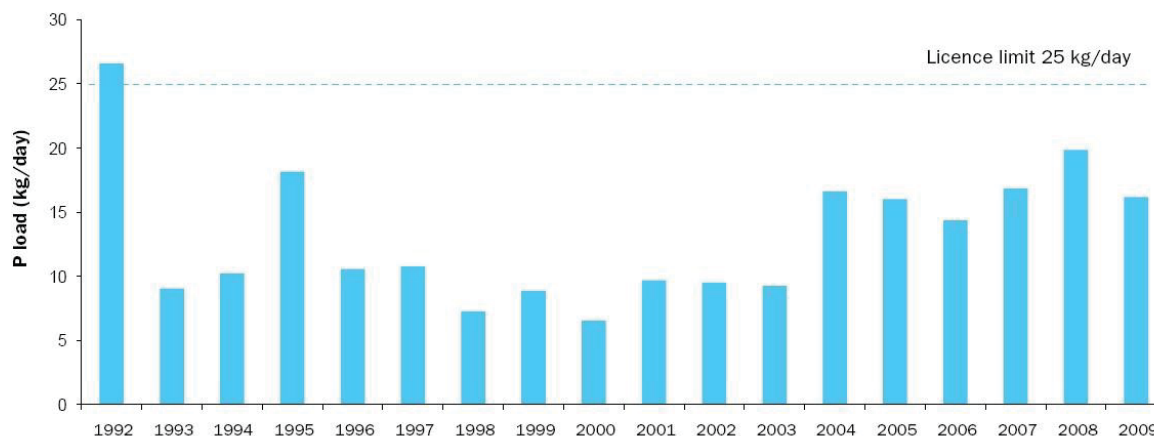


Figure 2 Total Phosphorus Load in LMWQCC Effluent [ActewAGL, 2010a]

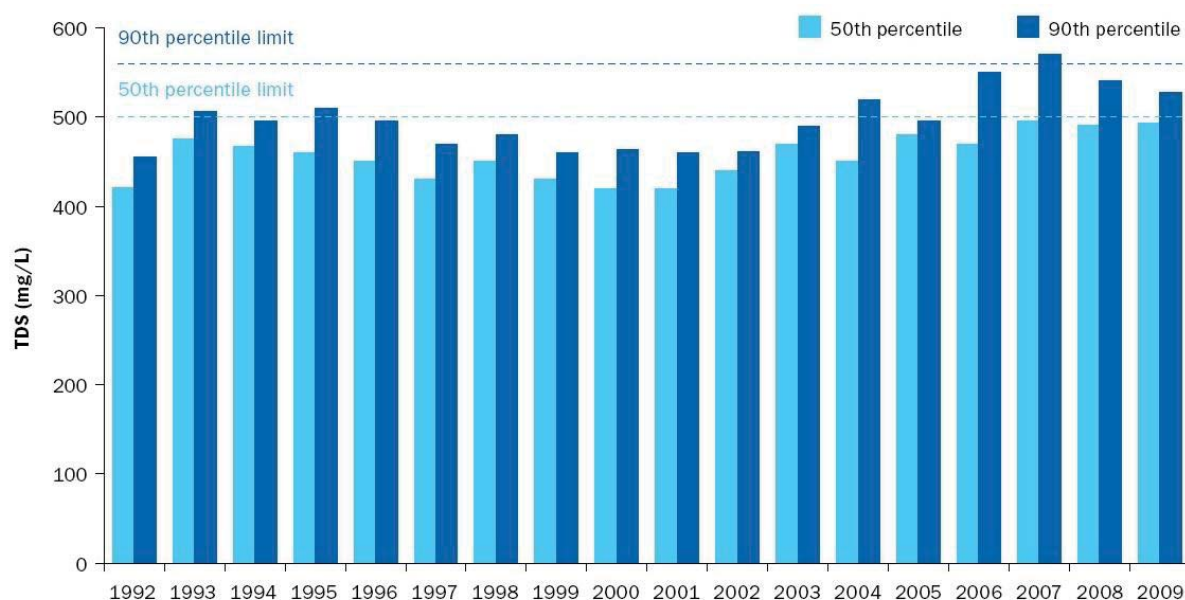


Figure 3 Total Dissolved Solids Concentration in LMWQCC Effluent [ActewAGL, 2010a]

Treated wastewater from the LWMQCC has higher pollutant concentrations than either treated stormwater or catchment runoff. Concentrations of total phosphorus and total nitrogen are summarised in Table 2 for LMWQCC, Fyshwick and a range of typical values for wastewater, stormwater and natural catchments for comparison. It can be seen that total nitrogen levels in particular are much higher for treated wastewater.

Table 2 Median concentrations comparison

Parameter	Biochemical oxygen demand (5 day)	Suspended solids	Total phosphorus	Total nitrogen
EPA Target [ActewAGL, 2010a]	4.0	5.0	0.3	-
LMWQCC 2004-2009 [ActewAGL, 2010a]	1	-	0.2	15
Fyshwick secondary effluent	39	67	4	37
Reclaimed water from Fyshwick	2	1	2	10
Wastewater [Mitchell et al., 2002]	100-500	100-500	4-30	20-85
Treated wastewater [Mitchell et al., 2002]	8-80	11-250	-	6.1-44.2
Raw Stormwater [Duncan, 1999]	14	152	0.42	2.4
Treated stormwater (Wetland)	-	6	0.06	1.0
Forest surface runoff	-	1.9	0.08	0.84
ANZECC Lowland River	-	-	0.05	0.5

1.2 Fyshwick Sewage Treatment Plant

The water balance for Fyshwick is summarised in Figure 4.

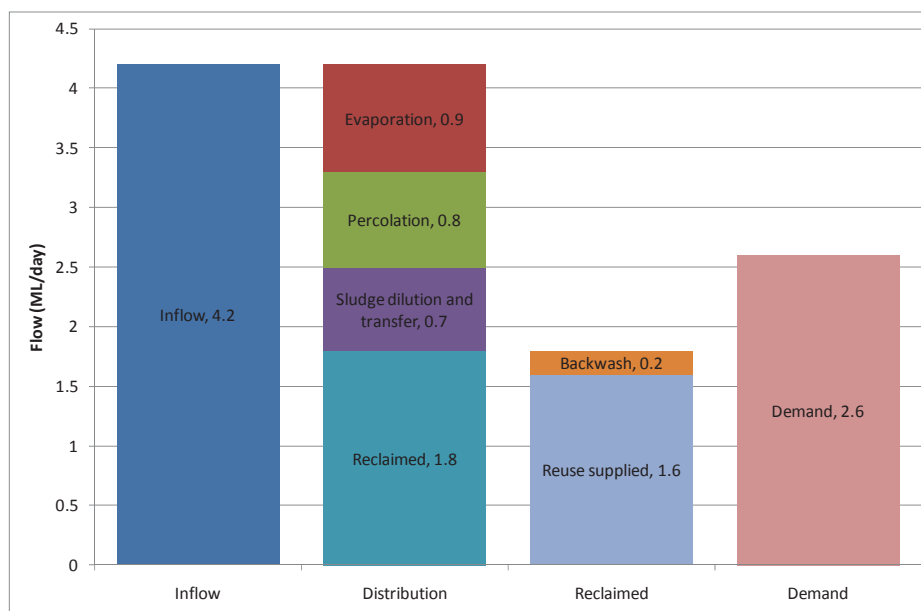


Figure 4 Water balance for Fyshwick (2006-2008)

The volumes and costs for the two wastewater treatment plants are summarised in Table 3.

Table 3 Summary of sewage treatment plants [ActewAGL, 2010a]

Scheme	Inflow volume (ML/year)	Reuse potential (ML/year)	Currently reused (ML/year)	Unmet demand (ML/year)	Cost per kL (\$)
Lower Molonglo	34,300	28,200	3,870	-	\$0.70
Fyshwick	1,500	300	190	130	\$3.50-\$4.00
Southwell Park (Sewer mining)	-	-	20*	20	\$13-\$15
Total	35,800	28,500	4,080	150	-

1.3 Stormwater reuse schemes

The data for existing stormwater ponds and lakes are summarised in Table 4 while those for proposed ponds and lakes are summarised in Table 5.

Table 4 Existing ponds and lakes with potential for stormwater harvesting

Storage	Storage number	Storage capacity (kL)	Estimated inflows (kL/year)
David St Wetland	1	3,025	229,700
Jarramlee (Dunlop 1)	2	13,970	108,500
Fassifern (Dunlop 2)	3	13,910	52,400
Gordon Pond	4	11,900	20,288
Gungahlin and Yerrabi Ponds	5	998,340	3,475,473
Lake Ginninderra	7	3,555,200	5,500,000*
Lake Tuggeranong	8	2,767,500	6,128,500
Lower Stranger Pond	9	61,560	851,300
Nicholls Pond	10	48,000	134,200
Point Hut Pond	11	336,000	1,207,700
Upper Stranger Pond	13	45,100	717,500
West Belconnen Pond	14	100,000	230,100
Banksia St Wetland	17	40,000	-
Inner North (Flemington Ponds)	18	58,113	1,196,000**
Coombs Pond A		45,000	0
Coombs Pond B		215,000	0

*Based on calibration estimate, CSIRO estimate: 9,527,400, GHD estimate: 3,850,000

**Estimated yield from Pond 1, Pond 2 and Dickson and Lyneham wetlands

Table 5 Proposed ponds and lakes with potential for stormwater harvesting

Storage	Storage number	Storage capacity (kL)	Estimated inflows (kL/year)
B1	20	234,400	240,012
B14	21	1,728	1,235,700
B2	22	194,080	1,621,953
B24	23	203,698	279,847
B28	24	8,220	480,600
B3	25	74,768	376,199
B37	26	287,066	173,529
G23	27	10,540	946,100
G25	28	0	103,597

Storage	Storage number	Storage capacity (kL)	Estimated inflows (kL/year)
NC1	29	8,000	27,704
NC12	30	27,000	10,585
NC12A	31	14,400	83,774
NC13	32	16,500	93,078
NC14	33	37,900	447,800
NC18	34	16,750	1,508,000
NC2	35	6,000	14,167
NC3	36	12,000	11,019
NC4	37	16,000	97,951
NC5	38	16,000	80,265
NC6	39	8,250	21,828
NC7A	40	10,000	122,423
NC8	41	7,500	55,968
NC9-11	42	13,580	746,700
T1	43	0	157,581
T2	44	35,660	550,100
T3	45	28,000	971,200
T4	46	9,260	1,350,400
North Weston Creek Pond	47	240,000	3,595,700
W19	48	61,680	1,095,200
W2	49	6,892	3,672,000
W26	50	0	248,960
W27	51	49,240	775,200
WC0	52	65,700	2,351,300
WC13	53	0	544,793
WC14/15	54	6,024	448,000
WC17	55	0	456,388
WC19	56	8,240	209,000
WC2	57	0	1,815,252
WC20-1	58	0	148,511
WC20-2	59	0	46,184
WC20-3	60	0	41,210
WC23	61	0	55,156
WC3	62	0	1,357,644
WC4	63	16,410	1,741,500
WC9	64	0	662,231

*Numbering based on CSIRO [Maheepala et al., 2009]

