

WATER RESOURCES AND SEWERAGE

WATER RESOURCES AND THEIR CONTROL

Ministry of Water Resources and Water Supply

The Ministry of Water Resources and Water Supply was established under the *Water Resources Act 1975* for the purpose of ensuring that the water resources of the State are utilised in the most efficient manner.

The *Water Resources Act 1975* vested in the Minister of Water Supply the administration of the *Water Act*, the *Melbourne and Metropolitan Board of Works Act* (in respect of water, sewerage, and drainage functions), the *Geelong Waterworks and Sewerage Act*, the *Latrobe Valley Act*, the *Mildura Irrigation and Water Trusts Act*, the *West Moorabool Water Board Act*, the *Dandenong Valley Authority Act*, the *Sewerage Districts Act*, the *Groundwater Act Part V*, the *River Improvement Act*, and the *Drainage of Land Act*.

As part of the Ministry, there is a Water Resources Council, consisting of eleven members appointed by the Governor in Council and comprising the Director of Water Resources who is chairman; the three commissioners of the State Rivers and Water Supply Commission; the chairman, secretary, and engineer-in-chief of the Melbourne and Metropolitan Board of Works; a representative or nominee from each of the Waterworks Trust Association of Victoria, the Victorian Irrigators Central Council, and the Ministry for Conservation, and the Co-ordinator of Works from the Victorian Treasury. The functions of the Council are to investigate and advise the Minister generally on matters pertaining to the water resources of the State or to water supply, drainage, or sewerage throughout Victoria, referred to it by the Minister.

During 1980, the Ministry was involved in a number of new and on-going studies, including:

- (1) *Study into institutional arrangements*. This study was aimed at investigating the responsibilities and activities of the various Authorities involved in water management in Victoria with a view to identifying areas of overlapping and conflicting interest.
- (2) *Urban Water Services Financing Study*. This study was concerned with assessing both the capital requirements for urban water and sewerage services in Victoria to the year 2000, and the implications of alternative financing methods for selected urban centres.
- (3) *Thomson River Biota Study*. This on-going study, which commenced in 1979, assesses the impact of construction sediment and flow regulations upon the substrata and biota downstream from the Thomson River dam site.
- (4) *Development of a sewerage strategy for the Yarra Valley*. The Victorian Government has adopted a report by the Water Resources Council recommending provision of reticulated sewerage systems for all urban areas in the Upper Yarra Valley, except where septic tank effluents can be contained on allotments.
- (5) *Nutrient reductions trials*. A twelve-month pilot study of alternative nutrient reduction processes for sewage effluent, has commenced at the Lilydale Sewerage Authority. Results of the study will determine which process is adopted at Lilydale and will also have State-wide application.

(6) *Commonwealth Grants Commission*. In 1980, the personal income tax sharing arrangements between the Commonwealth and the States provided for a certain fixed percentage of personal income tax collections to be allocated to the States as a whole (39.87 per cent). The distribution of this amount between the States is governed by a set of relativities established by the Commonwealth Government. For largely historical reasons Victoria's percentage share is much less than its population share.

The purpose of the current Commonwealth Grants Commission Inquiry is to review the tax sharing and determine whether changes in the relativities are desirable. The Office of the Director of Water Resources undertook the task of co-ordinating and preparing the submission to the Commonwealth Grants Commission for the Victorian water resources sector. This involved the preparation of several major reports illustrating Victoria's position relative to the other States and participation at the public hearings held in Melbourne. The final judgements of the Commonwealth Grants Commission was due to be made in mid 1981.

(7) *Reclaimed Water Committee*. Timber growth trials conducted at Mildura, Horsham, and Robinvale are continuing to determine the feasibility of growing native trees on land irrigated with sewage effluent. Vegetable growth trials are also being conducted to determine the feasibility of growing vegetables on land irrigated with sewage effluent. Associated investigations are also being carried out to determine the health effects resulting from such re-use, particularly the possibility of toxic heavy metal accumulation in the vegetables and the retention of pathogenic bacteria and viruses.

Further references: *Water resources and their control*, *Victorian Year Book* 1977, pp. 373-4; 1979, pp. 291-2

MELBOURNE AND METROPOLITAN BOARD OF WORKS

Introduction

The Melbourne and Metropolitan Board of Works is the authority for providing water supply, sewerage, and main drainage services to the Melbourne metropolitan area. It is also Melbourne's metropolitan planning authority. The formation of a body such as the Board was urged by an 1889 Royal Commission into Melbourne's sanitary conditions after continuous agitation by local municipalities for a sewerage system in the city. The Board was constituted by an Act of the Victorian Parliament in 1890 and began operations in July 1891. Its initial functions were to provide a sewerage system for Melbourne and the metropolitan area, and to assume responsibility for the city's water supply, previously administered by the Public Works Department.

In the years since its inception, the Board, in addition to assuming responsibility for main drainage, has also been made responsible for maintenance and improvement of metropolitan rivers and watercourses, town planning, and metropolitan parks. With the exception of town planning, the Board's responsibilities are laid down in the *Melbourne and Metropolitan Board of Works Act* 1958 (as amended). Until 1 August 1978, the Board comprised 54 unpaid commissioners, a full-time elected chairman, and from 1975, a deputy chairman. Commissioners who were required to be members of a municipal council, could not hold their seats for more than three years without reappointment, while the maximum term for the chairman was four years before his appointment was reviewed. The deputy chairman's term was also for four years. Following recommendations by a Board of Inquiry, the composition of the Board was changed on 1 August 1978. It now comprises a full-time appointed chairman and six part-time members, four elected by area commissions comprising groupings of municipalities and two appointed by the Victorian Government. Their appointments are for four-year terms.

Acts of the Victorian Parliament empower the Board to levy four rates annually: the water rate, metropolitan general rate (for sewerage services), metropolitan drainage and river improvement rate, and the metropolitan improvement or planning rate, all of which are based on net annual valuations of rateable properties but subject to specified minimum charges. The incoming revenue is used to operate and maintain the water, sewerage, and main drainage systems, to pay interest and redemption charges on loans raised for capital works, and to meet administrative expenses.

The proceeds of the metropolitan improvement rate meet annual expenditure for town planning, the Board's statutory contribution towards financing the Melbourne

underground rail loop, payments of compensation for lands reserved under the Metropolitan Planning Scheme, and for metropolitan parks. The capital works of the Board are financed mainly from money which the Board is given approval to borrow after the annual meeting of the Australian Loan Council has considered the projected loan programmes of semi-governmental authorities throughout Australia.

Further reference: Board of Inquiry into the Melbourne and Metropolitan Board of Works, 1977, *Victorian Year Book*, 1980, pp. 304-6

Melbourne's water storages

Water to Melbourne and the metropolitan area is supplied from seven storage reservoirs drawing on the water resources of mountain catchment areas. Pipelines carry the water from on-stream storages distant from the city to off-stream storages located around the perimeter of the metropolitan area. Water is then conveyed to service reservoirs and elevated tanks throughout the suburbs for distribution to consumers.

When the Upper Yarra Dam was completed in 1957, the capacity of the storage reservoirs serving the supply system was increased to 296,000 megalitres, comprising Yan Yean Reservoir (30,000 megalitres), Maroondah (22,000), O'Shannassy (4,000), Silvan (40,000), and Upper Yarra (200,000).

In the 23 years since Upper Yarra was commissioned, this storage capacity has more than doubled to 704,000 megalitres by construction of Greenvale (27,000 megalitres), Cardinia (287,000 megalitres), and Sugarloaf (95,000 megalitres). Work is under way on a new major reservoir on the Thomson River, in Gippsland, which will add another 1.1 million megalitres of water storage and give Melbourne, by the mid 1980s, a supply system with a storage capacity equivalent to three times the expected annual demand.

Other major works undertaken since 1957—and particularly following the severe drought of 1967-68—include duplication of the transfer main between the Upper Yarra and Silvan Reservoirs; diversion of several Yarra tributaries into the supply system; construction of the Yarra Valley Conduit to further increase transfer capacity between Upper Yarra and Silvan; construction of a transfer main between Silvan and Cardinia Reservoirs, as well as transfer mains from Cardinia to Dandenong, and from Dandenong to Notting Hill; and the Thomson Diversion Tunnel and Easton and Swingler Diversion Works to transfer water from the Thomson River to the Upper Yarra Reservoir. Major works currently in progress include the Sugarloaf Dam, with associated pumping station and water treatment works, and construction of the Thomson Dam.

The completion of the Greenvale (1971) and Cardinia Reservoirs (1973) added another 314,000 megalitres to the storage capacity of the metropolitan water supply system, bringing this capacity to its current level. Greenvale and Cardinia are off-stream storages in the sense that they are located on watercourses with little catchment of their own and hence are filled from external sources, i.e., the on-stream storages.

Greenvale Reservoir is on Yuroke Creek, a branch of the Moonee Ponds Creek in the north of the city, and serves Melbourne's north-western and western suburbs to Werribee. Greenvale is supplied by pipeline from the Silvan Reservoir near Monbulk in the Dandenong Ranges, east of Melbourne. Silvan stores water from the O'Shannassy, Upper Yarra, and Thomson systems.

Cardinia is by far the biggest of the Board's storages with a capacity of 287,000 megalitres. It supplies Melbourne's south-eastern suburbs as far south as the boundary of Frankston and is fed from the Upper Yarra system via a pipeline from the southern end of Silvan Reservoir. Supply to Silvan is supplemented by the new Yarra Valley Conduit from the Upper Yarra Reservoir which enables water diverted into the Upper Yarra from the Thomson River to be transferred to Cardinia Reservoir. This system also provides a marked degree of regulation of water from the Thomson River pending construction of the Thomson Dam.

Cardinia, with its large storage, supplies water to both the Dandenong and Notting Hill service reservoirs. The main dam embankment, with a base width of 303 metres, is rockfill with an impervious earth core. It has a maximum height of 86 metres, a crest length of 1,542 metres and contains about 3.7 million cubic metres of earth and rock. Cardinia started filling in 1973 and filled for the first time late in October 1977. The reservoir,

which was designed by the Snowy Mountains Engineering Corporation, has a shoreline of about 56 kilometres and a surface area of more than 1,295 hectares.

In mid 1973, the Victorian Government announced a dam-building programme aimed at further increasing the storage capacity of Melbourne's water supply system. Included in this programme is the Thomson Reservoir as the main component of the third stage of the Board of Works' largest water supply project to date—the diversion of water from the Thomson River, about 170 kilometres east of Melbourne, into the Upper Yarra system. Construction work on the Thomson project started in 1969 and the first stage—allowing diversion of water from the Thomson through a 19.6 kilometre tunnel to Fehrings Creek, a tributary of the Yarra—was commissioned in September 1974. Water from the Thomson was diverted into the tunnel, then into the Yarra River via Fehrings Creek. From the Yarra, the flow entered the Upper Yarra Reservoir. Stage two of the project involved extending this tunnel at both its western and eastern ends. The western extension carried the tunnel to the Yarra River near the Reservoir, thereby superseding the outlet into Fehrings Creek. The eastern tunnel extension allows diversion of flow from the Thomson at a point known as Swingler, just below the confluence of the Thomson and Jordan Rivers, thus making use of a larger catchment area. Incorporating a concrete diversion dam at Swingler, stage two was completed early in the second half of 1977. The major component of the third stage of the Thomson Diversion Scheme is a large storage on the Thomson River, north of Erica, to be formed by the Thomson Dam. When completed, this dam will be about 160 metres high and the earth and rockfill structure will form a reservoir inundating about 2,200 hectares. The dam will impound about 1.1 million megalitres and the proposed reservoir will extend for some 20 kilometres north of the wall.

A final decision to proceed with the Thomson Dam and its associated works was made by the Victorian Government early in 1976 after a study of the environmental implications during both the construction and operation of the dam. During the study, members of the public were able to make written submissions, either as individuals or collectively, on any aspect of the investigation, and these submissions were taken into account during preparation of the final report and recommendations. Apart from the Thomson Dam, the works involved in the third and final stage of the Thomson scheme entail an extension of the Thomson-Yarra diversion tunnel in a south-easterly direction for about 5.5 kilometres from Swingler to emerge within the proposed Thomson Reservoir, and allowing water to be transferred to the Upper Yarra system as required, as well as outlet works in the Thomson Dam for the release of water for other uses downstream. Excavation of the tunnel and construction of the dam embankment and associated works is proceeding. The Thomson Reservoir will store water during wetter years when inflows are high and thus ensure an adequate water supply for Melbourne during drier years. This will enable the Board to operate its available storages much more efficiently than would be possible without a large back-up storage such as the Thomson. In addition, the dam will provide regulation of the stored water to supplement the variable flows in the Thomson River for the irrigators and water users in the Thomson Valley.

The augmentation programme announced in 1973 also included the Sugarloaf Reservoir Project (95,000 megalitres live capacity), which will develop the resources of the Yarra River at Yering Gorge and the nearby Maroondah aqueduct. Commissioned in November 1980, the Sugarloaf scheme comprises an intake and pumping station on the Yarra in Yering Gorge; a "pressure tunnel" from the pumping station to the reservoir; a draw-off structure and tunnel from the reservoir to carry water to a pumping station below the main dam wall; a pipeline rising from this pumping station to a water treatment plant; a "clearwater" storage basin adjacent to the treatment plant; and a pipeline from the storage basin through which treated water is transferred to the supply system.

The main dam has a wall 85 metres high and 1,000 metres long which will impound 95,000 megalitres of water and is flanked by two smaller saddle dams. Comprehensive treatment of Sugarloaf water is necessary because it is drawn from a habitated catchment. The treatment plant is located close to the southern end of the main dam. It uses conventional water treatment methods in which chemicals are added to clarify water which is then filtered and chlorinated. As with the rest of Melbourne's water supply, water from Sugarloaf will be fluoridated in line with the requirements of the *Health (Fluoridation) Act 1973*.

Sugarloaf supplies the northern and western suburbs of Melbourne and thus reduced the demand on Silvan Reservoir. Water is conveyed to homes and industry in the Melbourne metropolitan area from various service reservoirs situated in convenient places so that an adequate pressure can be maintained in the mains. There are 86 service reservoirs and tanks with a combined capacity of 2,187 megalitres. Underground distribution and reticulation mains convey the water from the service reservoirs to its point of use.

As part of its water supply catchment management programme, the Board is carrying out extensive forest hydrology research at Coranderk and North Maroondah, two eucalypt forest areas north and south of Healesville. The experiments are designed to determine a scientifically based, efficient catchment management policy related to water yield and quality. At Coranderk, the effects of two different timber harvesting operations applied to mature eucalypt forests are being monitored, while at North Maroondah studies are being made to assess the effects of a regenerated eucalypt forest on water yield.

In the interest of preserving water quality, public access to the Board of Works' forested catchment areas is not allowed, but there are picnic and passive recreational facilities at all the Board's storages except the O'Shannassy Reservoir. Public access is also available to four smaller reserves — Donnelly's Weir, Coranderk Weir, Fernshaw, and the top of Black Spur. All the reserves are easily reached by car.

Total water consumption for 1978-79 was 393,626 megalitres, which was less than the record consumption of 402,600 megalitres for the previous year. Rainfall over the catchment area averaged 1,347.8 mm, compared with the long-term average of 1,349.7 mm. Substantial spring and early summer rains were followed by a dry autumn and winter.

At 30 June 1979, there were 815,486 properties or an estimated 2,479,000 persons in Melbourne supplied with reticulated water.

VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
WATER SUPPLY SYSTEMS: STREAMFLOW YIELDS
(megalitres)

Year	Yan Yean	Maroondah	O'Shannassy	Upper Yarra	Thomson	Total water yield
1975-76	23,000	91,400	152,400	230,900	47,200	544,900
1976-77	21,600	104,400	120,400	219,500	80,000	545,900
1977-78	20,800	79,400	109,200	216,900	67,100	493,400
1978-79	25,400	109,700	103,900	227,900	75,900	542,800
1979-80	14,300	72,800	79,900	122,400	76,800	366,200

Further references: Thomson-Yarra Development Scheme. *Victorian Year Book* 1974, p. 253; Cardinia Reservoir, 1975, pp. 188-9; Lower Yarra Development Scheme, 1979, pp. 295-6

Cost of water supply system

The cost of capital works in respect of the water supply system under the control of the Board is shown in the following table for each of the years 1974-75 to 1978-79:

VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
CAPITAL OUTLAY ON WATERWORKS
(\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79
Yan Yean system (including Greenvale)	320	82	45	42	30
Maroondah system (including Watson's Creek and Sugarloaf)	802	8,574	21,286	42,355	55,435
O'Shannassy, Upper Yarra, and Thomson system (including Silvan and Cardinia)	36,678	23,041	28,473	22,657	19,297
Service reservoirs	1,627	4,523	3,686	4,704	4,904
Large mains and pumping stations	3,690	14,086	18,488	19,330	9,470
Reticulation	5,963	8,766	9,590	17,712	12,566
Afforestation	22	6	21	20	—
Investigations, future works	1,917	Cr. 91	1	Cr. 154	Cr. 209
Total outlay	51,019	58,987	81,590	106,666	101,493

Consumption of water

During the year ended 30 June 1979, the maximum consumption of water in Melbourne and suburbs on any one day was 2,297 megalitres on 3 February 1979, and the minimum consumption was 694 megalitres on 25 December 1978.

The following table shows, for each of the years 1974-75 to 1978-79, the number of properties supplied with water and sewers, the quantity of water consumed, the daily average consumption, the daily average consumption per head of population served, etc.:

VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS: WATER CONSUMPTION AND SEWERAGE CONNECTIONS

Year	Improved properties supplied with water at 30 June	Total annual consumption of water	Consumption of water on any one day		Daily average of annual consumption of water	Daily consumption of water per head of population served	Improved properties for which sewers were provided at 30 June
			Maximum	Minimum			
	number	megalitres	megalitres	megalitres	megalitres	litres	number
1974-75	809,372	355,625	2,274	620	974	393.66	640,165
1975-76	829,941	384,058	2,290	658	1,049	418.56	662,912
1976-77	850,834	381,489	2,273	638	1,045	423.59	689,336
1977-78	868,640	402,632	2,399	705	1,103	444.08	716,670
1978-79	875,485	393,626	2,297	694	1,078	434.85	748,787

Sewerage system

The cost of sewerage works during each of the years 1974-75 to 1978-79, is shown in the following table:

VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS: CAPITAL OUTLAY ON SEWERAGE SYSTEM (\$'000)

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79
Farm purchase and preparation	560	898	742	574	1,235
Treatment works	11,425	10,409	7,458	4,942	4,164
Outfall sewer and rising mains	1,430	393	354	89	Cr.214
Pumping stations, buildings, and plant	2,772	1,969	921	1,207	1,491
Main and branch sewers	43,301	45,249	33,575	14,368	9,669
Reticulation sewers	20,067	26,554	30,667	50,378	46,621
Sanitary depots	—	—	3	61	Cr.15
Investigations	1,437	Cr.121	11	56	Cr.48
Total outlay	80,992	85,351	73,731	71,675	62,903

Disposal of nightsoil from unsewered premises

The responsibility for the collection, removal, and disposal of nightsoil from unsewered premises within the Melbourne metropolitan area was transferred from the individual municipal councils to the Melbourne and Metropolitan Board of Works by legislation in 1922. By agreement, each council pays to the Board a prescribed amount per annum to offset the cost of the service, etc. For the year 1978-79, working expenses were \$316,049, costs of conveying and treatment \$140,170, and investment \$46,407, making a total of \$502,626. Revenue was \$518,476, giving a surplus of \$15,850.

Drainage

The Board has been responsible for main stormwater drainage in the Melbourne metropolitan area since 1923. The current drainage area under the Board's control covers some 1,400 square kilometres. Besides being responsible for underground drains and the smaller creeks and watercourses, the Board also has responsibility over the metropolitan rivers within the drainage area. However, considerable portions of the catchments of these rivers are outside the Board's area of jurisdiction, a situation which has caused many problems. Local drainage responsibilities, those areas draining less than about 60 hectares, rest with the respective municipal councils.

The drainage functions of the Melbourne and Metropolitan Board of Works are aimed at the control of flooding, erosion, and pollution and include construction of works, maintenance of works and natural channels, and policing of regulations. Total prevention of flooding is not financially feasible so efforts are directed towards control and minimisation of the effects. Structural measures such as pipes and channels considerably improve the hydraulic efficiency of a waterway. (Lined channels are often used to overcome the susceptibility of many of Melbourne's soils to erosion.) However, such solutions are not always viable, feasible, appropriate, or desirable. Alternative solutions such as retarding basins have been successfully provided and 25 such basins are operated by the Board. A retarding basin is a reservoir, normally empty, having an outlet, always open, which is smaller than the inlet. During high flows the constriction holds back some of the flow and this only gradually escapes to the downstream system as the inflow subsides.

Other measures to minimise flooding take the form of regulations. The prevention of building in flood prone areas, the setting of designated flood levels which control floor levels in new buildings, and the restriction of filling in flood plains which uses up valuable natural flood storage, are examples of such regulations.

The Board carries out continual maintenance to ensure the required waterway area is always available. Such maintenance includes the removal of sedimentation, erosion prevention measures, clearing debris and rubbish, and de-snagging. In so doing the appearance of the creeks and watercourses is preserved and dangerous areas eliminated.

The Board is also the delegated agency of the Environmental Protection Authority in regard to pollution of the rivers, creeks and drains in the Melbourne metropolitan area. These responsibilities include conditional licensing of trade and industrial waste discharges, monitoring and analysing samples, and reporting any infringement or illegal discharge to the Authority.

At 30 June 1980, the total length of constructed drains under the Board's control was 518 kilometres.

Finance

Assessed value of property

The net annual value of property in 1977-78 and 1978-79 for the purpose of the Board's rating is shown in the following table:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
ASSESSED VALUE OF PROPERTY RATED
(\$m)**

Rate	Net annual value of property	
	1977-78	1978-79
Water rate	1,641.5	1,677.9
Metropolitan general rate (for sewerage services)	1,321.6	1,374.5
Metropolitan drainage and river improvement rate	1,360.6	1,382.6
Metropolitan improvement rate	1,668.9	1,706.5

Finance for capital works

Capital works are financed mainly from money which the Board is given approval to borrow after the annual meeting of the Australian Loan Council has considered the projected loan programmes of semi-governmental authorities throughout Australia.

Board's borrowing powers and loan liability

The Board is empowered under section 187 of its Act to borrow up to \$2,000m, exclusive of loans of \$4.8m originally raised by the Victorian Government for the construction of waterworks for the supply of Melbourne and suburbs. In addition, the Board may, under section 200 of its Act, receive advances by way of loan from the Treasurer of Victoria, and the value of these loans is not included in the limit of \$2,000m quoted in section 187. At 30 June 1979, the Board's total loan liability amounted to \$1,387.1m, of which \$1,126.9m had been incurred under section 187. All money borrowed is charged and secured upon the Board's revenues.

Revenue, expenditure, etc.

The following table shows the revenue, expenditure, surplus or deficit, and capital outlay of the Board in respect of its water supply, sewerage, and drainage functions during each of the years 1974-75 to 1978-79. The Board keeps a separate account of its financial activities as the Metropolitan Planning Authority.

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
REVENUE, EXPENDITURE, ETC.
(\$'000)**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79
REVENUE					
Water supply—					
Water rates and charges (including revenue from water supplied by measure)	44,960	57,140	67,189	73,951	82,037
Sewerage—					
Sewerage rates	57,688	73,237	84,228	92,390	103,792
Trade waste charges	3,471	5,033	6,681	7,411	7,989
Sanitary charges	1,280	1,456	2,423	2,712	3,042
Metropolitan farm—					
Grazing fees, rents, pastures, etc.	3	4	3	2	4
Balance, livestock account	Dr. 263	Dr. 4	229	421	1,279
Metropolitan drainage and rivers—					
Drainage and river improvement rate	8,366	10,353	11,870	13,697	15,541
River water charges	16	11	12	16	18
Total	115,521	147,231	172,635	190,600	213,702
EXPENDITURE					
Water supply—					
Management	6,394	7,690	8,694	10,445	12,087
Maintenance	11,531	14,158	16,488	18,847	20,819
Water supply works	1,400	1,652	1,652	1,652	1,932
Sewerage—					
Management	9,232	9,617	10,755	13,144	13,754
Maintenance	11,364	15,320	19,599	22,102	24,747
Sewerage works	2,600	3,068	3,068	3,068	3,588
Metropolitan farm—					
Management	465	658	813	884	941
Maintenance	2,118	2,548	2,992	3,383	3,751
Metropolitan drainage and rivers—					
Management	1,053	1,588	1,735	2,165	3,164
Maintenance	2,734	3,421	4,162	4,691	4,705
Drainage works	1,000	1,180	1,180	1,180	1,380
Pensions and allowances	404	513	844	—	—
Loan flotation expenses	628	720	1,128	672	1,593
Interest (including exchange)	51,708	64,161	74,246	89,052	106,304
Contributions to—					
Sinking fund	2,210	2,408	2,727	3,172	3,693
Loans redeemed reserve	4,955	5,610	6,436	7,159	7,850
Renewals fund	1,151	1,466	1,796	2,449	3,168
Depreciation	320	1,015	1,019	372	299
Superannuation account	3,123	4,505	4,965	5,317	5,653
Municipalities for valuations, etc.	273	279	265	444	442
Rates equalisation reserve	858	3,674	4,371	202	Cr. 6,468
Appropriations for contingencies, etc.	—	1,880	3,200	200	300
Other	—	100	500	—	—
Total	115,521	147,231	172,635	190,600	213,702
Capital outlay at 30 June—					
Water supply	375,356	434,343	515,931	622,597	724,091
Sewerage	541,686	627,037	700,769	772,445	835,348
Drainage and river improvement works	57,104	66,139	74,098	83,343	91,981

Town planning, metropolitan freeways, etc.

As a result of the passing of the *Metropolitan Bridges, Highways, and Foreshores Act 1974* by the Victorian Parliament, the Board's road-making powers, road assets, etc., and certain officers and other employees were transferred to the Country Roads Board, on 1 July 1974.

Also, under the same Act, the Board's responsibility for foreshores reverted to the Public Works Department.

In respect of its town planning functions, the Board now operates under the authority of the Minister for Planning.

The following table summarises the revenue, expenditure, and capital outlay of the Board in connection with its functions as the Metropolitan Planning Authority during the period 1974-75 to 1978-79:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
METROPOLITAN IMPROVEMENT FUND: REVENUE ACCOUNT
AND CAPITAL OUTLAY
(\$'000)**

Particulars	1974-75	1975-76	1976-77	1977-78	1978-79
REVENUE					
Metropolitan improvement rate and sundry income	12,438	14,972	16,344	17,447	17,995
Recoup from Country Roads Board	1,026	—	—	—	—
Sales of land	2,042	5,225	1,644	4,781	2,766
Other	993	665	19	—	—
Total revenue	16,499	20,863	18,007	22,228	20,761
EXPENDITURE					
Management	2,936	4,249	4,576	4,864	5,650
Maintenance	42	38	305	453	757
Interest	73	77	120	210	51
Contributions to sinking fund	24	Cr. 24	—	—	—
Reserved land and acquisitions	8,615	4,759	5,557	2,409	7,084
Metropolitan parks land acquisitions	3,170	3,812	6,080	6,629	2,775
Special Road Projects acquisitions, etc.	553	553	—	—	—
Construction works	81	308	894	1,451	1,284
Road and foreshore works	—	—	—	—	—
Contribution to Melbourne Underground Rail Loop Authority	721	1,261	1,372	2,250	3,036
Transfer to rates equalisation fund	61	5,469	Cr. 1,289	3,540	Cr. 337
Other	222	361	392	422	461
Total expenditure	16,499	20,863	18,007	22,228	20,761
Capital outlay at 30 June	41,213	44,825	55,591	61,238	69,498

STATE RIVERS AND WATER SUPPLY COMMISSION

Operations

The State Rivers and Water Supply Commission was constituted under the Water Act passed by the Victorian Parliament in 1905. Under the provisions of the Act, the Commission was made responsible for the conservation and distribution of Victoria's water resources and control of the waters from rivers and beds and banks of streams and the control of the other natural sources outside of the Melbourne metropolitan area.

Following a Royal Commission on water supply, the Victorian Parliament passed the Irrigation Act of 1886 which vested the right to the use and control of all surface waters of Victoria in the Crown. This Act also provided for the establishment of irrigation trusts. Within a few years, large areas of Victoria were included in their districts. Inadequate water conservation, divided control of water resources, insufficient charges, and irregular revenue because water was used on a large scale only in dry years, caused most of the trusts to fail. Their failure made clear the need for a single authority to manage the State's water resources and resulted in the formation of the State Rivers and Water Supply Commission.

In recent years the Commission's role has broadened. The *Groundwater Act 1969* gave the Commission additional responsibilities in regard to control of underground water. Amendments to the Local Government Act in 1973 extended the Commission's powers over sub-division of land. Prior to the amendment, the Commission's approval was only required for sub-divisions within irrigation districts: its approval is now required for all sub-divisions outside the Melbourne metropolitan area. The *Drainage of Land Act 1975*

conferred on the Commission additional powers relating to the drainage of land, and management of flood plains, outside the Melbourne and Metropolitan Board of Works and Dandenong Valley Authority areas.

The Commission comprises three commissioners appointed by the Governor in Council. It currently employs a permanent workforce of 1,837 persons throughout Victoria, and up to 1,300 casual employees according to the demand for labour on Commission works. About 450 personnel on the permanent staff are engaged in engineering, surveying, drafting, and other professional occupations, a further 490 are engaged in water distribution, district operations and maintenance, and another 510 are engaged in accounting and administrative functions. Of the casual labour force of 1,177 persons, 279 are engaged on construction projects and 822 on district maintenance, and 76 on miscellaneous works.

In addition to the administration of flood protection, drainage, and river improvement works throughout Victoria, more than 60 large storages, 320 subsidiary reservoirs, and 30,000 kilometres of channels and pipelines are operated by the Commission to supply water for irrigation, stock and domestic purposes, and reticulated town supplies. All these works were designed and constructed, and are operated and maintained, by the Commission. Delivery of irrigation water totalled 2,848,719 megalitres for 1979-80.

The Commission's engineering functions are divided between the following four Branches, each under the control of a chief engineer:

- (1) Major Works Branch is responsible for investigation, survey, design, and construction of major projects, maintenance and operation of major storages, and planning and laboratory services;
- (2) Rural Water Supplies Branch is responsible for design of works and operation and maintenance of irrigation, drainage, flood protection, and river improvement districts;
- (3) Town Water Supplies Branch is responsible for the construction, operation, and maintenance of urban water supply systems, as well as engineering and financial supervision of local water supply and sewerage authorities; and
- (4) Mechanical Services Branch is responsible for the design, construction, and maintenance of the Commission's mechanical and electrical engineering works as well as supervising the Commission's plant and vehicle fleets.

Support services to these Branches are supplied by the Finance, Accounts, Stores, Personnel, Property and Legal Services, Valuations, and Secretarial Branches of the Commission.

Outside the Melbourne metropolitan area there are now 450 towns served by a reticulated water supply scheme, of which 127 are managed by the Commission and the remaining 323 are managed by 204 local water authorities. There are also 139 sewerage authorities, 28 river improvement trusts, and 4 drainage trusts serving Victoria outside the Melbourne metropolitan area.

Other services offered by the Commission include: irrigation and agricultural extension services, such as surveying, irrigation land layout, and surface and underground drainage layout; salinity control; licensing and control of private diversions from rivers and streams and from underground sources; and assessment, licensing, and policing of discharges to water outside the Melbourne metropolitan area. The Commission has also developed, patented, and arranged for the manufacture under licence of small control structures, both manual and automatic, for use in farm (terminal) channels.

VICTORIA—MAJOR WATER SUPPLY PROJECTS COMPLETED, 1970-79

Project	Features
Lake William Hovell	Earth and rockfill dam, storage 13,500 megalitres
Merrimu Tunnel Stage 2 (Lerderderg River to Goodmans Creek)	Tunnel 4 kilometres long, 2.7 metres diameter
Barr Creek Salinity Lake Hawthorn Salinity Lake Mokoan	} Salinity control on Murray River
Rosslynne Reservoir	Earth and rockfill off-river storage, capacity 365,000 megalitres
	Earth and rockfill dam, storage 24,500 megalitres

VICTORIA—MAJOR WATER SUPPLY PROJECTS COMPLETED, 1970-79—*continued*

Project	Features
South Otway Pipeline	55 kilometres concrete-lined mild-steel pipeline of 500 mm diameter
Tarago-Western Part Pipeline	65 kilometres concrete-lined steel pipeline of 1,100 mm diameter
Tarago Reservoir Enlargement	Construction of concrete wave wall on top of spillway — new capacity 37,500 megalitres
Millewa Domestic and Stock Scheme	Replacement of channels with pipelines — serves 227,000 hectares
Dartmouth Dam	Earth and rockfill dam storage — capacity 4,000,000 megalitres

Water pollution control

The Commission's Pollution Control Section was established in 1973 to exercise powers delegated to the Commission by the Environment Protection Authority to control water pollution in country areas, excluding the La Trobe, Dandenong and Yarra Valleys, and also excluding direct discharges to marine waters.

Pollution inspectors are based at Melbourne, Wodonga, Shepparton, Bendigo, Ballarat, Frankston, Geelong, and Warrnambool. The inspectors at Frankston, Shepparton, Geelong, and Bendigo work under the supervision of the local district engineer in close liaison with Pollution Control Section. The inspectors have been recruited from positions in health inspection, waste treatment, laboratory work, inspection and pollution control in other government departments, and technical teaching. On appointment, inspectors undergo intensive training for two to three months at Head Office before working in the field. Initial training is reinforced by bi-monthly training programmes that facilitate co-ordination of inspectorial activities throughout Victoria. Inspectors also participate in training programmes conducted by the Environment Protection Authority and the Ministry of Water Resources and Water Supply's Sewerage Operator Training Centre at Werribee.

Policy on some discharges, such as town drainage and sewerage overflows, are still under consideration. Septic tank discharges directed to ground absorption fields and retained within the curtilage of the property are exempt from the licensing requirements of the *Environment Protection Act* 1970. Environment Protection (Service Station and Vehicle Wash) Regulations 1980 have been promulgated to control discharges from these facilities, and were planned to come into operation on 1 December 1980. Dairy, piggery, and poultry farm wastes continue to be disposed of on land as fertiliser, and under these circumstances these discharges are exempt from the licensing provisions of the *Environment Protection Act*.

Proposed expenditure on major works, urban water supply, sewerage, environmental protection, and water quality under the Commission's six-year programmes of capital works for the period 1980-81 to 1985-86 requires an allocation of \$240m (at December 1979 prices) over the programme period, subject to the availability of funds. This involves an average annual expenditure of \$40m.

Major provisions in the programme include:

- (1) Completion of two major water conservation dams already under construction and commencement of three further dams to provide water for urban, industrial, and irrigation supplies. Total estimated cost of these projects is \$75m.
- (2) Expenditure of \$40m for the construction of works to augment the Mornington Peninsula water supply system and to improve its operating capabilities and water quality.
- (3) Expenditure of \$10m on improvements in the Bellarine Peninsula water supply system.
- (4) Continuance of groundwater control programmes by extraction and disposal with partial re-use, in the Shepparton region.
- (5) Continuance of salinity control works in the Sunraysia and Kerang regions for the interception of saline groundwater flows to the Murray River, and disposal of saline drainage to evaporative disposal areas. The total programme, which is estimated to cost \$60m (at December 1977 prices), is subject to a Parliamentary Public Works Committee inquiry.

VICTORIA—LANDS UNDER IRRIGATED CULTURE: EXTENT OF IRRIGATION AND AREAS WATERED, 1979-80

Name of district, area, etc.	Total area of holdings in irrigation districts	Area classified as suitable for irrigation	Water rights apportioned including extra water right	Area irrigated, including lands adjoining a district										
				Total	Cereals including millet	Lucerne grown for pasture and hay	Sorghum and other annual fodder crops	Pastures			Vine- yards	Orchards	Market gardens	Fallow and mis- cellaneous
								Native	Annual	Perennial				
	hectares	hectares	megalitres	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares
GOULBURN-CAMPASPE-LODDON SYSTEM—														
Shepparton	82,488	76,069	181,646	36,009	402	389	9	148	12,643	17,644	101	3,690	332	651
Rodney	109,161	100,837	254,136	58,208	1,413	640	6	371	21,028	29,516	64	3,191	1,270	709
Tongala-Stanhope	31,183	28,631	105,114	26,197	261	164	74	4	7,338	17,729	—	193	75	359
Deakin	63,268	41,483	43,473	9,532	436	70	118	—	4,833	3,634	—	—	232	209
Rochester	75,638	68,922	148,369	39,869	950	161	8	24	15,664	20,817	—	13	626	1,606
Dingee	4,379	3,825	10,051	2,177	—	—	—	—	659	1,518	—	—	—	—
Calivil	26,734	24,723	39,957	11,160	264	275	—	44	5,935	4,268	—	—	10	364
Tragowel Plains	88,806	76,236	121,790	45,722	1,484	120	124	2,719	30,854	6,402	—	—	4	4,015
Boort	47,290	40,614	53,601	22,386	1,853	707	74	—	12,147	2,150	—	—	234	5,221
Campaspe	8,544	8,118	19,414	3,860	138	273	2	—	714	2,527	—	—	184	22
East Loddon	—	—	—	356	—	—	—	—	235	121	—	—	—	—
West Loddon	—	—	—	874	105	15	—	—	336	—	—	—	—	418
Total	537,491	469,458	977,551	256,350	7,306	2,814	415	3,310	112,386	106,326	165	7,087	2,967	13,574
MURRAY RIVER SYSTEM (Torrumbarry Weir)—														
Cohuna	52,290	49,006	135,559	43,501	228	562	596	1,053	20,893	19,860	—	—	124	185
Koondrook	38,150	32,533	73,072	25,957	2,353	74	112	342	16,434	5,137	—	182	27	1,296
Swan Hill	15,518	14,755	55,641	11,090	108	246	10	—	1,498	6,536	1,319	684	365	324
Third Lake	9,211	7,841	13,099	3,777	578	161	36	120	2,628	165	—	—	—	89
Mystic Park	8,674	7,736	11,477	3,772	426	84	61	198	2,307	434	28	17	17	200
Tresco	1,822	962	5,191	1,114	19	10	—	—	13	769	189	114	—	—
Fish Point	7,431	7,044	9,890	3,720	943	—	115	1,063	1,168	337	—	—	4	90
Kerang	34,397	29,857	61,937	23,716	1,670	110	57	2,184	14,074	4,155	—	3	4	1,459
Kerang North-West Lakes	—	—	—	801	256	26	50	—	287	15	86	39	17	25
Total	167,493	149,734	365,866	117,448	6,581	1,273	1,037	4,960	59,289	36,652	2,202	1,114	672	3,668
Murray Valley (Yarrowonga Weir)	129,385	113,866	254,220	56,438	3,140	595	323	4,395	24,572	19,023	142	1,465	376	2,407

VICTORIA—LANDS UNDER IRRIGATED CULTURE: EXTENT OF IRRIGATION AND AREAS WATERED, 1979-80—continued

Name of district, area, etc.	Total area of holdings in irrigation districts	Area classified as suitable for irrigation	Water rights apportioned including extra water right	Area irrigated, including lands adjoining a district										
				Total	Cereals including millet	Lucerne grown for pasture and hay	Sorghum and other annual fodder crops	Pastures			Vine- yards	Orchards	Market gardens	Fallow and mis- cellaneous
								Native	Annual	Perennial				
hectares	hectares	megalitres	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares
Direct from river by pumping—														
Nyah	1,566	1,325	9,279	1,108	—	6	1	34	21	182	640	79	119	26
Red Cliffs	5,507	5,183	43,766	4,802	—	7	—	4	2	40	4,509	187	7	46
Merbein	3,732	3,501	30,256	3,367	—	17	10	18	—	11	2,968	316	3	24
Robinvale	3,608	3,077	17,531	2,138	—	—	—	—	—	—	2,023	115	—	—
Carwarp-Yelta	—	—	—	242	140	22	31	49	—	—	—	—	—	—
Total	14,413	13,086	100,832	11,657	140	52	42	105	23	233	10,140	697	129	96
First Mildura Trust	15,864	8,010	73,243	8,010	—	—	—	—	—	214	6,160	284	—	1,352
Murray River system Total	327,155	284,696	794,161	193,553	9,861	1,920	1,402	9,460	83,884	56,122	18,644	3,560	1,177	7,523
OTHER NORTHERN SYSTEMS—														
Coliban	—	—	—	3,993	1	59	—	294	622	2,434	20	403	83	77
Wimmera	—	3,048	—	2,982	7	22	—	—	35	2,864	—	34	20	—
Total	—	3,048	—	6,975	8	81	—	294	657	5,298	20	437	103	77
SOUTHERN SYSTEMS—														
Bacchus Marsh	2,068	1,294	3,770	1,205	—	39	—	13	—	615	—	201	289	48
Werribee	3,767	3,554	9,670	3,194	4	66	—	—	—	1,114	—	29	1,901	80
Maffra-Sale	34,682	28,417	65,443	19,718	10	12	26	405	—	19,229	—	—	32	4
Central Gippsland	17,897	15,316	39,218	13,379	180	3	—	30	—	13,166	—	—	—	—
Mornington Peninsula	—	—	—	104	—	—	—	—	—	—	—	—	58	46
Bellarine Peninsula	—	—	—	125	—	—	—	—	—	—	—	—	105	20
Total	58,414	48,581	118,101	37,725	194	120	26	448	—	34,124	—	230	2,385	198
PRIVATE DIVERSIONS THROUGHOUT THE STATE	—	—	—	74,045	1,960	3,580	980	494	14,504	28,607	3,791	4,119	11,211	4,799
GRAND TOTAL 1979-80	923,060	805,783	1,889,813	568,648	19,329	8,515	2,823	14,006	211,431	230,477	22,620	15,433	17,843	26,171
GRAND TOTAL 1978-79	922,889	805,269	1,887,059	551,607	16,108	9,249	5,808	9,433	205,205	226,287	23,009	14,910	15,989	25,609

- (6) Continuance of surface drainage programmes in the northern irrigation districts, including those programmes associated with groundwater extraction in the Shepparton region. These programmes are estimated to cost some \$0.5m per annum.
- (7) A continuing programme, estimated to cost \$8.5m over the six-year period for water quality improvement works within the Commission's urban water supply systems.
- (8) Allocations for improvements to, and for water treatment at, urban centres, particularly those on the Murray River and in the Wimmera-Mallee areas.
- (9) Continuation of a programme of studies and works relating to flood plain management. Estimated expenditure will be approximately \$0.7m per annum.

Irrigation

Most irrigation is carried out in districts directly controlled by the Commission, although there is an increasingly large proportion of "private diverters", that is, irrigators who are authorised to take water from watercourses but whose holdings are not located inside an irrigation district. In the irrigation districts, water assigned to a given district is allocated to lands commanded by the channel system and suitable for irrigation on the basis of a water right. Irrigators pay a fixed sum for the volume of water allocated under water rights whether or not the water is actually used. Water rights are available in all but the driest years, and volumes in excess of water rights are usually available. The water right system ensures the irrigators of a minimum volume of water each year (except in severe drought years). Similarly, the Commission can rely on fairly constant revenue to meet the costs of district operations.

A feature of Victorian irrigation policy has been the development of closer settlement by intensive irrigation, that is, by allocating relatively large quantities of water per holding instead of limiting the allocation of water to a portion of each holding. This has meant that Victorian irrigation is predominantly devoted to dairying and horticulture, rather than to sheep raising. The advantage of intensive irrigation is that much higher returns are available from a given quantity of water and, consequently, a much larger rural population is supported. Delivery of irrigation water totalled 2,848,719 megalitres for 1979-80.

In 1979-80, the area watered by private diversion from lakes, rivers, etc., was 74,045 hectares and the number of private diversions authorised for irrigation was 6,477. The water delivered was used mainly to produce annual and perennial pastures and fodder, as well as potatoes, tobacco, hops, vegetables, vines, fruits, and cereals. About half the area privately watered is supplied from streams regulated by storages, the other half being from streams wholly dependent on rainfall. Many private storage dams are being built, frequently at substantial cost, to insure against low flows in the natural source.

The following table shows the areas irrigated in Victoria for the years 1975-76 to 1979-80:

VICTORIA—AREA IRRIGATED
(hectares)

Source of supply	1975-76	1976-77	1977-78	1978-79	1979-80
Goulburn-Loddon system	262,306	276,782	272,339	259,836	256,350
Murray River system	188,298	191,227	181,643	179,329	193,553
Other northern systems	7,475	7,454	7,035	6,541	6,975
Southern systems	35,566	35,012	36,341	34,800	37,725
Private diversions	84,556	78,339	77,988	71,101	74,045
Total	578,201	588,814	575,346	551,607	568,648

Further references: Irrigation, *Victorian Year Book* 1962, pp. 479-83; Wimmera-Mallee region water supply, 1963, pp. 499-501; Flood protection, river improvement, and drainage, 1963, pp. 501-2; Underground water, 1964, pp. 544-5; Water supply in Victoria, 1964, pp. 535-44; Goulburn-Murray Irrigation District, 1965, pp. 477-9; Spray irrigation in agriculture and dairying, 1965, p. 502; Private irrigation development, 1966, pp. 477-9; Water Research Foundation, 1966, pp. 479-80; River improvement, 1967, p. 298; Rivers and streams fund, 1967, p. 298; Dandenong Valley Authority, 1968, pp. 300-1; Water conservation, 1969, pp. 309-10; Water supply to Western Port, 1971, pp. 288-90; Lake William Hovell dam, 1972, pp. 294-5; River Murray Agreement and the River Murray Commission, 1972, pp. 296-301; Ten year plan, 1974, pp. 298-304; Millewa pipeline project, 1974, pp. 296-7; Snowy Mountains Hydro-Electric Scheme, 1974, pp. 298-304; Millewa Scheme, 1975, pp. 403-6; Tarago-Western Port pipeline, 1975, pp. 406-7; Storages, 1979, pp. 303-5

COUNTRY TOWN SUPPLIES

Introduction

During the gold rushes of the 1850s, large numbers of persons migrated to areas without adequate water supply either for domestic or mining purposes. The mining population was too unsettled to accept responsibility and no suitable supply authority existed. The Victorian Government, therefore, established the Department of Victorian Water Supply which constructed reservoirs where needs were most pressing. The earliest reticulated supplies were to Bendigo in 1859, Ballarat in 1862, and Geelong in 1865. From 1872, government loans enabled municipal corporations to construct many waterworks of enduring value.

The first comprehensive legislation for the supply of water to country districts was the Water Conservation Act of 1881. This Act provided for the constitution of waterworks trusts to construct and manage supply works throughout Victoria. More detailed legislation to control supplies in urban areas was added in 1884.

By 1945, there were 258 cities and towns in Victoria with water supply systems, providing reticulated supplies to 51 per cent of Victoria's population outside the Melbourne metropolitan area. There are now 450 cities and towns with reticulated water supplies. Supplies to 127 of these are managed by the State Rivers and Water Supply Commission—either as part of its major urban supply systems or as isolated towns in areas supplied for irrigation or domestic and stock purposes. The remaining 323 towns are supplied by local water authorities.

Eighty-one towns are supplied by the Commission's major urban supply systems on the Mornington Peninsula, Bellarine Peninsula, Otways, and Coliban areas which were constructed primarily to supply towns (although a substantial volume of water for irrigation is supplied to the Bendigo-Castlemaine areas). A further sixty towns are supplied from irrigation or waterworks districts in isolated areas of the State.

Local authorities

The administration of water and sewerage as separate authorities in country towns is unique to Victoria. Each authority enjoys autonomy in most of its functions but, as the Victorian Government usually provides a high degree of financial assistance, it requires that each trust submits its operations and proposals to the Commission's scrutiny before approval and funds are forthcoming. At June 1980, there were 204 local water authorities supplying 324 Victorian country towns. A further 14 town supply systems are under construction.

Organisation

There are two broad classes of local water authority:

- (1) "Local governing bodies", which are municipal councils constituted as local governing bodies under the Water Act; and
- (2) "waterworks trusts", the commissioners of which might comprise:
 - (i) councillors for the time being of the municipality concerned plus one Victorian Government nominee;
 - (ii) councillors of one or more municipal ridings plus up to three nominees; or
 - (iii) commissioners elected directly by the water ratepayers.

Local governing bodies (16) are usually limited to cities or boroughs as their water supply districts must be essentially urban in character. Although a local governing body may be composed entirely of councillors and use the council's name, it is a separate legal entity and its business and accounts must be kept apart from the administration of municipal affairs. Waterworks trusts usually comprise about six commissioners and have jurisdiction over a waterworks district, within which there may be one or more urban districts, and in some cases, rural districts.

Several local water authorities operate under special Acts which are usually supplementary to the Water Act. These special authorities include the Mildura Urban Waterworks Trust, the Geelong Waterworks and Sewerage Trust, the Latrobe Valley Water and Sewerage Board supplying water in bulk to towns and industries in the La Trobe Valley and the West Moorabool Water Board which supplies water in bulk to the

local authorities at Ballarat and Geelong. A number of small townships in Victoria are still supplied by local municipal councils under powers conferred by the Local Government Act. However, the provisions of that Act in relation to water supply are not sufficiently specific for the management of any substantial town water supply system. Although such supplies can receive consideration for a capital grant under the town water supplies assistance formula, the remainder of the costs must be found by the municipality concerned from its normal sources of loan funds.