

## 9 MAINTENANCE AND MANAGEMENT

### 9.1 INTRODUCTION : SOME LEGAL CONSIDERATIONS

Responsibility for the control and management of 'drainage and rivers' within the metropolitan area passed from the municipal councils to the Melbourne and Metropolitan Board of Works with the proclamation of the Metropolitan Drainage and Rivers Act (No 3284) in October 1923.<sup>1</sup> The Metropolitan Drainage and Rivers Act was introduced because of confusion concerning responsibility for undertaking improvement and maintenance works along the Yarra and other metropolitan watercourses. Clause 60 of the MMBW Act 1890, apparently gave the Board certain powers, stating, *inter alia*, that :

*All the bed soil and banks of the River Yarra Yarra and of all other public rivers creeks and watercourses within the metropolis (except so much thereof as is vested in the Melbourne Harbour Trust Commissioners the Victorian Railway Commissioners or the Corporations of the City of Melbourne)-*

*shall without any conveyance assignment or transfer be and become vested in the Board upon trust for the purposes respectively of supplying water to the inhabitants of the metropolis of providing for the sewerage and drainage of the metropolis and the commerce and recreation of the inhabitants of the metropolis ...*

The extent of the Board's rights and powers under Clause 60 was never clearly defined, and the situation was further complicated in 1905 with the introduction of the Water Act 1905 (No 2016), which vested the water of all streams in the Crown. The Board sought legal opinion, and Mr Weigall, K C advised :

*That the water was vested in the Crown, and that only the bed, soil, and banks of the Yarra and Saltwater Rivers within the Metropolis were vested in the Board; and that the Merri and other Creeks, not being 'public' or navigable streams, had not been vested in the Board by the Act. (Ref 1).*

In 1907, a conference was convened by the Minister of Water Supply in an attempt to resolve the question of responsibility for drainage in the metropolitan area. Much debate ensued, but it was not until 1923 that appropriate legislation was introduced (Refs 1 and 2).

The Metropolitan Drainage and Rivers Act, which became operative in January 1924, together with subsequent amendments and additions<sup>2</sup>, comprises Part X (Metropolitan Drainage and Rivers) of the Melbourne and Metropolitan Board of Works Act 1958 (No 6310), the Act that is currently in force. The Metropolitan Drainage and Rivers Act made the Board responsible for the control and management of the whole, or parts of, certain named rivers, creeks and watercourses within the metropolis (see the First Schedule to the Metropolitan Drainage and Rivers Act 1923, and the Twelfth Schedule to the MMBW Act 1958), and gave the Board the power to declare any unimproved watercourse, or any constructed drain (whether constructed by a municipality, public company or private individual) to be a Main Drain, and thereby come under the control of

<sup>1</sup> 'Metropolis' in the 1928 Act refers to the area as defined in Section 3 of the MMBW Acts of 1915 (No 2696 (Consolidated) and No 2790). In the current MMBW Act (No 6310 of 1958), 'Metropolis' means "the area within 20.9215 kilometres of the site of the building known as the post office [corner of Bourke and Elizabeth Streets] Melbourne and the area described in the Second Schedule of this Act ...". It should be noted, however, that the metropolis has been extended on a number of occasions since 1958 for drainage, sewerage and water supply purposes, and that the current drainage, sewerage and water supply boundaries do not coincide.

<sup>2</sup> See, in particular, the amending Metropolitan Drainage and Rivers Act 1926 (No 3463).

the Board. Although responsibility for the maintenance and management of certain watercourses passed to the Board of Works, title to the bed and banks remained with the Department of Crown Lands and Survey who vested them upon trust in the Board.

Moonee Ponds Creek is one of the watercourses named in the Twelfth Schedule to the MMBW Act 1958, and is listed in the following manner :

*The Moonee Ponds Creek from the south-west side of the bridge in existence at the commencement of the Melbourne and Metropolitan Board of Works Act 1928 over the said creek and carrying the railway tracks of the North Melbourne gravitation sidings towards its source.*

The Board's jurisdiction extends upstream to the metropolitan drainage boundary (see Figure 1-1) and includes all tributaries, or parts thereof, that are located within the boundary.

The Port of Melbourne Authority (formerly the Melbourne Harbor Trust) is responsible for the section of Moonee Ponds Creek from its junction with the Yarra River to the Footscray Road Bridge, but it has never been established who is responsible for the maintenance and management of the creek between Footscray Road Bridge and the Railways Gravitation Bridge (see Section 4-3). Upstream of the Gravitation Bridge, the bed and banks of the creek, or channel, are vested upon trust in the Board of Works, but what constitutes the bed and banks of the constructed channel between the Gravitation Bridge and Flemington Road Bridge has never been defined.

The upper reaches of Moonee Ponds Creek lie outside the Board's drainage area (Fig 1-1), the drainage boundary crossing Moonee Ponds Creek at a point approximately twenty-one kilometres from the Melbourne GPO. From a drainage management point of view, it would obviously be desirable for the whole of the Moonee Ponds Creek drainage basin to be included within the Board's drainage area. In early 1975, the Board resolved to advocate a policy of total catchment management for the rivers and creeks that flow through the metropolitan area, and in January 1979, the Victorian Government informed the Board of Works that it agreed in principle that the Board's drainage area should be extended to cover the whole of a number of drainage basins, one of which was that of Moonee Ponds Creek. The Government suggested, however, that prior to any extension of the Board's drainage boundary, discussions should be held between the Board of Works and the municipalities affected. The part of the Moonee Ponds Creek basin that lies outside of the Board's drainage area is located within the Shire of Bulla. To date, the Board has not entered into discussions with the Shire concerning the possibility of extending its drainage area in this locality.

The watercourses within the part of the Moonee Ponds Creek basin that lies outside of the Board's drainage area come under the jurisdiction of the State Rivers and Water Supply Commission of Victoria, although under the provisions of Section 645 of the Local Government Act 1958 (No 6299), the Shire of Bulla is empowered to undertake maintenance works along the watercourses if it deems necessary.

Although the Board of Works assumed responsibility for Moonee Ponds Creek in 1924, it did not immediately assume responsibility for the maintenance and management of some of the tributary watercourses, particularly those sections that had already been improved by municipal councils. As the need arose, and as finances permitted, the Board declared certain tributaries, or parts of tributaries, to be Main Drains, and these were duly gazetted as such. The gazettal procedure was, however, time-consuming, and the Board decided that it was easier to assume responsibility for the tributary watercourses under the provisions of the Twelfth Schedule (or earlier versions thereof) of its Act. Tributaries taken over in this manner are referred to as Drains rather than Main Drains.

In the following sub-section, the types of maintenance work that the Board undertakes along Moonee Ponds Creek and its tributaries are described and illustrated, and some of the management problems that it encounters are discussed. The creek network cannot be viewed in isolation, but has to be considered in relation to the adjoining land, and in Sub-sections 9.3 and 9.4, the planning zoning and land use of these riparian areas are described, and aspects of their management and maintenance discussed.

## 9.2 THE MAINTENANCE OF THE CREEK NETWORK

**9.2.1 Introduction.** For practical reasons the Board does not manage or maintain watercourses in tributary catchments with an area of less than 60 hectares (150 acres). As a result of discussions with municipal representatives in 1927 and 1929, the Board resolved that :

*For the present, only such part of any drain, creek or watercourse which carries off surface or stormwater flowing from the whole of an area of not less than 150 acres will be designed, constructed, or declared as a main drain.*

*These drains when declared, will vest in the Board from the point of discharge to a point where the area drained is 150 acres, beyond which point the construction, maintenance and all and any liability or obligations of the municipality with respect to the drains will remain with the Council.*

*The point of termination of a declared main drain shall be at a definite point such as a building line, and where the point of termination in respect of the 150 acre limit falls within a building block, the drain will be extended to the building line most favourable to the Council, or to the municipal boundary if a short distance upstream of the 150 acre limit.*

*Constructed drains which drain small areas, where the total length of drain serving 150 acres or more is less than 800 feet will not be declared as main drains.*

In practice the foregoing has been extended to apply to all drains and watercourses vested or to be vested in the Board, irrespective of whether declared as main drains or not.

The term '150 acre limit' (60 hectares) has now generally been replaced by the preferred term 'Board's Drainage Limit'.

Moonee Ponds Creek and its tributaries are maintained by two Sections of the Board's Operations and Maintenance Division. The Drainage and Rivers Section is responsible for the maintenance of Moonee Ponds Creek from the Victorian Railways' Gravitation Bridge upstream to the outlet structure of the Jacana Retarding Basin, and the Northern Area Maintenance Section is responsible for the section of Moonee Ponds Creek from the Jacana outlet structure upstream to the Board's drainage boundary, and for all of the tributaries that are located within the Board's drainage area.

### 9.2.2 Recurring Maintenance Tasks

(a) **Mowing and Weed Control.** The banks of Moonee Ponds Creek, and also land adjoining the creek owned by the Board of Works, are regularly mown. Mowing operations take place throughout the year, and each reach of the creek is mown, on average, four times per year. Mowing the flat land adjoining the creek is a relatively easy task, a slasher pulled by a tractor being used for the purpose (Plate 9-1A). The steep banks along the incised sections of Moonee Ponds Creek are far more difficult to mow. Where access is possible, a slope mower is used. Maintenance tracks have been constructed along the bank tops for much of the length of the creek to give access to slope mowers and other maintenance equipment. A slope



A Tractor and slasher



B Tractor and slope mower



C A brush cutter in operation



mower can also be operated from the creek bed along those reaches where the invert has been hard lined and access ramps have been constructed (Plate 9-1B). Along some reaches, the whole, or part of the banks cannot be reached by a slope mower and hand operated brush cutters have to be used (Plate 9-1C). Mowing with brush cutters is time consuming and adds to maintenance costs.

Noxious weed growth is controlled by area spraying with subsequent spot checks. Artichoke thistle (*Cynara cardunculus*) and fennel (*Foeniculum vulgare* Mill.) are widespread and require frequent attention. The former are sprayed with Bandel and the latter with Roundup.

- (b) **Debris and Sediment Removal.** Melbourne's watercourses have for long been regarded as convenient dumping grounds for all kinds of rubbish. Moonee Ponds Creek is no exception. Occasionally, even car bodies are dumped into the creek, and as Plate 9-2 indicates, while car models have changed, people's habits obviously have not. The dumping of rubbish along Moonee Ponds Creek is not, however, as serious a problem as it is along some other watercourses within the metropolitan area because access to the creek is restricted. The creek is fenced along part of its length, and along the lower reaches the Tullamarine Freeway acts as a barrier.

The Board of Works has legal power to take action against people who deposit or discharge materials into watercourses under its control, or on land within twenty-five feet of the bank edges, under the provisions of MMBW By-law No 25 and Part V of the Environment Protection Act 1970 (No 8056)<sup>1</sup>. By-Law No 25, which was gazetted in December 1927, states, *inter alia* -

All persons and corporations are prohibited from -

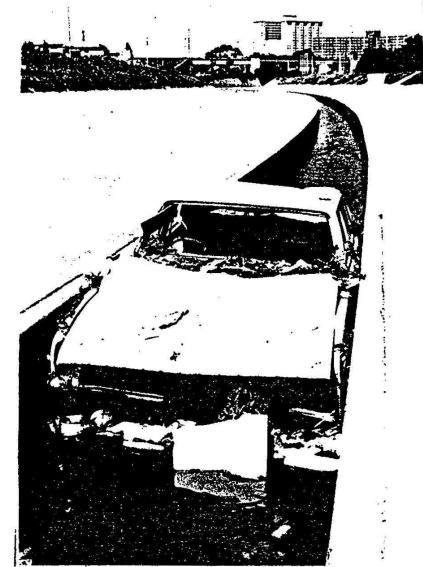
- (a) Depositing in or discharging into and from permitting or allowing to be deposited in or discharged into the said rivers creeks watercourses main drains or main drainage works or in or into any of them or in or into any portion of the same any materials matters or substances likely to cause interference with the flow of water in or the silting up of or injury to the same or any part thereof.
- (b) Depositing or discharging and from permitting or allowing to be deposited or discharged any such materials matters or substances within 25 feet of or from -
- (i) the said rivers creeks watercourses or any portion thereof;
  - (ii) any open drain or any portion thereof;
  - (iii) any open main drainage works or any portion thereof.

In addition to accumulated rubbish, the Board occasionally has to remove considerable quantities of sediment from the bed of Moonee Ponds Creek, particularly from the reaches downstream of Flemington Road where the gradient is extremely gentle. The sediment is mainly composed of sand, although considerable quantities of silt are deposited in the tidal reaches of the channel downstream of Macaulay Road.

<sup>1</sup> Prior to the introduction of the Environment Protection Act of 1970, the Board could take action against polluters of watercourses under its control under the provisions of MMBW By-Law No 32, which was gazetted in June 1933. In May 1971, By-Law No 32 was superseded by By-Law No 105 (Pollution of Water Courses), but the Environment Protection Act 1970 is used in preference to this By-law.



A Car bodies in the creek near Moonee Parade, Brunswick, mid 1950 (see also PLATE 7-6B)



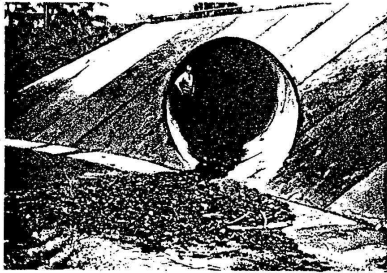
B Downstream of Ormond Road, 1979

PLATE 9-2 Car bodies dumped in Moonee Ponds Creek

A considerable proportion of the sediment originates from the upper parts of Moonee Ponds and Yuroke Creeks where bank erosion is active (see Plate 1-1). The creek gradients in the upper part of the basin are relatively steep, and during flood flows considerable quantities of sediment are washed downstream and deposited along the channel. During subsequent flood flows, the deposits are re-entrained and deposited progressively further downstream.

The deposition of sediment along Moonee Ponds Creek reduces the capacity of the watercourse and has accelerated erosion at some localities by deflecting flows on to the banks. Deposition is generally confined to the unlined sections of the creek, the partially lined sections having been designed to be self-flushing. However, as Plate 9-3A illustrates, deposition may occur along the lined sections at points where major tributary drains enter the main watercourse. During flood flows, turbulence occurs at such points and patches of still water where deposition can occur are created.

Deposition is particularly problematical downstream of Flemington Road Bridge. Sand and debris are trapped by the piles of the Flemington Road and Racecourse Road Bridges, and sand is deposited on the berms and in the low flow channel between Flemington Road and Macaulay Road (Plate 9-3B). Downstream of Macaulay Road, considerable quantities of sand and silt accumulate in the tidal reaches of the 5 000 cusec channel. The



A Sediment deposited at the outlet of the Westbreen Creek Drain during the April 1977 flood



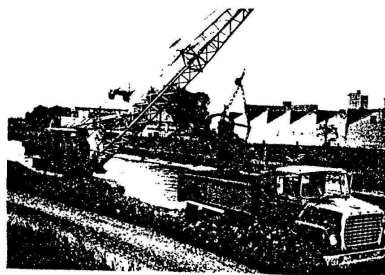
B Sand deposited on one of the berms downstream of Racecourse Road



C The berms downstream of Racecourse Road immediately after regrading



D Mechanical shovel in operation under Racecourse Road Bridge



E Drag-line in operation downstream of Macaulay Road

PLATE 9-3 Sediment accumulation and removal

accumulated sediment has to be removed regularly in order to maintain the capacity of the channel (see Section 4.4). As discussed in Section 4-2, the land adjoining Moonee Ponds Creek downstream of Flemington Road has a long history of flooding, and any significant reduction in the capacity of the channel could be potentially disastrous during major flood flows.

The sediment that accumulates on the berms is removed by a mechanical scraper, while sediment and debris are removed from the low flow channel by a mechanical shovel attached to a tractor (Plate 9-3D). The berms were regraded to a steeper angle in 1976 (Plate 9-3C) to make them less susceptible to waterlogging, a condition that inhibits grass growth. Along the tidal reaches of the channel downstream of Macaulay Road, sediment is removed by a drag line (Plate 9-3E) approximately once every three years.

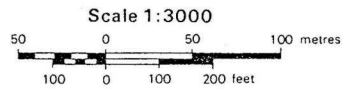
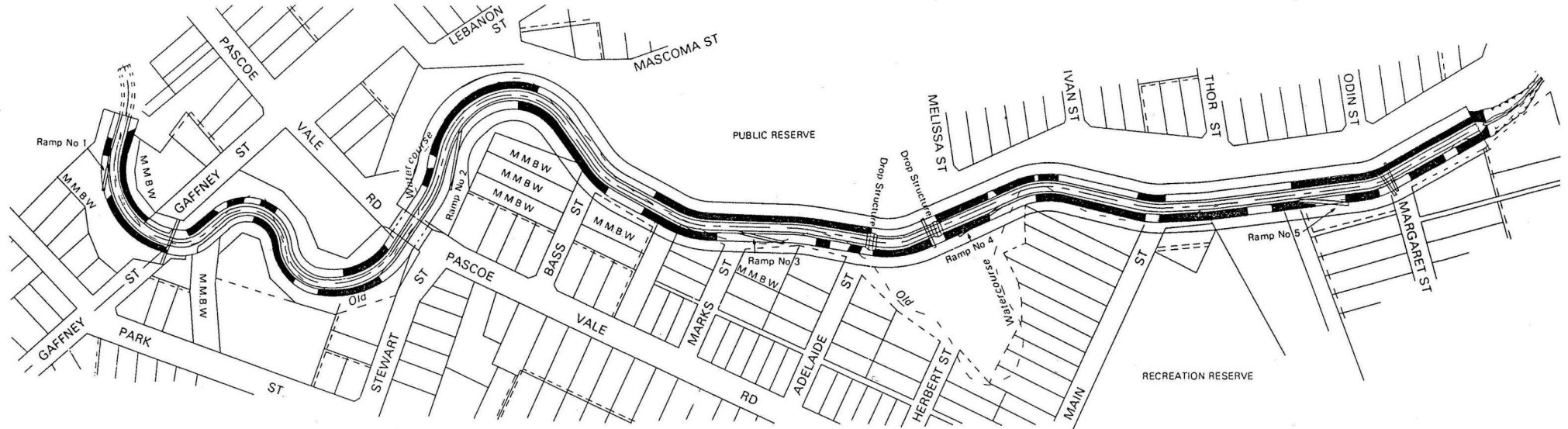
In an attempt to reduce maintenance costs, three sediment traps were installed along Moonee Ponds Creek in April/May 1979: one immediately downstream of Flemington Road Bridge, one immediately upstream of Ormond Road Bridge (Plate 9-4) and the other downstream of Albion Road. The trap downstream of Flemington Road was constructed by widening and deepening the existing low flow channel, while the other two traps were formed by constructing a low concrete dam across the invert of the lined channel.

(c) **Bank Repair**

(i) **Bank Slumping.** Along a number of reaches, Moonee Ponds Creek is quite deeply incised and the banks are vertical or sub-vertical. As discussed in Sections 4 and 5, erosion and slumping were recurrent problems. Creek improvement works over the past twenty years have virtually eliminated undercutting along most of these reaches, but slumping occasionally occurs on the steep upper parts of the banks. Where maintenance tracks have been cut into the banks the potential for slumping would appear to have been increased (Plate 9-5A and B). Slumped material has to be cleared away, and the exposed faces repaired and stabilised with a grass cover. More radical treatment was required, however, on a steep bank opposite the Holbrooke Reserve. Here a series of small terraces were cut in mid 1978 (Plate 9-6C). The terraces have proved to be successful, and slumping has not recurred at this site (Plate 9-5D).

(ii) **Repair of Eroded Banks.** Along the unlined sections of Moonee Ponds Creek bank erosion occasionally occurs, and has to be repaired. The repair of a scoured section of bank near Morrow Street, Brunswick is illustrated in the photographs in Plate 9-6. In early 1973, a stone gabion was constructed at the toe of the eroded bank, and the space behind the gabion was backfilled with rocks. During the May 1974 flood, the gabion was outflanked and undermined and the bank was extensively eroded. In June 1974, the bank was repaired for a second time. On this occasion a quite extensive area was reshaped and lined with loose rocks. This treatment has proved to be satisfactory; erosion has not recurred, and a good grass cover has become established (Plate 9-6D).

Along the partially lined sections of the creek, the water occasionally rises above the level of the hard lining and erodes the grassed upper banks. Extensive and severe erosion of this nature occurred between



**MINOR EROSION:** Generally a maximum depth of 0.25m and a maximum height of about 0.7m immediately above the concrete lining



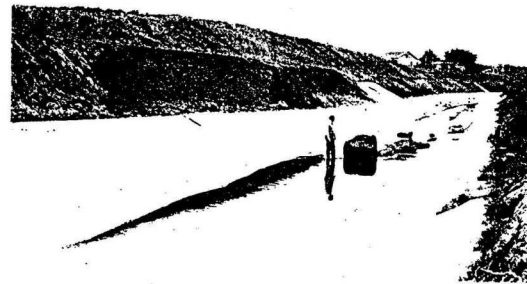
**MEDIUM EROSION:** Up to about 1m in depth and the height is for the full height of the earth bank in most cases



**MAJOR EROSION:** Occurs for the full height of the earth bank and extends back behind the concrete lining for distances ranging from about 1.5m to 5m



A East bank immediately downstream of Bass Street

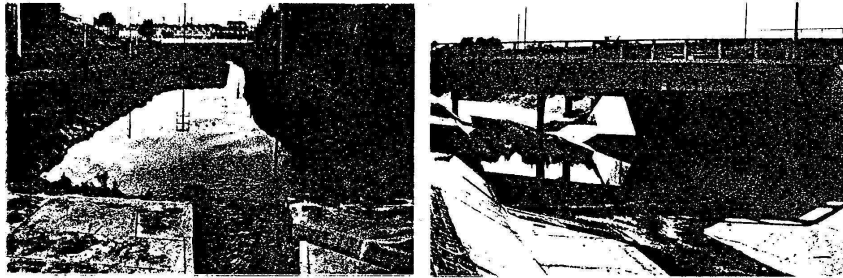


B Looking downstream from the Margaret Street footbridge



C Looking downstream towards the Margaret Street footbridge

**BANK EROSION BETWEEN GAFFNEY ST AND MARGARET ST, BROADMEADOWS  
CAUSED BY THE EASTER STORM 1977: LOCALITY PLAN**



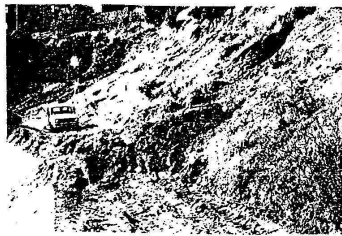
A The trap at Flemington Road Bridge

B The trap at Ormond Road Bridge

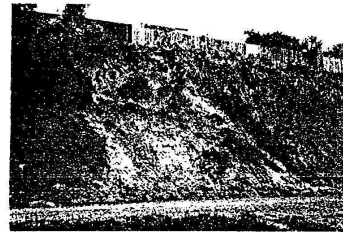
PLATE 9-4 Silt traps

Gaffney and Margaret Streets, Broadmeadows during the Easter Storm of 1977 (Fig 9-1). The improvement works between Gaffney and Margaret Streets had only just been completed (see Section 8.4), and there had not been time for the batters to settle or for a thick grass cover to become established. Erosion occurred to a depth of approximately 0.25 m within a 0.70 m high band immediately above the concrete lining along both banks of this section of the creek. At a number of points the erosion extended to the top of the bank and to depths of five metres (Fig 9-1). Erosion was particularly severe at the entry to the section, immediately downstream of the Margaret Street Footbridge, just downstream of the two drop structures, and between Marks Street and downstream of Bass Street. The severe erosion downstream of Margaret Street Footbridge can be attributed to turbulence caused by a large boulder that had been transported downstream from the transition zone (see photograph in Fig 9-1). The potential hazard of using unsecured rocks for bank protection is clearly demonstrated.

The eroded sections were backfilled, shaped and grassed, and it was decided to install bg slabs on a trial basis at one of the worst affected



A Slumping upstream of Reynard Street, June 1974



B Slumped bank between Dawson and Victoria Streets, October 1978

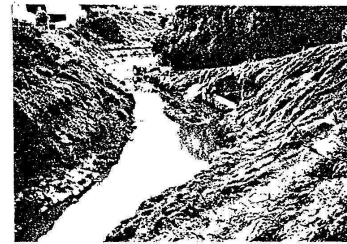


C Newly constructed terracing opposite the Holbrooke Reserve, August 1978



D The same bank as in C in August 1980

PLATE 9-5 Bank slumping and repair



A Installation of rock gabion, April 1973



B Eroded bank and collapsed gabion, May 1974



C Placing of protective rock cover, June 1974



D The rock protected bank, August 1980

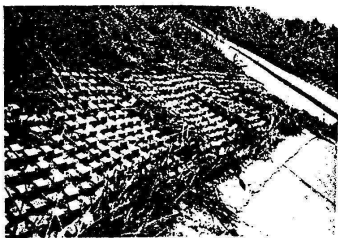
PLATE 9-6 Bank repairs near Morrow Street, Brunswick



sites, namely, the section of bank just downstream from Bass Street (Fig 9-1). Some difficulties were experienced with regard to the use of the bg slabs; it proved difficult to establish a good grass cover, and the slabs settled unevenly because of the uncompacted nature of the fill (Plate 9-7A). A reasonable grass cover has since been established (Plate 9-7B), but the stability of the grass and slabs has yet to be tested by a major flow.

Erosion above the hard lining has recurred most frequently on the outside of a number of bends and at certain access ramps and can be attributed to the occurrence of super-elevation and resultant turbulence at these sites during flood flows. At a number of sites it has proved necessary to raise the concrete lining (Plate 9-8). Upstream of Dawson Street, Brunswick, the channel, which was constructed when the Tullamarine Freeway was built, has a sharp double bend in it. Hydraulically such a bend is extremely undesirable, but was unavoidable because the Board was unable to purchase a piece of privately owned land. Super-elevation and turbulence occur at the bend, the latter being accentuated by a small energy-dissipating drop structure a short distance upstream (Plate 9-8A). Quite predictably erosion occurred above the lining on the outside of the first bend. In order to prevent the bank from being more severely eroded, and the concrete lining from being undermined, the Board decided to raise the lining for a short distance along the outside of the bend (Plate 9-8B). Since the lining was raised no further erosion has occurred.

Where the creek passes under the Tullamarine Freeway at Bell Street, Broadmeadows, the concrete lining has been raised along a straight reach of the channel. Initially, the lining extended 1.83 metres (6 feet) up the banks, but was frequently overtopped. Bank scour occurred threatening to undermine the lining (Plate 9-8C). A contributory factor was the poorly established grass cover on the batters under the Freeway bridge. The concrete lining was extended a further 2.57 metres (8 ft 5 in) up both banks of the channel over a distance of 185 metres (200 yards), (Plate 9-8D).

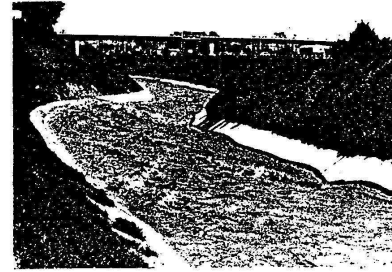


A January 1979. The slabs have settled unevenly, and the soil in the compartments' has been washed away



B The slabs partially covered by grass in August 1980

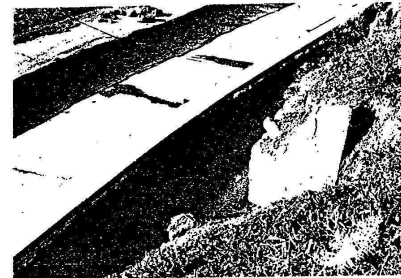
PLATE 9-7 Bg slabs on the east bank of Moonee Ponds Creek near Bass Street, Broadmeadows



A Turbulent flow upstream of Dawson Street. Note eroded bank and the wave-like nature of the water surface



B Extension of concrete lining upstream of Dawson Street



C Scour hole behind the concrete lining at Bell Street



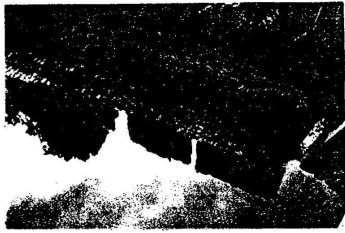
D Raising the concrete lining under the Tullamarine Freeway at Bell Street

PLATE 9-8 Bank erosion and the extension of the concrete lining near Dawson Street, Brunswick and at Bell Street, Broadmeadows

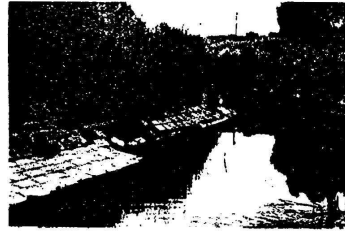
(iii) **Repair of Pitched Sections.** Contrary to popular opinion, pitched channels are not maintenance free; as Plate 9-9 clearly shows, pitched sections can deteriorate. With time, the mortar between the pitchers disintegrates, and the pitchers become displaced and eventually washed away. Along some reaches the breakdown of the mortar can be directly attributed to reed and grass growth (Plate 9-9B). Several of the pitched sections along Moonee Ponds Creek have had to be regouted, which is a relatively time-consuming and costly task.

(d) **Inspection and Maintenance of Underground Drains.** The underground drains within the Moonee Ponds Creek basin are regularly inspected by the Board's Northern Maintenance Section, and any maintenance work that is deemed necessary is undertaken by the Section. On average, each drain is inspected once every five years.

**9.2.3 Minor Improvement Works.** Downstream of the Jacana Retarding Basin there are two sections of Moonee Ponds Creek that have not been partially



A Head of tidal channel above Macauley Road Bridge, August 1980. The pitching have since been repaired



B Upstream of the junction with Five Mile Creek, November, 1978

PLATE 9-9 Pitching in state of disrepair

hard-lined or channelised. One section is located between Donald Avenue and Woodland Street, Essendon, and the other between Margaret Street, Broadmeadows and the Jacana Retarding Basin (Fig 9-2). Although no major improvement works have been undertaken along these two sections, they cannot be considered to be natural watercourses; most reaches have been considerably modified on one or more occasions. Over the past twenty-five years most reaches have been cleaned out, some reaches have been straightened, at least three bends have been cut off, the banks along some reaches have been battered back to gentler angles, and rocks have been placed along the toes of the banks at some sites. The works were undertaken to improve the capacity of the channel, for erosion control, and for beautification purposes.

Between the Jacana Retarding Basin and the loop at Athens Court (Fig 9-2), the creek has been straightened and the banks reshaped (Plate 9-10). As noted in Section 6.2, the creek was straightened immediately downstream of the Jacana Basin at the time that the basin outlet structure was built. The date when the remainder of this section of the creek was reshaped is not known. Erosion has been a recurring problem along this part of the creek, and in 1976 it was deemed necessary to place rock spalls along the toe of the western bank between the Railway Trestle Bridge and Morgans Factory in order to arrest erosion.

Predictably, erosion has been a recurring problem on the outsides of the sharp bends between Athens Court and Flannery Court (Fig 9-2; Plate 9-11A). In 1976, the banks were reshaped and lined with a protective layer of rock spalls at two sites (Plate 9-11). At the same time the creek was cleaned out to improve its capacity because the allotments at Athens Court were considered to be flood prone.

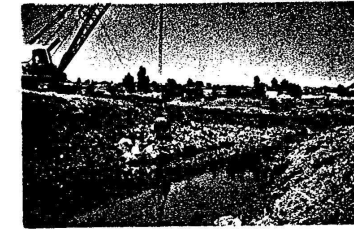
During the Easter 1977 storm, undercutting at one of the banks caused the rocks to slip, while the bank above the rocks was severely scoured (Plate 9-11D). The bank was repaired and erosion has not recurred. The appearance of this reach of the creek in mid 1980 is shown in Photographs C and E of Plate 9-11. No additional works are anticipated along this section of the creek in the immediate future, although general maintenance works are planned for the 1981/82 financial year. Creek improvement works were undertaken between the City of Broadmeadows Nursery (opposite the John Pascoe Fawcner Reserve) and Margaret Street - where the channel is partially concrete-lined - between 1976 and 1978.



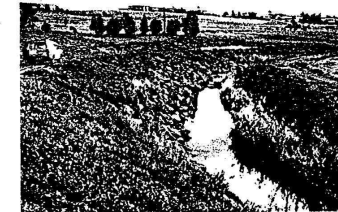
PLATE 9-10 View looking downstream from the Railway Trestle Bridge towards Athens Court. Note the fill in the left foreground



A Bank erosion opposite Athens Court, late 1975



B Placing rocks opposite Athens Court, early 1976



C The same reach as in B in mid 1980

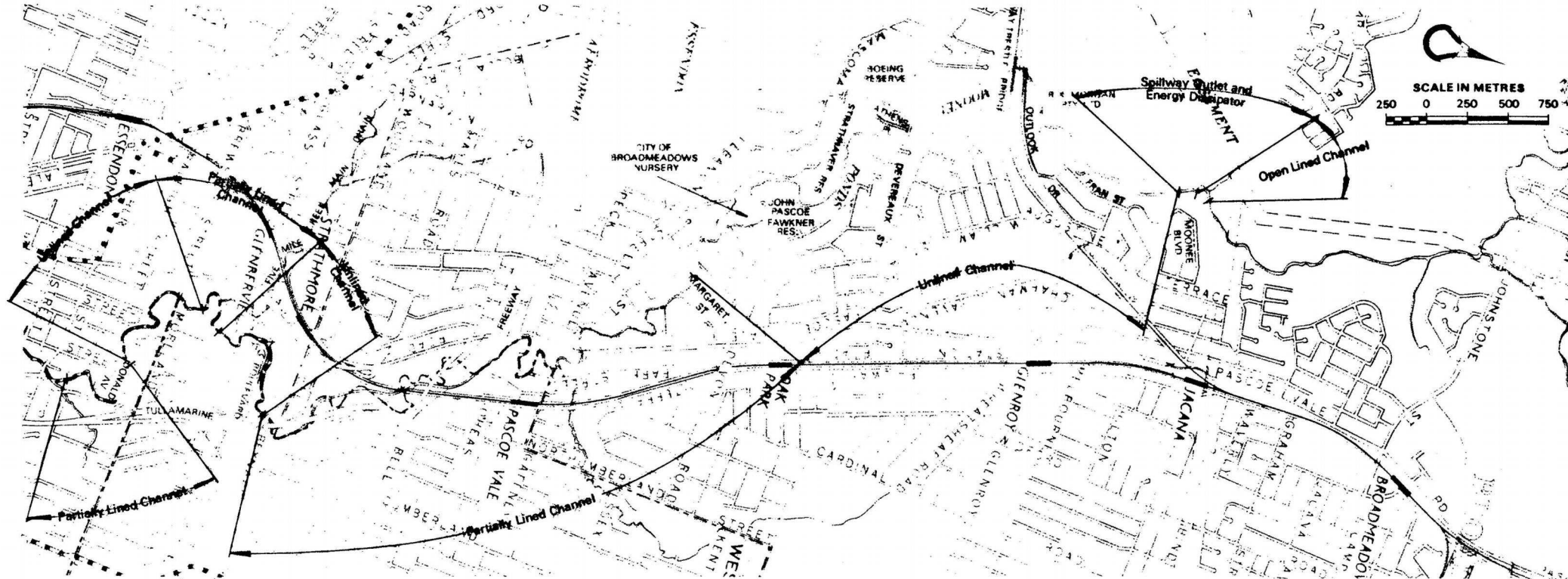


D Bank erosion opposite Flannery Court caused by the Easter 1977 flood



E The same reach as in D in mid 1980

PLATE 9-11 Erosion and rock lining near Athens Court



**THE UNLINED SECTIONS OF MOONEE PONDS CREEK BETWEEN DONALD AVENUE, ESSENDON AND THE JACANA RETARDING BASIN.**

**Figure 9.2**

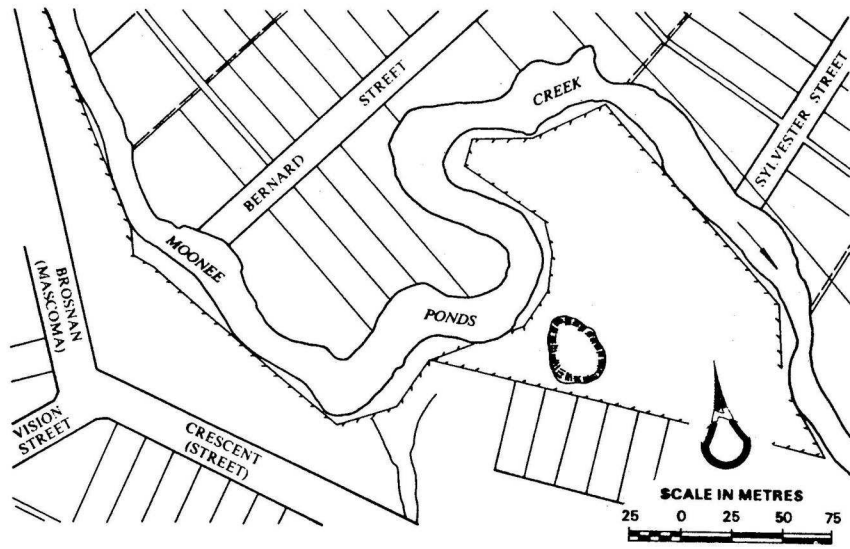
The creek was cleaned out and the banks were reshaped along several reaches. Because of the severity of erosion at the Broadmeadows Nursery, it was decided to cut off the sharp bend in the creek (Plate 9-12 A and B). Part of the new channel was lined with rock spalls, and the old channel was back-filled (Plate 9-12C). However, erosion continued to be a problem immediately upstream of the improved reach, and in early 1980 further improvement works were carried out. The banks were reshaped and partially rock-lined, and an access ramp to the creek invert was constructed (Plate 9-12D).

The creek has also been straightened, and the banks reshaped, between Woodland Street and Moreland Road, Essendon (Fig 9-2). In the early 1950s, the eastern bank of the creek along The Boulevard was being actively eroded (Plate 9-13A and B). The banks were vertical and crumbling and were considered to be a danger to children. The Board decided that remedial action was required and reshaped the eroded banks and at the same time cut off a tight bend in the creek below Woodland Street Bridge. In 1967, this reach of the creek was further modified; the banks were regraded, the channel was realigned, and maintenance tracks were constructed (Plate 9-13C and D). In 1977 the bank toes were lined with rock spalls in order to prevent erosion (Plate 9-13E).

As described in Section 5.1.4, a loop of the creek at the junction with Five Mile Creek was cut off in 1960/61 to facilitate the construction of the Moonee Ponds Relieving Sewer, and the creek was realigned under Moreland Road when the Moreland Road Bridge was reconstructed. Both of the realigned sections were partially hard lined.

**9.2.4 Some Management Problems.** The Board of Works has to expend considerable amounts of money annually on maintenance works along Moonee Ponds Creek because of inconsiderate actions by some members of the general public. As noted in Section 9.2.2 (b), rubbish is occasionally dumped in the creek and on the creek banks, and although the Board is empowered to take legal action under the provisions of one of its By-Laws (No 25), offenders are seldom caught in the act. Fences that the Board has erected along some sections of the creek for safety reasons and for reasons of legal liability (the question of public access and legal liability is discussed in detail in Section 9.4.1 below) have undoubtedly deterred some potential rubbish dumpers, but the problem remains and is likely to continue.

Another recurring management problem is that certain sections of Moonee Ponds Creek and adjoining land are popular haunts for mini and trail bike riders. The most



A The original course of the creek



B Severely eroded bank, March 1975

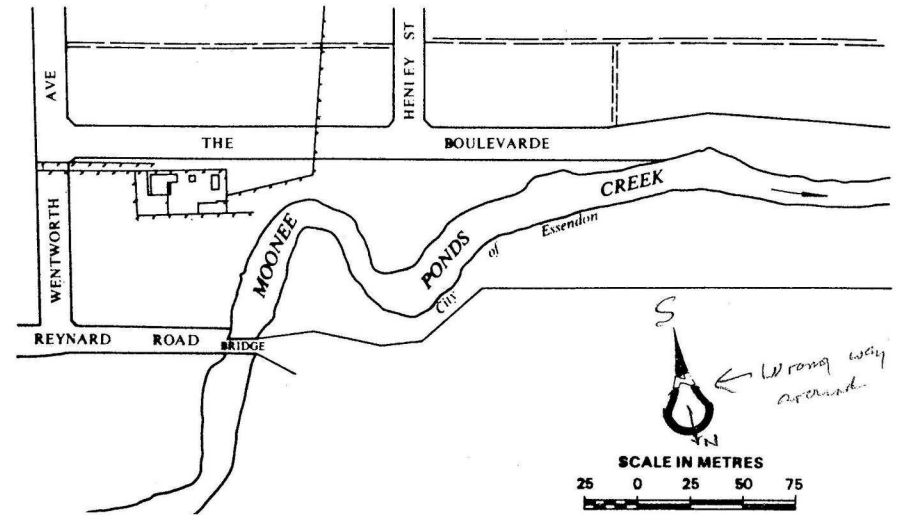


C The reshaped creek, April 1976

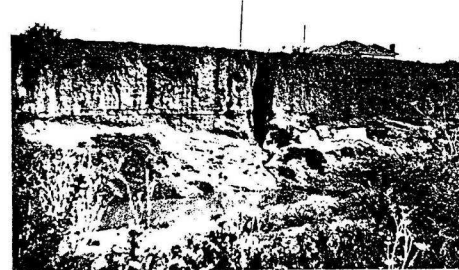


D The reshaped creek, August 1980

PLATE 9-12 Improvements near the City of Broadmeadows Nursery



A The original course of the creek



B Bank erosion along The Boulevard in the early 1950s



C View looking downstream in 1967 prior to the improvement works being undertaken



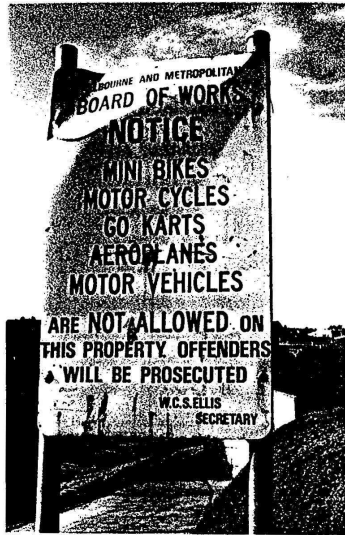
D The same view as in C later in the year



E The same view in mid 1980. Note the rock lining

PLATE 9-13 Improvements at The Boulevard, Coburg

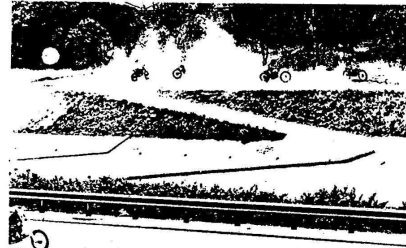




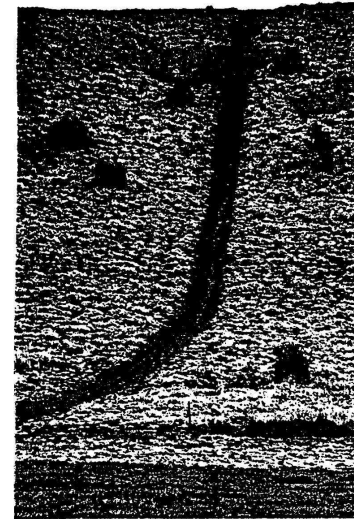
A Warning notice erected by the Board of Works



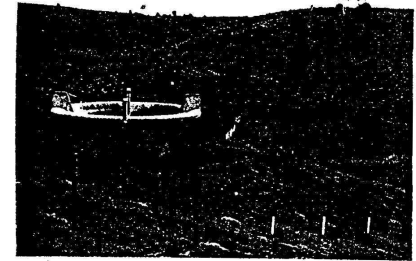
B Trail bikes on Moonee Ponds Creek (upstream of Flemington Road)



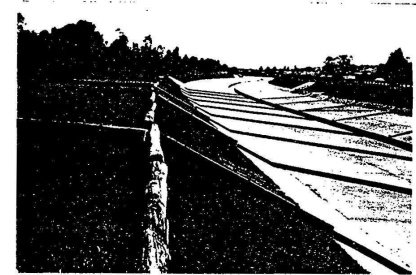
C Trail bikes on Moonee Ponds Creek (upstream of Flemington Road)



D Trail bike track on the valley side downstream of the Jacana Retarding Basin



E Trail bike tracks on the Jacana Retarding Basin embankment and on the valley side opposite



F Obstacles placed on the channel banks and invert upstream of Flemington Road

PLATE 9-14 Trail bikes

popular areas are the Jacana Retarding Basin, the Strathnaver Reserve, and the area between Ormond Road and Macaulay Road. The lined section of the creek between Ormond Road and Flemington Road is particularly favoured (Plate 9-14B and C); the maintenance ramps provide easy access to the concrete invert which makes an ideal race track. The Tullamarine Freeway lights allow activities to continue into the night, much to the annoyance of local residents.

Numerous complaints have been received over the years from local residents about the noise created by the bikes, many of which are not fitted with adequate silencers. In one internal report, the Engineer Rivers and Streams noted that "On a recent occasion, a Board Inspector, following up a complaint from near Moonee Ponds Creek, Broadmeadows, was unable to converse because of the noise of some 25 bikes on the opposite high bank - the complainant stated that he had counted 111 bikes at one time!"

In addition to the problem of noise, the bikes cause considerable damage to the banks and to adjacent land (Plate 9-14D and E). The tracks created by the bikes are not only unsightly, but are potentially prone to rilling and gullying by surface runoff.

The Board of Works has attempted to deter bike riders from operating along Moonee Ponds Creek and on adjoining land owned by the Board. Warning notices (Plate 9-14A) have been placed at a number of strategic points, and fences and gates have been

erected at certain localities, but these measures have met with only limited success. The fences are frequently cut (on one occasion a steel supporting post was cut with an oxy-acetylene torch), and are occasionally smashed down by old cars. The fences are of limited value at certain localities because the riders can outflank them by riding along the bed of the creek; for obvious hydraulic reasons the fences cannot be extended across the creek.

Immediately upstream of Flemington Road Bridge, obstacles have been placed on the creek invert, on the bank sides, and along the top of one of the banks in an attempt to discourage the bike riders, or at least to slow them down and thus reduce noise levels, numerous complaints having been received about the noise created by the bikes from the residents of a nearby block of flats. Four by four inch concrete curbing stones were fixed to the invert and to the lined portion of the banks, and old SEC poles were placed along the upper parts of the banks and along one of the bank tops (Plate 9-14F). The obstacles would appear to have been relatively successful, but unfortunately they create a number of problems: they trap sediment, make it difficult to mow the grass, and modify the hydraulic design of the channel. For these reasons it is unlikely that they will be installed along other reaches of the creek.

The measures outlined above, although of value, have not been sufficient to deter bike riders from trespassing on land vested in or owned by the Board, and the Board has been

forced, in conjunction with the Victoria Police Department, to try to apprehend offenders and take them to Court. Offenders are generally prosecuted under MMBW By-Law No 120 or the Recreation Vehicles Act 1973.

The Recreation Vehicles Act 1973 (No 8407) was introduced, together with the Land Conservation (Vehicle Control) Act 1972 (No 8379), by the State Government to control the use of recreational and off-road vehicles on both privately and publicly owned land throughout the State. The Land Conservation (Vehicle Control) Act relates to public land which is not located "within a city, town or borough" (that is, is located within a shire), and includes Crown Land vested in the MMBW. The Recreation Vehicles Act 1973 relates to the use of recreation vehicles in specified types of public places, which may be either publicly or privately owned. Regulations made under this Act prohibit the use in a public place of any recreational vehicle which is not fitted with a silencer, or with a device capable of producing an open exhaust, or which produces undue noise for certain other reasons.<sup>1</sup>

In the case of Moonee Ponds Creek and its tributaries, the Land Conservation (Vehicle Control) Act can only be used with respect to certain public land that is located within the Shire of Bulla. However, Crown Land vested in the MMBW within the Shire of Bulla is extremely limited in extent, and trail bikes have not been a problem in these areas.

The Recreation Vehicles Act 1973 can be used with respect to certain 'public places' along Moonee Ponds Creek that are located within the cities that the creek traverses. Some of these 'public places' are owned by, or vested in, the Board of Works. The Jacana Retarding Basin falls into this category; the land is owned by the Board of Works, but is leased to the Broadmeadows Council for passive recreational purposes.

The Recreation Vehicles Act cannot, however, be used with respect to land owned by, or vested in, the Board of Works that is located within a city and to which the public does not have access. In order to be able to take legal action against trail bike riders apprehended in such areas, the Board introduced a new By-Law (By-Law No 120) in 1975.<sup>2</sup> Section 2 of the By-Law states that :

*No person shall -*

*(a) cause or permit a recreation vehicle to be within; or*

*(b) drive, ride or use a recreation vehicle on,*

*any lands or works vested in or under the control or management of the Board.*

and Section 4 states that :

*Any person that contravenes the provision of this By-Law shall be guilty of an offence and be liable to a penalty not exceeding \$500.00.*

<sup>1</sup> Further details concerning these two Acts, and also the Local Government Act 1958 (No 8299), which empowers municipalities to make by-laws relating to the use of motorised recreational vehicles on both private and public land, can be obtained from the Acts themselves, or from a pamphlet published by the Environment Protection Authority of Victoria entitled "A Review of the Acts Controlling the Use of Mini Bikes and Trail Bikes in Victoria" (Report No 24/77).

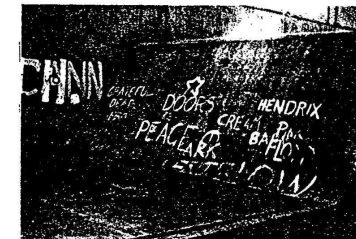
<sup>2</sup> Statutory Rules 1975, No 185 Melbourne and Metropolitan Board of Works Act 1958 -- By-Law No 120 Recreation Vehicles on Lands and Works Vested in or under the Control or Management of the Board.

For obvious reasons, apprehending bike riders is not an easy task. On a number of occasions Board of Works personnel have collaborated with police officers, some equipped with trail bikes, to undertake special patrols along Moonee Ponds Creek. During these patrols a number of offenders have been apprehended and brought to Court. Unfortunately, the arrests do not seem to have acted as a deterrent; bike riders continue to frequent certain sections of Moonee Ponds Creek, much to the annoyance of local residents.

In addition to the problem of trail bikes, there is also the recurring problem of vandalism. Trees and shrubs that have been planted for beautification purposes are occasionally damaged or destroyed (Plate 9-15A); the stream level recorder on the west bank of the creek immediately upstream of Flemington Road Bridge is frequently damaged (the recorder cable is cut, on average, three to four times a year) and attempts are often made to damage the recorder housing and the staff gauge; and not surprisingly, the concrete surfaces along the creek, particularly those at the Jacana Retarding Basin outlet, are visited by graffiti writers and artists (Plate 9-15B).



A Damaged trees and shrubs near Mt Alexander Road, June 1977



B Graffiti on the Jacana Retarding Basin outlet structure, August 1980

PLATE 9-15 Vandalism

**9.2.5 Maintenance Costs.** As can be seen From Table 9-1, a considerable amount of money has been expended over the past few years on maintenance works along Moonee Ponds Creek.

Works on tributary watercourses have accounted for only a very small percentage of annual maintenance expenditure. During the 1970s, bank repair works have accounted for the major part of annual maintenance costs, which is one reason why the Board of Works has advocated a policy of partially hard-lining certain sections of the creek.

As the figures in Table 9-1 show, maintenance costs can fluctuate considerably from year to year. Certain maintenance works have to be undertaken on a regular basis (for example, mowing, the removal of silt from the lower reaches of Moonee Ponds Creek) and can be readily programmed, but others, such as the removal of rubbish or the repair of a collapsed bank, clearly cannot be predicted.

**TABLE 9-1 MOONEE PONDS CREEK : ANNUAL MAINTENANCE EXPENDITURE -- 1974-1980**

Year	Rivers and Streams Section (\$)	Northern Maintenance Section (\$)	Annual Total (\$)
1974-75	184 540	55 200	239 740
1975-76	353 789	102 500	456 289
1976-77	534 529	146 800	681 329
1977-78	451 644	147 461	599 105
1978-79	400 800	9 800*	410 600
1979-80	445 700	90 000	535 700

\* No major works undertaken.

### 9.3 THE MANAGEMENT OF LAND ADJOINING MOONEE PONDS CREEK : SOME LEGAL CONSIDERATIONS

**9.3.1 Early Subdivisions and Reserves.** In May 1881, an Order in Council was gazetted "*Permanently Reserving as Sites for Public Purposes, the Crown Lands forming the Bed, or such Part of the Bed as indicated, of Each of Certain Rivers, Rivulets, etc; and the Crown Lands within the Limits Specified*" (Ref 3). One of the rivers listed was the Yarra. It was stipulated in the Order that along the Yarra all unalienated land "*1 1/2 chains from each bank from its source to the Plenty River, and 1 chain from each bank of all its tributaries between the same points ...*" was to be reserved for Public Purposes. Moonee Ponds Creek, and the neighbouring Merri and Darebin Creeks, were presumably not included because virtually all of the land adjacent to the banks of these watercourses was alienated long before 1881 (see, for example, Figs 4-2 and 4-10).

The original title boundaries, and also the boundaries of many subsequent subdivisions, were permitted to extend to the bank edge, or even to the water's edge, along some sections of Moonee Ponds Creek and its tributaries (see Fig 4-10). Along some of the smaller tributaries the watercourses were included within title boundaries. Drainage reserves were, unfortunately, not created. During the latter part of the nineteenth century and the early decades of the present century, there was relatively little control over the subdivision of land, and scant regard was given by developers to drainage. Public sewers and drains within a municipal district were vested in the municipality by virtue of the Local Government Act 1874 (38 Vict, No 506)<sup>1</sup>, but it was not until 1914

<sup>1</sup> The Town of Melbourne was incorporated in 1842 by an Act of the New South Wales Parliament (6 Vict, No 7). The Municipal Institutions Act 1854 (18 Vict, No 15) enabled areas fulfilling certain population requirements to petition to be constituted as a 'municipal district' (see Refs 4, 5 and 8).

when a Local Government Acts Amendment Act (No 2257) was introduced that 'the municipalities obtained the power to require plans of subdivision to set aside reserves and to indicate the proposed method of drainage (see Sections 58-69 of the Act).'<sup>1</sup> In practice, however, relatively few reserves for drainage purposes were created by councils.

As discussed in Section 4, 5 and 8, the failure to create drainage reserves along Moonee Ponds Creek at the time of initial subdivision resulted in the Board of Works inheriting a number of drainage problems. As development proceeded within the basin, privately owned land abutting the watercourse was eroded and numerous complaints were received. In order to facilitate drainage improvements at several localities it was necessary to purchase narrow strips of land adjoining the creek, which added to the costs of the projects and was generally time consuming. The fact that it was not practicable to purchase wide strips of land along Moonee Ponds Creek for channel enlargement, or to act as floodways, determined the drainage strategy for the creek that was adopted in the early 1960s; the Board's decision was that the only practical solution would be to construct one or more retarding basins in the upper part of the basin to attenuate peak flows, and to improve the channel downstream of the basins along the line of the existing watercourse.

### 9.3.2 Board of Works Control over Land Adjacent to Moonee Ponds Creek.

(a) **Introduction.** The bed and banks of Moonee Ponds Creek vest upon trust in the Board of Works. It should be noted that according to the Board's Act, only those parts of the land that are normally covered by water are so vested, although under certain circumstances the term 'bank' can be defined more broadly.<sup>2</sup> In general, the upper banks of adjoining land, although covered by floodwaters from time to time, do not vest in the Board, although where drainage works have been undertaken on such land, the works themselves are vested in the Board by virtue of Section 265 (1) of the Board's Act.

The Board of Works is able to exercise some control over the type of development that can occur on land adjacent to Moonee Ponds Creek by virtue of having acquired title to some of the land (see Section 9.4, Fig 9-6), and through the provisions of a number of pieces of legislation relating to town planning, the creation of drainage reserves and easements, and the development of flood prone land.

<sup>1</sup> Plans of subdivision lodged in the Office of Titles prior to 1914 could delineate reserves but such plans did not have to be submitted to Council for sealing (see, for example, Transfer of Land Act 1890 (54 Vict, No 1149) Section 172).

<sup>2</sup> In Part X, Section 259(1) of the MMBW Act 1958 (No 6310), 'bed' and 'banks' are interpreted in the following manner:

'Bed' and 'Banks' with reference to any river creek or watercourse to which this Part applies together include the land over which normally flows or which is normally covered by the water thereof, but do not include land from time to time temporarily covered by the flood waters of such river creek or water-course and abutting on or adjacent to such bed or banks. 'Bed' means the relatively flat and 'Banks' the relatively steep portions of the first-mentioned land: Provided that where the context so requires the term 'Banks' extends also to any lands vested in or acquired by or under the management and control of the Board which abut on or are adjacent to the banks as hereinbefore defined.

(b) **Reserves and Easements.**<sup>1</sup> As noted, the councils have been empowered to require drainage reserves to be set aside at the time of subdivision since 1914, but the Board of Works did not have the same power until 1974. Prior to that date it could request that drainage reserves and easements be set aside at the time of subdivision, but could not prevent a plan of subdivision from being sealed if the request was not complied with. In December 1973, the Local Government (Subdivision of Land) Act 1973 (No 8531) was gazetted. This Act amends, *inter alia*, Section 569 of the Local Government Act to enable the Board of Works to :

- advise councils that it consents to or refuses consent to, the sealing of a plan of subdivision [ Section 569B(7) (c) ], and
- advise council to make 'requirements' in regard to drainage as to conditions for sealing of a plan of subdivision, and that a statement should not be issued to the Office of Titles releasing the plan until the Board is satisfied that it has adequate guarantees that the requirements will be fulfilled [ Section 569E (1A), (3A), and (3B) ].

The Act enables the Board to require that drainage reserves and easements be set aside at the time of subdivision to ensure that patterns of subdivision that would be inimical to sound drainage practice do not occur, and to ensure that certain areas are not developed in a manner that would be detrimental to the Board's drainage interest.

In recent years the Board has obtained a number of registered drainage easements and easements of inundation over land adjoining Moonsee Ponds Creek. The Board has not required drainage reserves to be set aside because of the relatively short lengths of land along the creek that have been involved; drainage reserves are generally required when extensive stretches of land adjacent to major watercourses are being subdivided, so that relatively wide, open floodways on a single title, and therefore generally uncluttered by subdivisional fences, can be obtained.

(c) **Restrictions to the Development of Flood Prone Land.** Since the completion of the Jacana Retarding Basin in 1967, flooding has not been a serious problem along Moonsee Ponds Creek. Some land adjoining the creek can, however, be considered to be flood prone, particularly if flood prone

<sup>1</sup> A reserve is a piece of land set aside on a plan of subdivision for one or more purposes, e.g. drainage, sewerage, recreation. It is private land still vested in a private person or subdivisional company. The creation of a reserve does not give a municipal council or a public authority any rights to the area, even though they may have insisted on the reserve being created. A municipal council may take over a reserve by applying to the Local Government Department to have an Order published in the Government Gazette vesting the reserve in the council (see Section 569BA of the Local Government Act). The Board of Works cannot take over a reserve in such a manner, but it may obtain title to the land. This it frequently does, often for a nominal fee.

An easement is a right to use the land of another person in a particular manner and does not give any rights of ownership or possession over the land being used. An easement normally must attach to one particular piece of land which allows the owner of that land the right to use some other land. The Board obtains easements for drainage and sewerage purposes by registering at the Office of Titles an Instrument of Creation of Easement signed by the registered owner of the land. Such easements should be distinguished from easements created by a plan of subdivision which are for benefit of the various owners of lots on that plan of subdivision and which give no rights to the Board.

When a registered easement is obtained, a legal agreement is drawn up between the Board of Works and the landowner stipulating the Board's rights with respect to the easement and any restrictions placed on the owner concerning the use of the easement.

A special type of registered easement that is sometimes obtained by the Board is an easement of inundation. Such an easement is obtained over land that is subject to inundation from watercourses that are vested in the Board.

land is defined as land that would be inundated by a 100-year flood (that is by a flood that has a statistical one per cent chance of occurring in any given year).<sup>1</sup>

Since the gazettal in December 1973 of the Local Government (Subdivision of Land) Act, the Board of Works has had the power to exercise control over the subdivision of land adjacent to watercourses and can require that no buildings be erected or any fill be placed on land that is considered to be flood prone. Building on flood prone land can also be regulated by the provisions of the Uniform Building Regulations [ as amended by the Local Government (Land Liable to Flooding Act) 1979 (No 9356) ] and by Board of Works By-Law No 35 (Sewerage). In addition, the Drainage of Land Act (No 8811), as complemented by the Water Drainage Act 1978 (No 9155), enables the Board to seek to proclaim land as being liable to flooding and to control development thereon.<sup>2</sup>

- (d) **MMBW By-law No 25.** The Board of Works, through the provision of Section 1(h) of its By-Law No 25, can take action against private persons or government and other bodies who deposit material within twenty-five feet of any watercourse vested in the Board [ see Section 9.2.2(b) ]. This provision should ensure that watercourses are not significantly modified, but as reference to Plate 4-13 will show, this regulation has not always been strictly adhered to.
- (e) **Town Planning Restrictions.** The type of development, or redevelopment, that can take place along the land adjoining Moonsee Ponds Creek is, to a certain extent, constrained by the planning zoning of the Melbourne Metropolitan Planning Scheme (see Section 9-4). The uses to which land within a particular zone (or reservation) may be put, and whether any conditions have to be fulfilled, are set out in the Table to Clause 7 of the Planning Scheme Ordinance (Ref 11). The use to which land along Moonsee Ponds Creek can be put is also constrained by Section 24 (8)(b) of the Planning Scheme Ordinance, which requires that the permission of the responsible authority must be obtained before any buildings or works can be constructed or carried out within thirty metres of either bank.<sup>3</sup>

### 9.3.3 Planning : Proposals and Zoning.

- (a) **The 1929 Plan of General Development.** The growth and development of Melbourne during the latter half of the nineteenth century and the first half of the present century was controlled by the municipalities; there was no single planning

The Water Resources Council of Victoria (Ref 7) recommends :

that the flood magnitude which should be adopted for delineation of flood prone areas should be the greater of:

EITHER THE LARGEST RECORDED FLOOD OR THE FLOOD WHICH CAN BE EXPECTED, BASED UPON RECORDED HISTORICAL FLOWS, PRECIPITATION OR OTHER VALID DATA, AS HAVING A STATISTICAL 1% CHANCE OF BEING EQUALLED OR EXCEEDED DURING ANY ONE YEAR.

<sup>2</sup> Prior to the gazettal of the Local Government (Subdivision of Land) Act 1973, the regulation of development on flood prone land was mainly the responsibility of the local authorities. Unfortunately, the local authorities frequently permitted flood prone land to be developed even though they had the legal powers to prevent it; for example, between 1919 and 1978, Section 205 of the Health Act stated, *inter alia*, that "No person shall erect... any dwelling on land liable to flooding ...". For details of the history of legislation regulating the development of flood prone land, see Refs 8, 9 and 10.

<sup>3</sup> This constraint was first introduced in 1963. In Modification No 2 to the 1961 Interim Development Order (gazetted 8 May 1963), an additional sub-clause was added to Section 24 requiring the consent of the Responsible Authority before any works could be constructed on any land (other than land vested in the Melbourne Harbor Trust Commissioners) within a distance of fifty feet from certain named watercourses, one of which was "The Moonsee Ponds Creek including its two branches which join near the intersection of Broadmeadows Road and Lyons Street, Broadmeadows". For certain watercourses, including Moonsee Ponds Creek, the distance was increased to one hundred feet in 1970 (Amendment No 2 to the Melbourne Metropolitan Planning Scheme, gazetted 11 February 1970). The one hundred feet was changed to thirty metres in Amendment No 51 which was gazetted on 5 March 1975.



body and no overall planning scheme. Development within the metropolitan area was inevitably often haphazard and unplanned (see, for example, Refs 12 and 13). The municipalities were aware of the problems, however, and appreciated the need for co-ordinated town planning. In July 1920, the Melbourne City Council passed the following resolution (Ref 14) :

*That this Council considers that the rapid growth of the City and the Metropolis is creating unsatisfactory conditions, which require immediate attention, and that it is therefore necessary to further regulate development on modern scientific lines, so as to provide for the future demands of business, recreation, housing, traffic, and other matters, and that the Lord Mayor be requested to call a conference of representatives of the Metropolitan Municipalities to consider the best means of carrying out this proposal.*

The Metropolitan Municipalities held a conference later in the year and a number of recommendations were subsequently forwarded to the Government. As a result, the Metropolitan Town Planning Commission Act (No 3262) was passed in 1922 which provided for the establishment of a Metropolitan Town Planning Commission. The duties of the Commission were defined in Section 10 of the Act in the following manner :

*The Commission shall enquire into and report upon the present conditions and tendencies of urban development in the metropolitan area, and shall in such report set out -*

- (a) General plans and recommendations with respect to the better guidance and control of such development or any portion thereof; and*
- (b) Estimate in reasonable detail the costs involved in the construction, maintenance, and administration of all matters or things the subject of such recommendations.*

The Commission was appointed in March 1923 and presented its report, *Plan of General Development, Melbourne* (Ref 14), in 1929. The report contains recommendations for the co-ordinated development of the metropolitan area, and advocated that a Town Planning Act should be passed without delay to ensure the implementation of its recommendations.

One of the recommendations contained in the report is that the metropolis should be zoned for particular types of development. The Commission considered that :

*The effect of the zoning scheme would be to encourage the compact and orderly growth of the metropolis along lines best suited to the particular type of development, and in accordance with the expansion that has taken place in the various districts in the past.*

Eight types of zone were envisaged : three residential, three industrial and two business.

With respect to the Moonee Ponds Creek basin, the major part of the existing residential area (Fig 1-5) was zoned Residential B, and the rural land to the north of the existing residential area in Essendon, Coburg, and Broadmeadows was also zoned Residential B to allow for the future expansion of the urban area. The existing industrial area to the south of Flemington Road was zoned Industrial B.

The Commission gave considerable attention to the need for recreational land, and recommended the development of a network of parklands along the watercourses

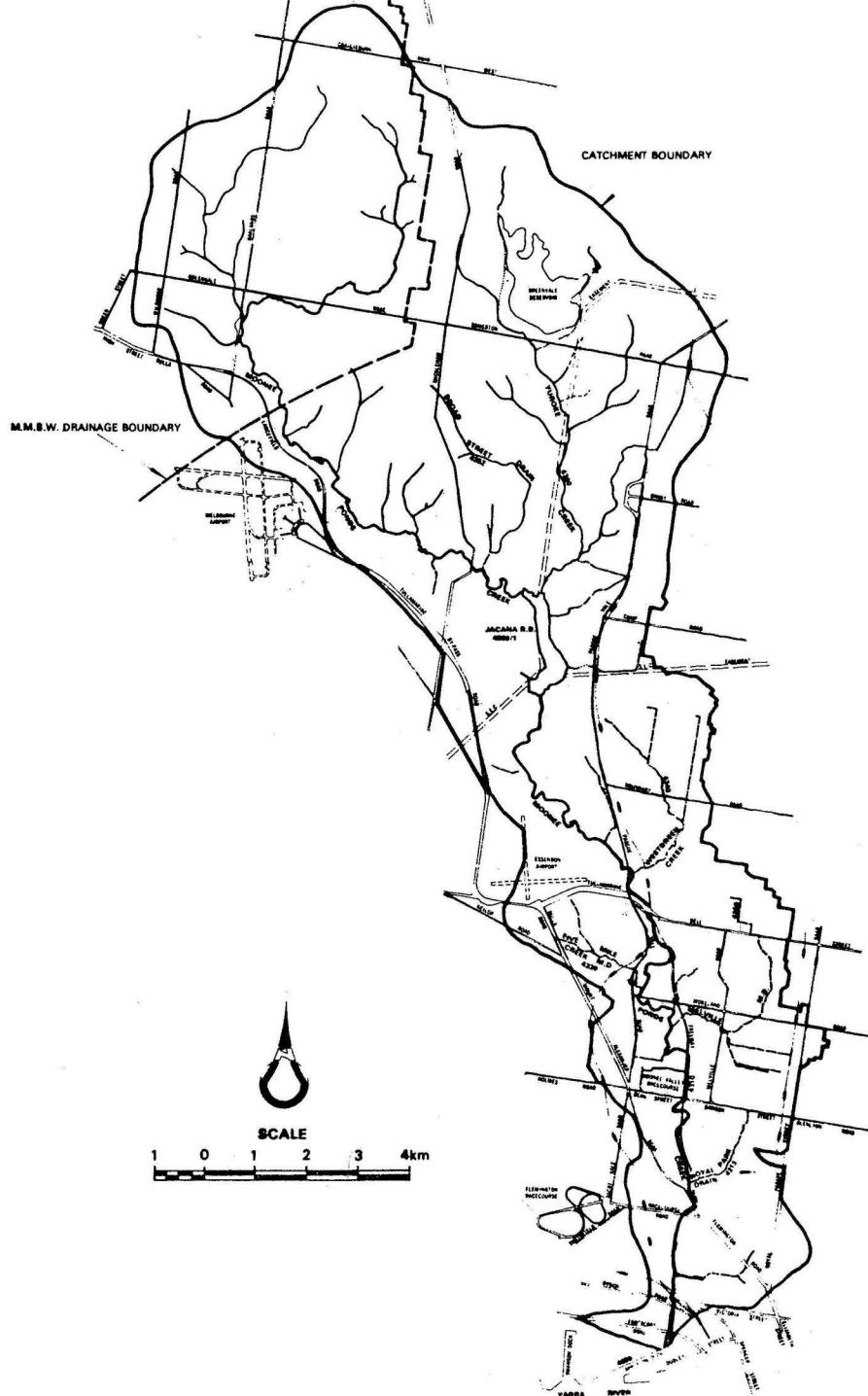
traversing the metropolitan area. It noted that much of the land adjacent to the watercourses was flood prone and of little value for residential and industrial development, but had a number of advantages with regard to the development of parks, commenting that -

- 1 The lands are cheaper than any other on account of their unsuitability for buildings.*
- 2 They are particularly amenable to landscape treatment, and for the formation of playing ovals on the many small areas of flat lands along them, while the steep slopes provide natural vantage points for spectators.*
- 3 Their resumption for park purposes will prevent the erection of buildings which may be subject to flooding, thereby avoiding unsatisfactory housing conditions and added expense to municipalities by reason of flood prevention or drainage measures.*
- 4 The proper treatment of the lands would convert what will become drainage canals with houses close to their banks, into picturesque belts of park lands, which will considerably increase the value of contiguous property, especially the frontages to the proposed fringing roads.*
- 5 Their utilization for park purposes will supply the present deficiency of properly located park lands, and make reasonable provision for the recreation of the prospective population.*
- 6 Their resumption will give public control of the banks of the streams.*

In the case of Moonee Ponds Creek, the Commission acknowledged that the irregularity of its course, and the extent of development along its lower reaches, precluded the development of a continuous parkway similar to those proposed for a number of other watercourses in the metropolitan area. However, they noted that it should be possible to obtain several useful enclosures along the creek in Essendon and Coburg (Fig 9-3). In the rural areas upstream of Pascoe Vale there were no constraints to the development of a continuous parkway, and the Commission advocated that land along the creek should be reserved for recreational purposes and should be linked to a large park that it considered should be created in the vicinity of Somerton Railway Station (Fig 9-3). The Commission envisaged that "*The Somerton Park would have an area of 1,280 acres of picturesque country at an elevation sufficient to overlook the whole of the northern suburbs*".

The development plan and related recommendations proposed by the Commission were never implemented, but undoubtedly influenced the planning scheme that was prepared in the early 1950s by the Melbourne and Metropolitan Board of Works for the State Government.

- (b) The 1954 Planning Scheme.** In 1949, the Victorian Government requested the Melbourne and Metropolitan Board of Works to prepare a planning scheme for the metropolitan area. The metropolitan area was defined as the area within a fifteen mile radius of the city centre, together with a twenty-five mile extension south-eastwards to include Frankston. The Planning Scheme prepared by the Board of Works was placed on public exhibition in 1954, and two volumes explaining the scheme were published. The scheme was not approved by the Government until 1968; between 1955 and 1968 the area covered by the proposed scheme was placed under a series of Interim Development Orders (IDOs) which were administered by the Melbourne and Metropolitan Board of Works.



METROPOLITAN TOWN PLANNING COMMISSION 1929

Figure 9-3

The zones and reservations proposed in the 1954 Planning Scheme for the Moonee Ponds Creek basin were generally similar to those proposed in the 1929 report. In both schemes, the northern boundary of proposed urban development approximately follows the line of the Essendon - Broadmeadows railway (Fig 9-4). As in the 1929 Report, considerable emphasis was placed in the 1954 Scheme (Ref 15) on the development of a park system for the metropolitan area, including -

*A series of radial parks, mostly along the valleys of the River Yarra and various creeks and watercourses, adjoining the large park areas and thus affording the opportunity not only for field sports, but also a place for walking, riding and cycling within easy distance of the home.*

As can be seen from Figure 9-4, a number of strips of land along Moonee Ponds Creek between the Jacana Retarding Basin and Flemington Road were reserved as Existing Public Open Space or Proposed Public Open Space in the 1954 Planning Scheme. The establishment of these reservations ensured that residential and other urban development could not encroach up to the edge of the creek as had occurred in earlier years. The creation of the reservations was not particularly popular at the time with the local councils, upon whom the burden of maintenance generally fell. The City of Broadmeadows, for example, forwarded the following letter to the Board of Works in July 1958 :

**Re: Melbourne and Metropolitan Master Planning Scheme**

*Council at its last meeting directed me to seek the views of your Board regarding the 100 ft Reserves at the Merri Creek and Moonee Ponds Creek. Council feel that these Creek Reserves are of little benefit to the community and that no good purpose is being served by retaining them as part of both the MMBW Master Planning Scheme or in Council's own Planning Scheme. However before making any move in this matter, Council directed me to seek the views of your Board.*

Attitudes have certainly changed!

Since 1955, when the first IDO was introduced, there have been a large number of amendments to the Planning Scheme. With respect to Public Open Space Reservations, some of the proposed reservations have been reclassified as existing reservations, parts of some proposed reservations have been reserved or zoned for other purposes, and additional reservations have been proposed (Figs 9-4 and 9-5). The location of existing and proposed reservations along Moonee Ponds Creek in mid 1980 is shown in Figure 9-5 and Figure 9-6 B to I.

Public Open Space Reservations have not been created along Moonee Ponds Creek upstream of Westmeadows Township. Most of the land upstream of Westmeadows was zoned Rural in both the proposed 1954 Planning Scheme and the approved 1968 Planning Scheme, thus precluding urban development in the upper part of the basin. The Rural land was for the most part rezoned to Conservation A and General Farming A by Amendment No 3 Part 1A on 20 December 1978.<sup>1</sup> This zoning will ensure that the land remains in an essentially rural state because only extremely limited residential development is generally permitted in these zones.

<sup>1</sup> Amendment No 3 related to the additional part (Extension Area) of the Metropolitan Area for which the MMBW became the Responsible Authority in May 1968.

#### 9.4 THE MANAGEMENT OF LAND ADJOINING MOONEE PONDS CREEK : ZONING, OWNERSHIP AND LAND USE

**9.4.1 Introduction.** Land use along Moonee Ponds Creek can be divided into three broad categories : privately owned residential land, recreational areas owned or managed by the municipalities, and land used for a variety of public purposes by bodies such as the MMBW, the Country Roads Board, the Victorian Railways Department, and the Port of Melbourne Authority.

The majority of the land adjoining Moonee Ponds Creek that is zoned for residential purposes was developed many years ago; relatively few changes in land use have occurred in these areas in recent years, and few changes are envisaged in the future. In contrast, land use in some of the non-residentially zoned land adjoining the creek has changed considerably over the past two decades as the municipalities have developed the areas for recreational purposes. Further changes of this nature can be expected as development proposals are implemented.

During the 1950s, the councils were generally not interested in developing the land along the creek for recreational purposes because of the development and maintenance costs that would have been involved. During the late 1960s and the 1970s, however, attitudes changed. The general public became far more aware, and concerned about, environmental issues, and there were increasing calls to set aside land for both active and passive recreation, and for the conservation of flora and fauna. Watercourses often became focal points of attention. Moonee Ponds Creek was no exception; resident groups and private individuals petitioned the MMBW and their local councils to develop the land along the creek for public use. As a result a number of areas have been developed, and there are plans to develop a number of others.

Recommendations for the development of the land along the length of Moonee Ponds Creek were presented in a report produced in mid 1975 by the Preston Institute of Technology for Region 14 of the Victorian Division of the Regional Organisation of Councils. The Preston Institute of Technology's brief was to prepare a study of Melbourne's northern waterways, the objectives being "*to research and document the existing condition along each waterway and to recommend means of improving them and their use for public recreational purposes*" (Ref 16). Funds for the study were made available by the Commonwealth Government under its Area Development Programme. The format of the project was approved and monitored by the Commonwealth Department of Urban and Regional Development. The Report, which was published in August 1975, contained a brief account of existing conditions along Moonee Ponds Creek and made a number of recommendations for the development of the creek and its environs. The recommendations are concerned mainly with landscaping and the development of land along the creek for recreational purposes; unfortunately, little consideration is given to drainage matters.

Some of the plans that have been proposed for the development of land along Moonee Ponds Creek require public access to land owned by, or vested in, the Board of Works. For the most part, the Board has fenced the land that it owns along the creek, and has also erected fences to prevent public access to the banks and bed of certain sections of the watercourse. The Board has erected the fences for safety reasons, for reasons of legal liability, and as discussed above, to discourage vandals, mini and trail bike riders, and potential rubbish dumpers. The Board considers that the constructed sections of Moonee Ponds Creek and certain other drainage works and structures are potentially hazardous to the public, particularly children, and that the use of maintenance tracks by heavy vehicles and other equipment and by pedestrians and cyclists is generally incompatible. It might be contended that the watercourse of Moonee Ponds Creek is not a dangerous place; while this may be possibly true at times of low flow, it is certainly not true during times of flood flows. During flood flows, the water in the channel is deep; the flow around the bends is often turbulent; and flow velocities, particularly along the

partially lined sections, are high. Velocities along the partially lined sections may exceed three metres per second; anyone falling into the channel during such a flow would be unable to stand, and would have difficulty climbing out of the channel. This was tragically illustrated on Good Friday 1977. A youth launched a canoe into the lined section of the creek downstream of Victoria Street, Brunswick, but capsized in turbulent water on a bend (see Plate 9-8A) before he travelled far downstream. His body was not recovered.

Critics of the Board's fencing policy often overlook the question of legal liability. The Board has sought legal opinion on its liability to fence main drains, drainage works and natural watercourses on several occasions since 1932 : from Sir Clifton Eager in 1932, from Sir Robert Best in 1944, from Mr L Voumard in 1961 and 1967, Mr G Hooper in 1962, and from The Ombudsman on two occasions in 1975. The opinions given deal with various aspects of the subject, but four main conclusions emerge:

- The Board should fence all works that it has constructed along watercourses.
- The Board should fence all eroding watercourses if works have been undertaken by the Board upstream of the relevant sections or if the Board has permitted the inflow of additional waters.
- The Board should fence all lands owned by it as a title owner of lands.
- In general the Board has no liability with respect to natural watercourses which are considered to be natural hazards.

In the following sub-sections, land use, land ownership, land management and current planning zoning (as at mid June 1980) along Moonee Ponds Creek from its junction with the Yarra River to upstream of Westmeadows Township, and along Yuroke Creek upstream to near Somerton Road, are described and briefly discussed. For convenience of description and cartographic presentation, the creek has been divided into eight sections, and a map showing land ownership/ management and planning zoning has been prepared for each section (Fig 9-6 B to I). In addition, various development proposals for some of the sections are briefly described and discussed.

**9.4.2 Moonee Ponds Creek : Yarra River to Flemington Road.** To the south of Footscray Road, Moonee Ponds Creek flows through Crown Land vested upon trust in the Port of Melbourne Authority (Fig 9-6B). The area has been appropriately reserved for Public Purposes (for the Port of Melbourne Authority) in the Melbourne Metropolitan Planning Scheme.

The land along the west bank of the creek downstream of Footscray Road remains undeveloped while the land along the east bank is occupied by warehouses and car parking lots, although these do not generally extend to the edge of the channel. The channel immediately south of Footscray Road is part of the old Railway Coal Canal, the width of which has been considerably reduced over the years by filling. The swampy land to the west of the channel near its junction with the Appleton Dock is one of the last vestiges of the once extensive West Melbourne Swamp.

The major part of the land adjoining the Moonee Ponds Creek channel between Footscray Road and Flemington Road, and also much of the land occupied by the channel between these two points, is owned by the Victorian Railways Board (Fig 9-6B). The land is freehold land held under three different types of title : Crown Grant; certificate of title in the name of the Victorian Railways Board; and certificate of title in the name of the now defunct Board of Land and Works, the Board having originally purchased the land for railway purposes. For virtually all practical purposes, however, all of the land can be considered to be owned by the Railways Board.

Between Flemington Road and Racecourse Road, title to the land adjoining the west bank of the channel, and also title to part of the channel, is held by the City of Melbourne. The land owned by the City of Melbourne is separated from Railway owned land by a narrow strip of Crown Land (Fig 9-6B), this section of the channel being located therefore on titles held by three separate authorities. The channel is also located on Crown Land between Gracie Street and the Railway Gravitation Bridge, while land along the western bank of the channel immediately upstream of Dynon Road is also Crown Land. One piece of land along the west bank of the channel is owned by the SEC and another by the MMBW.

The major part of the land owned by the Victorian Railways Board to the south of Arden Street is used for railway purposes, but to the north of Arden Street only the land occupied by the Coburg line is so used. The land owned by the Railways Department to the west of the Coburg line embankment is generally coincident with the 5 000 cusec channel and is utilised for drainage purposes only. An electricity sub-station is located on the piece of land owned by the SEC to the south of Arden Street. The piece of land owned by the MMBW along Dynon Road was acquired for future road works. The land between Flemington Road and Racecourse Road that is owned by the City of Melbourne is occupied by the Debney Park Community Centre and by the Australian Ballet Centre.

As discussed in Section 9-1, the bed and banks of Moonee Ponds Creek upstream of the Railway Gravitation Bridge are vested upon trust in the Board of Works, although what actually constitutes the bed and banks of the constructed channel between the Gravitation Bridge and Flemington Road has never been resolved. Likewise, the question of responsibility for the maintenance of the channel between the Gravitation Bridge and Dynon Road has yet to be resolved.

The land owned by the Victorian Railways Board to the south of Arden Street and along the route of the Coburg line between Arden Street and Flemington Road is, for the most part, reserved for railway purposes in the Melbourne Metropolitan Planning Scheme (Fig 9-6B). The land owned by the Railways Board to the west of the Coburg line between the Gravitation Bridge and Flemington Road, together with the Council owned land at Debney Park, is a Proposed Public Open Space Reservation, having been reserved as such in the MMBW Interim Development Order (IDO) that was gazetted on 1 March 1955.

Between Flemington Road and Arden Street, the Proposed Public Open Space Reservation is generally coincident with the 5 000 cusec channel. The part of the reservation along the east bank of the channel between Arden Street and the Gravitation Bridge is occupied by railway sidings. Only the council owned land at Debney Park is currently open to the public. The Railways Board, quite understandably, does not permit the public access to land that is being used for railway purposes, and the Board of Works does not permit public access to the area for which it is responsible for reasons of safety and legal liability (see Section 9.4.1).

Possible future developments along this section of Moonee Ponds Creek include the reconstruction of the channel through the Port area, and the construction of a Freeway along the line of the creek, with associated drainage reconstruction between Flemington Road and Footscray Road. In August 1979, the Port of Melbourne Authority informed the Board of Works that when the reconstruction of Berths Nos 16 to 21 in the Victoria Docks was completed, the additional cargo generated would require the construction of a new road bridge and possibly a new railway bridge over Moonee Ponds Creek, and that they planned to reconstruct the channel of Moonee Ponds Creek where it traversed the Port area. The Port of Melbourne Authority was anxious that the design of the planned channel should complement any proposals that the Board of Works had for channel improvements further upstream. The Board of Works informed the Port of

Melbourne Authority that preliminary investigations with respect to the design of a new channel for the section of the creek between Footscray Road and Flemington Road were in progress.

In October 1971, the Victorian Government directed that priority be given to the construction of a Freeway (the F14) connecting the Tullamarine Freeway to a point south of the Yarra River. The Highway Planning Unit of the MMBW was assigned to undertake a preliminary investigation. Four alternative routes were proposed and a fifth was subsequently added (Fig 9-7). A preliminary report prepared by the MMBW Planning and Highways Branch concluded that "*the only possible location for a freeway is over or adjacent to Moonee Ponds Creek from Tullamarine Freeway to Footscray Road*".

The drainage works which would be required for each of the alternative schemes are summarised below -

Route No 1 - Improvement works to the existing channel and the levee banks at crossing points between Park Street and the end of the freeway would be required.

Route Nos - Improvement works to the existing creek channel and levee banks between Footscray Road and the end of the proposed freeway, and the construction of a satisfactory outlet, would be required.

2 and 3

Routes Nos - Improvement works to the existing creek and the levee banks between Footscray Road and the end of the proposed freeway would be required.

4 and 4A

Route No 5 - This route would not affect the creek.

In 1978, the Main Drainage Division of the Board of Works commenced an investigation relating to the drainage works that would be required if a freeway or arterial road were constructed along the line of Moonee Ponds Creek between Flemington Road and Dynon Road.

**9.4.3 Moonee Ponds Creek : Flemington Road to Donald Avenue, Essendon.** Between Flemington Road and Ormond Road, Moonee Ponds Creek originally meandered across a quite extensive floodplain. As described in Sections 5.2.5 and 7.2, the creek was realigned in 1962 immediately upstream of Flemington Road, and was completely realigned between Flemington and Ormond Roads in 1967 at the time when the Tullamarine Freeway was constructed.

As can be seen from Figure 9-6C, the Board of Works holds title to much of the land traversed by the Freeway and the reconstructed Moonee Ponds Creek. The Board acquired title to most of this land in the late 1940s and early/mid 1950s when a plan to realign the creek between Flemington and Ormond Roads and to fill and develop parts of the floodplain for recreational purposes was formulated [ see Section 5.2.3(b) ]. For financial reasons the plan was never implemented. When the Tullamarine Freeway was being planned, it was decided that the land that had already been acquired by the Board should be utilised for the freeway and associated drainage works, and that additional contiguous strips of land should be acquired where necessary. The land required for freeway and drainage purposes is appropriately reserved (that is Proposed Main Road Reservation and Proposed and Existing Public Purpose Reservations) in the Melbourne





PROPOSED ALTERNATIVE ROUTES FOR THE F14 FREEWAY

Figure 9.7

and Metropolitan Planning Scheme<sup>1</sup>. The constructed channel vests in the Board of Works by virtue of Section 265 (1) of the MMBW Act 1958<sup>2</sup> even though title to part of the land is held by the City of Melbourne.

Some of the land that the Board owns, and some of the land vested in the Board between Ormond Road and Flemington Road is surplus to its requirements and will not be retained. Land not required for drainage or other purposes to the east of the reconstructed channel will, in due course, be transferred to the Country Roads Board who replaced the Board of Works as the responsible authority for the Tullamarine Freeway in 1974. Parts of the old course of the creek, which are Crown Land vested upon trust in the MMBW, are also no longer required for drainage purposes and are being divested. The Board of Works will formally surrender the land, and once the approval of the Governor-in-Council has been obtained, it will revert to the Department of Crown Lands and Survey. As can be seen from Figure 9-6C, the portions of the old creek that cross the land occupied by the freeway and by the new channel are not being divested.

Once divested, the land may be transferred by the Department of Crown Lands and Survey to another authority or to a private individual. A short section of the old course of the creek near Mt Alexander Road was divested in 1976 and sold to a landowner whose property abutted on to it. For much of its length, the old course of the creek abuts council-owned land, and it would seem logical that such land should eventually be transferred to the appropriate council.

The land immediately to the west of the constructed channel is zoned for residential and recreational purposes (Fig 9-6C); the Tullamarine Freeway runs along the western boundary of the channel. The two Proposed Public Open Space Reservations, which were included in the 1955 IDO (gazetted 1.3.55) have been acquired by the Cities of Melbourne and Essendon. The reservation to the south of Delhi Court remains in an undeveloped state, but the land owned by the two councils to the north of Delhi Court has been developed for active and passive recreation (Plate 9-16).

Between Ormond Road and Dean Street, the original alignment of Moonee Ponds Creek has been retained, although the watercourse has been straightened and widened along some reaches. The land to which the Board of Works owns title along this section of the creek was, for the most part, acquired for freeway purposes, and some of the land will be transferred to the Country Roads Board in due course. The Board will probably retain ownership of the piece of land immediately to the north of Ormond Road that is located between the freeway and the creek because part of the land is required for maintenance purposes and the only access to it is along a Board of Works maintenance track. This piece of land was reserved for Board of Works use in 1966 (Modification 4A to the 1961 IDO, gazetted 31.8.66).

The bed and banks of this section of the creek, and also land adjoining the creek, were reserved for Public Open Space (Existing or Proposed) in the 1955 IDO (Fig 9-6C). For reasons of public safety and legal liability (see Section 9.4.1), the Board does not permit public access to this section of the creek. The Holbrook Reserve and Ormond Park, which abut on to the creek, are council owned and have been developed for active recreation.

<sup>1</sup> The reservations were created at various dates: the Proposed Main Road Reservation was included in the 1955 Interim Development Order (gazetted 1.3.55) and extended by Modification 4A to the 1961 IDO (gazetted 31.8.66); the Existing Public Purpose Reservations were included in the 1959 IDO which was gazetted on 18.3.60; and the Proposed Public Purpose Reservations were included in Modification 4A to the 1961 IDO.

<sup>2</sup> Section 265 (1) of the Melbourne and Metropolitan Board of Works Act 1958 states, "All main drains main drainage works and river improvement works constructed or in the process of construction by the Board shall vest in the Board".



PLATE 9-16 Land being developed for recreational purposes between Moonee Ponds Creek and Mooltan Street by the City of Melbourne

Moonee Ponds Creek was realigned between Dean Street and Hope Street when the Tullamarine Freeway was constructed. A number of loops were truncated. The Board of Works holds title to some of the land occupied by the freeway and channel and, as along the other freeway sections, will transfer land surplus to its requirements to the Country Roads Board. The new channel vests in the Board of Works by virtue of Section 265 (1) of the MMBW Act 1958, and the area occupied by the channel, and strips of land on either side, were reserved for Board of Works use in 1966 (Proposed Public Purpose Reservation, Modification 4A to the 1961 IDO, gazetted on 31.8.66).

Only part of the old creek course has been divested to date. The part of the old course that was located to the west of the freeway between Dean and Wilson Streets (Fig 9-6C) was surrendered by the MMBW in 1970, and was subsequently transferred to private ownership.

The City of Brunswick holds title to land along the eastern side of the channel between Hope Street and to the south of Hunter Street. The land between Hope Street and Hunter Street has been developed as a park for passive recreation. The area was reserved for Public Open Space in the 1955 IDO. To the north of Dawson Street, a narrow strip of Crown Land along the east bank of the creek was placed under the management of the City of Brunswick in November 1918. This strip of land is now occupied by the improved channel and maintenance track, and public access is not permitted.

For much of its length between Hope Street and Donald Avenue, Moonee Ponds Creek is confined between steep banks. During the 1960s and early 1970s the Board improved the channel along a number of reaches to prevent erosion and to increase its capacity. In order to carry out the works the Board had to acquire several narrow strips of land (Fig 9-6C). The earliest of the improvement works undertaken along this section of the creek was that at Hilda Street, Essendon. The channel was realigned and partially hard-lined, and the section of creek was rezoned from Proposed Public Purpose Open Space Reservation to Public Purpose Reservation for the Board of Works (Modification 1 to the 1961 IDO, gazetted 11.4.62). A part of the old course of the creek was surrendered by the Board in December 1971, and transferred to private ownership in April 1977.

Three pieces of land that were considered to be surplus to the Board's requirements have been transferred to the City of Essendon. A narrow strip of land between Donald Avenue and Vanberg Road (Fig 9-6C) was transferred to the Council in December 1976 under a seven year agreement<sup>1</sup>, and two pieces of land in the vicinity of Fanny Street were sold to the council in May 1980 (Fig 9-8). The latter two pieces of land, together with intervening Crown Land, will be managed as one unit by the City of Essendon. The Crown Land comprising the old course of Moonee Ponds Creek (the creek having been deviated at this location in 1962) is still vested upon trust in the Board of Works, but for all practical purposes is under the control of the City of Essendon, while the City of Essendon has been appointed as the Committee of Management for the narrow strip of Crown Land along the east bank of the old creek course. Prior to the change in the municipal boundary that occurred after the creek was deviated, the City of Brunswick was the Committee of Management for this strip of land, having been appointed in 1919.

The area occupied by the creek, and narrow strips of land along the banks between Hope Street and Donald Avenue, were reserved for Public Open Space in the 1955 IDO. The Board does not allow the public access to this section of the creek for reasons already elaborated. In order to obtain greater control over the use to which land adjoining the watercourse could be put between Albion Street and the Tullamarine Freeway (Fig 9-6C), the Main Drainage Division of the Board of Works requested that the existing Proposed Public Open Space Reservation should be changed to a Stream and Floodway Zone.<sup>2</sup> The request was approved by the planning authority, and the new zoning was gazetted on 15.4.78 under Amendment 83, Part 1.

The strip of Crown Land along the east bank of the original creek between Waxman Parade and Donald Avenue, for which the City of Brunswick was made the Committee of Management in 1919, would now appear to be located within the Board of Works exclusion fencing, the strip of land having been required for the drainage improvement works that were undertaken along this section of the creek during the 1960s.

**9.4.4 Moonee Ponds Creek: Donald Avenue, Essendon to Margaret Street, Broadmeadows.** Between Donald Avenue and Woodland Street, Essendon, the creek has been straightened at a number of localities, but its general alignment has been retained. As along the section immediately downstream, the Board of Works owns title to several narrow strips of land which it acquired to enable improvement works to be undertaken and maintenance tracks to be constructed (Fig 9-6D). In order to facilitate more efficient maintenance between Moreland Road and The Boulevard, the Board wishes to acquire two additional strips of land along which access tracks would be constructed.

The watercourse and adjoining land between Donald Avenue and Woodlands Street were reserved for Public Open Space in the 1955 IDO (Fig 9-6D). The Cross Keys Reserve, which is part Government Road Reserve and part Crown Land with the City of Essendon as the Committee of Management, has been developed for active recreation

<sup>1</sup> The Board of Works occasionally purchases land in PPOS reservations on behalf of municipalities who repay the Board over a fixed period of time, usually seven or ten years. In addition, the Board occasionally sells land that it has acquired in PPOS reservations for a particular purpose, but has become surplus to its requirement, to the municipalities under a similar arrangement. Once an agreement has been signed the land is for all intents and purposes council land, although the title is held by the Board of Works (that is the Board of Works remains the registered proprietor) until final settlement is made.

<sup>2</sup> The use to which land can be put is generally far more restricted in a Stream and Floodway Zone than in a Proposed Public Open Space Reservation; for example, the Board can prevent land being filled in a Stream and Floodway Zone, but does not have the power to do so in a PPOS Reservation, except within a relatively short distance of the creek banks (30 m in the case of Moonee Ponds Creek). For further details, see the MMBW Planning Scheme Ordinance, Table to Clause 7 and Clause 24(8) (Ref 11).

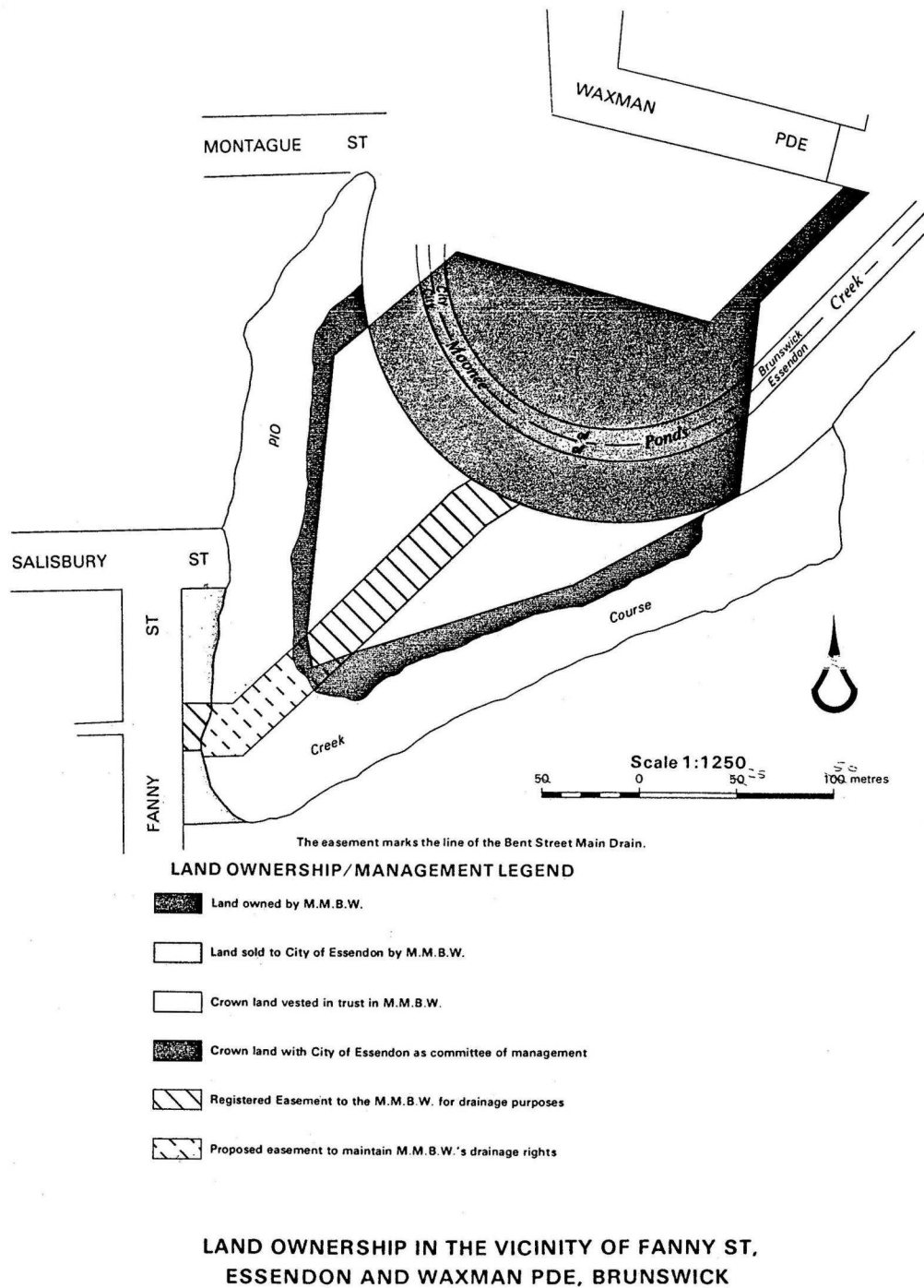


Figure 9-8

by the City of Essendon. In December 1976, the Board transferred (under a seven-year agreement) Proposed Public Open Space land surplus to its requirements at the junction of Moonee Ponds Creek and Five Mile Creek to the City of Essendon (Fig 9-6D). The Board has retained a strip of land along Moonee Ponds Creek to ensure access for maintenance purposes, and required an easement of inundation to be created over part of the transferred land (Fig 9-9). Another piece of land surplus to its requirements on the inside of the truncated loop of the creek will probably be transferred to the City of Essendon in the not too distant future. The City of Essendon has plans to develop the area for passive recreation, and proposes to plant numerous trees and shrubs and to install barbeques. The old course of Moonee Ponds Creek remains Crown Land vested upon trust in the Board of Works. It would seem likely that the part of the old course that has been filled will become part of the surrounding parkland but the section of the old course that has been retained as an outlet for Five Mile Creek will remain under the direct control of the Board of Works.

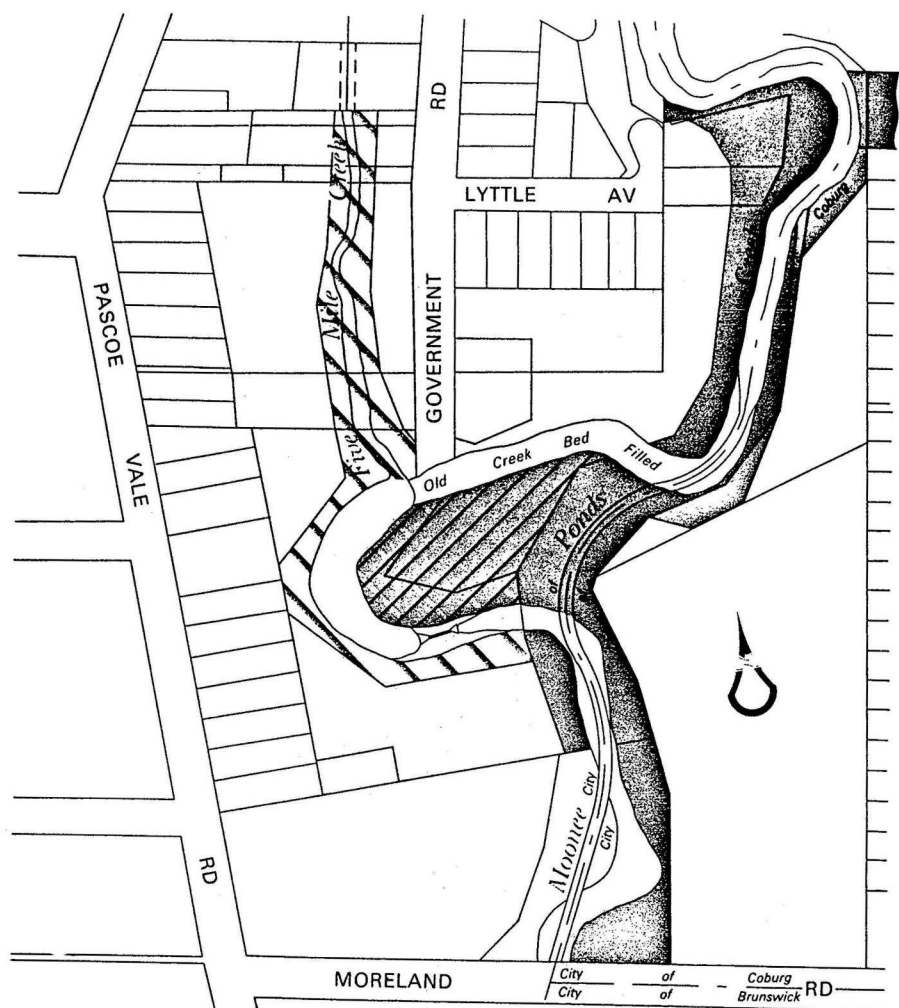
On 28 August 1978, an article appeared in the *Coburg Courier* stating that the Essendon and Coburg Councils planned to develop land along the banks of Moonee Ponds Creek as a linear park. The City of Essendon wished to develop a parkway between Woodland Street and Primrose Street (Fig 9-6D) for walking, jogging and bicycle and horse riding, and the City of Coburg wished to develop a walking track between Moreland Road and Brentwood Avenue. The two councils approached the Board of Works requesting that the Board sell some of the land to them, or allow the public access to the land. The Board informed the two councils that it was not prepared to sell land that it required for drainage and maintenance purposes, and that for reasons of safety and legal liability it could not permit public access to the land. In addition, the Board pointed out that some of the land that the councils proposed to develop was privately owned.

Moonee Ponds Creek was relocated for most of its length between Woodland Street and Tate Street during the construction of the Tullamarine Freeway (Fig 9-6D). Land acquired by the Board of Works along this section of the Freeway that is not required for drainage or other purposes will be transferred to the Country Roads Board in due course. The old course of the creek is no longer required for drainage purposes and is in the process of being divested. As noted, the new channel vests in the Board by virtue of Section 265(1) of the MMBW Act 1958.

Between Woodland Street and the Freeway, where the existing alignment of the creek was retained, the land occupied by, and adjoining the watercourse is reserved for Public Open Space. The land was reserved for this purpose at varying dates between 1955 and 1970. As along other constructed sections of Moonee Ponds Creek, the channel and adjoining maintenance tracks are fenced off and public access is not permitted.

To the west of the Freeway, and immediately upstream of the Freeway, the land occupied by the channel, and strips of land on either side of the channel, are Proposed Public Purpose Reservations for the Board of Works (Modification 4A to the 1961 IDO, gazetted 31.8.66).

The Board of Works holds title to several pieces of land along Moonee Ponds Creek between Tate Street and Margaret Street (Fig 9-6D), the land having been acquired during the 1960s and 1970s to enable drainage improvement works to be undertaken (see Sections 5.1.3 and 8.4). As part of the improvement works, two tight loops along the creek were cut off. The old course of the creek at Herbert Street is in the process of being divested, but no action would appear to have been taken to date to divest the old course of the creek at Avoca Crescent-Somerses Street. It is interesting to note that along the Herbert Street loop, two property owners whose allotments had been eroded by the creek, extended their rear fences to their property boundaries once the old course of the creek had been filled (Plate 9-17). The Board transferred two contiguous pieces of land



**LAND OWNERSHIP/MANAGEMENT LEGEND**

- M.M.B.W. owned land to be retained for drainage purposes
- M.M.B.W. owned land surplus to requirements can be transferred to Council
- Council owned land
- M.M.B.W. land transferred to City of Essendon in Dec 1976. City of Essendon will acquire title to the land in Dec 1983
- Easement of inundation (existing or required)
- Crown land
- Land required for drainage purposes currently in private ownership

**LAND OWNERSHIP AT THE JUNCTION OF FIVE MILE CREEK AND MOONEE PONDS CREEK**

Figure 9-9

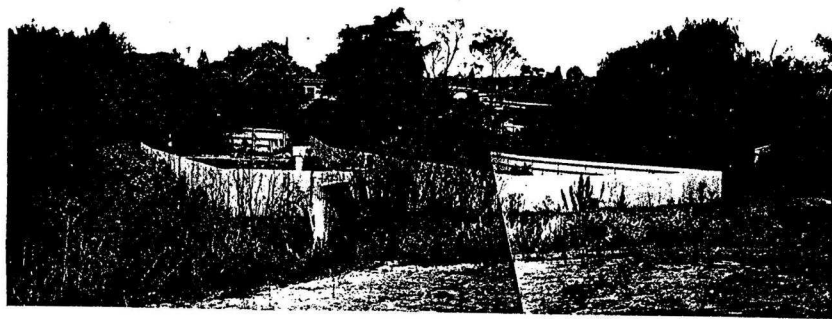


PLATE 9-17 The old, filled course of the creek at Herbert Street, Broadmeadows. The fences have been extended to title boundaries

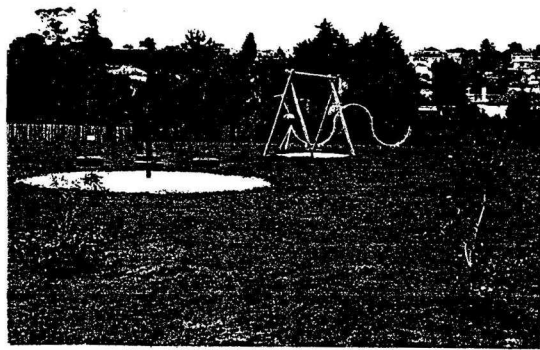


PLATE 9-18 The Esslemont Reserve. The depression in front of the fence line marks the old course of the creek

surplus to its requirements immediately south of Gaffney Street (and to the west of Somerset Street) to the City of Coburg in October 1977 and June 1980.

The land along this section of the creek is reserved, with the exception of the short section between Gaffney Street and Pascoe Vale Road, for Public Open Space (Fig 9-6D). Three Existing Public Open Space Reservations abut on to the creek: the Oak Park Sports Centre, the Reserve at Melissa Street, and the Esslemont Reserve<sup>1</sup> (Plate 9-18). The former two areas have been developed for active recreation by the City of Broadmeadows and the City of Essendon who own the land, while the Esslemont Reserve has been developed by the City of Essendon as a children's playground.<sup>2</sup>

<sup>1</sup> The Public Open Space Reservations along this section of the creek were included in the 1955 IDO and were extended at some localities by Modification 2 to the 1961 IDO which was gazetted on 8.5.63. The Esslemont Reserve was gazetted as an Existing Public Open Space Reservation on 2.8.72 as part of Amendment No 12.

<sup>2</sup> As a result of the change in the municipal boundary that occurred after the creek had been deviated, the Esslemont Reserve is now located within the City of Coburg.



**9.4.5 Moonee Ponds Creek : Margaret Street, Broadmeadows to Valley Crescent, Broadmeadows.** As reference to Figure 9-6E will show, virtually all of the land along both banks of Moonee Ponds Creek between Margaret Street and the Railway Trestle Bridge is owned by the City of Broadmeadows and the City of Essendon. The Board of Works holds title to a narrow strip of land along the west bank of the creek between Mascoma Street and the end of De Havilland Avenue. The Board acquired the land for possible future drainage works and for maintenance purposes. The small piece of Board owned land protruding into the council land near De Havilland Avenue is coincident with the open section of the Board's Mascoma Street Drain. When the City of Essendon acquired the area immediately west of the strip of land owned by the Board, the Board made the requirement that an easement of inundation should be created over part of the land (Fig 9-10).

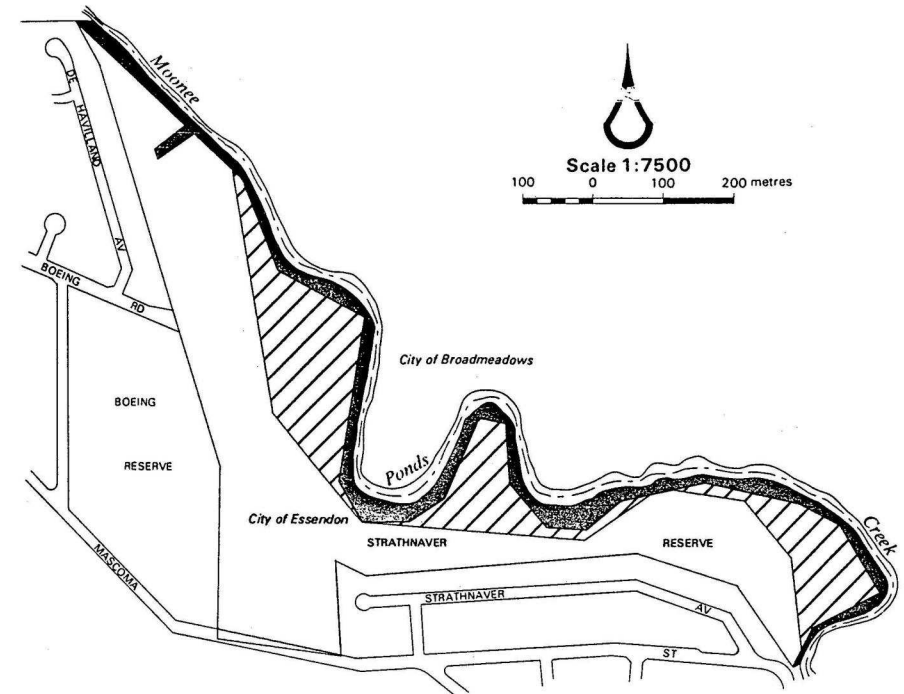
The land along this section of the creek is reserved for Public Open Space. Between the Trestle Bridge and the John Pascoe Fawcner Reserve (see Fig 9-6E) Existing Public Open Space Reservations (gazetted at various dates between 1959 and 1971) have been developed, or are being developed, for both passive and active recreation by the Cities of Broadmeadows and Essendon. Some of the Proposed Public Open Space land to the south of the John Pascoe Fawcner Reserve has been developed for passive recreation<sup>1</sup>, while a piece of land opposite the John Pascoe Fawcner Reserve is occupied by the City of Broadmeadows nursery.

Between the Trestle Bridge and the Jacana Retarding Basin, most of the land along the west bank of the creek is privately owned, while most of the land along the east bank is owned by the City of Broadmeadows (Fig 9-6E). The land along the creek between these two points is reserved for Public Open Space, except near Outlook Drive where residentially zoned land extends down to the creek bank. The Proposed Public Open Space Reservation was included in the 1959 IDO (gazetted 16.3.60) and was extended by Modification 2 to the 1961 IDO (gazetted 8.5.63). The land along the east bank is open to the public for passive recreation and is maintained by the City of Broadmeadows. A small area has been set aside for use by the Broadmeadows City Bowmen. With the exception of the area occupied by the factory complex of R K Morgan Pty Ltd, the land immediately to the west of the creek between the Trestle Bridge and the Jacana Retarding Basin has not been developed.

**9.4.6 Moonee Ponds Creek : Valley Crescent Broadmeadows to Yuroke Creek.** The Jacana Retarding Basin is located between Valley Crescent, Broadmeadows and the junction of Moonee Ponds and Yuroke Creeks. The major part of the land required for the basin was purchased in the mid 1960s when the basin was being designed. Land on either side of Moonee Ponds Creek immediately upstream of the junction with Yuroke Creek was acquired in 1971, and land on either side of Yuroke Creek immediately upstream of Johnstone Street was acquired from the Housing Commission in mid 1980.

With the exception of two narrow strips of land that were already reserved for Proposed Main Roads (Fig 9-6F), the area occupied by the Jacana Retarding Basin was gazetted on 11.2.70 under Amendment No 2 as a Public Purpose Reservation for the Board of Works. The basin embankment and the outlet structure are fenced, but the remainder of the basin is open to the public. As discussed in Section 6.2, the Board of Works leased the major part of the basin to the City of Broadmeadows for recreational purposes in

<sup>1</sup> Detailed proposals for the recreational development of land along Moonee Ponds and Yuroke Creeks within the City of Broadmeadows are contained within two consultants' reports, the *Moonee Ponds Creek Open Space Study* commissioned by the City of Broadmeadows and the *Moonee Ponds Creek and Environs Study* commissioned by the MMBW (Refs 17 and 18). Some of the recommendations contained within the studies have been implemented but others, for a variety of reasons, have not.



#### LAND OWNERSHIP/MANAGEMENT LEGEND

Land transferred to Essendon Council	
Land retained by M.M.B.W. for drainage and major improvement works	
Easement of inundation	

#### LAND OWNERSHIP ALONG THE WEST BANK OF MOONEE PONDS CREEK IN THE BOEING AND STRATHNAVER RESERVES, ESSENDON

Figure 9-10

1965. The City of Broadmeadows has laid out two sports ovals near the junction of Moonee Ponds and Yuroke Creeks, leaving the remainder of the leased area for passive recreation, although it would not appear to be extensively used for that purpose.

**9.4.7 Yuroke Creek and Otway Crescent Drain.** The land along the lower reaches of Yuroke Creek and its tributaries is, for the most part, currently owned by the Housing Commission, Victoria, but will eventually be transferred to the Board of Works and the City of Broadmeadows (Fig 9-6G). As noted, a relatively small area of land on either side of Yuroke Creek to the north of Johnstone Street was transferred to the Board of Works in mid 1980. The land further upstream along Yuroke Creek and the land along the lower part of the Otway Crescent Drain that will be transferred to the Board is required for a retarding basin (see Section 6.3). The area was reserved for this purpose in 1970 in the Melbourne Metropolitan Planning Scheme (Proposed Public Purpose Reservation - Board of Works - gazetted on 11.2.70 as part of Amendment No 2).

The land to be transferred to the City of Broadmeadows is generally steep. It is zoned for residential purposes (Fig 9-6A) but is clearly not suited to low cost housing development. At present, this land, together with other land along the lower part of Yuroke Creek, would not appear to be utilised, but has considerable potential for recreational purposes.

The upper reaches of Yuroke Creek and its headwater tributaries flow through generally undeveloped rural land. However, part of the land is zoned Reserved Living and Corridor A, and could be developed for residential purposes at some future date. If such development does occur, drainage works will almost certainly be required along the major watercourses given the erodible nature of the bed and bank materials (see Plates 1-1 and 9-20, and Section 6-4).

**9.4.8 Moonee Ponds Creek : Upstream of Yuroke Creek.** Between its junction with Yuroke Creek and Koala Crescent, Westmeadows, Moonee Ponds Creek has been beautified and some sections have been realigned. Further upstream, the creek flows through essentially rural land, and the creek remains in a semi-natural state.

Immediately upstream of Yuroke Creek, the land on either side of Moonee Ponds Creek is owned by the Board of Works, part of the land having been acquired for the Jacana Retarding Basin. The land along Moonee Ponds Creek between the upper end of the Jacana Basin and Hackett Street, Westmeadows is Crown Land, Crown Land managed by the City of Broadmeadows, or land owned by the City of Broadmeadows (Fig 9-6H).

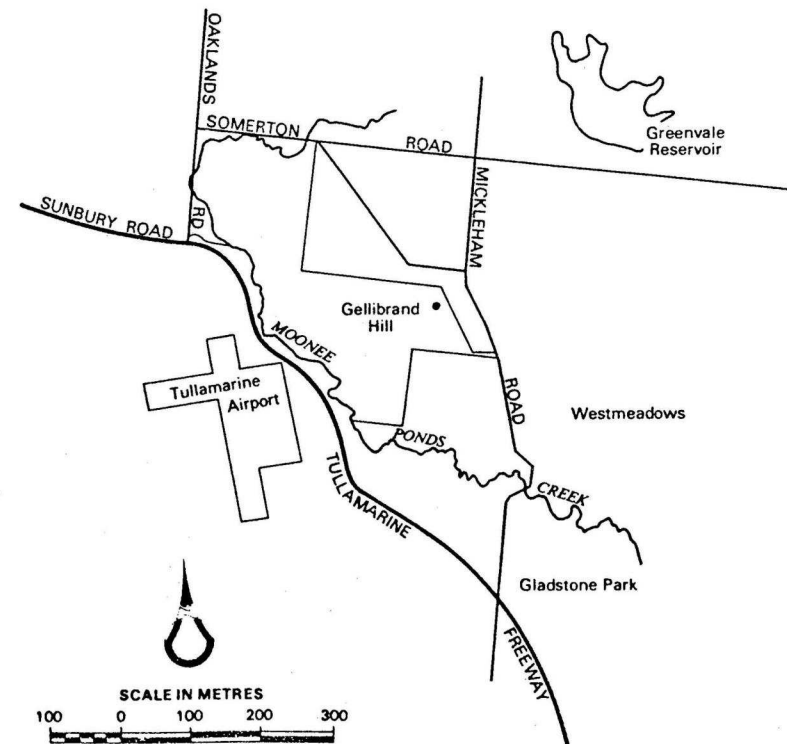
The land occupied by the Jacana Retarding Basin is reserved for Public Purposes for the Board of Works, while the land along the creek between the Jacana Basin and Hackett Street, Westmeadows is reserved for Public Open Space (Fig 9-6H). The Proposed Public Open Space Reservations were included in the 1955 and 1959 IDOs.

The land along Moonee Ponds Creek between Yuroke Creek and Westmeadows Township has been developed for recreational purposes by the City of Broadmeadows. A bicycle track has been constructed along the side of the creek between the Jacana Basin and Westmeadows Township, numerous trees and shrubs have been planted, and a parkland area has been created immediately upstream and downstream of Fawkner Road Bridge (Plate 9-19). The Proposed Public Open Space Reservation owned by the City of Broadmeadows upstream of Hackett Street has been developed for sporting activities.

Upstream of Westmeadows Township, the creek traverses a relatively large Proposed Public Purpose (Board of Works) Reservation (gazetted 11.2.70 as part of Amendment



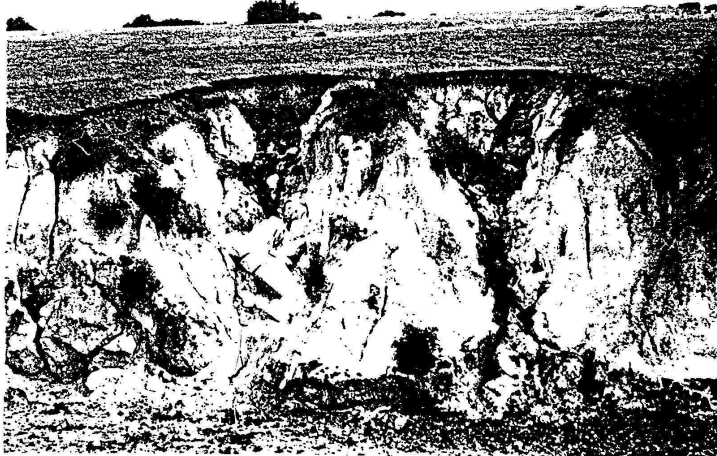
PLATE 9-19 Parkland along Moonee Ponds Creek at Westmeadows Township



THE GELLIBRAND HILL REGIONAL PARK



A The deeply incised middle section of the watercourse



B Erosion of the bank by overland flow. The two gullies are probably located along the lines of collapsed tunnels

PLATE 9-20 Erosion along the middle reaches of the Broad Street Drain

No 2). The reservation marks the site of a possible future retarding basin (The Tullamarine Retarding Basin - see Section 6.3). A large proportion of the site has been acquired by the Board of Works (Fig 9-6). The basin site has not been developed in any way, and the creek remains in a fairly natural state. Upstream of the site, Moonee Ponds Creek and its headwater tributaries flow through relatively undeveloped rural land that is, for the most part, zoned Conservation A and General Farming A (Fig 9-5). The area zoned Conservation A is coincident with the Gellibrand Hill Regional Park that was opened in November 1980. As can be seen from Figure 9-11, Moonee Ponds Creek flows through the northern part of the Park and then forms its south-western boundary. The Park is managed by the National Parks Service of Victoria. Details of the Park and a proposed plan of management are contained in Reference 19.

Although the upper part of the Moonee Ponds Creek basin remains in an essentially rural state, bank erosion is taking place along some reaches of Moonee Ponds Creek and a number of its tributaries. Erosion has been particularly severe along the middle reaches of the Broad Street Drain where vertical crumbling banks up to ten metres high have developed (Plate 9-20). The eroded material is deposited downstream along the improved sections of Moonee Ponds Creek where it is unsightly, reduces channel capacity, and encourages vegetative growth in the creek bed. The removal of such deposits adds considerably to maintenance costs.

## 9.5 REFERENCES

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- 2 MMBW, 1917. Memorandum presented by the Chairman at an informal meeting of the Board on 8 May 1917.
- 3 Order-in-Council, dated 23 May 1881, gazetted 27 May 1881, page 1389.
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- 5 McCormack, W T B and Fricke, F W, 1934. "Country roads and bridges", *Journal of the Institution of Engineers Australia*, 6, 361-363.
- 6 Barrett, B, 1979. *The Civic Frontier*. Melbourne University Press; Melbourne, see in particular Chapters 4 and 15.
- 7 Water Resources Council of Victoria, 1978. *Flood plain management in Victoria*. Melbourne.
- 8 MMBW *Interim Drainage Basin Criteria Manual*. MMBW-D-0016.
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- 12 Davison, G, 1978. *The rise and fall of marvellous Melbourne*. Melbourne University Press; Melbourne.

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- 14 Metropolitan Town Planning Commission, 1929. *Plan of General Development*. Government Printer; Melbourne.
- 15 MMBW, 1954. *Melbourne Metropolitan Planning Scheme 1954. Report*. Melbourne; Chapter 9.
- 16 Preston Institute of Technology, 1975. *Northern Melbourne Waterways Study*. Melbourne.
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- 18 Scott and Furphy Engineers Pty Ltd, 1976. *Moonee Ponds Creek and environs study*. MMBW; Melbourne.
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## 10 FUTURE DRAINAGE MANAGEMENT POLICIES

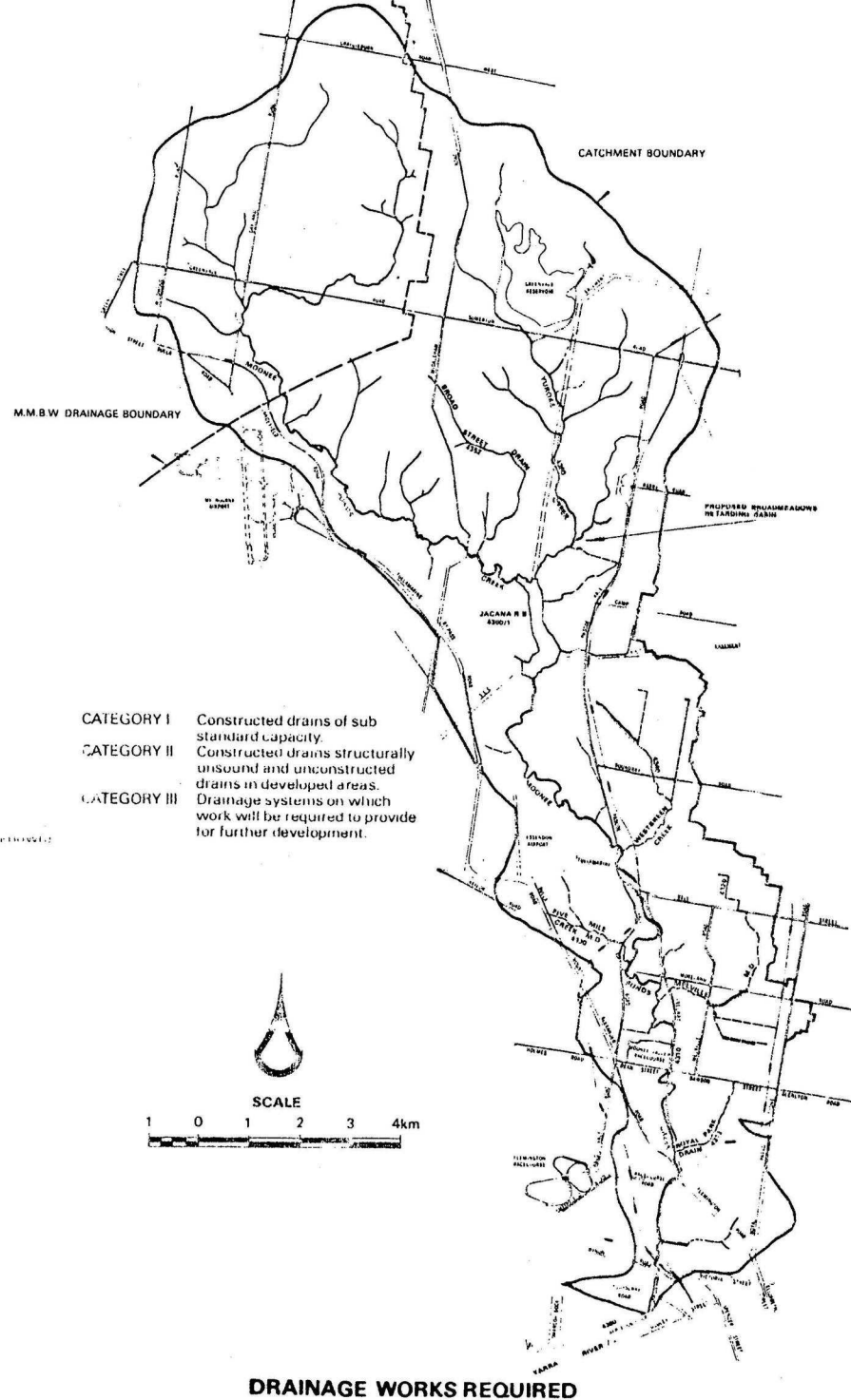
### 10.1 INTRODUCTION

The main drainage management policies for the Moonee Ponds Creek basin in the coming years will be to minimise the risk of flooding along certain sections of Moonee Ponds Creek and a number of tributary watercourses; to prevent, or minimise, bed and bank erosion, and concomitant siltation; to maintain the improved sections of the watercourses to ensure that design criteria are not significantly altered; to maintain, and where possible improve, the visual appearance of the open watercourses through regular mowing of the banks, weed eradication, the removal of rubbish, and the maintenance, and if necessary replanting, of trees and shrubs; and to ensure that the open, unlined sections of the watercourses do not deteriorate to such an extent that they become potential health hazards. It is the Board's intention to try and achieve these objectives in a manner that is acceptable to local residents and municipalities, thereby avoiding conflicts of the nature that have occurred in the past. If conflicts are to be avoided, there will need to be effective communication between the Board and the general public. By informing the public of its intentions at an early stage, and by clearly outlining the reasons for its proposals and the constraints within which it has to work, the Board should be able to forestall uninformed and unnecessarily emotive criticism of the type that has frequently occurred in the past. In addition, early contact with local residents, local interest groups, and local councils, can bring to light potential problems and issues that had not been anticipated or fully appreciated.

It is inevitable that a variety of drainage works will have to be undertaken along Moonee Ponds Creek and some of its tributaries in the not too distant future. Sections of some of the older underground drains within the basin are of sub-standard capacity and will eventually have to be replaced or supplemented, and major improvement works will be required along parts of Moonee Ponds Creek and a number of its upper tributaries (Fig 10-1): for example, the section of Moonee Ponds Creek between Flemington Road and Footscray Road is well below current design capacity (Fig 10-2), and will eventually have to be upgraded; two unlined sections of Moonee Ponds Creek between Donald Avenue, Essendon and the Jacana Retarding Basin will probably have to be improved if high recurring maintenance costs are to be avoided; it is envisaged that one, and possibly two, relatively large retarding basins will be required upstream of the existing Jacana Basin to attenuate the more frequent and higher flood peaks that will accompany urban development in the upper part of the basin; and it will become necessary to improve some of the tributary watercourses in the north-eastern part of the basin as the urban area expands in that region.

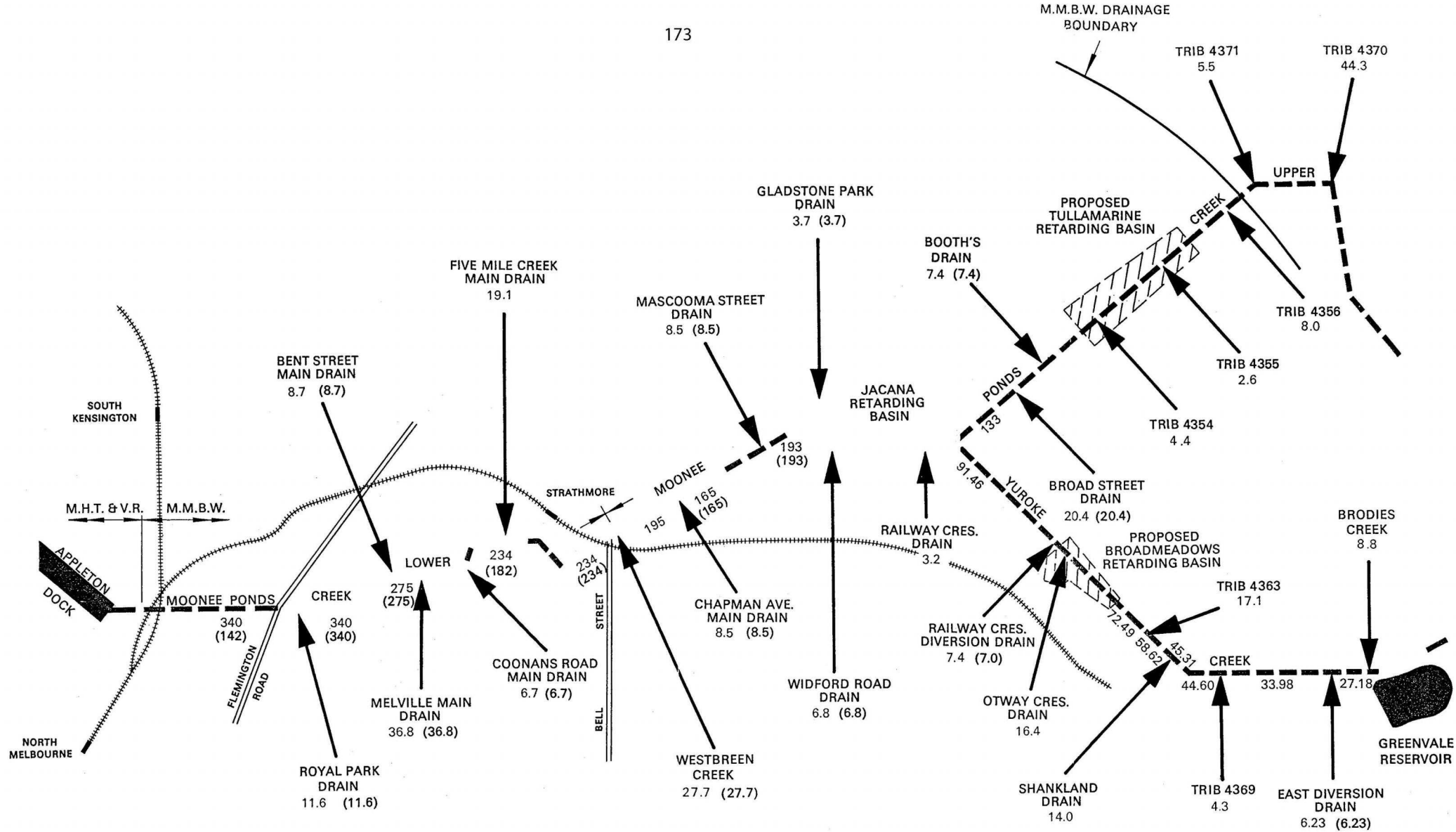
The formulation of drainage policies for the Moonee Ponds Creek basin has been, and will continue to be, constrained by the nature of the existing improvement works, by the legacy of residential and industrial development having been allowed to take place on potentially flood prone land in the lower part of the basin, and by the legacy of early subdivisions along the middle reaches of Moonee Ponds Creek having been allowed to extend to the bank or water's edge. Because of the lack of drainage reserves along the middle reaches of the creek, extensive channel widening or the creation of wide floodways is not considered to be a practical proposition, and for this reason the basic policy that was formulated in 1960, that is the construction of large retarding basins in the upper half of the basin and the reconstruction of the channel along its existing alignment downstream of the basins, has been retained.

The design of any future drainage works within the Moonee Ponds Creek basin will obviously have to take into account the flow regimes of Moonee Ponds Creek and its tributaries. Like other urbanised creeks within the metropolitan area, Moonee Ponds Creek is characterised by a wide range of flow conditions; dry weather flows are often little more than a trickle, but during storms the creeks rise rapidly and flood peaks tend to be relatively high. An additional factor to be considered is the effect that the Jacana Retarding Basin, which became operational in 1967, has on flows along the middle and lower reaches of Moonee Ponds Creek.



**DRAINAGE WORKS REQUIRED**

Figure 10.1



**LEGEND**

- OPEN CONSTRUCTED DRAIN
- - - OPEN EARTH DRAIN
- NATURAL WATERCOURSE

RED FIGURES INDICATE DESIGN CAPACITY (CUMECs) UNDER PRESENT DAY STANDARDS  
 BLACK FIGURES IN BRACKETS INDICATE PRESENT CAPACITY (CUMECs)  
 WHERE NO FIGURE IS GIVEN THE CREEK IS AN UNLINED WATERCOURSE OF UNCERTAIN CAPACITY.

**CAPACITIES OF THE MOONEE PONDS CREEK DRAINAGE SYSTEM**

The character of storm flows along the lower reaches of Moonee Ponds Creek can be seen by reference to the flood hydrographs shown in Figures 10-3 and 10-4. The form of the rising limbs of the hydrographs and the time lags between rainfall and flood peaks are, with the exception of the storm of November 1971, what one would expect for an essentially urbanised catchment. The form of the rising limb for the November 1971 storm reflects a response to a prolonged storm of relatively low intensity. The falling limbs of the hydrographs show far greater variation. The falling limbs of the storm hydrographs of January and July 1963 are typical of an urbanised creek without retardation storage, while the similarity in form of the falling limb of the January 1980 storm indicates that the storm cell was centred downstream of the Jacana basin. The effect of storage in the Jacana basin on the falling limbs of flood hydrographs can be clearly seen for the severe storms of May 1974 and April 1977 (Fig 10-4). Water was also stored in the Jacana Basin in August 1978 and this undoubtedly affected the form of the falling limb, but to what extent is uncertain as the wave-like form of part of the limb suggests that there was a blockage in the channel upstream of the gauge site. With respect to the April 1977 storm, it is interesting to speculate what the form of the hydrograph would have been had there been no retarding basin or if the storm had fallen on a wet rather than a dry catchment.

It is apparent that any future drainage improvement works along Moonee Ponds Creek and tributaries will have to take cognizance of the almost non-existent dry weather flows and the potential danger of water stagnating in pools, and plan for the unattenuated flood peaks that can be expected along the tributary watercourses, along Moonee Ponds Creek upstream of the Jacana Retarding Basin, and also downstream of the basin if a major storm cell is centred over the lower parts of the catchment. In addition, the prolongation of flows as a result of storage in, and gradual release from, the Jacana Basin will also need to be considered because it has been shown elsewhere that prolonged flows of medium magnitude may cause more erosion to unprotected banks than flows of greater magnitude but shorter duration.

## 10.2 MANAGEMENT POLICIES

Downstream of Flemington Road the Moonee Ponds Creek channel is under capacity (Fig 10-2). The levee banks between Flemington Road and downstream of Arden Street, which were constructed in 1936/37, would be over-topped by a major flood flow, and quite extensive areas of low-lying land on either side of the banks would be inundated. The extent of the land considered to be flood prone is shown in Figure 10-5.

The immediate management policy for the section of Moonee Ponds Creek downstream of Flemington Road will be to maintain the capacity of the channel by regularly removing accumulated sand and silt, and to try and ensure that any works carried out beyond the Board's area of responsibility, that is downstream of the Railway Gravitation Bridge, do not adversely affect flows further upstream, particularly during times of flood. In order to minimise damage and disruption should the levee banks be over-topped, it is recommended that future development of the flood prone area should be closely controlled, and that the floor levels of any new buildings should be higher than designated flood levels. If a freeway extension or arterial road is constructed along the line of Moonee Ponds Creek between Flemington Road and Footscray Road, the creek will need to be reconstructed to a capacity equivalent to the improved section immediately upstream of Flemington Road or at least to a capacity capable of carrying the hundred-year flood.

From Flemington Road to just south of Moreland Road, and from Woodland Street to Margaret Street, Moonee Ponds Creek is partially hard-lined, and it is considered unlikely that further drainage works will be required. The management policies for these two improved sections will be to ensure that design criteria are maintained and that the visual appearance of the watercourse does not deteriorate. To achieve these objectives it will be essential that the banks are regularly mown, any noxious weed growth eradicated, any accumulated sediment and rubbish removed, and any erosion to the grass lined upper banks repaired. To enable maintenance works to be carried out

effectively along these two sections of the creek it is imperative that the vehicle access tracks be retained and kept in a good state of repair.

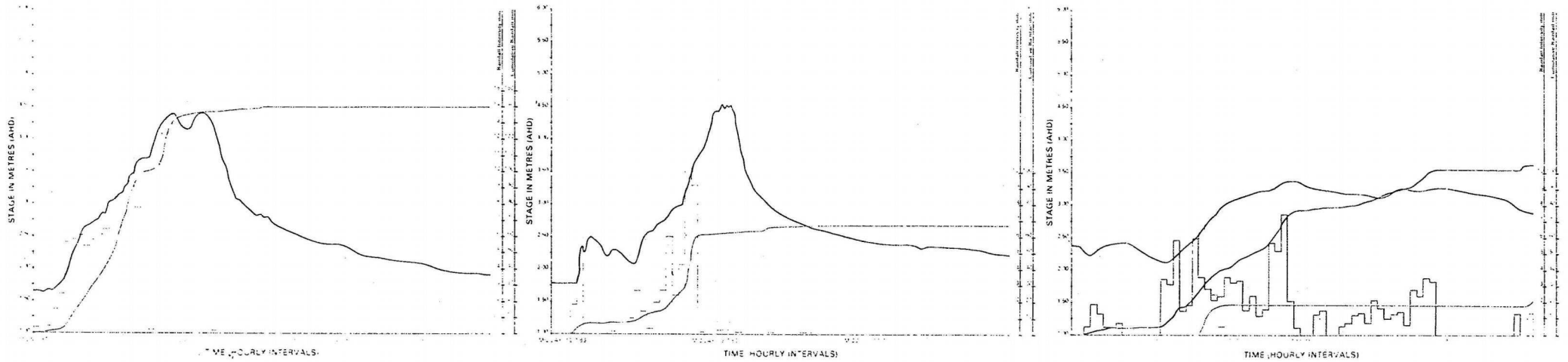
Between Donald Avenue and Woodland Street, and from Margaret Street upstream to the Jacana Retarding Basin, Moonee Ponds Creek has been modified on a number of occasions, but no major drainage improvement works have been undertaken. However, because of the inadequate capacity of the channel and the erodible nature of the banks, it is possible that major drainage works will ultimately be required along both sections (Fig 10-1). To date, attempts have been made to stabilise the banks along some reaches with loose rocks but this has proved to be only partly successful, the rocks tending to be unstable during major flood flows (see, Plate 9-11 D and the photograph in Figure 9-1). At some future date there will probably be a need to stabilise the bed and lower banks, and to realign some reaches along these two sections of the creek. In the meantime, it will be essential that the capacity of the watercourse is maintained, and that the various temporary works that have been constructed are kept in a good state of repair. In addition, it will be imperative that all development along the adjoining floodplain is closely controlled. Until major improvement works are undertaken, it can be anticipated that further small-scale bank stabilisation will be required, and that the existing rock lining, which is essentially a cosmetic treatment, will occasionally be damaged by flood flows and have to be repaired.

As reference to Figure 10-1 will show, drainage works will probably be required along some of the tributary watercourses downstream of the Jacana Retarding Basin. The remaining open section of the Royal Park Drain and two open sections of Westbreen Creek will eventually have to be improved, while the undergrounded Acacia Street and West Street Drains, and part of the undergrounded Melville Main Drain, all of which are of sub-standard capacity, will have to be improved or supplemented.

The Jacana Retarding Basin, which became operational in 1967, has attenuated flood peaks along the middle and lower reaches of Moonee Ponds Creek. During both the May 1974 and April 1977 storms, considerable volumes of water were stored in the basin, although on neither occasion did the water overtop the glory hole spillway. It is possible that more efficient use could be made of the basin by throttling the normal outlet to pond water more frequently. During the April 1977 storm, flow from the normal outlet overtopped the concrete lining along the improved section between Margaret and Gaffney Streets, although according to design criteria, this should not have happened until the glory hole spillway came into operation. As described in Section 9.2, the grass-lined banks above the concrete lining were extensively eroded (see photographs in Figure 9-1). Before any modification to the outlet could be undertaken, however, detailed analyses of existing and future flow data from the gauges at the Jacana outlet and upstream of Flemington Road would be required, and due consideration would have to be given to the effect of any modification on the design of any additional retarding basins that might be constructed further upstream. With respect to the storage area of the Jacana Retarding Basin, the Board will endeavour to prevent any filling from taking place.

As reference to Figure 9-5 will show, a relatively small proportion of the upper part of the Moonee Ponds Creek basin to the east of Mickleham Road is zoned Residential C, two areas are zoned Corridor A<sup>1</sup>, and an extensive area is zoned Reserved Living. The land zoned Residential C is developed, or being developed, and it can be anticipated that the land zoned Reserved Living will be released for urban development in the coming years. As development proceeds in this part of the basin there will be a need for drainage works to be undertaken to minimise erosion and flooding along the watercourses within

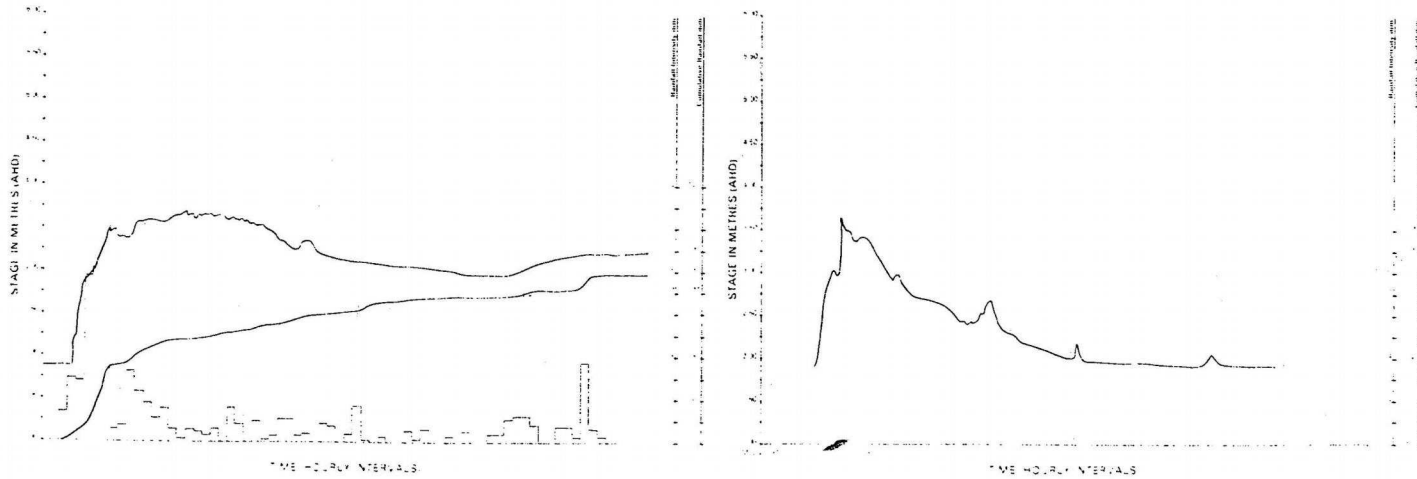
<sup>1</sup> The MMBW has proposed (Proposed Amendment No 90 Pt 2) that the land zoned Corridor A to the south of Somerton Road should be rezoned to General Farming A. However, the Town and Country Planning Board requested, in March 1979, that the MMBW review its recommendation and consider retaining as Corridor A the land lying outside of the 25 Noise Exposure Forecast contour along the Tullamarine Airport approach path. The MMBW re-examined its proposal, and re-affirmed its original recommendation that the land should be rezoned General Farming A.



JANUARY 1963

JULY 1963

NOVEMBER 1971



AUGUST 1978

JANUARY 1980

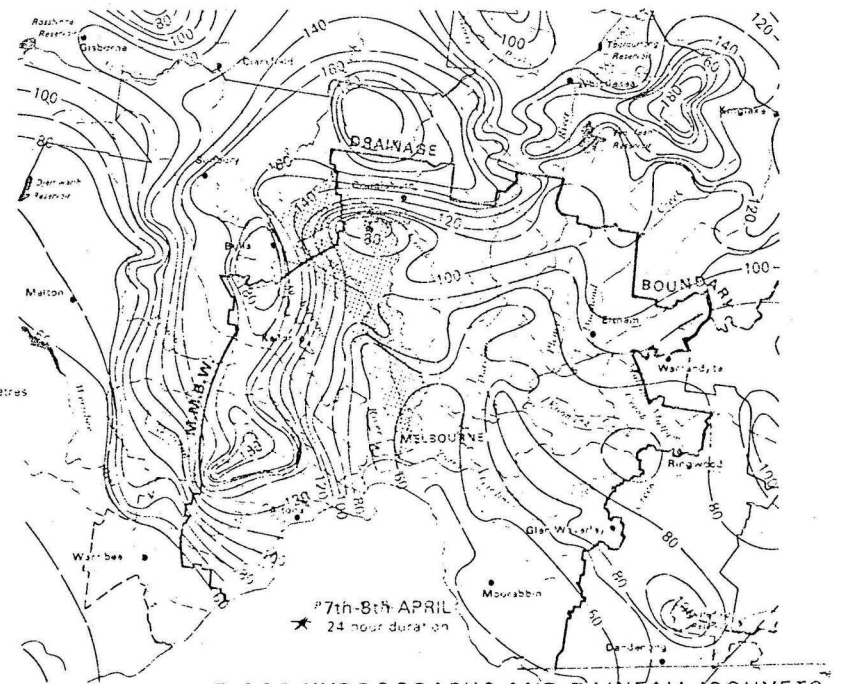
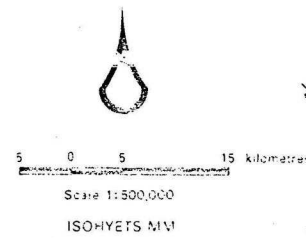
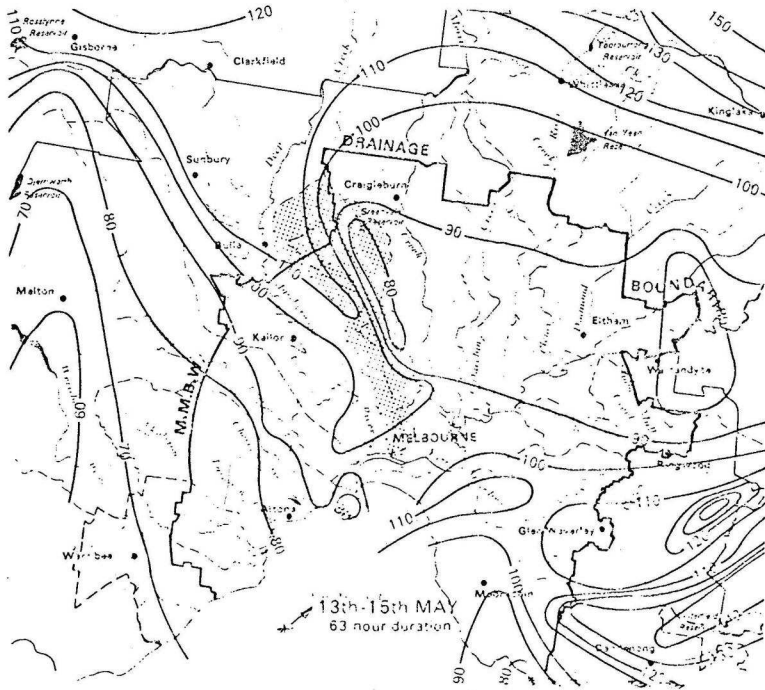
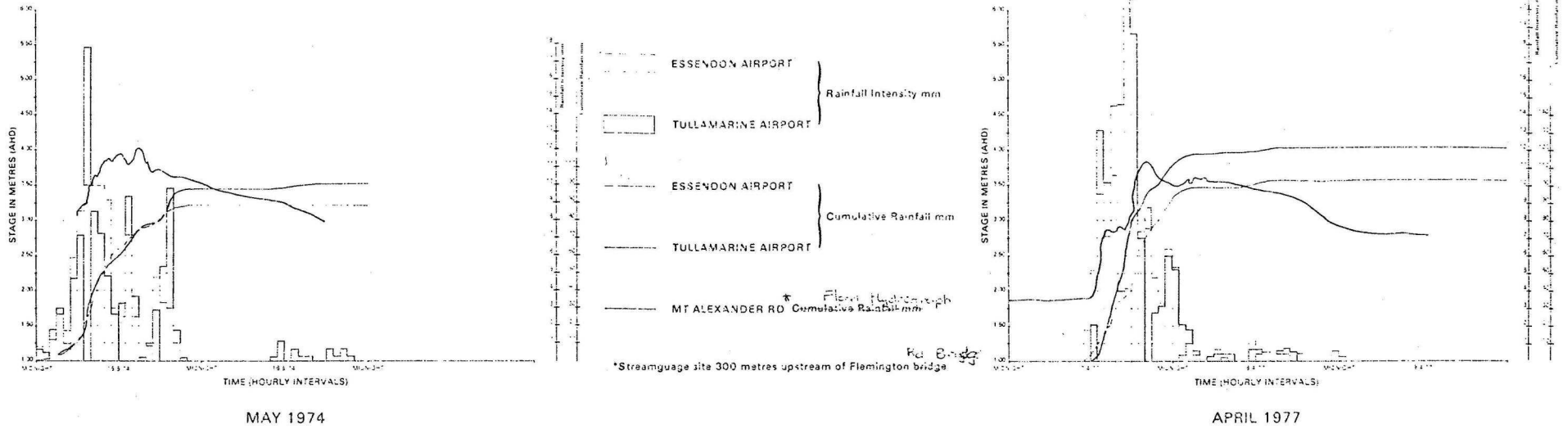
- |  |                     |   |                        |
|--|---------------------|---|------------------------|
|  | ESSENDON AIRPORT    | } | Rainfall Intensity mm  |
|  | TULLAMARINE AIRPORT |   |                        |
|  | ESSENDON AIRPORT    | } | Cumulative Rainfall mm |
|  | TULLAMARINE AIRPORT |   |                        |
| COOPERS RD Rainfall Intensity mm       |                     |   |                        |
| COOPERS RD Cumulative Rainfall mm      |                     |   |                        |
| MT ALEXANDER RD Cumulative Rainfall mm |                     |   |                        |

\*Streamgauge site 300 metres upstream of Flemington bridge

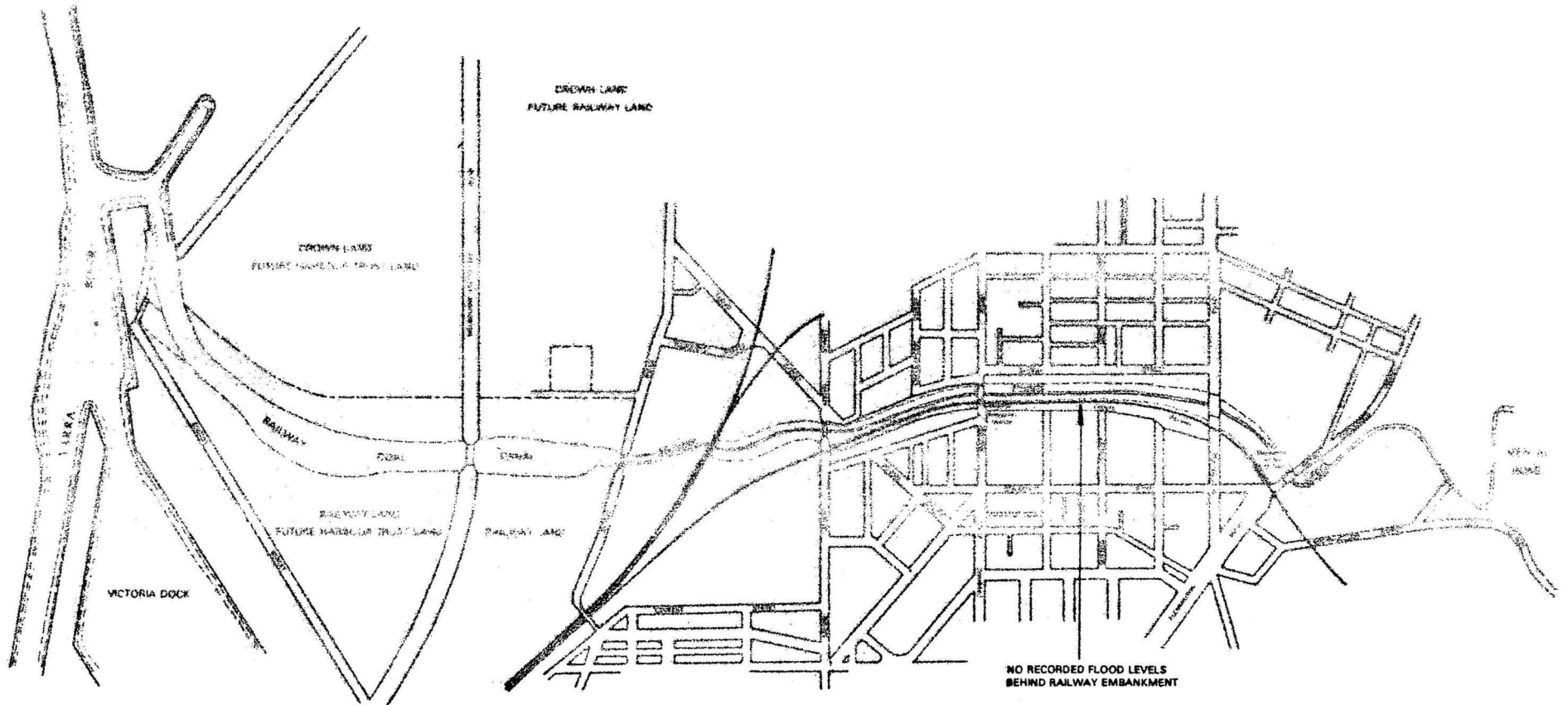
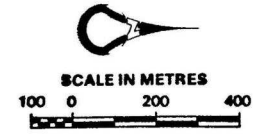
FLOOD HYDROGRAPHS FOR SELECTED STORMS

Figure 10-3





FLOOD HYDROGRAPHS AND RAINFALL ISOHYETS FOR THE STORMS OF MAY 1974 AND APRIL 1977



**FLOODPRONE LAND SOUTH  
OF FLEMINGTON ROAD**

Figure 10.5

and immediately downstream of the development areas, and to attenuate flood peaks passing downstream. There are plans to construct a large retarding basin at the junction of Yuroke Creek and the Otway Crescent Drain in the mid 1980s (see Section 6.3) to attenuate peak flows entering Moonee Ponds Creek from the Yuroke Creek sub-basin. The basin will be designed to complement the existing basin at Jacana. It is envisaged that drainage works will be required along the upper reaches of Yuroke Creek and the Otway Crescent Drain, along two tributaries of Yuroke Creek (Nos 4363 and 4367), and along the Broad Street Drain (Fig 10-1). Particular care will be needed to ensure that erosion does not become a serious problem along these relatively steep watercourses, and in the case of Broad Street Drain it is possible that works will be required to rehabilitate existing badly eroded sections.

To the west of Mickleham Road, the upper part of the Moonee Ponds Creek basin is zoned Conservation A, General Farming A and reserved for various Public Purposes (Commonwealth Government, Social Welfare Department, Mental Hygiene Department, Agriculture Department, Victoria Police), and extensive urban development is therefore precluded. Upstream of Westmeadows Township land along either side of Moonee Ponds Creek has been reserved for the Board of Works (Proposed Public Purpose Reservation) for a retarding basin. There are, however, no plans to construct a basin at this site in the near future, but it is considered prudent to retain the site for a number of reasons: in case the zoning upstream of the site should be changed to allow residential or industrial development to take place; in case a considerable volume of storage area is lost in the Jacana Retarding Basin; and in case future experience indicates that a basin is required on the site to complement the Jacana Basin and the basin on Yuroke Creek.

It is not anticipated that any major drainage works will be required along Moonee Ponds Creek upstream of the junction with Yuroke Creek in the near future. It should, however, be borne in mind that the existing improvement works between Yuroke Creek and Westmeadows Township were undertaken for beautification purposes and that little if any consideration was given to flood alleviation when they were designed. Roads and private properties will occasionally be flooded along this section of Moonee Ponds Creek until such time that a basin is built further upstream or the capacity of the watercourse is increased.