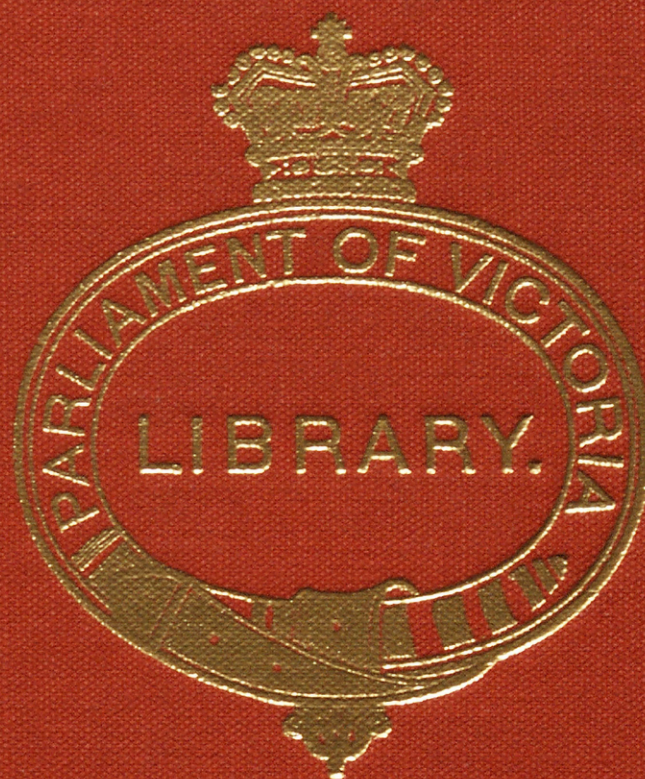


VICTORIA

MINUTES
OF THE
PROCEEDINGS
OF THE
LEGISLATIVE
COUNCIL

—
VOL. 5
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PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

REPORT

upon

RADIO MASTS

Ordered to be Printed

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

MEMBERSHIP

The Honourable R. I. Knowles, M.L.C. (Chairman)

Dr. G. M. Vaughan, M.P. (Deputy Chairman)

The Honourable W. R. Baxter, M.L.C.

Mr. C. W. Burgin, M.P.

The Honourable D. E. Henshaw, M.L.C.

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The Honourable B. A. Murphy, M.L.C.

The Honourable B. T. Pullen, M.L.C.

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COMMITTEE STAFF

Mr. M. R. Knight - Director of Research

Mr. G. H. Westcott - Secretary

* * * * *

RADIO MASTS INQUIRY SUB-COMMITTEE

The Honourable B. T. Pullen, M.L.C. (Chairman)

The Honourable W. R. Baxter, M.L.C.

Mr. C. W. Burgin, M.P.

Mr. M. J. McDonald, M.P.

* * * * *

TERMS OF REFERENCE
PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

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RECOMMENDATIONS

6.9 The Committee recommends -

- (1) That the Minister for Planning request the Governor in Council to amend the Melbourne Metropolitan Planning Scheme to define "radio mast" as:

Radio mast used in conjunction with the transmission or receipt of wireless, telegraphy or television means a mast which together with antennae -

- (a) has any horizontal distance in excess of 3 metres; or*
- (b) when attached to a building, exceeds a height of 5 metres above the roof line; or*
- (c) when not attached to a building exceeds a height of 14 metres above the ground.*

Antennae are to be defined as rigid elements attached to the radio mast or rotating boom supported by the radio mast. This definition does not include flexible wires or cables.

- (2) That "radio mast" be included in residential zones of the Melbourne Metropolitan Planning Scheme as a Column 4 use. These zones are:

Township "A" Zone
Residential "A" Zone
Residential and Office Zone
Residential "B" Zone
Residential "C" Zone
Special Residential Zone No. 1
Special Residential Zone No. 2.
Special Residential Zone No. 3.
Urban Conservation Residential Zone No. 1.
Residential "D" Zone.
Reserved Living Zone.

- (3) That each Municipality in the Melbourne metropolitan area be requested to establish guidelines for the approval of permits for larger radio masts. These guidelines should include:
- (a) The procedure to be followed including the notification of neighbours, the provision of opportunity to object to the proposal and to appeal against the councils' decisions.
 - (b) The factors to be taken into account - which might include:
 - (i) The size and form of radio mast and associated antennae.
 - (ii) The size of proponents allotments and adjacent allotments.
 - (iii) The relative location of radio mast to buildings, windows, doors.
 - (iv) Prevailing heights of TV antennae in immediate neighbourhood and general community acceptance.
 - (v) The vegetation, topography, landscape.

* * *

The Natural Resources and Environment Committee, appointed pursuant to the provisions of the *Parliamentary Committees Act 1968* (No. 7727) has the honour to report as follows:

INQUIRY INTO RADIO MASTS

CHAPTER ONE

HISTORICAL BACKGROUND

TERMS OF REFERENCE

- 1.1 On 7 December 1982, the Committee was directed by His Excellency the Governor in Council:

To inquire into, consider and report to Parliament, by 30 June 1983, whether the environmental impact of larger radio masts throughout the metropolitan area is of a degree of significance sufficient to justify municipal control over the appearance of such masts in residential areas.

IMMEDIATE BACKGROUND

- 1.2 The Melbourne and Metropolitan Board of Works (MMBW) formally advertised Amendment No. 115 Part 3 to the Melbourne Metropolitan Planning Scheme in June 1979.
- 1.3 This amendment, when approved by the Governor in Council, would have required that within specified zones of the Melbourne metropolitan area the erection of a radio mast would be subject to the issue of a permit by the responsible authority.

A radio mast was defined as:

Radio mast used in conjunction with radio transmission or reception within a dwelling means a mast which together with antenna -

- (a) *exceeds a height of 14 metres above the ground, or*
- (b) *when attached to a building, exceeds a height of 5 metres above the highest part of such building.*

1.4 There were 11 objections to the Amendment, with the main thrust of the objections being that the minimum heights were excessive. The height parameters of Section 3139 of the Uniform Building Regulations were quoted as being appropriate. The Board accepted the substance of the objections to the extent that the detached height was changed to 8 metres (in lieu of 14 metres) and the attached height was changed to 3 metres above the roof line (in lieu of 5 metres above the highest point of such building), and added the following paragraph:

- (c) *has any horizontal dimensions in excess of 3 metres.*

1.5 The Board formally adopted the Amendment with the above modifications on 10 February 1981 (a copy of the Amendment as adopted is attached as Appendix 1).

1.6 It is understood that this Amendment was not intended to apply to normal domestic television receiving aerials.

1.7 This Amendment was submitted to the then Minister for Planning, the Hon. L. S. Lieberman, M.P. for his approval prior to the approval of the Governor in Council being sought and the Amendment being formally ratified.

1.8 By the time the Amendment had been submitted to the Minister for approval, certain interested groups had become aware of the form in which the Amendment had been adopted by the MMBW and the Minister received a substantial number of letters expressing opposition to the Amendment as adopted by the Board.

1.9 At the request of the Minister for Planning, a meeting of interested groups was convened on 17 June 1981. The following representatives attended:

Department of Planning
Commonwealth Department of Communications
C B operators
Wireless Institute of Australia
TV Electronic Technicians Institute
TV Electronic Servicemen's Association
Antennae Manufacturing Industry
Local Government

The idea was advanced at the meeting of a self-regulatory approach to the control of radio masts in which guidelines would be prepared by a joint working party from the Wireless Institute of Australia and the Municipal Association of Victoria.

1.10 On 24 August 1981, the Minister for Planning formally canvassed the self-regulatory, non-statutory approach with the Institute and the Association.

1.11 Little progress was made on this matter and on 2 July 1982, the following recommendations were formally adopted by the Legislative Committee of the Municipal Association of Victoria and were communicated to the Secretary for Planning and the MMBW:

- (1) That the Association does not support the introduction of self-regulation by the Wireless Institute of Australia (WIA) because such an approach would not provide a sufficient and enforceable system for the amenity protection of the community as a whole, particularly as the level of membership of the WIA is not sufficiently high to enable the Institute to effectively enforce the compliance of all residence-based amateur (hobby) radio operators with self-regulations, it being noted that WIA membership in Victoria constitutes only 48%-58% of the total number of amateur operators;

- (2) That the Department for Planning be advised accordingly, and requested to:
 - (i) prepare and issue Departmental guidelines for masts for councils and installing operators to follow;
 - (ii) develop and issue a statement of planning policy in relation to masts generally;
 - (iii) initiate further discussions between its own representatives and representatives of the Melbourne and Metropolitan Board of Works and the WIA before any further action is taken to finalise and implement any planning scheme changes, because the MAV acknowledges that amateur radio masts require special technical consideration in order to function effectively, and that these considerations (including reception) can vary with location and local topography (e.g. valleys, hilly areas, etc.) and therefore it is important that the drafters of controls and the implementers of those controls be aware of these matters before formulating the controls, statements of planning policy and Departmental guidelines.

- (3)
 - (a) That controls and regulations affecting amateur radio masts in residential areas should apply through formal town planning means but that permits should only need to be applied for in cases where the mast height exceeds a pre-determined height; masts not exceeding that pre-determined height would be allowed as of right provided Ordinance conditions are met (e.g. similar to MMPS Column 3 Uses).
 - (b) That care be taken in the drafting of planning controls for amateur radio masts to ensure due regard is given to the local amenity, and that it be noted in this context that a proliferation of higher TV antennas in all residential areas will possibly occur in the not too distant future as a result of the transmission frequency changes now being foreshadowed.

- (4) *That the Department for Planning and the MMBW be asked to examine the merits of making clear distinctions between radio masts, TV antennas and other mast categories in the community, when further investigating the question of controls, etc. and to take into account the TV antenna height differences which often occurs between country and metropolitan areas.*

1.12 The MMBW responded on 8 July 1982 to the recommendations of the Municipal Association of Victoria as follows:

- (i) *the first recommendation that the Association not support the introduction of self-regulation by the Wireless Institute of Australia accords with the views of the Board. In the Board's letter to the Secretary for Planning dated 6 January 1982 the Board expressed the view that non-statutory controls would not lead to an improvement of the existing situation;*
- (ii) *in respect to the second recommendation:*
- * *the Board raises no objection to the preparation and issue of guidelines relating to radio masts provided that such guidelines are designed to supplement statutory controls,*
 - * *the Board considers that the issue of a statement of planning policy in relation to radio masts is unnecessary as the erection of radio masts can be adequately controlled by planning schemes, supplemented by non-statutory guidelines if deemed necessary,*
 - * *the controls adopted by the Board in Amendment No. 115 Part 3 were introduced as a result of representations by various Councils and individuals on the need for such controls and were arrived at after consideration of the matter by a panel set up to hear objections to this Amendment. It is important to note that the Amendment would not prohibit radio masts but would merely require that radio masts exceeding the definition specifications would in the residential and non urban zones require a planning permit from the responsible authority which could then consider each application on its planning merits. Further, masts of lesser dimensions would not require any permit; and*
- (iii) *in respect to the recommendation relating to the wording of the definition some advantage is seen in providing clarification so as to differentiate between radio masts and television antennas. This can be achieved by inserting the expression "(not being television reception)" after the word "reception" where appearing in the definition. It is important to note however that the definition includes the words "reception within a dwelling" and therefore does not include radio masts used in conjunction with businesses and in turn does not affect such masts in business and industrial zones.*

1.13 The Department of Planning then formally reported to the present Minister for Planning, the Hon. Evan Walker, M.L.C., on 11 August 1982 with the recommendation that the Amendment, as adopted by the MMBW be approved. In coming to this recommendation the Department, in particular, noted:

- (i) *the general support for controls from the MMBW, the Municipal Association of Victoria and a number of municipalities in the Melbourne metropolitan area; and*
- (ii) *the fact that local government approval for radio masts was already provided for in the Uniform Building Regulations and that there was consistency between the Regulations and the Amendment as adopted.*

1.14 The Minister's response was to decide that a request should be made for the issue of radio masts in residential areas to be referred to the Natural Resources and Environment Committee.

PROCEDURE ADOPTED BY THE COMMITTEE

1.15 Following the Order in Council of 7 December 1982, the Committee advertised the Terms of Reference in the national press on 3 February 1983, and called for submissions to be made to it by 31 March 1983.

1.16 To conduct the inquiry, the Committee appointed a Sub-committee consisting of the following Members:

The Hon. B. T. Pullen, M.L.C. (Chairman)

The Hon. W. R. Baxter, M.L.C.

Mr. C. W. Burgin, M.P.

Mr. M. J. McDonald, M.P.

1.17 The Sub-committee received 612 submissions and held a public hearing at Parliament House on 20 May 1983. The Sub-committee prepared a draft report which was subsequently adopted by the full Committee.

1.18 Appended to this report are:

- (1) Copy of Amendment No. 115 Part 3 to the Melbourne Metropolitan Planning Scheme (Appendix 1);
- (2) Summary of written submissions (Appendix 2);
- (3) Submission from the Wireless Institute of Australia (Victorian Division) (Appendix 3);
- (4) Summary of evidence given at the public hearing (Appendix 4);
- (5) History of planning controls (Appendix 5);
- (6) Statistical information (Appendix 6);
- (7) Relevant Department of Communications instructions (Appendix 7);
- (8) A list of submissions received (Appendix 8);* and
- (9) A list of witnesses (Appendix 9).*

* Minutes of Evidence and Submissions not printed.

CHAPTER TWO

TECHNICAL BACKGROUND

GENERAL

- 2.1 A radio mast, together with the antennae that it may support, is a structure designed to facilitate the reception or transmission of electromagnetic radiation.
- 2.2 Electromagnetic radiation is a phenomena which is used as a medium for the transmission of information between remote points. In particular, the process of transmission of information may be referred to as wireless telephony, wireless telegraphy, television transmission or radio transmission.
- 2.3 Radio masts to be found in the residential areas of metropolitan Melbourne at the present time can be categorised in relation to the type of communication service with which they are associated and are as follows:
 - (1) Reception of television broadcasts and UHF/FM radio broadcasts;
 - (2) Transmission and reception on the Citizens Radio Band Service (CBRS) and on the Amateur Radio Service (ARS); and
 - (3) Transmission and reception on allocated frequency bands by public service authorities.

The physical characteristics and numbers of radio masts and antennae used for each of these categories differ because of the range of the operating frequencies used and the types of communication link desired.

RECEPTION OF TELEVISION AND UHF/FM RADIO BROADCASTS

- 2.4 It has been estimated that there could be up to 600 000 external television masts and antennae in residential areas of metropolitan Melbourne (see Appendix 6). The number of antennae installed for reception of UHF/FM radio is relatively small at this time. However, it is possible that eventually most houses will be equipped with an antennae system which is capable of receiving both the existing television broadcasts, UHF/FM radio broadcasts and possibly UHF television broadcasts.
- 2.5 These antennae systems are frequently attached to the wall or roof of a house and may rise several metres above the roof line. The height of the antennae will be dependent upon the reception characteristics of the area and the best reception will normally be obtained if the receiving antennae are within line of sight of the transmitting antennae. The transmitting antennae used by the television and radio stations are usually mounted on any tall masts located on nearby hills.
- 2.6 All receiving antennae located within any particular area will tend, in general, to be lifted up to similar heights above the roof level.
- 2.7 The horizontal dimensions of the television antennae are in the first instance dependent upon the frequencies at which the television and radio broadcasts are transmitted. This results in overall configurations which will not normally exceed three metres in any horizontal direction.

TRANSMISSION AND RECEPTION ON THE CITIZENS BAND RADIO SERVICE (CBRS) AND THE AMATEUR RADIO SERVICE (ARS)

- 2.8 Approximately 14 000 licenses were issued in 1982 in Victoria for stations operating on the CBRS. Each of these licenses can cover up to five pieces of equipment; for example, a base station and four mobile transceivers.

- 2.9 The CBRS can be used by anyone who has purchased an approved transmitter/receiver (maximum output 5 watts) and has obtained a CBRS license from the Department of Communications. No qualifications or tests are necessary to obtain the license other than proof that the equipment is of an approved design.
- 2.10 The CBRS operates on two bands of frequencies. There are 40 channels on fixed frequencies lying in the 26 MHz to 28 MHz band and 40 channels on fixed frequencies lying in the 476 MHz to 478 MHz band.
- 2.11 The majority of CBRS operators use the service for social or business communications between mobile stations or between fixed and mobile stations; for example, road transport operators, control of yacht races and car rallies, communication with service vehicles, etc.
- 2.12 The antennae system used by the majority of CBRS operators for fixed base stations usually consists of a vertical whip aerial mounted on the roof of a building. This is not a visually significant device and has the appearance of a large fishing rod.
- 2.13 A very small number of CBRS operators use the service to make very long range contact with other enthusiasts in countries such as the United States of America and the United Kingdom. This group of operators will tend to use the lower of the two frequency bands and a high gain antennae system which will be very similar to that used by operators on the ARS and which will shortly be described.
- 2.14 It is estimated that some 2 800 licensed ARS operators live in the metropolitan area of Melbourne and that of these operators no more than 840 would possess a mast of the type which is described below. Current estimates indicate that about thirty to forty new masts of this type are being erected each year by ARS operators; however, the total number of radio masts of this type appears to remain constant as a proportion of the masts are removed each year (see Appendix 6).

- 2.15 ARS operators are enthusiasts who must pass examinations on theoretical and practical aspects of radio communications before being licensed by the Department of Communications. ARS operators are allowed to operate on variable frequencies over a large number of specified frequency bands and may modify their equipment in order to obtain better results.
- 2.16 In general terms, ARS operators continually aim to improve their equipment and their techniques so as to gradually obtain the ability to make reliable and predictable radio contact with amateur radio stations around the world.
- 2.17 One of the fundamental ways in which ARS operators achieve their objectives relies on the use of very efficient antennae systems which can be rotated. This enables concentrated radio beams to be directed towards other stations. The radio beams may be aimed in such a way as to reflect from the ionosphere or to use other characteristics of the earth's atmosphere to re-direct the radio beam to its final destination.
- 2.18 Ideally, the height of these antennae systems should be sufficient so that a clear view of the far horizon can be obtained in all directions from the plane of the antennae. This is not always possible and is frequently very expensive to attain.
- 2.19 The antennae used by an ARS operator with a radio mast of the type just described will normally be raised above the height of surrounding television antennae. The typical height of these systems lies between 15 metres and 20 metres above ground level although much higher masts are sometimes used.
- 2.20 The horizontal dimensions of an ARS operator's antennae frequently exceeds three metres in each of the horizontal directions because of the radio frequencies at which he operates and the requirements of a high gain antennae at these frequencies.
- 2.21 In addition, the ARS operator may occasionally have more than one radio mast and set of antennae and he may have arrays of wire antennae suspended between masts or adjacent trees.

TRANSMISSION AND RECEPTION ON ALLOCATED
FREQUENCY BANDS BY PUBLIC SERVICE AUTHORITIES

- 2.22 A small number of radio masts has been installed by Public Service authorities in areas zoned as residential in metropolitan Melbourne. The number of these masts probably does not exceed 50.
- 2.23 Public Service authorities may have to install radio masts and antennae in residential areas from time to time to control such things as water and sewerage pumps, water reservoirs, traffic lights, electrical services and police services.
- 2.24 In general terms, radio communication systems for these services will operate on VHF or microwave frequencies. They may require masts up to thirty metres in height and the antennae will be either in the form of short vertical antennae attached at intervals up the mast or they will be directional microwave dish antennae located on a line of sight with the receiving antennae. Both types of antennae may be located on the same mast.
- 2.25 These radio masts are covered in the Melbourne Metropolitan Planning Scheme (MMPS) under the heading of Minor Public Utility and are a Column 4 use in residentially zoned areas. A planning permit is already required before they can be erected and this report will not consider them further.

CHAPTER THREE

ENVIRONMENTAL IMPACT

3.1 Larger radio masts and their associated antennae have the potential to cause three forms of environmental impact -

- (1) Physical impact through failure of the structure or support system;
- (2) Visual or noise impact caused by interference with television or other electronic equipment, emanating from the radio signals transmitted via the antennae; and
- (3) Visual impact of the structure itself.

PHYSICAL IMPACT

3.2 The Uniform Building Regulations 1974 and the proposed Victorian Building Regulations have been drawn up so as to ensure that the mast and it's antenna are structurally sound and unlikely to collapse.

3.3 In certain parts of the United States of America it is the practice to ensure that TV and radio masts are set back from boundaries so that if they fall over they do not fall into the neighbouring property. This concept, if applied in Victoria, would prevent many amateur radio stations from operating and the Committee is not of the opinion that it should be applied as a matter of course. However, if it is possible to set back a radio mast the equivalent of its own height from the boundaries of a property, this would certainly reduce both the risk of injury to third parties and the visual impact of the mast on neighbours.

- 3.4 The apparent structural stability of the radio mast and antennae may affect the visual impact of the assembly. A mast that appears unduly "top heavy" and which sways in the wind may be structurally sound but may cause alarm in the eyes of the next door neighbour, particularly if failure of the structure would cause it to fall on to his house or into his garden. Thus the apparent potential for physical impact may heighten the neighbours awareness of the mast and this may be expressed as a dislike for the appearance of the mast.

INTERFERENCE

- 3.5 Interference is covered by the *Wireless Telegraphy Act 1905* of the Commonwealth and the Regulations under that Act.
- 3.6 The Commonwealth Department of Communications has recently circulated a draft of the Radio-communications Bill 1983 for comment. This Bill allows, amongst other things, for the making of, and compliance with, receiver and transmitter standards, radio frequency planning, the issue of transmitter and receiver licenses and the settlement of interference disputes. The Bill if enacted will replace the *Wireless Telegraphy Act 1905*.
- 3.7 It is expected that before the Radio-communications Bill is presented to Federal Parliament in the Budget Session this year, it will be amended to also make provision that all audio and home entertainment equipment manufactured in or imported into Australia complies with standards which will ensure that interference from all sources is minimised.
- 3.8 Specific regulations are in place for both the Citizens Band Radio Service (CBRS) and the Amateur Radio Service (ARS) at the present time dealing with the subject of interference and these are included in Appendix 7.
- 3.9 The potential for interference being caused to neighbouring television sets and other electronic equipment by transmissions from ARS and CBRS stations does lead to two related effects.

3.10 The first effect can arise because one way of reducing local interference is to increase the height above ground level of the transmitting antennae.

3.11 The second effect can arise because, if a neighbour experiences interference, this interference and the visual effects of the mast may become linked and can become associated sources of annoyance.

VISUAL IMPACT

3.12 The major factors affecting visual impact are seen to be:

- (1) The height of the radio mast and antennae relative to surrounding buildings, trees and landscape;
- (2) The horizontal and vertical dimensions, shape and visual density of the antennae, mast and any supporting wires relative to surrounding buildings, trees and landscape;
- (3) The location of the observer;
- (4) The frequency with which the observer views the mast in the course of his normal activities;
- (5) The relative size, number and density of similar structures in the neighbourhood;
- (6) Any changes in appearance of the structure brought about by rotation of the antennae, the addition or removal of antennae, the raising or lowering of the masts, roosting birds, and movement of the antennae and mast in high winds;
- (7) Association with structural stability as previously mentioned; and
- (8) Association with electrical interference as previously mentioned.

CHAPTER FOUR

EXISTING PLANNING CONTROLS

- 4.1 The historical situation is outlined in Appendix 5.
- 4.2 The current situation is that some authorities believe that Part (a) of Section 3139 of the Uniform Building Regulations (UBR) provides for some degree of control over radio masts on the grounds of amenity. Section 3139 reads:

Erection of Wireless and Television Masts and Towers:

- (a) *Except where the consent of the Council has been obtained, masts, poles, aerials and antennas used in conjunction with the transmission or receipt of wireless, telegraphy or television shall not -*
- (i) *exceed a height of 8m above ground level when not attached to a building; or*
- (ii) *exceed a height of 3m above the highest point of the roof covering when attached to a building.*
- (b) *In all cases where such masts, poles, aerials and antennas are to be erected, the Building Surveyor may require that they be demonstrated to be structurally sound."*

- 4.3 The recommendations of the Building and Development Advisory Committee (BADAC) and the subsequent implementation of the *Building Control Act 1981* (see Appendix 5) stress the need to separate planning considerations from structural and health considerations and lead to the conclusion that it is not appropriate for radio masts to be controlled from an amenity or planning aspect under the UBR. The rationale for this conclusion relates to the professional training of the two appeal authorities, i.e. the Building Referees and the Planning Appeals Board.

4.4 Some authorities have attempted to use planning controls to provide a mechanism by which radio masts can be controlled. This strategy has failed when the matter has been taken before the Town Planning Appeals Tribunal (see Appendices 2, 3 and 5). The reason that the Planning Appeals Tribunal did not uphold planning decisions relating to the erection of radio masts was that no specific provision for radio masts was contained in the MMPS and the use of an amateur radio station from a dwelling house was seen to be a hobby compatible with residential use.

4.5 The proposed Amendment No. 115 Part 3 to the MMPS was an attempt both to rectify the lack of planning controls and to implement the BADAC recommendations.

CHAPTER FIVE

EVIDENCE TO THE INQUIRY

5.1 Summaries of written submissions and evidence given verbally to the Committee are contained in Appendices 2, 3 and 4.

5.2 In brief, the Municipal Association of Victoria believed that some form of planning control was necessary and their case is set out in the introduction to this report.

Additional points raised by individual councils are contained in Appendices 2 and 4.

5.3 The submission of the Wireless Institute of Australia representing the ARS operators (contained in Appendix 3), and some 565 identical submissions from these operators made the following points:

- (1) *Amateur radio operators are licensed by the Department of Communications and require efficient antennae systems to communicate locally, interstate, and internationally;*
- (2) *The single most important part of an amateur station is the antennae system which is governed by the natural laws of physics;*
- (3) *An amateur radio station is an asset to the local community and therefore enhances the amenity of the area;*
- (4) *The percentage of objections from neighbouring ratepayers is extremely low and these objections are mainly based on ignorance. They occur in only a few municipalities, with the remainder of municipal councils having no hesitation in issuing a building permit;*

- (5) *The visual impact of a radio mast of the types used by radio amateurs is not significant in most of the residential areas when viewed in the broader aspect of the environment of power poles, street lamp standards, trees etc, and this has been recognised by the Town Planning Appeals Tribunal in its decisions;*
- (6) *It is not considered that a radio mast of modern design engineered for supporting antennae in the Amateur Radio Service which are 20 metres or less in height constitutes a larger radio mast as per the Inquiry's Terms of Reference;*
- (7) *The Town Planning Appeals Tribunal has held that a resident has a right to do those things which accompany normal domestic living including the performance of a hobby. It has taken the view that a planning permit is not required for the erection of radio masts used for domestic or hobby purposes;*
- (8) *The current provisions of the Uniform Building Regulations and the Building Referee procedure are adequate to handle all situations and the granting of additional powers to municipal councils is opposed; and*
- (9) *If the Inquiry deems amateur radio masts to be larger radio masts, then the Wireless Institute of Australia, Victorian Division, recommends:*

"That radio masts in the Amateur Radio Service should not be subject to any planning controls. Alternatively that radio masts used in the Amateur Radio Service be exempt from planning controls provided that masts shall be within the following dimensions:

Height of mast - maximum of 20 metres.

Width of mast - the horizontal dimension of the mast measured at a height of 3 metres above the ground shall not exceed 50 centimetres."

CHAPTER SIX

DISCUSSION

- 6.1 The Committee considers that the term "larger radio masts" contained in the terms of reference given to the Committee for this Inquiry applies primarily to the radio masts erected by ARS operators and some CBRS operators, although some television and UHF/FM radio reception masts could also fall within this description.
- 6.2 It is currently possible for an individual to erect a very large, structurally sound, radio mast on a small block of land in a residential area of metropolitan Melbourne without obtaining the approval of the responsible planning authority. This means that neighbours affected by the visual aspects of the radio mast have no recourse to object to, or to prevent, the erection of the mast other than by resort to Common Law provisions. The Committee believes that this is an unsatisfactory situation.
- 6.3 Domestic television and UHF receiving aerials in a particular locality all tend to be located at a similar height above ground or roof level. This height will depend upon the reception characteristics of the area and it can be expected that in an area of bad reception most houses will have external television aerials. Domestic television and UHF receiving aerials do not normally exceed three metres in any horizontal direction.
- 6.4 Amateur radio mast antennae frequently do exceed three metres in one or more horizontal dimensions. In addition, amateur radio mast antennae are normally raised above the level required for domestic television and UHF receiving aerials in order to obtain efficient transmission characteristics. There are, of course, considerably fewer amateur radio masts than there are domestic television reception aerials and, consequently, as they are larger they are also more obvious. A fairly high proportion of amateur radio masts are not seen as a visual intrusion by adjacent neighbours; unfortunately this is not always the case and the potential for erection of totally unacceptable structures exists.

- 6.5 It is difficult to define logical mast and antennae dimensions above which the potential for serious visual intrusion may exist. Factors such as vegetation, topography, block size and other masts and antennae in the vicinity may influence the visual effects. Thus it is almost impossible to draw any logical level at which a planning permit should be required and, initially, some arbitrary level must be chosen.
- 6.6 The Committee believes that some clarification and improvement of the present confused situation in relation to the control of the erection of radio masts is required and that this would best be achieved by the introduction of a suitable amendment to the Melbourne Metropolitan Planning Scheme.

POSSIBLE FUTURE PLANNING CONTROLS

6.7 The Committee considered the following possible amendments to the Melbourne Metropolitan Planning Scheme:

(1) No planning controls over radio masts or antennae

Advantages Simple.
Does not restrict radio enthusiasts.

Disadvantages Individuals may suffer serious loss of visual amenity and have no right of appeal or redress; OR

(2) Amendment No. 115 Part 3 to the Melbourne Metropolitan Planning Scheme as adopted by Melbourne and Metropolitan Board of Works on 10/2/81

This is set out in Appendix 1 of this report. The Amendment included the definition of radio mast as a Column 4 use (planning permit required) and defined radio mast as:

"Radio mast" used in connection with radio transmission or reception within a dwelling, means a mast which together with antenna -

- (a) *exceeds a height of 8 metres above the ground;*
- (b) *when attached to a building, exceeds a height of 3 metres above the roof line; or*
- (c) *has any horizontal dimensions in excess of 3 metres.*

Advantages Coincides with requirements under the UBR. Provides affected individuals with the rights of objection and appeal on the grounds of loss of amenity.

Implements the BADAC recommendations.

Disadvantages May lead to all television aerials requiring a permit in some areas of Melbourne (this could be overcome by use of a Local Development Scheme - See Appendix 2).

ARS and CBRS operators may not always be permitted to erect large masts and antennae; OR

- (3) Amendment No. 115 Part 3 to the Melbourne Metropolitan Planning Scheme as originally advertised.

This was similar to (2) except that critical parameters for a radio mast were defined as:

- (a) exceeds a height of 14 metres above the ground, or
- (b) when attached to a building, exceeds a height of 5 metres above the highest part of such building.

No mention was made of the horizontal dimensions of the antennae.

Advantages Would require slightly less amateur radio enthusiasts to obtain planning permits when compared with (2).

Disadvantages Inconsistent when compared with UBR.

Eleven municipal councils objected to this proposal when originally exhibited by the MMBW on the grounds that serious loss of visual amenity could occur without means of redress being available; OR

(4) Amendment to the Melbourne Metropolitan Planning Scheme based on combination of (2) and (3) above, plus UBR wording

This possibility would include the following definition of radio mast:

Radio mast used in conjunction with the transmission or receipt of wireless, telegraphy or television means a mast which together with antennae -

- (a) *has any horizontal distance in excess of 3 metres;*
or
- (b) *when attached to a building, exceeds a height of 5 metres above the roof line; or*
- (c) *when not attached to a building exceeds a height of 14 metres above the ground.*

Antennae are to be defined as rigid elements attached to the radio mast or rotating boom supported by the radio mast. This definition does not include flexible wires or cables.

Advantages Clearly applies to large masts and antennae used for wireless and television, reception or transmission, but nevertheless unlikely to significantly affect TV or UHF/FM receiving antennae.

Not as stringent as (2) Antennae defined.

Disadvantages Uses different cut-off parameters to the UBR.

Most ARS and CBRIS operators will require a planning permit before erecting a large mast and antennae.

However, the relevant considerations are also distinct in being structural and amenity based respectively; OR

(5) Amendment to the Melbourne Metropolitan Planning Scheme put forward by the Wireless Institute of Australia

This would be worded so that radio masts are exempt from planning controls provided that masts are within the following dimensions:

Height of mast: maximum of 20 metres.

Width of mast: the horizontal dimension of the mast measured at a height of 3 metres above the ground not to exceed 50 centimetres.

Advantages The majority of ARS operators would not require a planning permit before erecting their mast and antennae.

Disadvantages In certain circumstances a radio mast height of 20 metres could be visually unacceptable and no rights of appeal or redress would exist; OR

- (6) Amendment to the Melbourne Metropolitan Planning Scheme similar to Amendment 115 Part 3 (option (2)) but applying only to radio masts used in conjunction with a radio station licensed under the Wireless Telegraphy Act 1905 (or its successor).

Advantages Would not result in planning permits being required for masts and antennae used for domestic television or radio reception.

Would require that planning approval is obtained for the majority of the larger radio masts and antennae.

Would provide affected individuals with the rights of objection and appeal.

Disadvantages Would affect many ARS and a small number of CBRS fixed installations in residential areas. However, could be seen to be a discriminatory method of applying what is essentially an amenity control.

CONCLUSIONS

6.8 The Committee concludes that:

- (1) The potential degree of visual significance of individual larger radio masts used in conjunction with the transmission or receipt of wireless, telegraphy or television, and located in a residential area within the metropolitan area is sufficient to justify municipal control over the erection of these masts;
- (2) No specific guidelines can be established for the whole of the metropolitan area as to when the erection of a larger radio mast is acceptable and when it is not. This depends on the local environment, the nature of the proposed mast and local attitudes. It is suggested that procedures similar to those adopted by the City of Brighton and the Shire of Diamond Valley be adopted by individual councils. (see Appendix 4); and
- (3) It is concluded that the appropriate approval is to put in place a general amendment to the Melbourne Metropolitan Planning Scheme to set a basic amenity standard and that if local authorities believe that tighter controls can be justified, they should then apply to vary the controls by way of local development schemes.

RECOMMENDATIONS

6.9 The Committee recommends -

- (1) That the Minister for Planning request the Governor in Council to amend the Melbourne Metropolitan Planning Scheme to define "radio mast" as:

Radio mast used in conjunction with the transmission or receipt of wireless, telegraphy or television means a mast which together with antennae -

- (a) *has any horizontal distance in excess of 3 metres; or*
- (b) *when attached to a building, exceeds a height of 5 metres above the roof line; or*
- (c) *when not attached to a building exceeds a height of 14 metres above the ground.*

Antennae are to be defined as rigid elements attached to the radio mast or rotating boom supported by the radio mast. This definition does not include flexible wires or cables.

- (2) That "radio mast" be included in residential zones of the Melbourne Metropolitan Planning Scheme as a Column 4 use. These zones are:

Township "A" Zone
Residential "A" Zone
Residential and Office Zone
Residential "B" Zone
Residential "C" Zone
Special Residential Zone No. 1

Special Residential Zone No. 2.
Special Residential Zone No. 3.
Urban Conservation Residential Zone No. 1.
Residential "D" Zone.
Reserved Living Zone.

- (3) That each Municipality in the Melbourne metropolitan area be requested to establish guidelines for the approval of permits for larger radio masts. These guidelines should include:
- (a) The procedure to be followed including the notification of neighbours, the provision of opportunity to object to the proposal and to appeal against the councils' decisions.
 - (b) The factors to be taken into account - which might include:
 - (i) The size and form of radio mast and associated antennae.
 - (ii) The size of proponents allotments and adjacent allotments.
 - (iii) The relative location of radio mast to buildings, windows, doors.
 - (iv) Prevailing heights of TV antennae in immediate neighbourhood and general community acceptance.
 - (v) The vegetation, topography, landscape.

Committee Room
7 September 1983.

**AMENDMENT NO. 115 PART 3 TO THE MELBOURNE METROPOLITAN PLANNING
SCHEME AS ADOPTED BY THE M.M.B.W. ON 10 FEBRUARY 1981**

(THIS AMENDMENT HAS NOT BEEN APPROVED BY THE GOVERNOR IN COUNCIL)

PART A - GENERAL

1. Title:

This Planning Scheme may be cited as the Melbourne Metropolitan Planning Scheme Amendment No. 115 Part 3.

2. Arrangement of Scheme:

This Planning Scheme is divided into the following -

Part A - General

Part B - Variation of the Principal Scheme

3. Definitions:

In this Planning Scheme, unless inconsistent with the context or the subject matter -

"Approval Date" means the date on which notice of approval of this Planning Scheme by the Governor in Council is published in the Government Gazette.

"Principal Scheme" means the Melbourne Metropolitan Planning Scheme approved by the Governor in Council on the 30th day of April, 1968, as amended or varied by any subsequent planning scheme or an amendment made by the Governor in Council notice of approval of which or notice of which (as the case may be) has been published in the Government Gazette.

4. Application of Scheme:

After the approval date, the Principal Scheme shall be amended and varied in the manner and to the extent shown in Part B hereof and such Principal Scheme and the amendments and variations herein shall be read and construed as one.

PART B - VARIATION OF THE PRINCIPAL SCHEME

5. Planning Scheme Ordinance:

- (1) Immediately following the interpretation "Racing Stables" in Clause 2(1)(a) there shall be inserted the following interpretation -

"Radio Mast" used in connection with radio transmission or reception within a dwelling, means a mast which together with antenna -

- (a) *exceeds a height of 8 metres above the ground,*
- (b) *when attached to a building, exceeds a height of 3 metres above the roof line, or*
- (c) *has any horizontal dimensions in excess of 3 metres.*

- (2) The Table to Clause 7 shall be amended as follows -

| | | | |
|-----|--------------------------|---|--|
| (a) | Section 1C Column 4 | - | Corridor "A" Zone Insert "Radio Mast" |
| (b) | Section 3 Column 4 | - | Residential "A" Zone Insert "Radio Mast" |
| (c) | Section 4(a) Column 4 | - | Residential "A1" Zone Insert "Radio Mast" |
| (d) | Section 4(b) Column 4 | - | Residential "A2" Zone Insert "Radio Mast" |
| (e) | Section 5 Column 4 | - | Residential "B" Zone Insert "Radio Mast" |
| (f) | Section 6 Column 4 | - | Residential "C" Zone Insert "Radio Mast" |

- | | | | |
|-----|-----------------------------|---|--|
| (g) | Section 7 Column 4 | - | Residential "D" Zone Insert "Radio Mast" |
| (h) | Section 36A Column 4 | - | General Farming "A" Zone Insert "Radio Mast" |
| (i) | Section 37A Column 4 | - | Intensive Agriculture "A" Zone Insert "Radio Mast" |
| (j) | Section 38A Column 4 | - | Special Extractive "A" Zone Insert "Radio Mast" |
| (k) | Section 39A Column 4 | - | Landscape Interest "A" Zone Insert "Radio Mast" |
| (l) | Section 40A Column 4 | - | Conservation "A" Zone Insert "Radio Mast" |
| (m) | Section 43 Column 4 | - | Special Conservation Zone Insert "Radio Mast" |

Dated this 10th day of February, One thousand nine hundred and eighty one.

THE COMMON SEAL OF MELBOURNE
AND METROPOLITAN BOARD OF WORKS

on being affixed hereto was
attested by:

Signed A. H. Croxford, Chairman.

Signed O. T. W. Cosgriff, Secretary.

SUMMARY OF WRITTEN SUBMISSIONS

Amateur Radio Operators

Five hundred and sixty-five similar submissions were received from people claiming to be amateur radio operators. A proportion of these submissions came from States other than Victoria. These submissions contained all or some of the following statements:

- * *Amateur radio operators are licensed by the Department of Communications and require efficient antenna systems to communicate locally, interstate, and internationally.*
- * *The single most important part of an amateur station is the antenna system which is governed by the natural laws of physics.*
- * *An amateur radio station is an asset to the local community and therefore enhances the amenity of the area.*
- * *The percentage of objections from neighbouring ratepayers is extremely low and are mainly based on ignorance. These objections occur in only a few municipalities with the remainder of municipal councils having no hesitation in issuing a building permit.*
- * *The visual impact of a radio mast of the types used by radio amateurs is not significant in most of the residential areas when viewed in the broader aspect of the environment of power poles, street lamp standards, trees etc., and this has been recognised by the Town Planning Appeals Tribunal in its decisions.*
- * *it is not considered that a radio mast of modern design engineered for supporting antennas in the Amateur Radio Service which are 20 metres or less in height constitutes a larger radio mast as per the inquiry's terms of reference.*
- * *The Town Planning Appeals Tribunal has held that a resident has a right to do those things which accompany normal domestic living including the performance of a hobby. It has taken the view that a planning permit is not required for the erection of radio masts used for domestic or hobby purposes.*

- * *The current provisions of the Uniform Building Regulations and the Building Referee procedure are adequate to handle all situations and the granting of additional powers to municipal councils is opposed.*

Wireless Institute of Australia, Victorian Division

The Wireless Institute claims to represent all radio operators in the ARS in Victoria.

The Institute made a very detailed submission which is attached as Appendix 3 to this report.

The recommendation made by the Institute was as follows:

That amateur radio masts do not fall within the terms of reference of the inquiry as they are NOT larger radio masts.

If the Inquiry deems amateur radio masts to be larger radio masts then the Wireless Institute of Australia, Victorian Division recommends:

That radio masts in the Amateur Radio Service should not be subject to any planning controls. Alternatively that radio masts used in the Amateur Radio Service be exempt from planning controls provided that masts shall be within the following dimensions:

Height of mast - maximum of 20 metres.

Width of mast - the horizontal dimension of the mast measured at a height of 3 metres above the ground shall not exceed 50 centimetres.

Statutory bodies operating radio communication systems

Submissions were received from:

- The State Electricity Commission
- The Gas and Fuel Corporation
- The Melbourne and Metropolitan Board of Works (Administrative Services)
- The Public Works Department
- The Victoria Police

These submissions all expressed concern that any additional controls might delay or inhibit the erection of radio aerials for communications associated with essential services often of an emergency nature.

St Johns Ambulance Brigade

The Brigade drew attention to the service provided by the Wireless Institute Civil Emergency Network during the "Ash Wednesday" bushfires and indicated their concern that any legislation might be introduced over what has traditionally been a self regulating pursuit. The Brigade felt that a reasonable sprinkling of towers and antenna was a small price to ask the community to pay in return for a corps of skilled and dedicated enthusiasts who provide an unparalleled, voluntary, emergency service.

Commercial and other organisations

Submission were made by the following organisations:

- Polar Electronic Industries Pty Limited
- Antenna Engineering Australia Pty Limited
- G.B. Telespares Pty Limited
- Television and Electronic Technicians Institute of Australia

All were opposed to the introduction of planning controls and pointed out that the proposed MMBW amendment would affect a wide range of commercial installations, TV antenna and future satellite receiver aerials. Concern was also expressed that the controls might affect the businesses of those making the submissions or of the members of their organisations.

A submission was also made by Watchman Electronics who pointed out that it is possible for amateur radio operators to obtain good operating efficiency without the use of large aerials and enclosed a sales leaflet for Miniature Transmitting Antenna produced in New South Wales.

Municipalities inside the metropolitan area

Submission were received from nineteen municipal councils. Of these, fifteen directly supported the need for some form of planning control and out of these fifteen, eight Municipalities supported the proposed Amendment No 115 Part 3 to the Melbourne Metropolitan Planning Scheme although two of the eight believed that the Amendment should be broaden to cover:

- (i) siting in order to prevent the antenna assembly approaching within 3m of any common boundary, dwelling or street alignment whilst static or during rotation; and
- (ii) areas in non-residential zones within a certain minimum distance (30m) from a residential zone to be included in the amendment.

One municipality supporting the Amendment added that unless suitable guidelines are established by the Committee, no effective control can be established over the appearance of such masts in residential areas.

One municipality indicated that 'radio mast' would have to be defined and suggested that the same definition as that contained in the UBR be used.

Of the other seven municipalities supporting the Amendment, four gave support in very general terms; one considered that radio masts should be made a column 3 use in a residential area (this would be a permitted use subject to compliance with certain conditions); one considered that radio masts over 7 metres height above ground level should be subject to a planning permit in residential areas; and another considered that radio masts exceeding a height of 14 metres above ground level or exceeding a height of 5 metres above the highest part of the roof of a supporting building should be subject to planning control within residential areas (this was the original form of the Amendment).

The grounds upon which these fifteen municipalities supported the need for planning controls were:

- (i) the lack of control over visual amenity through the UBR;
- (ii) the rulings of the Town Planning Appeals Tribunal;
- (iii) the loss of visual amenity which could result from the erection of a radio mast; and
- (iv) the need to have an established appeal process for those directly affected by the installation of a radio mast.

Of the remaining four municipal submissions, three indicated a belief that adequate control could be exercised through the Uniform Building Regulations, or by the use of by-laws and the fourth considered that "there are instances where radio masts could be detrimental to the residential amenity of an area."

Municipalities outside the metropolitan area

Submissions were received from two municipalities outside the Melbourne metropolitan area.

The Shire of Narracan indicated that it would be very much appreciated if the Committee could extend its inquiry into the environmental impact of television reception masts in rural areas. It was submitted that Yallourn North presents a forest of aluminium above the roof tops.

The Shire of Korumburra indicated that Section 3139 of the UBR enabled the Council to require permits for aerials over certain dimensions. The specific following comments were made:

"Aerials in excess of 6 metres (fixed to the ground) should have the consent of the immediate neighbours when erected in Township areas."

"Where two-way radio aerials are required in a residential area they should obtain approval from the immediate neighbours"

Private individuals

Four private individuals and one group of residents in Frankston (apart from the amateur radio operators opposing planning controls previously mentioned) made submissions.

One private individual who was obviously also a radio amateur said "hams play a role in society and shouldn't seek exemption from tower legislation."

Two submissions from private individuals and one from a group of residents in Frankston, supported the need for municipal control over the appearance of radio masts on the grounds of specific problems with radio masts in their own neighbourhoods. One of these private individuals gave evidence to the Committee and his problem is dealt with in more detail later in this report. The group of residents in Frankston provided photographic evidence and made the following comments:

We find the present situation, where one person in pursuit of a hobby can erect an enormous steel structure which completely dominates and changes the natural look of the surrounding area, absolutely unacceptable.

The antenna erected in our immediate vicinity, at 2 Tavistock Road, Frankston, has drastically altered and impeded the views and outlooks from all our houses. It stands 20 metres high and has large spreading antenna at the top as well as a tower like structure from the ground upwards into the sky. The residents with properties on the high side of the antenna, with views over Frankston and the Bay, now have to look through this man-made steel eyesore. The residents on the lower side of the structure feel as though they are living next to some giant oil rig and tend to feel that while in their own backyards, Big Brother is watching

This structure has been erected with out any official advice to the residents concerned prior to its erection.

We have spoken to real estate agents and they have confirmed that because of the antenna the value of properties in the immediate area has been considerably lowered.

We feel that the erection of this antenna has been an infringement of our civil rights and we intend to take up our grievances with the Local Council members in the next few days.

The fourth submission was from the wife of a man based at the Australian Casey Antarctic Base, who indicated that she and her family had been able to talk regularly with her husband, free of charge, because of a friend's radio equipment having a mast and antenna of adequate size and height.

The Wireless Institute of Australia

VICTORIAN



DIVISION

Reference:

FOUNDED ... 1910
INCORPORATED 1925412 BRUNSWICK STREET,
FITZROY, 3065
Telephone 417 3535

The Secretary,
Natural Resources and
Environment Committee,
Parliament House,
MELBOURNE. Victoria. 3002.

Dear Sir,

Please find enclosed the Submission of the Wireless Institute of Australia Victorian Division to the Inquiry into Radio Masts.

The Institute wishes to reserve its right to call expert witnesses to support its submission and the right to submit additional material.

For further information the following people may be contacted:-

Mr. Alan R. Noble,
19 Willow Avenue,
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4 Ansett Crescent,
Forest Hill, Victoria. 3131.
Telephone (Home) 232-3534
(Business) 62-3726

Yours faithfully,

Ian Palmer

IAN PALMER
Secretary W.I.A. Victorian Division
29/3/83

A SUBMISSION

by the

WIRELESS INSTITUTE OF AUSTRALIA VICTORIAN DIVISION

to the

INQUIRY INTO RADIO MASTS

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

PARLIAMENT OF VICTORIA

Prepared by -
Mr. A.R. Noble
Mr. J.K. Linton
for the W.I.A. Victorian Division

Authorised on Behalf of Council
W.I.A. Victorian Division

I.M. Palmer

I.M. Palmer, Secretary

412 Brunswick Street,
BRUNSWICK VIC. 3065
Telephone: 417 3535

Dated 30th March, 1983

RECOMMENDATION

THAT Amateur Radio Masts do not fall within the terms of reference of the Inquiry as they are NOT larger radio masts

IF the Inquiry deems Amateur Radio Masts to be larger radio masts then the Wireless Institute of Australia Victorian Division recommends

THAT Radio Masts in the Amateur Radio Service should not be subject to any planning controls

alternatively

THAT Radio Masts used in the Amateur Radio Service be exempt from planning controls provided that masts shall be within the following dimensions:

Height of Mast: maximum of 20 metres

Width of Mast: the horizontal dimension of the mast measured at a height of 3 metres above the ground shall not exceed 50 centimetres.

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SECTION 1 WHAT IS AMATEUR RADIO?

1.1 The activity of Amateur Radio is almost as old as radio itself. When Marconi sent the letter S in morse code using wireless telegraphy on December 12, 1901 in the historic trans-Atlantic transmission he could have been described as a Radio Amateur.

Before this event experiments in the 1890's involving the detection of radio waves (known as Hertzian Waves) were being conducted in several countries including Australia.

From 1905 licences were required in Australia for the use of wireless telegraphy for experimental purposes, the forerunner of today's Amateur Radio station licence.

1.2 Obviously radio-communication cannot be constrained by national borders. Use of the radio spectrum has been co-ordinated by the International Telecommunication Union (ITU), a specialised body of the United Nations. This is achieved by the allocation of bands of frequencies to particular Services such as the Aeronautical Service, the Maritime Service and the Broadcasting Services. From the earliest days of the international co-ordination of frequency allocations through the medium of the ITU, bands of frequencies have been allocated to the Amateur Radio Service.

1.3 The definition of the Amateur Service has remained virtually unchanged since 1927 and is defined as "... a means of self-training, inter-communication and technical investigations carried on by Radio Amateurs, that is, duly authorised persons interested in radio techniques solely with a personal aim and without pecuniary interest."

1.4 Radio Amateurs have played a significant role in the pioneering and development of radio, television and other communication facilities.

Australian Radio Amateurs achieved communication within the Commonwealth of Australia and had achieved trans-Pacific radio contacts before there were any radio broadcasting stations in Australia.

1.5 Radio Amateurs have to satisfy the Department of Communications of their individual technical competence and are authorised to carry out technical investigations. The ITU requires member countries to examine persons on their technical and regulatory knowledge before being issued a certificate of proficiency which then qualifies that person to operate an Amateur Radio Station. This is where the Radio Amateur and the Citizens Band Radio operator differ. Citizens Band operators are not examined on their technical ability, are not authorised to carry out technical investigations and are restricted to voice mode communication on two short range bands.

1.6 The person who is a licensed Radio Amateur establishes a station at his/her home. Amateur Radio is a normal incident to the use of residential land as shown by the deliberations of the Town Planning Appeals Tribunal.

1.7 This station may vary in complexity, home built or of commercial origin or a mixture of both.

The individual may be interested in operating his station simply to communicate with fellow Radio Amateurs around the world by voice or morse code.

Alternatively, he may specialise in the more sophisticated modes of transmission available such as radio teletype, television, or communications through Amateur built satellites.

Australian Radio Amateurs have significantly contributed to Amateur Radio Satellites, which have been launched by American, Russian and European space agencies.

1.8 One benefit the Amateur Radio Service provides to the community is a pool of trained and qualified radio operators.

These operators have provided communications at time of bushfire, flood and other natural disasters.

During the 1939 "Black Friday" Bushfires in South Australia and Victoria, Radio Amateurs using their own equipment and knowledge established an emergency communications network. This was the fore-runner of the Wireless Institute Civil Emergency Network (WICEN). In the "Ash Wednesday" Bushfires of 1983 WICEN was officially activated by the State Emergency Service and provided a valuable contribution in the area of communications. See Appendix 5.

Virtually the only communications for many hours with Darwin after cyclone Tracey struck in December 1974 was via a Radio Amateur in the ruins with a fellow Amateur at his home in Mooroolbark (Melbourne).

WICEN is part of the State Disaster Plan in Victoria, and in most other States and Territories of the Commonwealth.

1.9 The outbreak of World War 2 saw Radio Amateurs joining the services to become wireless instructors and high ranking officers in charge of communications.

Some found themselves in the islands as members of the "Coastwatchers" sending intelligence reports back on enemy movements.

1.10 Radio Amateurs are men, women and teenagers, the abled and disabled, who have a diversity of backgrounds which are found in all sections of the general community. This has been illustrated by a recent survey: See Appendix 2.

The Amateur Radio Service results in spreading of technological understanding and competence throughout the community.

- 1.11 Amateur Radio crosses international boundaries and helps foster friendship and understanding between the peoples of different nations.

- 1.12 Radio Amateurs being an integral part of the community are prepared and willing to use their technical competence and equipment for the benefit of the general community, both in the time of disaster and as a part of appropriate social activity. Therefore, the Amateur Radio Station is an asset to the community and enhances the amenity of the area.

SECTION 2 RADIO MASTS IN THE AMATEUR RADIO SERVICE - TOWN PLANNING APPEALS
TRIBUNAL DECISIONS

- 2.1 The issue of radio masts in a residential area has been canvassed repeatedly by specialised planning tribunals solely on the grounds of amenity. In all cases where the radio mast was for an Amateur Radio Station the decision has upheld the right of such use in a residential area.
- 2.2 We refer to the Town Planning Appeals Tribunal, Appeal No. X78/16A heard on the 16th June, 1978 (Ryan -vs- City of Heidelberg). Appeal Tribunal, chaired by, P. Opas Q.C., found that "the use of an amateur radio station from a dwelling house to be a hobby compatible with residential use...". The Tribunal stated "A permit for the erection of a radio mast is required under the Uniform Building regulations, but that is not a town planning matter".
- 2.3 We refer to the Town Planning Appeals Tribunal, Appeal No. X74/1023 heard on the 14th April, 1975 (Roper -vs- City of Nunawading). Appeal Tribunal, chaired by F.H. Lonie, found that "It seems to us that an amateur radio station conducted as a hobby in and from a detached house would be part of the normal use of such a house. We do not think a planning permit for the proposed mast is required though a building permit under the Uniform Building Regulations would of course be necessary. Whether or not a permit is required we are, however, of the opinion that the proposed mast would have very little affect on the amenity of the neighbourhood and any slight adverse effect which it may have is in our opinion more than compensated for by the community benefit given by this radio station".
- 2.4 We refer to the Town Planning Appeals Tribunal, Appeal No. X74/240 heard on the 20th June, 1974 (Glanville -vs- City of Heidelberg). The grounds on which the City of Heidelberg refused a permit was "The proposed structure would detract from the visual amenity of the area being large, obtrusive and out of character in a residential area". The Tribunal, chaired by F.H. Lonie, in upholding the appeal said "It is clear that existing amateur stations confer substantial benefit on the community by virtue of their use in emergency situations. We do not think that the proposed 40 foot mast and antenna would greatly affect the visual amenity of the area".
- 2.5 We refer to the Town Planning Appeals Tribunal, Appeal No. 15, heard on the 7th October, 1979 (Flack -vs- City of Waverley). "The application was refused by the City of Waverley on the grounds that it would be detrimental to the amenity of the area and would affect the value of the abutting properties." The radio mast in subject was of the "windmill" type with a base about 7 feet square which it was proposed to position in a backyard. The Tribunal's decision stated "our inspection showed that the subject land is in a pleasant residential area still in course of development. However, we are not satisfied that the proposed use will have a detrimental effect on the area or on the value of the adjoining properties".
- 2.6 While the Appeals Tribunal has found in favour of radio masts in residential areas for Radio Amateurs they have generally disallowed appeals on merit involving business two-way radio systems.

SECTION 3 RADIO MASTS - ENVIRONMENTAL CONSIDERATIONS

- 3.1 By experience we know that the primary concern of neighbours in relation to a proposed radio mast is that it will interfere with their reception of television. Once the neighbour is assured the mast will not interfere with TV reception, this form of objection disappears. This question arises mostly from the lack of knowledge of the subject. Radio masts of themselves CANNOT interfere with the reception of television signals. However, the position is that the Department of Communications is the Commonwealth Department charged with the responsibility for detection, correction and regulation of all interference matters. The subject, therefore, lies outside the responsibility and competence of Municipalities.
- 3.2 Experience also shows the next area of objection concerns the visual impact of a radio mast. This form of objection mainly results from mental visualisations of how a "20 metre TOWER" will look in a neighbour's yard. However, it is found also that when a personal explanation aided by sketches and diagrams is given to the neighbour this form of objection disappears.
- 3.3 Difficulties arise in both the above-mentioned areas (interference and visual) when unreasonable people or a pre-existing unfriendly relationship are involved.
- 3.4 We submit that the visual impact of a radio mast of the types used by Radio Amateurs is not significant in most residential areas when viewed in the broader aspect of the environment of power poles, street lamp standards, trees etc., and this has been recognised by the Town Planning Appeals Tribunal in its decisions. (See Paragraphs 3.10 a and b)
- 3.5 Power lines in residential areas are a source of interference to the reception of radio and television signals as are many modern domestic appliances such as TV sets, TV games, Microwave ovens, Video recorders. Such sources and objects like buildings and trees can obstruct and interfere with reception of signals. Therefore, these factors also make it necessary for the antenna to be placed as high as possible.
- 3.6 It may happen that a neighbour's television receiver receives some of the signal from a close-by radio transmitter. This does not necessarily mean that there is any fault in the transmitter. The Department of Communications finds in fact that in more than 80% of cases of TV interference complaints, the fault lies in the TV set or its installation. Less than 1% of complaints involve Amateur Radio stations.
- 3.7 However, it is a fact that where the antenna of a transmitting station is placed well above the plane of nearby TV antennas, the probability of transmitted signals causing interference (even where the TV set is faulty) is markedly reduced.

- 3.8 The Institute has had put to it in the past the question of painting masts with the intent of reducing visual impact. Our opinion is that painting of a radio mast such as those commonly used by Radio Amateurs in residential areas would serve little purpose and we rely on the following in forming this conclusion -
- * The Handbook for Radio Engineers refers to the painting of masts used in medium frequency, commercial and national broadcasting stations to emphasise the height of a mast and thus detract from its width. These masts are often very large and painting them for environmental purposes appears to make them look slimmer and taller; we refer to masts of 50 - 500 metres in height.
 - * Masts used by Radio Amateurs are usually hot-dipped galvanised and when viewed in most lighting conditions they appear to be black from a distance or silver from close-by. If painted they would still appear black from a distance and any colouring would be discernible only from close-by. It is considered that the natural galvanised metallic colour of these masts blends in most cases with the sky and surroundings in most prevalent lighting conditions.
- 3.9 It is pointed out that extendable masts are not engineered to be wound up and down on a daily basis. This would require some 700 operations a year and the pulleys and cables as used on these masts would not take this wear and tear. Some Councils have demanded that masts be kept in the lowered position when not in use despite the fact that the antenna then looks larger than when the mast is up. We suggest that from a safety aspect, as well as a visual aspect, the Inquiry should not find that masts be wound down on a daily basis when not in use.
- 3.10 The Wireless Institute of Australia Victorian Division recognises -
- (a) the undesirability of value judgements on a case by basis as has been practice in the past with applications for erection of a radio mast which have been referred to the Planning Appeals Tribunal;
 - (b) that in all of the cases before the Planning Appeals Tribunal where the applicant has been a Radio Amateur, the application has been granted;
 - (c) that every Radio Amateur has a responsibility to his neighbours and to the community in which he lives, similar to that which he expects his neighbours to have; together with special responsibilities arising directly out of his particular activities in operating radio transmitting equipment. Many of the latter responsibilities are prescribed by law and are to be found in the Wireless Telegraphy Act and the Amateur Operator's Handbook (See Appendix 6) administered by the Department of Communications;

- (d) that the question of the erection of a radio mast in a residential area for the purposes of engaging in Amateur Radio as a hobby and private interest without pecuniary gain, lies in the area of a persons right to engage in a legal and a highly regulated domestic activity within one's own residential property and the possible impact that the exercise of such a right might have on one's neighbours.

It appears to be a question of balance and reasonable compromise where there is a conflict of views.

3.11 In cases where conflict of views is in evidence, and from past experience these seem to be exceedingly few when account is taken of the number of active Radio Amateurs in the metropolitan area. We believe that balanced consideration should be given to the benefits that accrue to the immediate and general community from an Amateur Station when considering objections to its operation.

SECTION 4 RADIO MASTS - TECHNICAL CONSIDERATIONS

4.1 The antenna system of an Amateur Radio station is the most important part of the installation, no matter whether this station is simple or complex, modest in cost or extremely expensive and no matter what mode of communication is used. This is important to the role of experimentation and development of new devices/applications which are expected within the terms of the licence held by the Radio Amateur.

4.2 The minimum height for efficient antenna operation is a half-wavelength of the frequency of reception or transmission. Substantial improvement in transmitting or receiving efficiency is achieved by an increase in height from half-wavelength to one wavelength above ground. This increase in height provides a lower angle of radiation of the transmitted signal resulting in longer distance communication being achieved. This half-wavelength factor also determines the antenna dimensions.

4.3 And so we see that the basic purpose of a mast is to raise and support an antenna structure at such a height as to afford efficient operation of the antenna.

The following table lists the half-wave dimensions in metres for the various internationally agreed Amateur Radio Service frequency bands in the high-frequency (H.F.) spectrum.

| Amateur Frequency Band (MHz) | "Half Wave" Unit Length (meters) |
|------------------------------|----------------------------------|
| 1.8 - 2.0 | 78 |
| 3.5 - 4.0 | 39 |
| 7.0 - 7.3 | 21 |
| 10.1 - 10.15 | 15 |
| 14.0 - 14.35 | 10.4 |
| 18.0 | 8.2 |
| 21.0 - 21.45 | 7.08 |
| 24.0 | 6.2 |
| 28.0 - 29.7 | 5.1 |

Table 1: Half-Wavelengths as a function of Frequency (HF Spectrum)

4.4 Because of the physical constraints at the 1.8 MHz and 3.5 MHz bands, antennas are used at heights lower than a half-wavelength, which results in a high angle of radiation of the transmitting signal; thus communication is confined mainly to Australasia.

- 4.5 Allowing for some compromise at 7.0MHz (see Table 1) we are of the opinion that a reasonable total height for a radio mast in a residential area for use in the Amateur Radio Service is 20 metres, subject to certain conditions of mast design and space availability.
- 4.6 While we have so far confined discussion to High Frequency (HF) bands the Amateur Radio Service has a number of Very High Frequency (VHF), Ultra High Frequency (UHF) and microwave frequency bands. Transmission on these bands is restricted to line-of-sight propagation which therefore requires an antenna to be at an adequate height to establish communication. These bands were used extensively during the "Ash Wednesday" bushfires utilizing mountain top Amateur Radio Repeater Stations, which enabled the establishment of a State-wide emergency communications network.
- 4.7 We are also aware of the different styles and designs of structures which may be employed as radio masts. These range from guyed poles or pipes and the modern slim-line extendable self-supporting mast to the wide based heavy construction "windmill" type such as is found in farming areas.
- 4.8 We therefore further propose that masts of triangular, square or rectangular cross-section having a dimension on any side in excess of 50cm, measured at a height of 3 metres above the ground, and being self-supporting or guyed could be subject to consideration on merit by the planning authority as to its possible effects on the amenity of the area. It is recommended that all other masts should be accepted as a legitimate part of the resident's desired domestic requirements and exempt from objection on the ground of visual impact or objection on the ground of effect on amenity.
- 4.9 The Institute submits that the Inquiry may find that radio masts of modern design engineered for supporting antennas in the Amateur Radio Service which are 20 metres or less in height and of side dimension less than 50 cm measured at 3 metres above the ground do not constitute a larger radio mast as per the inquiry's terms of reference. Alternately, we recommend that masts within these dimensions should not be subject to any further controls.

- 5.1 The Institute has given some thought to the question before the Inquiry which relates to control at the municipal level. In this regard we wish to make some observations which may be of assistance to the Inquiry.
- 5.2 Many areas of Melbourne have poor VHF television reception at roof top height, and this situation will be accentuated with the introduction of more UHF television. Residents in these areas are obliged to use masts up to 25 metres in height to enable them to receive television. The presence of such masts is accepted by the community as a necessity and no doubt they are considered by the users to "enhance the amenity of the area".
- 5.3 If TV masts are to be exempt from any planning control at Municipal level and Amateur Radio masts are not to be exempt then it may appear that the Inquiry is being asked whether the government should discriminate between users of these masts (if TV masts are included as "larger masts") and Radio Amateur whose mast requirements are of a similar order (if Amateur Radio masts are seen as "larger masts").
- 5.4 If planning controls were to be applied to all Amateur Radio masts the costs to the community in administrating the regulations and the costs to the individual Amateur would rise, if one assumes that our planners are now fully occupied.
- Such costs would not seem to be warranted when the history of complaints or objections to Amateur Radio masts is reviewed. That history shows that only a very small percentage of applications to erect a radio mast for Amateur Radio purposes are objected to by neighbours. It is evident that some objections have originated at Municipal level, perhaps through the failure of the applicant to adequately explain the nature of the use, that is, the nature of Amateur Radio and the technical requirements for a radio mast of a certain minimum height. Therefore, in some cases, it is believed that Municipalities have adopted adverse positions as to Amateur Radio masts in the absence of adequate information.
- 5.5 In no case submitted to the Town Planning Appeal Tribunal the applicant for an amateur radio mast been unsuccessful. It might seem that a minority of Municipal Councils wish to see some change to the system because of this stand taken by the Appeals Tribunal.
- 5.6 As far as the Institute is aware the appearance of a radio mast used by Radio Amateurs has not detracted from the amenity of any area nor the value of any property.

- 5.7 The Institute recommends that firm guidelines be made available to Councils to ensure that the consideration of any application is properly weighed on the balance between the interests of the applicant together with accruing benefits to the community and on the other hand the objections and their value to the Community.
- 5.8 We believe that a responsible Authority has as much responsibility on it to assist an applicant in his desires as it does to serve the interests of his neighbours. It appears from experience of a number of applicants that the required balance of responsibility and judgment has not always been exercised by the responsible authority.

SECTION 6 LARGER MASTS AND AMATEUR RADIO MASTS

- 6.1 There are many large radio masts situated in residential areas of metropolitan Melbourne. Some of these are to be found on Municipal buildings and sites. These masts generally are used for communications to support commercial, industrial and government activity. Some of these masts are in excess of 70 metres in height and have bases which span 3 to 4 metres square.
- 6.2 By comparison masts used by Radio Amateurs are small. These masts vary in design ranging from piping or poles to hold a wire antenna or small VHF antenna through to the wind-up telescopic, tilt-over fabricated steel-web type. The latter is the most expensive type (installed cost around \$800) and is engineered to support a directional antenna.

SECTION 7 CONCLUSION

For all the reasons put forward in this submission the Wireless Institute opposes the granting of additional powers to Municipal Councils and states its support for the current Uniform Building Regulations.

ATTACHMENTS

Appeal No. X78/16A
Appeal No. X74/1023
Appeal No. X74/240
Appeal No. 15



VICTORIA

TOWN PLANNING APPEALS TRIBUNAL

APPEAL NO. X78/16A

APPLICATION NO. 3380

Heard at Melbourne on the 16th June, 1978.

Mr. J. B. Ryan

Appellant

City of Heidelberg

Local Authority

This appeal is brought by John Bernard Ryan against the refusal of the City of Heidelberg to grant a permit for the erection of a radio mast at 39 Durham Street, Heidelberg. The subject land is within a residential zone. Twenty-six (26) objectors, who were local residents, opposed the issue of a permit, which was refused by the responsible authority on the sole ground "erection of the radio mast would detrimentally affect the amenity of the surrounding residential area."

During the course of the submission on behalf of the responsible authority, the Chairman raised the issue as to whether a permit was required in the circumstances. This was a preliminary point which had to be resolved before the application could be considered on its merits. To enable the matter to be fully researched the hearing was adjourned sine die with liberty to all parties to make written submissions as to the necessity for a permit. Such submissions were to be forwarded within fourteen (14) days to the other parties and the Registrar.

As a result of research and the assistance of the parties, attached are the relevant cases to come before this Tribunal dealing with radio masts.

In the present case it is proposed to erect a mast 13.41 metres high (approximately 44ft.) with an antenna on top being of unspecified height. Clearly it could not exceed more than a few feet.

Consideration of prior decisions of this Tribunal show that it is only in the case of *Roper v MMBW* (1975) 2 VPAD 247, that the matter of whether a planning permit was needed was adverted to. Every other case where such a point might have been raised seems to have been decided on the merits of the case without consideration of this point.

In order to test the matter, one has to start at the position obtaining prior to the introduction of planning control. At that remote point of time, a land owner could use and develop his land as he wished without seeking a permit from any authority and subject only to the common law sanction of actions for nuisance and the like. With the introduction of controls, his rights have become so eroded that there is scarcely any use or development on his land for which he does not have to seek a permit. However, some such rights remain and must be considered as remaining, except where they have been taken away.

Clause 4 (4) of the Melbourne Metropolitan Planning Scheme Ordinance provides (omitting irrelevant words for the purpose of this case) "save where the permission of the responsible authority is specifically required with respect to the erection, construction or carrying out of buildings or works, the use of land for a purpose which is permitted by, or under, the provisions of this Ordinance shall be deemed to include the erection, construction or carrying out of buildings or works, designed to enable such land to be used for such purposes." Within a residential "C" zone as tabulated in the table to clause 7 of the Ordinance "detached house" appears as a column 2 use. Read with clause 7 (1) (a) it is clear that the column 2 use for the purpose of a detached house may be carried out without a town planning permit.

The responsible authority contends that the erection of a radio mast is a column 4 use as coming within "any purpose not specified or included in any other column of this section of this table". On the other hand, Mr. Braun for the applicant, submits that because the Ordinance is silent concerning radio masts, this means that the permission of the responsible authority is not specifically required with respect to the erection, and that the use of the land for the purposes of a detached house includes the right to erect a radio mast to enable the land to be used for the purpose of a detached house. In these circumstances, no permit is required.

By analogy with the decisions of the Supreme Court given in the unreported cases of *Clare v Jeff's Bulk Appliances Pty. Ltd.* (a decision of Mr. Justice Murphy delivered 13th August, 1976, but otherwise unreported) and *State Savings Bank v. City of Melbourne* (a decision of Mr. Justice Starke delivered the 4th February, 1976) hobbies which may be reasonably conducted at home must be considered as adjuncts of the use of a detached house for the purpose of dwelling.

1.
Many people have hobbies which they delight in and provided these can be carried out at home as a concomitant of normal residence, it would seem that no town planning permit is required.

As Mr. Justice Murphy said in Clare's case, "if a permit to conduct a shop had been granted, it is my opinion that advertising goods for selling in the shop would not have been a separate use for which a permit would have been required. It would, in my view, be absurd to interpret the Waverley Interim Development Order in such a way that a butcher, for example, who had a permit to conduct, say a butcher's shop, was required on each occasion that he changed his advertising from "prime mutton" to "baby lamb" to obtain a fresh permit. Would a householder require a permit to pull out his petunias and put in dahlias, or a fresh permit to install a plaster lion or dwarf in his garden? I do not construe the Interim Development Order in this way, particularly having regard to the provisions of the Town and Country Planning Act 1961, in that context."

It could no longer be contended that the use of a radio set or television set in a dwelling is not designed to enable land to be used for the purpose of dwelling in a detached house - or for that matter in a flat or unit. These instruments are so much part of what is considered civilised living, that very few houses would be without them. To enable them to be effectively used, so that proper reception within the house is ensured, an external radio aerial or television antenna is certainly desirable, if not necessary.

In some districts where interference to good reception is caused by nearby hills or forest, a mast carrying aerial or antenna must be quite high. This is particularly true of the Ballarat area where masts in excess of 80ft. are not uncommon.

We must take the Ordinance as we find it. We are not entitled to legislate to fill in gaps in the Ordinance. It is clear that no permission of the responsible authority is specifically required with respect to radio masts. Looking at the decisions of this Tribunal set out in the attached list and with respect to each of which we have consulted the registry file to consider the submissions, it is remarkable that even where decisions were given on the merits, no permit was refused for a mast below 150ft., regardless of the zoning.

Two permits were refused on the merits for masts in each case of 175ft. It was only in one case where it was held no permit was needed. In the case in which the City of Nunawading appealed as an objector against the determination of the MUDW to grant a permit for a 100ft. mast in a residential "C" zone to a householder - (1975) 2VPAD 117 - the Tribunal disallowed the appeal on the basis that no reception was possible with a lower mast thereby indicating that within a residential "C" zone it was certainly not considered unreasonable for a householder to erect a mast sufficiently high to enable a good radio or television reception.

In Goss's case - (1971) VPAD 71 - again in a residential "C" zone, the Tribunal permitted a mast of 50ft. as part of a home occupation in residential "C" zoned land for the effective control of vans fitted with two-way radio. In Glanville's case - (1975) IVPAD 127 - it was considered by the Tribunal that an amateur radio station operated as a hobby should be permitted in a residential "C" zone. Similarly in Roper's case, the Tribunal although deciding that no permit was needed, obviously considered that the conduct of an amateur radio station formed part of the normal use of a house.

It would be quite simple for the planning scheme Ordinance to provide that a permit should be required for the erection of a mast above a certain height. It has not seen fit to do so and we cannot make good the omission. It is not for us to say for example that a permit is required above a particular height where the Ordinance does not provide the necessity for a permit at any height.

Having considered the prior decisions of the Tribunal and taken into account the submissions made by the parties, we agree with the decision in Roper's case that no permit is required in the instant case for the reasons above enumerated.

The use of an amateur radio station from a dwelling house we consider in the same way that other divisions have done, to be a hobby compatible with residential use and as the Ordinance does not specifically require a permit, we consider this a use ancillary to the right to use or develop the land for the purpose of a detached house.

A written submission after the hearing was presented by the City of Heidelberg under cover of a letter dated the 27th June, 1978. We have taken this into account in coming to our decision.

We consider consistently with the earlier decision of the Tribunal above referred to, that the radio mast proposed in this case is a use that is "normal" to the enjoyment of the dwelling. A mast of the proposed height is neither abnormal nor exceptional - see Peak V. Jackson (1967) 1 All E.R. 172 @ 176.

"Radio Station " and "Radio Studio" are not descriptions which are defined in the Ordinance. We do not consider that either of these two designations is appropriate to the operation of a radio transmitter by an amateur in the normal enjoyment of a dwelling. In any event, we are not here being asked to authorise a radio station or a radio studio. We are being asked to permit the erection of a radio mast for which, in our opinion, no permit is required.

We also received a very helpful and comprehensive submission by Mr. Braun for the applicant. He fortified the submission made at the hearing with the publication of the Radio Frequency Management Division of the Postal and Telecommunications Department covering conditions governing the licensing and operation of the citizen radio service. He also supplied us with a booklet issued by the International Amateur Radio Union of England relating to amateur radio service. Further he supplied us with decisions of American Courts which have high persuasive authority. In this case, we certainly respectfully agree with the decision in Skinner v. Zoning Board of Cherry Hill, appendix C to the written submission. - 80 NJ Super 380 (App. Div. 1963)

That case concerned the issue of a building permit to an operator who indulged in the hobby of radio reception and transmission, who sought a permit for the erection of a radio tower and antenna not to exceed 100ft. in height in a residential zone. The operator claimed that the proposed use was an accessory use permitted in a residential zone, but the Board of Adjustment overruled that condition, finding that the proposed tower was not an accessory use because an antenna of this nature is not customarily incidental to a dwelling in a residential neighbourhood.

The court stated that the primary question was whether a radio tower for use by an amateur as a hobby, constituted an accessory use within a residential zone.

The Court held that zoning regulations being restrictive of property rights ought not to be too broadly interpreted and held that an amateur radio tower is a permissible accessory use in a residential zone.

In *Detmar v. County Board of Zoning Appeals* (1971) 28 OHIO Misc.35. the judge said in a similar case "Appellant is an amateur radio operator. This is a hobby through which the ham operator gains skill in science, electronics and radio technique. Family hobbies, recreation and education are without question accessory uses customarily incident to single family dwellings. The words "uses customarily incident to single family dwellings" mean the course of activity a family customarily does in or about their home. It does not limit the use to the identical activity chosen by the neighbours. As long as the activity is a form of family hobby recreation, or education, it is permissible even though it may be unusual, unless it is specifically excluded by a zoning restriction. The fact that not many people have amateur radio antennae no more precludes this use than the fact that not many people have tennis courts precludes their use".

The language of the Ordinance therein question differs from the present, but the reasoning is the same and the conclusion reached that an antenna was customarily incident to single family dwellings is consistent with the view we have formed here. Other American cases which Mr. Braun cited support this view.

We therefore determine that the appeal by the applicant is allowed on the ground that no permit is required. For this reason it is directed that no permit issue. Because this matter of law had to be decided before the merits could be considered, no evidence has been received as to the particular merits of the case and the decision turned solely on the resolution of the matter of law.

A permit for erection of a radio mast is required under the Uniform Building regulations, but that is not a town planning matter.

DATED:

[Signature]
Chairman: P.H. NOPAS. Q.C.

[Signature]
Member: W.R. GOULD.

[Signature]
Member: K.M.S. HOLLAND.

Mr. R. Viney & Mr. J. McInerney represented the City of Heidelberg.

Mr. B. Braun appeared for the Appellant.

Mr. P. Tsitas represented the objectors.

Objectors present were Mr. G. Leckie and Mr. J. Schworm.



VICTORIA

TOWN PLANNING APPEALS TRIBUNAL

APPEAL NO. X74/1023

APPLICATION NO. 76323

Heard at Melbourne on 14th April, 1975

| | |
|--|-----------------------|
| W. & N. Roper | Applicant/Appellants |
| Melbourne & Metropolitan Board of Works | Responsible Authority |
| City of Nunawading | Local Authority |
| Macquarie Builders & Others | Objectors |

An appeal against the refusal of the Responsible Authority under the Melbourne Metropolitan Planning Scheme to permit the erection on Lot 28 on plan of subdivision No. 97848 situated in Explorers Court, Vermont South of a 43 feet radio mast with an Antenna at the top. The subject land is in an area zoned "Reserved Living" the land fronting Explorers Court has been subdivided and has been almost wholly developed.

The ground of refusal was :

The proposed use is not an appropriate one for the land because of its effect on the amenity of the adjoining properties."

The Appellant, Mr. W. Roper is a holder of a amateur radio licence under the Wireless Telegraphy Act, 1905-1939. Under the relevant regulations the licensee of an amateur radio station is required to use his licensed equipment without pecuniary gain. It is in fact a hobby carried on in the home. We are satisfied that amateur radio stations during a period of crisis afford a service of benefit to the community. In Section 8 of the table to Clause 7 of the Metropolitan Planning Scheme Ordinance a detached house is a Column A use and as a detached house has in fact been erected on the subject land without protest from the Responsible Authority, we assume a permit for its erection was granted.

It seems to us that an amateur radio station conducted as a hobby in and from a detached house would be part of the normal use of such a house. We do not think

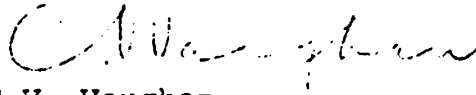
APPEAL NO.X74/1023

a planning permit for the proposed mast is required though a building permit under the uniform building regulations would of course be necessary. Whether or not a permit is required we are, however, of the opinion that the proposed mast would have very little affect on the amenity of the neighbourhood and any slight adverse effect which it may have, is in our opinion more than compensated for by the community benefit given by this radio station.

The appeal is therefore allowed and it is directed that a permit issue for the proposed use.

DATED: 14 MAY 1975


Chairman: F.H. Lonic


Member C.V. Vaughan

Mr Braun instructed by Pavey, Wilson, Cohen & Carter appeared for the Appellant.

Mr. Brock represented the Responsible Authority.

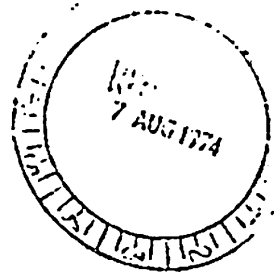
Mr. Mithen represented the Local Authority.

The Objectors did not appear.



VICTORIA

TOWN PLANNING APPEALS TRIBUNAL



APPLICATION NO. 3007

ANNEXURE NO

APPEAL NO. X74/240

Heard at Melbourne on Thursday 20th June, 1974

F.C.M. & M.I. Glenville

Applicant/Appellants

City of Heidelberg

Responsible Authority

Mr. R. Starcati & Another

Objectors

.....

This was an appeal against the refusal of the Responsible Authority under the Melbourne Metropolitan Planning Scheme to permit the use of land known as No. 23 Falcon Road, Macleod to be used for the purpose of erecting a radio tower and antenna.

The subject land is in an area zoned Residential C.

The ground of refusal was:

"The proposed structure would detract from the visual amenity of the area being large, obtrusive and out of character in a residential area".

The Appellant holds a licence for an amateur station under the regulations made under the Australian Wireless Telegraphy Act 1905-1936.

It is clear that existing amateur stations confer substantial benefit on the community by virtue of their use in emergency situations.

We do not think that the proposed 40 foot mast and antenna would greatly affect the visual amenity of the area. We think however that the mast should be so located on the Appellant's land that no portion of it or the antenna would project over the neighbouring properties.

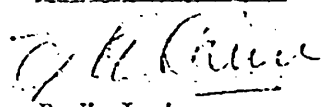
The Appeal is therefore allowed and it is directed that a permit issue subject to a condition that the radio mast shall be so situated on the Appellant's land that no portion of the antenna will in any circumstances project over any of the adjoining properties:

DATED:

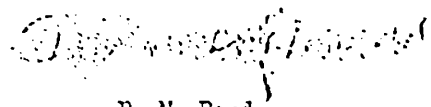
12 JUL 1974

APPELL NO. X73/210

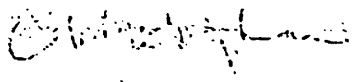
Chairman:


F. H. Ionic

Member:


F. H. Read

Member:


G. V. Vaughan

Mr. Brown for Favey Wilson Cohen and Carter appeared for the Appellant.

Mr. Mellors represented the Responsible Authority

Mr. D. R. Gibson instructed by Bellofiore, Sartori & Co. appeared for the Objectors.

TOWN PLANNING APPEALS TRIBUNAL

APPEAL No.15

This appeal was heard on 7th October, 1969 and is an appeal by Mr. R.T. Flack against the refusal of the City of Waverley to grant a permit for the erection of a radio tower on land known as No. 171 Lawrence Road, Mount Waverley.

The land the subject of the appeal is in a Residential C zone with a residence thereon. The land has a frontage of 55 feet to the West side of Lawrence Road by a depth of 138 feet 5 inches on its Northern boundary and 137 feet 3½ inches on its Southern boundary.

The proposal was advertised by direction of the Minister for Local Government and three objections were received but none of the objectors attended the hearing nor was the City of Waverley represented. No permit is required from the Melbourne and Metropolitan Board of Works for the proposed use in a Residential C zone.

The appellant is the holder of a Limited Amateur Radio Operator's Certificate and the proposed tower is to be used in connection with the transmission and reception of messages in the High Frequency Band allocated to amateur radio operators. The tower would be of the "windmill" type with a base about 7 feet square and about 1 foot 3 inches square at the top. The proposed position for the tower is in the backyard of the operator's residence close to an existing shed.

The application was refused by the City of Waverley on the grounds that it would be detrimental to the amenity of the area and would affect the value of the abutting properties. These were also the grounds submitted by the three objectors.

Our inspection showed that the subject land is in a pleasant residential area still in course of development. However, we are not satisfied that the proposed use will have a detrimental effect on the area or on the value of the adjoining properties. The use is a permitted one under the Board's Planning Scheme and the City of Waverley is reported to hold the opinion that a radio mast not exceeding 25 feet in height could normally be permitted in a residential area.

The decision of the Tribunal is that the appeal by Mr. R. T. Flack is allowed and it is directed that a permit shall issue.

DATED this 21st day of October 1969.

Whitman CHAIRMAN

Ilw... MEMBER

... MEMBER.

The appellant appeared in person.

A2.1 National and State Level

The Natural Disasters Organisation recognises the Amateur Radio Service and its value in times of national emergency. The service has been used to provide communications for government authorities e.g. Darwin Disaster Cyclone Tracey, and the recent Ash Wednesday Bushfires.

The Coastal Surveillance Centre Canberra has commended the Service in handling of distress communications with small craft at sea.

DISPLAN (State Disaster Plan) recognises the capacity of the Amateur Radio Service which has a role in times of emergency.

State Emergency Service has used Amateur Radio communications facilities to augment their own.

The Amateur Radio Service provides communications for organisations such as Red Cross who do not have their own facilities.

Promotion of tourism and international friendship; assistance with information to intending visitors from overseas. Amateur Radio actively bridges the difference of colour, creed, religion or politics.

In a State of Emergency including a declaration of war any Amateur Station may be taken over and operated under direction for the benefit of the nation. (See Appendix 6)

A2.2 Local Level.

Bushfire, flood, storm and other civil local emergencies - the Service provides links to supplement (and replace in the case of breakdown) other communication systems which may prove inadequate in certain circumstances.

Community Service - provision of communication facilities for community activity and fund raising events e.g. Murray River canoe marathons, car and motor cycle rallies, water sports including yacht and speedboat races, street parades, door knocks, sporting events, fun runs etc. These communications are provided in the interests of community SAFETY and also enable organisers to work more efficiently in the public interest.

Contributions are made through exhibits at Municipal Libraries, local events and Shows etc.

Disabled persons are actively encouraged and assisted to become interested and qualified.

Youth Development and Training as a stepping stone to a career in electronics or communications. A valuable activity to involve the vigour of youth in a sizeable way, giving many people an alternative to potential loose-end activities and associated trouble.

Suburban fires, accidents etc. are able to be reported quickly and help summoned by Amateur Radio.

Amateur Radio IS NOT A COST on the community in any way. All facilities are provided by the Radio Amateur. As a condition of licence all services provided are given free of pecuniary gain.

Amateur Radio provides technological competence within each local community. As the recent bushfires proved no other organisation could mobilise so many technically qualified operators, in most cases with their own equipment, as such short notice.

The Service also provides 2-way links to homelands for Australia's multi-cultural society and makes a significant contribution to Australia's national image to the people's level.

Computer extract from membership records of 473 people, most living in the Melbourne metropolitan area, who are actively involved in Amateur Radio.

PROFILE OF OCCUPATIONS

| | |
|------------------------------------|-------|
| ACADEMIC 9, | 1.9% |
| BUSINESS ADMINISTRATION 32, | 6.8% |
| COMMUNICATIONS AND ELECTRONICS 50, | 10.6% |
| DATA AND COMPUTERS 11, | 2.3% |
| ENGINEERING 34, | 7.2% |
| FINANCE AND ACCOUNTING 10, | 2.1% |
| TECHNICAL SALES 5, | 1.1% |
| ELECTRICAL TRADE 11, | 2.3% |
| TELECOM 20, | 4.2% |
| MEDICAL 13, | 2.8% |
| TRANSPORT INDUSTRY 23, | 4.9% |
| MANUFACTURING 15, | 3.2% |
| BUILDING AND ALLIED 13, | 2.8% |
| PUBLIC SERVICE 21, | 4.4% |
| RETIRED 57, | 12.1% |
| TEACHING 26, | 5.5% |
| STUDENT 32, | 6.8% |
| TELEVISION INDUSTRY 6, | 1.3% |
| MISCELLANEOUS OR NOT STATED 75, | 15.9% |

APPENDIX 4 - ROLE OF THE WIRELESS INSTITUTE:

The 15,000 Australian Radio Amateurs are represented by a single national body - the Wireless Institute of Australia.

It was formed in 1910 making it the world's oldest radio society, and has always been the single voice for affairs in the Amateur Radio Service.

The W.I.A. consults and negotiates with overseas bodies, both Amateur and Governmental, on international matters.

Within Australia it has a close relationship with the Department of Communications on matters concerning the regulation of the Amateur Radio Service.

As part of its State Disaster Plan obligations the W.I.A. maintains close liaison with emergency service authorities and disaster relief agencies.

ATTACHMENTS

News Release: Minister for Communications
Telegram: Minister for Communications
Letter: State Emergency Service
Letter: RNZAF Praises Radio Amateurs in Pacific
Search
Letter: Coastal Surveillance Centre praises Radio
Amateurs

COMMUNICATIONS

Press Release
41/83 28 February 1983
No. Date

Minister for Communications
The Hon. N.A. Brown, Q.C., M.P.

MINISTER PRAISES RADIO OPERATORS' IN BUSHFIRES

Amateur radio operators had shown complete dedication to the best interests of the community in providing an emergency communications network in the fight against the Victorian bushfires, the Minister for Communications, Mr Neil Brown, said today.

"The operators gave generously of their expertise and without thought of cost to themselves," Mr Brown said.

In all, 160 members of the Wireless Institute Civil Emergency Network (WICEN), using their own radio equipment and vehicles, had swung into action working under arrangements which had been planned with the State Emergency Service.

They had remained on duty in the five main bushfire areas from Wednesday night of the previous week until Tuesday morning of last week. Some operators had worked up to 30 hours at a stretch with almost no sleep.

Another 150 members of WICEN had been on standby with their equipment.

Mr Brown said the Red Cross and St John's Ambulance Brigade had relied on WICEN for their communications. As soon as evacuations began, officers of the Victorian Department of Community Welfare working in the field, also used WICEN.

The WICEN network had also provided a backup service for the Country Fire Authority in the Macedon area and the Otways. Individual policemen, who did not have immediate access to the police communications network, had used WICEN.

"At one stage, when communications were cut in the Gembrook and Emerald area, WICEN operators remained there at risk to their own safety and reported on the progress of the fire, the availability of power, the supply of petrol for fire vehicles and other vital matters," Mr Brown said.

..12

At the start of the emergency the Victorian office of the Department of Communications had promptly issued special call signs to WICEN operators which meant they had had continuity of identification when changing shifts.

This saved time during operations and avoided the risk of confusion.

WICEN had set up a control centre in a borrowed caravan on a hill in a Melbourne suburb and with this facility kept high frequency and VHF links open with country areas.

Mr Brown said WICEN had also used VHF repeaters belonging to the Wireless Institute of Australia, enabling operators to use handheld and mobile radios over a very wide range.

Amateurs had also worked from home stations, some of them in the danger areas, and some who were providing services elsewhere later learned that their homes had been damaged.

Mr Brown said that in order to participate in the operation some of the amateurs had had to leave their jobs and risked losing pay or forgoing their annual leave. He appealed to employers to recognise the work done by the amateurs in service to the community at a time of grave danger.

"The members of WICEN justifiably pride themselves on being able to serve the community in such disasters as the bushfires through the use of their knowledge and experience and with their own equipment," Mr Brown said

TELEGRAM TELEGRAM TELEGRAM

TELEGRAM
25 FEB 1969
4: 2507
FITZROY, 3045

FR 181= N22 =
MELBOURNE TLX VIC 74/69 12.25P

MR ALAN NOBLE 12
PRESIDENT WIRELESS INSTITUTE OF AUSTRALIA
412 BRUNSWICK ST FITZROY

CONGRATULATIONS TO YOU AND THE MEMBERS OF THE CIVIL EMERGENCY NETWORK ON YOUR FINE PUBLIC SERVICE IN PROVIDING COMMUNICATION LINKS TO VICTIMS AND THEIR FAMILIES DURING THE DEVASTATING WEEK OF BUSHFIRES IN VICTORIA. I AM SURE IT WAS BOTH A GREAT COMFORT TO THOSE AFFECTED AND OF GREAT ASSISTANCE IN ORGANISING RELIEF
NEIL BROWN MINISTER FOR COMMUNICATIONS

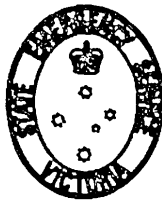
TELEPHONE 267 4686
TELEX AA 33764

ALL CORRESPONDENCE TO BE
ADDRESSED TO THE DIRECTOR

3/82/1

REF.....

DMR:EM.



VICTORIA STATE EMERGENCY SERVICE

HEADQUARTERS
31 QUEENS ROAD
MELBOURNE, VIC. 3004.

24th February, 1983.

Mr. P. Mitchell,
State Co-ordinator,
Wireless Institute Civil Emergency Network,
3 Summerhill Road,
EAST BRIGHTON. VIC. 3187.

Dear Sir,

This is to certify that the Wireless Institute Civil Emergency Network (WICEN) was activated by the Victoria State Emergency Service (VICSES) for communications support during the bushfires in Victoria 16th February 1983 till 21st February 1983.

May I take this opportunity of expressing the gratitude of VICSES for the effort and assistance given by the volunteer members of WICEN during this disaster.

Yours faithfully,

D. M. Rosenfield
PSO (Communications)
for Director



ROYAL NEW ZEALAND AIR FORCE

TELEPHONE: WEI 3000 Ext. 886

No. 5 Squadron
RNZAF Base Auckland
Air Force Post Office
Whenuapai
AUCKLAND

16th February, 1982

Dear Sir,

I was the Air Electronics Officer (the communications and sensor supervisor) on KIWI 865, the first of the search and rescue P3 Orions of the RNZAF sent to search for the distressed yacht CYN SAN on 30 January 1982.

Throughout my six hours on the radios, yourself and your fellow hams on 14335 kHz both in Australia and New Zealand, displayed a level of co-operation and dedication with which you should feel justly proud. Without your assistance our job of finding CYN SAN would have been very much more difficult, indeed, without your organisation we would not even have known the vessel was in distress until long after she was totally lost. The South Pacific is a very large area to search without a reasonable starting point so we may never have been able to bring the search to a successful conclusion.

For your information CYN SAN was eventually found some 250 miles south-west of her originally reported position and was finally towed to port in Noumea by the French Navy.

Thank you again for your valuable assistance.

(B. J. GODWIN)
Flight Lieutenant
AE Leader 5 Squadron

The Editor,
Amateur Radio,
PO Box 150,
Toorak, Victoria 3142.

7th July, 1981.

Dear Sir,

Through the pages of your journal, I would like to thank all the amateurs who provided invaluable assistance to the Australian Coastal Surveillance Centre on the night of the 20th June. For those who have never heard of it, the Australian Coastal Surveillance Centre (formerly the Marine Operations Centre) is the Commonwealth Government's Marine Search and Rescue Authority. We are responsible for the largest marine SAR area in the world — half way to Africa, half way to New Zealand, south to Antarctica and north to the PNG/ Indonesian islands chain. We operate 24 hours per day throughout the year, are staffed by professional mariners and were involved in 1564 SAR incidents last year.

On the night of the 20th June the yacht "Lady Johanna" caught fire whilst in the vicinity of Willis Island, some 450 km east of Cairns. The skipper broadcast a distress call on 14.332 MHz and within a very few minutes our phones were ringing with reports from all over Australia and relayed reports from New Zealand, Canada and the USA. Shortly afterwards the fire was extinguished and the distress call was cancelled, this too was relayed to us instantly.

It was a great effort on the part of amateur radio operators and only the most recent example of the excellent assistance you have provided over a long period of time. Whilst the incident is still fresh in our memories I would like to take the opportunity of suggesting a few ways of improving your co-operation even more.

When a distress call is received from a marine craft either phone the police or make a reverse charge call to us in Canberra (062) 47,5244. Don't hesitate to make it a reverse charge call for during the "Lady Johanna" incident we kept the phone line open for quite a long time and we don't want you worrying about your STD bill!

If there are several of you on the circuit when a distress call is heard, try and decide (briefly) between yourselves as to who will phone us — a minor problem the other night was that though we have five dedicated SAR phones, there were only four of us on duty and the calls were coming thick and fast.

Bear in mind that in a distress situation the boat skipper is under tremendous pressure, is probably frightened (I speak from experience) and may well be in a bit of a panic. A calm voice (yours) at the other end can be very reassuring. Don't badger the skipper; you should listen a lot and not say very much, but do try and obtain the following information:—

NAME POSITION NATURE NUMBER

NAME of the craft, call sign (official and/or amateur)

POSITION

NATURE of the distress situation

NUMBER of persons on board

then if there is time, a description of the craft, its safety equipment and any other information would be most useful to us. If possible make a tape recording of the communications, in the heat of the moment you might forget exactly what was said and it is very useful to be able to play back.

If you receive a distress call from any source outside Australia's area of responsibility, say from the USA, Asia or Europe, then please phone us. We will discuss the report with you and then immediately pass it on to the appropriate overseas SAR authority.

Once again, our sincere thanks to you all for your most recent effort.

Yours faithfully,

J. P. BARR, Controller,
Australian Coastal Surveillance Centre. ■

ATTACHMENT

Amateur Radio Operator's Handbook

**SUMMARY OF EVIDENCE GIVEN AT THE PUBLIC HEARING
ON 26 MAY 1983**

1. Mr. P. J. Brown, a Town Planner from the Department of Planning, was the first to submit evidence. Mr. Brown outlined the background which had led up to the Inquiry and the part played in it by his Department. In particular Mr. Brown made the following points:
 - (i) A planning permit is not required in the absence of specific mention of radio masts in a planning scheme. Following submissions made to the Melbourne and Metropolitan Board of Works by councils in the Board's area, the Board saw the need to introduce specific mention of radio masts in the Melbourne Metropolitan Planning Scheme (MMPS) and that resulted in Amendment 115. The Amendment, if approved in its adopted form, will mean that radio masts are subject to a planning permit in both the residential areas and in the non-urban areas of Metropolitan Melbourne. It would also mean that neighbours would have the right to object to the erection of the mast and to appeal against a decision permitting the erection of a radio mast;
 - (ii) There is no uniform approach to this particular matter in other States;
 - (iii) The Department of Planning was concerned about amenity in terms of the appearance of the structure rather than the structure's use as a radio mast or television aerial; and
 - (iv) There is scope in the planning legislation for different planning controls over radio masts in different areas, covered by the MMPS by the introduction of a Local Development Scheme. The Local Development Scheme can build on or supplement the broad controls in the MMPS.

However, Mr. Brown questioned whether a Local Development Scheme would be approved by the Minister for Planning if a municipality wanted significantly different controls to those contained in the MMPS.

2. Mr. I. McCartney a Town Planner from the Melbourne and Metropolitan Board of Works made the following points on behalf of the Planning Section of the Board of Works:

- (i) The position at the moment is that under the MMPS no permit is required to erect a radio mast. Previously the Board has always maintained the view that this was a hobby, although a number of municipal councils acting under delegated authority under the MMPS do consider that a permit is required and have been asking people to apply for planning permits.

Therefore, what the Board is effectively doing is to clarify the situation by amending the MMPS to make it clear that a planning permit is now required for radio masts exceeding certain dimensions. The amendment was not directed at prohibiting radio masts in any way; rather, it was basically to allow planning aspects to be considered before approval was granted.

- (ii) The major complaint received by the Board about radio masts is that they are an eyesore and that the nearby neighbours do not like to have antennae visible from their properties. They are blocking out the views. The Board has received complaints from various parts of the metropolitan area, however, it is not as if the Board is receiving complaints every second day. It is just that there is occasional concern with complaints being received every now and again.
- (iii) There should not be any limitation placed on the closeness of the masts or antennae to the adjoining property because it would be difficult to write into the Amendment a minimum distance that could be effectively applied in all cases;

- (iv) The logic behind the dimensions in the proposed Amendment is basically that if a person needs to obtain a permit under the UBR because of the dimensions of the particular mast, those same dimensions would indicate that a planning permit may also be required so it was an attempt to make it more simple for the users;
- (v) A council could issue the building permit and the planning permit together; it is a matter of administration. One is dealt with by the Building Surveyor to make sure that the mast does not blow away onto a neighbour's roof on a windy day. The other one is dealt with by the Planning Officer looking at planning matters of amenity and the two permits might be issued at different times, because two different people are involved. However, new legislation is being drafted to ensure that all necessary permits are issued at the one time.
- (vi) It is difficult to make the distinction between radio masts and television antennae but the Board made it because it believes it is a basic right that everybody should be able to have television. However, when one starts launching into hobbies, some hobbies can cause detriment. Hobbies are not perhaps such a basic right and it could be compared to a person having two canaries in a cage, that is acceptable; but if a person has 1 000 canaries in his back yard it then starts to reach a stage where one has to draw a line. It is a fine line and the Board drew it at that point set out in the Amendment; and
- (vii) Mr. McCartney indicated that as a matter of principle, under the new Building Control Act, every attempt is being made to separate the planning matters from the building matters; to put planning matters into planning controls and to keep the structural and building elements under the Building Control Act.

3. Mr. W. H. M. Hoyle, representing the Electronics Section of the Melbourne and Metropolitan Board of Works, indicated that he headed the Electronics Section, which amongst its responsibilities had to provide radio communications facilities for both voice, telemetry data and other matters in connection with the Board's facilities for controlling the supply of water and sewerage pumping plants, etc. The following points were made by Mr. Hoyle:

(i) A major program of works is now under way to provide remote control and operation of the Board's facilities to reduce the cost of sending people out for operation and maintenance of water pumping stations and the like.

The Board has already installed quite a number of radio installations on small pumping stations in residential areas, on small water tanks and the like, to transmit data as to whether the tank is empty. The Board put these things up very quickly. The support structure is as small as necessary, but the necessity to transmit this information to a major computer system in the Board's Head Office requires a highly directional antenna, the horizontal dimensions of which are greater than the limitations in the Board's Amendment. The Board would be severely restricted as summer approaches each year in dealing with water supply deficiencies if it had to go through additional planning processes in order to gain the approval to carry out these urgent works;

(ii) Mr. Hoyle indicated that there were objections to radio masts erected by his Section in a residential area at Braeside about eighteen months ago. As a result of the delays that were caused by restrictions being imposed, the Board had to defer contractors starting work roofing the Moorabbin Reservoir, which was being monitored by the radio facility that was being erected. Additional costs were borne by the ratepayers of Melbourne because of the delays in allowing that contract to proceed;

- (iii) The greatest height of antennae the Board use is 30 metres. These are to give widespread coverage for communication between the base station and mobile transceivers. Many antennae used by the Board are much smaller. Where possible, the Board uses hilly sites, like Olinda, and other places where it is not necessary to erect high antennae. The largest and most commonly used antennae had a horizontal dimension of approximately six metres;
- (iv) Mr. Hoyle indicated that interference could occur on domestic television receivers as a result of amateur radio transmissions. However he indicated that he understood that in every case where this has been investigated by the Department of Communications, they have found that the fault has been due to deficiencies in the design or construction of the television set, tape recorder or whatever the equipment is that has been affected by the interference problems. The difficulty has been dealt with in the United States of America by legislation passed during the last twelve months, that requires manufacturers of domestic entertainment equipment to include radio frequency immunity circuits to render them immune to this sort of problem. This can be done with little cost, but unfortunately no such legislation exists in Australia;
- (v) Mr. Hoyle believed that television antennae would be caught up by the proposed Amendment to the MMPS; and
- (vi) Mr. Hoyle indicated that he was not arguing that public bodies such as the Board, the Gas & Fuel Corporation, the SECV and many others with essential services to provide, should be treated differently than the general public in relation to a planning control.

4. Ms. A. Austin, Executive Officer and Mr. L. D. Shedden, Senior Town Planner, from the Municipal Association of Victoria gave evidence which set out the historical background and the Association's stance on the matter of radio masts, this has been included elsewhere in this report. Ms. Austin indicated that the MAV had initially become involved as the result of a letter, in December 1978, from the City of Chelsea, expressing concern at a Planning Appeals Tribunal decision that no permit was required for an amateur radio mast in residential areas. (Ryan v City of Heidelberg).

Mr. Shedden indicated that at the time of the Ryan v City of Heidelberg case before the Town Planning Appeals Tribunal he was the planner for the City of Heidelberg and his comments were based on his experience at that time.

The outcome of the case of Ryan v City of Heidelberg was the reason why the City of Heidelberg and the Local Government Planning Association wished for some planning control over radio masts. It was not based on a desire to prohibit all or most of these masts, but to try and ensure that proposed radio masts which would cause amenity problems, were looked at in detail to see if the problems could be avoided.

The following is an extract from Mr. Shedden's evidence (at page 25):

It is very difficult to assess the number of complaints. In the case of Heidelberg, I took a number of calls (after this appeal) from people who were complaining about radio masts being established. The complaints were not recorded or taken any further on the basis that the Council had the planning appeal decision which said no planning permit was required. In the normal course of events the Council staff advised the people it was not a matter that could be taken into account (at that time) in a planning scheme and there was virtually nothing local councils could do about those masts.

No record was kept of those individual complaints and it would be difficult, apart from using people's memory (in most councils) to ascertain the level of complaint that had been received in the past.

There are many cases where radio masts do go up and no complaint is lodged and certainly not all radio masts do cause so-called amenity problems. It really gets down to visual amenity problems. It depends on a number of factors as mentioned in the MAV submission such as topography of the land, the quality of the

residential area and probably people's pride in their visual amenity in the area in general.

What Heidelberg was seeking at the time, through the planning scheme amendment, was to have some discretion over cases which could cause amenity problems and what the planning scheme process would allow to happen. It would allow the seeking of community views on a particular application where the council thought that it may cause some detriment to the adjoining properties. (There is a process for advertising town planning applications.) The proposed amendment would give some control over the location, which is a critical factor. Each case would have to be assessed on its particular merits; to look at the particular site and to look at what the applicant is seeking in regard to the type of structure, height of the mast, and also take into account existing vegetation.

In issuing a planning permit, if this is the outcome of it, maybe the Council could put in controls over additional landscaping around the area to control the type and height of trees, to set the mast within the site in a particular location, and if the worst occurred it could prohibit or refuse to grant a permit which would then open up the normal planning appeal process - which gives adjoining residents a right to be heard. They are then able to put forward their views and the matter can be arbitrated on by an independent panel.

5. Mr. J. K. Linton, Mr. J. A. O'Shannassy, and Mr. A. R. Noble gave evidence on behalf of the Wireless Institute of Australia (Victorian Division)

The following is an extract from Mr. O'Shannassy's evidence (page 34 and following):

It has been mentioned many times before that technically there is not distinction between a radio antenna and a television antenna. Technically they are the same in general appearance. For instance, a lot of antennae today include a facility for operating an FM receiver, particularly radio FM and particularly if the person operating the equipment wishes to get low noise high quality stereo reception and lives any distance from Mount Dandenong he has to have an outdoor antenna to get a good signal to give him the quality and reception the service is capable of.

Further, in Melbourne, we know from long experience there are a large number of areas that require large outdoor antennae for good television reception, such as Kew, Surrey Hills, Heidelberg, Hawthorn, Richmond, South Yarra and the western suburbs such as St. Albans where Channel 0 is particularly concerned. They all need significant sized outdoor antennae, in some cases at significant heights depending on the local terrain.

As UHF television develops - it will certainly develop here - things will change again. UHF, of course, developed in Europe and England and almost every home will require an external antenna and the height of that antenna will be a function of the geography of the country between the reception point and the transmitter, but we will certainly see a proliferation of more antennae as UHF television develops in our community.

If we talk about radio masts or antennae, there is also the question of reception. All citizens have the right to receive broadcasts and other transmissions. The listening to short wave broadcasts is widespread with the advent of improved and cheaper equipment. Many people are taking an interest in radio reception but despite the new and improved equipment one still needs a significant size of outdoor antenna.....

I submit that the regulation as drafted is not only restrictive to radio amateurs, and although it is designed primarily to control the antennae of radio amateurs, we must consider its impact on a whole range of other citizens on whom it would also impact. It would seem to me to be technically and legally very difficult to distinguish these various uses. How would a person in a municipal office distinguish between a television antenna, broadcasting antenna, amateur antenna and antennae for short wave listening purposes?

I quote one of the main suppliers of television masts for amateur radio purposes in Victoria. His records show that in 1982 he installed 25 masts for amateur radio purposes and some of these were transplants. That is, they were lifted from one residence and re-erected at another. Another supplier - and I think that exhausts the normal market - supplied eight in 1982, and therefore, the number we are speaking of is not very large. It makes me wonder why this type of regulation is called for when such a small number of additional towers are included.....

The average mast we are talking about would be a steel structure with concrete foundations. Once established, it is unlikely to be moved. That provides the vertical support. Mounted upon that, in the cases we are mainly speaking about, is a horizontal section which is the antenna proper and that would normally be able to be rotated by a remote control on the radio amateur's operating equipment. Therefore, the antenna - and to give the Committee a comparison, a television antenna - could be similar, with rods which would rotate. In general, the profile or outline of that antenna to neighbours, regardless of its position, would not significantly change. There is one other type of antenna which would consist of vertical square or diamond shape of wires, usually two, in a vertical plane - two of them would be eight or ten feet apart, normally, and that also rotates under remote control. Again, there would not be any significant change in the appearance or profile of that antenna to the neighbours.....

However, the majority of radio amateurs purchase a commercial tower which complies with the Uniform Building Regulations and therefore, is the easiest one to buy and erect, without any complicated engineering computations and so forth. They install it quite easily. It is readily available and reasonably priced. I am now referring to the commercially made antennae. Some more serious amateurs build their own antennae to their own design or to some design they see in a technical journal. From time to time they may add or take away from the original one. However, it is certainly a type of operation which takes a lot of thought and planning and a great deal of physical work on the part of the radio amateur. It is not the type of thing which happens from hour by hour or even day by day. It would happen from time to time. One can also support from the tower upon which the rotating antenna is placed, wire antennae for the lower frequency bands we mentioned in our submission, which are 7.0, 3.5 and 1.8 Megahertz. In general, wire antennae would be used because technically, one needs a long antennae for these low frequency bands. It is not physically possible within the confines of the the ordinary domestic situation to rotate such an antenna, so one would use fixed wires and there could be wires strung from the tower - one or more of them; and they would perhaps go somewhere towards the perimeter of the block. It is very similar to the receiving antenna which I mentioned earlier which would be used by more enthusiastic short wave listeners. They would string the wires from the home to a tree or to a post or perhaps even a pipe. In this other case the amateur does a somewhat similar thing. There would be, perhaps,

a little more refinement a little more accuracy and a better technical understanding of what he is doing.....

A popular antenna tower supplied to a standard design is about 15 metres. Then you normally need to have above the pipe that was previously mentioned on which to mount the antenna. There are also other towers, slightly larger ones, which go up to 20 metres and above. There are a few above 20 metres, but we consider in the Wireless Institute that 20 metres represents a fair middle ground between what the very enthusiastic amateur might wish to erect and what is reasonably workable.

I suppose you would say that of the newer towers being sold at the moment through commercial channels to the amateurs, around about 15 metres plus some additional height above that to mount and rotate the antenna would be representative.

6. Mr. L. D. and Mrs. L. E. Allen, residents of Chelsea gave evidence in relation to a 26 metre amateur radio mast which had been located in a neighbour's garden until a few days before the hearing. The neighbour, Mr. Flanagan gave evidence to the Inquiry after Mr. and Mrs. Allen. The mast supported a rotating beam eight metres long which had five metre antennae fitted to either end.

The major concern of Mr. and Mrs. Allen was that the operation of the amateur radio station resulted in radio interference being picked up by their Hi-Fi record player to the extent that the record player became unusable. A tape recording of the interference was played to the Sub-committee.

The radio interference and the visual intrusion of the radio mast were clearly linked in the minds of Mr. and Mrs. Allen who indicated that if they had had the opportunity to object to the radio mast before it was erected they would have done everything they could to prevent the erection of the mast. The mast having been erected, they pursued the matter of the radio interference through the Department of Communications without success.

7. Mr. R. J. Flanagan, the neighbour of Mr. and Mrs. Allen confirmed the dimensions of the radio mast described by Mr. and Mrs. Allen and agreed that the interference experienced by them probably was as a result of transmission from his equipment, however, he felt that as the Department of Communications had investigated the matter and had told Mr. and Mrs. Allen how to solve the problem it was no longer his concern. He also stated that he believed Mr. Allen did not like the radio mast because it reminded them of the interference.

8. Mr. R. B. Browne, Deputy Building Surveyor and Development Approvals Co-ordinator for the City of Brighton gave evidence and made the following points.

(i) The Council is concerned in regard to the visual pollution of these antennae rather than anything else and had received a number of complaints from various residents. It has endeavoured to achieve some control additional to what is placed in the UBR. Council realises that the UBR generally cover matters of structural stability, but in some cases they do enunciate a public policy in the public interest in regard to some matters. The Council feels that the height restrictions placed on radio masts, etc., is one of those matters, as radio masts are similar to outbuildings for which restrictions are made at a particular height, no doubt because of a perceived amenity problem;

(ii) The Council has a policy in regard to applications for mast antennae which exceed the height of the UBR. This is in order to try to make a proper assessment on the merit as to whether the Council considers a mast higher than 8 metres, if it is detached, should be agreed to. It reads:

1. *On receipt of the application, Council Officers will advise each adjoining property owner or any other considered to have an interest, that the application has been made and can be inspected at the municipal offices; and that their views will be taken into consideration.*

2. *To enable the Council to reach an informed decision, applicants are advised to submit full details of the proposal, including:*

(a) *A 1:100 block plan showing for the subject allotment and all adjoining allotments, the location, nature and approximate height of all buildings and trees.*

(b) *Full details of the proposed mast and antenna(e) if any, so that its proposed appearance may be clearly illustrated.*

(c) *Photographs and sketches illustrating the visual effects of the proposal will be helpful.*

(d) *A written submission, amplifying the reasons for the choice of the type of mast and antenna(e) proposed;*

- (iii) The Council believes that it is within its powers in using the UBR in this way because within the Regulations there is a limitation on masts to 3 metres if it is attached to a building and 8 metres if it is detached. At any greater height it is at the discretion of the Council. They have been given a discretion in that a height limitation has been placed, not for any structural requirement, which cannot be done, but purely from an amenity point of view similar to the general requirements of a lot size. Council tends to enunciate a policy considered to be in the public interest;
- (iv) The Council's policy has not been upheld when appealed against. The Council has had a number of appeals in regard to masts going over the 8 metre height and those appeals have been upheld in favour of the proponent in each case. Council is not very happy about the matter because it considers that the radio masts are detrimental visually from the adjoining properties;
- (v) The appeals were made to the Building Referees. The Council is of the view that there is no control under planning requirements as far as these types of masts are concerned. It considers they are part of the normal enjoyment of a dwelling, as defined within the planning ordinance, and as Council believes it has no direct planning control, so the UBR are the only aspect over which Council has some control.

9. Evidence was given by Mr. R. A. Morgan, Director of Building Control and Chairman of the Building Referees, Local Government Department, gave evidence which provided much of the information on the Uniform Building Regulations which is included in Appendix 5 to this report Mr. Morgan then went on to say (at page 68):

I have not taken out figures, but I would imagine that we might have five to ten appeals a year regarding radio masts - perhaps only five a year on radio masts.

When they come to the building referees as an independent body there could be different members who make the decision. I have not a record or an analysis of where they have come from, which council, or whether the decision has been the opposition's way or the applicant's way.

The Chairman questioned what would occur if planning controls were introduced (at page 70):

THE CHAIRMAN: Would those two appeals follow, one to the Building Referees and one to the Planning Appeals Board.....

MR. MORGAN: Appeals to the Building Referees are only to matters controlled by the Building Regulations, and given that there was a Planning Regulation covering the environmental issue it certainly would not be a matter that Building Referees could consider.....

THE CHAIRMAN: The course of events that you would see that a person would apply under the new planning control and, having obtained a use permit to go ahead, then the actual details of the construction, and so on, would be subject to Building Regulations and only that part of it would be dealt with.

MR. MORGAN: Yes, the next step in the co-ordination of building and planning controls as in the BADAC report is that in a Council one person shall be appointed as a Development Approvals Co-ordinator.....

I understand the intention is that the new Planning Act shall say that each Council shall appoint a Development Approvals Co-ordinator, and he shall be the same person appointed as the Development Approvals Co-ordinator in the Building Control Act, in which case a single permit only will issue from the Council.....

The new Planning Act is not with us, and the only responsibility of a Development Approvals Co-ordinator is to deal with the Building Permit. In fact, he has to issue a Building Permit irrespective of whether a Planning Permit will or will not be given.

To clarify the situation our advice to Councils has been that they stamp the plan -

"This is a building approval but take warning that you may require a planning permit for this."

That will disappear should the new Planning Act come to fruition and there is co-ordination for the first time between Building and Planning Permits.

10. Mr. F. H. Parry, Building Surveyor for the Shire of Diamond Valley made the following points when giving evidence:

- (i) The Shire of Diamond Valley for background information, is hilly terrain on the outskirts of Melbourne and the problem is not only radio masts but television antennae etc., because of the poor reception areas for television and a percentage of radio hams through the area;
- (ii) Because the UBR state that a mast, pole, aerial or antennae used in conjunction with the transmission of wireless, telegraphy or television must be at a maximum height of 8 metres if detached from the building and a maximum height of 3 metres above the top of a building, unless Council consents to a greater height the Council has drawn up a policy and it has split in its policy the reception of television or radio as distinct from transmission of radio or television signals. Where an aerial or mast is used for the reception of wireless, telegraphy or television and is higher than the laid down requirements the consent of the adjoining neighbours to the dwelling are required, but where an application is made for the erection of a mast for the transmission of wireless, telegraphy or television then the views of the property owners within a radius of 100 metres in the urban areas and in the rural areas of property owners with a dwelling within the 100 metres radius must be obtained before council will consider this application, so the council, when it does consider such an application, has the views of these adjoining property owners;
- (iii) There is a type of unguyed telescopic mast that goes to 10 metres that is used by some radio hams and the Council has considered that that type of mast would be permitted subject to the conditions of obtaining a licence from the Licensing Section of the Postal and Telecommunications Department, consent of the adjoining owners and there being no electrical interference caused to the adjoining properties;

- (iv) Further, pursuant to the powers conferred by Section 163 of the *Building Control Act 1981*, the Council had delegated its first part of the policy and a later part to the Building Surveyor. They will delegate their policy in regard to applications for the receipt of wireless, telegraphy or television with the consent of the adjoining owners and also for the use of a 10 metre high unguyed telescopic mast;
- (v) One of the interesting things here is that this is all done under the current UBR and under those Regulations the consent of Council is needed. At the moment there is a draft of the Victorian Building Regulations which is intended to replace the UBR early in the New Year and in the draft the consent is taken from Council and given to the Building Surveyor. It is a point that should be noted;
- (vi) In the Shire of Diamond Valley, there are just as many problems, aesthetically, with antennae for the receipt of television as there are with radio ham masts because of the hilly terrain. There are areas of poor television reception so there are reasonably high television antennae, but as against that everybody wants to watch their television so basically everybody in those areas has a high mast whereas the detraction aesthetically from the area itself is basically everybody's concern but, with respect to the radio hams, it is by seeking the views of all the adjoining neighbours that Council has never really had a problem with any of them. Council has not refused any and has never had any complaints about them; and
- (vii) The policy adopted by the Council has been in operation in a fragmented form for approximately eight to nine years because it has grown as problems arose. It was in a number of fragmented forms until quite recently when it was consolidated into one policy late last year or early this year without virtually changing any of the fragmented pieces.

HISTORIC PLANNING CONTROLS

The perceived problem which Amendment 115 Part 3 to the Melbourne Metropolitan Planning Scheme (MMPS) attempted to resolve was the apparent lack of legislation which would enable control to be exercised over the construction of amateur radio masts and antennae in residential and non urban zones of the metropolitan area for reasons other than that of structural safety.

These amateur radio masts are typically between 15m and 20m in height but could be up to 40m in height and support a considerable array of antenna. Owners of neighbouring properties have from time to time seen the erection of such masts as representing an unacceptable loss of visual amenity to themselves. There are properties in Melbourne which have three radio masts on the one small residential block.

Radio communication services including the Amateur Radio Service and the Citizens Band Radio Service are controlled under the *Wireless Telegraphy Act 1905*.

The general conditions governing the licensing and operation of Radio communication services established under the *Wireless Telegraphy Act 1905* are set out in Publication RB68 (Nov 82) (Revised) issued by the Department of Communications. Section 6 of this document reads as follows:

6. Approval of Other Authorities -

- (a) *Antenna Masts: Antenna structures must comply with town-planning legislation, local building regulations and the requirements of the Department of Aviation in relation to aircraft flight paths in the approaches to airports. The licensee is responsible for ensuring that all relevant statutory rules relating to antenna structures are observed and should consult his local council or other appropriate authority and the office of the Department of Aviation in his State before proceeding to erect any antenna mast. Failure to comply with these requirements may invite prosecution as well as demands for immediate removal of the offending structure.*

- (b) *Location of Stations: Prospective licensees should in the case of fixed installations also ascertain from the local Municipal or Shire Council whether the establishment or operation of the radiocommunication station at the site proposed would violate town-planning regulations."*

Within Victoria two approaches have been used in the past to regulate the erection of radio masts in relation to their potential effects on the visual amenity of neighbours.

The first approach has been the use of the Uniform Building Regulations and the powers of appeal under these to the Building Referees.

The second approach has been the use of the *Town and Country Planning Act 1961* and the powers of appeal under this Act to the Planning Appeals Board (previously the Town Planning Appeals Tribunal).

The 1961 Uniform Building Regulations which were effective from 15 May 1961 until 1 January 1974, contained the following clause.

"The erection of wireless and television masts and towers exceeding 25 feet in height shall be subject to the Council's approval of the location, height, design, and materials of construction."

This was seen to allow the Council to take visual amenity into account when arriving at a decision.

In January 1974, the UBR were modified and now read:

3139 Erection of Wireless and Television Masts and Towers:

"(a) Except where the consent of the Council has been obtained, masts, poles, aerials and antennas used in conjunction with the transmission or receipt of wireless, telegraphy or television shall not -

- (i) exceed a height of 8m above ground level when not attached to a building; or*

- (ii) exceed a height of 3m above the highest point of the roof covering when attached to a building.
- (b) *In all cases where such masts, poles, aerials and antennas are to be erected, the Building Surveyor may require that they be demonstrated to be structurally sound."*

This was, and still is seen by many Councils to allow visual amenity to be taken into account under section (a). However, in 1980 the Building and Development Advisory Committee (BADAC) made the following recommendations -

BADAC Report Part 1 Building Controls

CHAPTER 8. - MATTERS RELATING TO BUILDING CONTROL

Section 1. - Planning and Environmental Matters.

- 8.1 *We received a number of submissions to the effect that the Uniform Building Regulations contain matters which because of the advent of planning, environmental and historic buildings controls could more appropriately be dealt with in other legislation.*
- 8.2 *The main planning matters in the Uniform Building Regulations include site requirements, allotment sizes, building setbacks (other than for natural light) from title boundaries, site coverage and building heights. Approximately 50 per cent of all modifications to the Building Regulations have been concerned with site requirements. (See Appendix 4.)*
- 8.3 *Listed below are the Uniform Building Regulation clauses that the Committee believes could be more appropriately regarded as planning and environmental matters. In principle such matters should be contained in planning controls provided the planning system is capable of providing the equivalent ease of modification currently available through the Referees. In Part II. of this Report such a system is recommended based partly on a speedier appeal system and partly on more flexible planning regulations.*
- 8.4 *Occasionally building matters are contained in planning ordinances. For example, the proposed Amendment 30 to the Melbourne Metropolitan Planning Scheme contains controls over the height of walls, the size of balconies and the amount of light entering a window.*
- 8.5 *There has been a greater tendency for building standards to be imposed through non-statutory codes, as conditions on planning permits or by requirements served on applicants during the*

examination stage. Of particular concern is the requirement of some planning authorities to require detailed working drawings prior to the issue of a planning permit.

- 8.6 Planning and environmental matters should be removed from the Building Regulations after a phasing out period of twelve months after appropriate planning legislation is available to permit modifications. The controls would be re-made in State-wide Planning Regulations applicable to all municipalities irrespective of whether they have a planning scheme. The Committee considers the following clauses of the Uniform Building Regulations would be more appropriately handled in State Planning Regulations.

One of the clauses listed is 3139 (a).

This recommendation was reinforced by the Building Control Act 1981 which contains the following:

29. (1) Upon the coming into operation in any municipal district or part thereof under any approved planning scheme or approved local development scheme made under the Town and Country Planning Act 1961 of any provision regulating any matter referred to in paragraph (k) or (l) of section 25, any siting regulation or siting by-law or part thereof which also regulates that matter shall cease to have effect in that municipal district or that part of the municipal district (as the case may be).

(2) A council shall publish notice in a newspaper circulating generally within its municipal district of the fact that any siting regulation or siting by-law has pursuant to sub-section (1) ceased to have effect in the municipal district or part thereof.

(3) Notwithstanding anything in this Act or in any regulation or by-law made under this Act, where any approved planning scheme or approved local development scheme made under the Town and Country Planning Act 1961 (whether before or after the commencement of this section) makes provision for regulating any matter referred to in paragraph (k) or (l) of section 25 with respect to an area, a person shall not, in relation to a building or land in that area be required to comply with the requirements of any siting regulation or siting by-law regulating that matter in that area.

(4) In this section -

"Siting regulations" means -

- (a) any of regulations 801, 803-7 (both inclusive), 808-810 (both inclusive), 812, 813, 815-817 (both inclusive) and 3130-3133 (both inclusive) of the Uniform Building Regulations 1974; and

- (b) *any building regulation made pursuant to a power conferred by paragraph (k) or (l) of section 25; and*

"Siting by-law" means -

- (a) *any by-law made under a power conferred under paragraph (o) of sub-section (l) of section 926 of the Local Government Act 1958 in relation to any matter referred to in paragraphs (25), (26), (27) and (28) of section 925 of that Act before the repeal of those sections by this Act and continued in force under this Act; and*
- (b) *any by-law made under a power conferred by paragraph (x) of sub-section (l) of section 26 in relation to any matter referred to in paragraph (k) or (l) of section 25.*

Section 25 (k) and (l) referred to in Section 29 read:

25. (k) the siting of buildings including their height, location and the proportion of open space to be provided around them;

(l) prescribing the minimum area of land on which buildings may be constructed;

The extension of this section of the *Building Control Act 1981* to cover clause 3139 (a) of the UBR 1974 was omitted and the matter has been taken up in the draft Victoria Building Regulations which are intended to replace the UBR and have recently been circulated for comment. These new draft regulations contain the following section in place of the existing section 3139 in the 1974 UBR. It should be noted that the discretionary power of the council has been given to the building surveyor, the intention being that he should exercise this power only in respect of structural rather than amenity matters.

MASTS, AERIALS, ETC

53.5 Except with the consent of the building surveyor, a mast, pole, aerial, or antenna, chimney flue pipe. or other service pipe shall not -

- (a) *when attached to a building, exceed a height of 3m above the highest point of the roof of the building; or*
- (b) *when not attached to a building, exceed a height of 8m above the adjacent ground level.*

Thus to some extent the proposed Amendment 115 Part 3 of the MMPS can be seen as a response to the proposed changes to the functions of the UBR contained in the Victorian Building Regulations resulting from the BADAC Recommendations. The proposed Amendment would take the visual amenity aspect of radio masts from the building regulations and place it in the planning controls.

There is an earlier history of councils attempting to use planning controls as a means of protecting the visual amenity of landholders adjacent to proposed radio masts. Four such cases appeared before the Town Planning Appeals Board between October 1969 and June 1978, and the decisions of the Tribunal in each case are attached as Appendices 1,2,3, and 4 to the Wireless Institute Submission which is Appendix 2 of this Report. The determination in the case of the final Appeal No X78/16A by Mr. J.B. Ryan against the City of Heidelberg on 16 June 1978 pointed out that only in one other case had the question of whether a planning permit was needed been raised and in all previous cases the issue had been decided on the merits of the case.

In Appeal No X78/16A, the Tribunal ruled that the use of an amateur radio station from a dwelling house to be a hobby compatible with residential use and as the planning scheme ordinance did not specifically require a permit, the appeal was allowed on the grounds that no permit was required.

Thus again to some extent the proposed Amendment can be seen as a response to the Planning Appeals Tribunal determination to ensure that future appeals are not disallowed on the grounds that the planning scheme ordinance carries no specific mention of radio masts.

The proposed Amendment as drafted could be constructed as applying to masts and antennae used for the reception of television broadcasts in areas of poor reception as well as the larger radio masts. This was not the intention.

No specific suggestions were made to the Committee that masts and antennae used for the reception of radio and television broadcasts should be controlled in the MMPS although the Shire of Narracan indicated that they were concerned about the "forest of aluminium" in Yallourn North which is located outside the Melbourne metropolitan area in the Latrobe Valley.

It can be envisaged that in the long term future certain municipalities may wish to exercise planning controls over all forms of mast and antennae particularly if overhead electrical distribution systems are removed from these specific localities.

The *Town and Country Planning Act* 1961, was amended in 1979 so that Local Development Schemes can be introduced by municipalities within the framework of the MMPS. This concept allows a municipality to vary the details contained in the MMPS to suit the peculiarities of the area covered by the Local Development Scheme.

If Amendment No 115 Part 3 was approved in its present form, individual municipalities with the approval of the Melbourne and Metropolitan board of Works and Minister for Planning would be able to vary the parameters defining when a permit is required for the erection of a radio mast through the approval of a Local Development Scheme. Thus it is possible that problems with television reception in a particular area could be catered for in the Local Development Scheme and result in taller masts/antenna being acceptable without a permit in that area.

An alternative approach arises from the fact that reception of television and radio broadcasts is allowed without the need to obtain a license under the *Wireless Telegraphy Act* 1905. All other transmitting and receiving equipment is required to be licensed.

The Melbourne and Metropolitan Board of Works Statutory Planning Section have indicated that radio masts used by public authorities in residential areas are already covered in the MMPS and fall in the category of Minor Utility Installation. This category is listed as a Column 4 use in most residential zones and therefore requires that a permit be issued by the local council or the Melbourne and Metropolitan Board of Works before the radio mast is erected.

Radio masts and antennae installed on a temporary emergency basis are not considered to require a planning permit under the MMPS. If one of these emergency temporary installations becomes permanent then a permit must be obtained or the structure removed.

STATISTICAL INFORMATION

(1) Numbers of licensed amateur radio stations

The following statistics were obtained from the Australian Bureau of Statistics for the numbers of licensed amateur radio stations in Victoria on June 30 each year.

| 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|-------|-------|-------|-------|-------|-------|-------|
| 2 135 | 2 314 | 2 615 | 3 425 | 3 986 | 4 380 | 4 142 |

(2) Amateur Radio Service stations having large radio masts

The Wireless Institute of Australia in a paper dated March 1982 entitled "A Contribution to the Development of Non Statutory Guidelines for the Erection of Masts in Metropolitan Residential Areas" estimated that some 2 800 licensed radio amateurs live in the metropolitan area of Melbourne and *that for economic reasons no more than 30% of radio amateurs would possess a mast of the type at which the majority of objections seem to have been aimed.* On this basis it can be expected that some 840 amateur radio masts exist in the metropolitan area or 1 290 in the whole of Victoria.

(3) Citizens Band Radio Service stations having large radio masts

It has not been possible to obtain statistical information on this aspect, however, it is thought that the number of these installations in metropolitan Melbourne at this time is very small.

(4) Rate of installation of new amateur radio masts

Mr. O'Shannassy of the Wireless Institute in his evidence on 26 May 1983 stated that, in conversations with suppliers of radio masts, one supplier had installed twenty five masts (some of which were "transplants") and another supplier had supplied eight masts during 1982. Mr. O'Shannassy said that he thought that exhausted the total market. The total number of radio masts, replaced re-positioned or added during 1982 was therefore about thirtythree on the basis of Mr. O'Shannassy's evidence. It has been assumed that any large CBRS radio masts are included in this total.

(5) Appeals against the installation of new radio masts

The Wireless Institute of Australia presented evidence relating to four appeals to the Planning Appeals Tribunal which were made between June 1974 and June 1978 (see Appendix I of the Institute submission).

Mr. Shedden of the Municipal Association of Victoria in giving evidence to the Committee indicated that he thought the decision by the Planning Appeals Tribunal in the case of Ryan v City of Heidelberg (X78/16A) in June 1978 led many councils to believe that the council had no powers to control the erection of radio masts and consequently complaints would not have been recorded.

At the request of the Committee following the public hearing, the Municipal Association of Victoria requested all Victorian Municipalities to provide brief details regarding complaints received in relation to radio masts. The response to the Association's request was as follows:

| | Metropolitan Cities & Shires | Provincial Cities & Towns | Rural Shires |
|---|---------------------------------|------------------------------|-----------------|
| Number of Municipalities | 53 | 36 | 122 |
| Municipalities who responded | 31 | 14 | 27 |
| Respondents indicating no complaints | 16 | 14 | 25 |
| Respondents who had received complaints | 15 | 0 | 2 |

Several councils indicated in submissions and evidence that they believed they had powers to control the erection of radio masts on the grounds of amenity under Section 3139 of the UBR.

Appeals against decisions made by councils under the UBR are referred to the Building Referees.

The Chairman of the Building Referees, Mr. Morgan estimated that about five appeals were made each year on the subject of radio masts. Based on Mr. Morgan's estimate, appeals were made in respect of about 15% of the radio masts erected each year.

(6) Television aerials

There are approximately 900 000 occupied private dwellings in the Melbourne Statistical Division. It could be expected that a reasonably high proportion of these dwellings would have a television set (between 80% and 90%). It would not be unreasonable to expect that 75% of the dwellings with television sets would have external aerials in the metropolitan area. Thus it is estimated that there could be up to 600 000 external television aerials in the metropolitan area.

(7) Radio Masts for Commercial and Public Services

The following statistics were obtained from the Australian Bureau of statistics for the numbers of licensed base stations for mobile land based services in Victoria

| 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|-------|-------|-------|-------|-------|-------|-------|
| 3 774 | 4 038 | 4 192 | 4 295 | 4 504 | 4 594 | 3 873 |

Under the conditions set out in the MMPS none of the radio masts used for commercial services should be located on residentially zoned land. A small number of radio masts used for public services is located on residentially zoned land in the metropolitan area and the number is not likely to exceed fifty.

These radio masts would fall into the category of "Minor Utility Installation" which is a Column 4 use in most residential zones of the MMPS and the erection of these masts would therefore be subject to the issue of a planning permit by the responsible authority.

RELEVANT DEPARTMENT OF COMMUNICATIONS INSTRUCTIONS

- (1) Extract from Department of Communications Publication No RB14 -

Conditions Governing the Licensing and Operation of the Citizens Band Radio Service:

8. *Interference - The CBRS station licence is issued on the understanding that the relative station will not cause interference to other services. A station causing interference shall cease operation until the matter has been resolved.*

8.1 *The technical limits placed on the transmitter power and antenna gain shall be observed at all times (see section 23).*

8.2 *Where reception of sound or vision broadcasting programs is known (by the licensee of persons concerned with the licensee's equipment) to be affected by the operation of a CBRS station, the licensee shall ensure that future transmissions, on such frequencies in such areas as caused the interference, shall cease during the operating hours of the broadcasting or television stations affected until specific directions are given by an authorised officer or the interference is removed.*

8.3 *CBRS stations must accept interference caused by industrial, scientific or medical equipment or by other radio-communication services.*

- (2) Extract from Department of Communications Publication - Amateur Operators Handbook.

Avoidance of Interference

5.37 *The licensee of an amateur station shall take all such steps as are necessary for ensuring that the operation of his station does not cause interference to other radio stations or services or to the reception of broadcasting or television programs.*

5.38 If the licensee becomes aware that equipment authorised under the licence might be causing interference (e.g. to nearby television reception), the licensee should be prepared to co-operate in all reasonable steps towards rectifying the problem. If, for any reason, a solution is not found, the licensee should advise the complainant to lodge a written complaint with the Department. The matter may well be resolved sooner if the Department is also advised directly on the circumstances of the interference. Such reporting can be assisted if an interference report form (App. 16) (RB 131) is obtained from the Department's nearest head office.

5.39 In the event that, on investigation by the Department, a licensee is officially advised orally or in writing that operation of the equipment is causing interference, the licensee may be directed to cease or restrict operation of the station until further notice. Non-compliance with such a direction would incur the risk of prosecution and penalty.

* * *

LIST OF SUBMISSIONS RECEIVED

Antenna Engineering Australia Pty. Ltd.
Mr. & Mrs. L. D. Allen, Carrum.
City of Altona
Australian Business and Industrial Radio Association
Australian Labor Party - Portland Branch
Mr. J. D. Bird, Broadmeadows.
City of Brighton
City of Camberwell
City of Chelsea
City of Coburg
Mr. C. Cook, Box Hill South.
Shire of Diamond Valley
City of Doncaster and Templestowe
G. & A. Doughty, Frankston.
Mr. K. Eltham, Beaumaris.
City of Fitzroy
City of Footscray
City of Frankston
Gas and Fuel Corporation of Victoria
K. Glenister, Frankston.
G. B. Telespars Pty. Ltd.
S. Harrington, Frankston.
City of Hawthorn
City of Heidelberg
Mr. H. L. Hepburn, East Brighton.
R. & B. Heywood, Frankston.
Mr. W. H. M. Hoyle, Wattle Glen.
J. & J. Johnston, Frankston.
P. A. & R. A. Kidd, Frankston
Shire of Korumburra
S. Langusch, Frankston.
R. & B. Laughton, Frankston.
W. & M. M. Lawrie, Frankston.
Shire of Lillydale
City of Malvern
Melbourne and Metropolitan Board of Works
Mr. R. D. Morris, East Brighton.
Municipal Association of Victoria
Shire of Narracan
City of Northcote
Mr. M. Oliva, Tatura.
L., M. & B. Passee, Frankston.
Department of Planning, Victoria
Polar Electronic Industries Pty. Ltd.
City of Prahran

City of Preston
Public Works Department
J. & N. Reade, Frankston.
R. & C. Scott, Frankston.
Mrs. C. Smith, Essendon.
City of Springvale
State Electricity Commission
Television and Electronic Technicians Institute of Australia
Victoria Police
Watchman Electronics
Shire of Werribee
Mr. G. J. White, Burwood.
The Wireless Institute of Australia
J. & E. Woolley, Frankston.

In addition, 565 similarly worded submissions were received from amateur radio operators.

* * *

LIST OF WITNESSES

Mr. P. J. Brown
Representing the Department of Planning.

Mr. I. McCartney
Mr. W. H. M. Hoyle
Representing the Melbourne and Metropolitan Board of Works.

Ms. A. Austin
Mr. L. D. Shedden
Representing the Municipal Association of Victoria.

Mr. J. K. Linton
Mr. J. A. O'Shannassy
Mr. A. R. Noble
Representing the Wireless Institute of Australia.

Mr. L. D. Allen
Mrs. L. E. Allen
Private Individuals.

Mr. R. J. Flanagan
Private Individual.

Mr. R. B. Browne
Representing the City of Brighton.

Mr. R. A. Morgan
Representing the Local Government Department.

Mr. F. H. Parry
Representing the Shire of Diamond Valley.

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

FIRST REPORT

STATE ELECTRICITY COMMISSION PROPOSAL

FOR A

500 000 VOLT TRANSMISSION LINE

FROM COLDSTREAM TO SOUTH MORANG

Ordered to be Printed

D-No. 13/1982-83

EXTRACTED FROM THE MINUTES OF THE PROCEEDINGS OF THE
LEGISLATIVE COUNCIL

FRIDAY 2 JULY 1982

- 34 JOINT INVESTIGATORY COMMITTEES--The Honourable W.A. Landeryou moved, by leave, That, contingent upon the enactment and coming into operation, this Session, of legislation to establish Joint Investigatory Committees:

* * *

- (c) The Honourables W.R. Baxter, D.E. Henshaw, R.I. Knowles, B.A. Murphy and B.T. Pullen be members of the Natural Resources and Environment Committee;

Question--put and resolved in the affirmative.

EXTRACTED FROM THE VOTES AND PROCEEDINGS OF THE
LEGISLATIVE ASSEMBLY

THURSDAY 1 JULY 1982

- 36 COMMITTEE APPOINTMENTS--Motion made, by leave, and question-- That, contingent upon the coming into operation of the Parliamentary Committees (Joint Investigatory Committees) Act 1982--

* * *

- (c) Mr Ihlein, Mr McDonald, Mr McGrath, Mr McKellar, Mr Reynolds, Mr Tanner and Dr Vaughan be appointed members of the Natural Resources and Environment Committee.

--(Mr Fordham)--put and agreed to.

WEDNESDAY 23 MARCH 1983

- 6 NATURAL RESOURCES AND ENVIRONMENT COMMITTEE--Motion made, by leave, and question--That Mr Reynolds be discharged from attendance on the Natural Resources and Environment Committee and Mr Burgin be appointed in his stead (Mr Fordham)--put and agreed to.

TERMS OF REFERENCE

PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The Need for Reinforcing Transmission to the 500 000 Volt Terminal Stations in the Outer Metropolitan Area

Para 2.35 The Committee concludes that the transmission capacity between the Latrobe Valley and the outer metropolitan area must be adequate to transmit all the additional available export energy from the new power generating plant being constructed in the Latrobe Valley. Otherwise, it will not be possible to fully utilise this more efficient generating plant to:

- (i) Optimise the operating costs of the electricity supply system;
- (ii) Compensate for any short term failure of other sources of power supply such as the Newport Power Station, the Snowy River Hydro Electric Scheme or Victorian Hydro Generation; and
- (iii) Meet any increase in demand that may occur.

Para 2.36 The Committee recommends that:

The fourth 500 000 volt transmission line between the Latrobe Valley and the Melbourne Metropolitan Area should be constructed and in service by the time the third Loy Yang generating unit becomes operational.

Alternatives for Effecting Transmission Reinforcement to the 500 000 Volt Terminal Stations in the Outer Metropolitan Area

Para 3.45 The Committee concludes that:

- (i) The arrangements proposed by the SEC for routing and terminating of the fourth 500 000 volt transmission line from the Latrobe Valley to the outer Melbourne Metropolitan Area, (including the reconnection of existing transmission lines) would appear on balance to be the most favourable of the alternatives for reasons of cost, security of supply to the outer metropolitan area and potential environmental impact;
- (ii) The undergrounding of part or all of this transmission line cannot be economically justified; and
- (iii) As the effects of radiation associated with electrical fields were adequately addressed in the Portland Transmission Line Inquiry this aspect does not require further reporting or investigation at this time.

Para 3.46

The Committee recommends that:

- (i) The feasible route to be subjected to detailed examination of environmental issues should be that proposed by the SEC running along the same easement as the existing line from Hazelwood to South Morang between Coldstream and South Morang (route LV1).
- (ii) The Environment Effects Statement to be prepared on the proposed Coldstream to South Morang line at the request of the Minister for Conservation should examine in detail the environmental effects of the SEC proposed Coldstream to South Morang 500 000 volt transmission line. The Statement should also examine in principle only, the relative environmental impact of alternative transmission lines discussed in this Report.

Alternative Processes for Obtaining Planning Approval to Construct the Line from Coldstream to South Morang

Para 4.25

The Committee concludes that:

- (i) The normal planning approval processes would be unnecessarily complex and lengthy in the case of the proposed Coldstream to South Morang Transmission Line.
- (ii) The most appropriate procedure in this case, if and when, it has been determined that it is appropriate for a transmission line to follow the proposed route between Coldstream and South Morang, would be for the Minister for Planning to request the Governor in Council to exempt the line from planning controls under section 35(d) of the Town and Country Planning Act 1961. This request would follow the preparation of an Environment Effects Statement by the SEC and the holding of a public inquiry by an independent panel appointed by the Minister for Conservation under section 9 of the Environment Effects Act 1978.
- (iii) In view of the sensitive areas through which the proposed transmission line may pass it may be important that conditions be applied to the process of construction of the transmission line along the route eventually selected. These conditions could take the form of conditions upon which the Governor in Council agrees to exempt the transmission line from planning control or could be agreed between the Minister for Planning and the Minister for Minerals and Energy as a condition of the Minister for Planning applying to the Governor in Council for exemption of the transmission line from planning controls.

- (iv) It is unlikely that the Upper Yarra Valley and Dandenong Ranges Regional Strategy Plan will require any amendment to allow the transmission line to be constructed along the existing easement as the proposed inquiry procedure falls within the general intent of procedures set out in the Regional Strategy Plan for approval of major utility installations.
- (v) The Melbourne Metropolitan Planning Scheme falls under the ambit of the Town and Country Planning Act 1961 and use of section 35(d) of this Act would exempt the transmission line from the requirements of the Melbourne Metropolitan Planning Scheme.

Para 4.26

The Committee recommends that:

- (i) An Environment Effects Statement (EES) should be prepared by the State Electricity Commission;
- (ii) The EES should be advertised and made available to the general public and in particular to landholders along the route of the proposed line. The advertisement should make clear the approval procedure which will be followed;
- (iii) The Minister for Conservation should appoint an independent panel in accordance with section 9 of the Environment Effects Act 1978, and should consider limiting the terms of reference of this panel so that matters already examined in this Report are not unnecessarily re-examined. The panel should be asked to recommend to the Minister for Planning whether or not the proposed line should be approved, and if so, what conditions, if any, should be applied to the construction of the line;
- (iv) On receipt of the independent panel's recommendations the Minister for Conservation should make his assessment as required by the Environment Effects Act 1978 and provide it to the Minister for Planning;
- (v) Having received the Minister for Conservation's assessment, and providing that approval of the proposed line has been recommended by the independent panel and agreed to by the Minister for Planning, the Minister should seek the formal agreement of the Minister for Minerals and Energy and the State Electricity Commission, that the Commission will abide by conditions to be applied to the construction of the line as specified by him; and

- (vi) If such an agreement is obtained the Minister for Planning should apply to the Governor in Council for the construction of the transmission line to be exempt from planning control under section 35(d) of the Town and Country Planning Act 1961.

The Natural Resources and Environment Committee, appointed pursuant to the provisions of the Parliamentary Committees Act 1968 (No. 7727) has the honour to report as follows:

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

CHAPTER ONE

INTRODUCTION

1.1 TERMS OF REFERENCE

On 26 October 1982 the Committee was directed by His Excellency the Governor in Council:

"To consider, make recommendations and make a final report to Parliament before 31 March 1983 on -

- 1 the forward planning needs for the development of the State Electricity Commission of Victoria transmission system servicing the metropolitan area;
- 2 the criteria to be adopted in locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in part or in full in the light of land use, economic and environmental constraints; and
- 3 the processes for assessment and approval of power lines to minimise duplication of permits and maximise public input."

- 1.2 On 23 March 1983, following a request by the Committee for an extension of time to fully examine all of the matters addressed by the three Terms of Reference, the Minister for Minerals and Energy requested the Committee to report progressively in accordance with the following:

(a) By May 1983

Report on the SEC's proposal for a 500 000 volt transmission line from Coldstream to South Morang, addressing -

- . under the first term of reference, the need for reinforcing transmission to the 500 000 volt terminal stations in the outer metropolitan area;
- . under the second term of reference, the feasible route to be subjected to detailed examination of environmental issues;
- . under the third term of reference, the recommended processes for assessment and approval of the route in this instance.

(b) By July 1983

Report on the SEC's proposals for interconnecting 220 000 volt transmission lines between terminal stations at Richmond and Brunswick via Clifton Hill and between Fishermen's Bend and Newport, addressing -

- . under the first term of reference, the needs for the development of the transmission system serving the central business district and the inner metropolitan area;
- . under the second term of reference, the feasible options and alternative routes to be subjected to detailed examination of environmental aspects;
- . under the third term of reference, the recommended processes to be adopted for the assessment and approval of routes in this instance.

(c) By March 1984

Report in relation to future transmission requirements generally, addressing -

- . under the second term of reference, the general criteria for locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in the light of land use, economic and environmental constraints;
- . under the third term of reference, the processes for assessment and approval of future power lines to minimise duplication of permits and maximise public input.

1.3 On 29 March 1983, His Excellency the Governor in Council ordered that the Committee make its final Report to Parliament before 31 March 1984.

PURPOSE OF THIS REPORT

- 1.4 This report specifically addresses the SEC's proposal for a 500 000 volt transmission line from Coldstream to South Morang and in particular:
- (i) The need for reinforcing transmission to the 500 000 volt terminal stations in the outer metropolitan area;
 - (ii) The feasible route to be subjected to detailed examination of environmental issues; and
 - (iii) The recommended process for assessment and approval of the route in this instance.

The Committee has received many submissions which relate both to this proposal and to the Committee's overall Terms of Reference.

The Committee took these into account in arriving at the recommendations contained in this Report. However detailed discussion of the broader aspects of those submissions particularly with respect to the processes for assessment and approval has been omitted from this Report and will be contained in the Committee's final Report.

PROCEDURE FOLLOWED BY THE COMMITTEE

- 1.5 Following the Order in Council of 26 October 1982, the Committee advertised the Terms of Reference in the national press on 22 November 1982 and called for submissions to be made to the Committee by 4 February 1983.
- 1.6 Public hearings were held at Parliament House on 1 and 8 December 1982 at which the State Electricity Commission presented its submission and initial evidence.
- 1.7 On 9 February 1983, the Committee inspected the routes of the transmission lines and terminal station sites proposed by the SEC in their earlier submissions. Representatives of local municipalities were present on those inspections.
- 1.8 In March 1983 the SEC produced a document entitled "State Electricity Commission Proposal for a 500 000 volt Transmission Line Coldstream to South Morang - March 1983". By agreement with the Committee this document was circulated to all municipalities along the route of the proposed line and to individuals and groups who had made earlier submissions to the Committee on this particular topic.
- 1.9 The SEC then held exploratory discussions with these municipalities, individuals and groups during March and April.
- 1.10 On 26 April a further public hearing was held at Parliament House to receive evidence relating only to its Terms of Reference dealing with the proposed Coldstream to South Morang 500 000 volt transmission line. This hearing was advertised in the Victorian press on 21 April and all those who had made submissions on this topic were notified.

- 1.11 At this hearing the SEC formally presented to the Committee its document entitled "State Electricity Commission Proposal for a 500 000 volt Transmission Line Coldstream to South Morang - March 1983", and presented some additional evidence answering some of the questions which had been raised during the exploratory discussions previously mentioned.
- 1.12 Evidence was also taken at this hearing from all other interested parties who wished to make a verbal submission at this time on the Coldstream to South Morang Line.
- 1.13 This Report now proceeds to address in turn each of the Terms of Reference relating to the proposed Coldstream to South Morang 500 000 volt transmission line.
- 1.14 Appended to this Report are:
- (i) A list of submissions received⁽¹⁾ (Appendix 5);
 - (ii) A list of witnesses (Appendix 6); and
 - (iii) Minutes of Evidence⁽¹⁾.

(1) Minutes of Evidence and Submissions not printed

CHAPTER TWO

THE NEED FOR REINFORCING TRANSMISSION TO THE 500 000 VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

THE CASE PUT FORWARD BY THE STATE ELECTRICITY COMMISSION

The existing Latrobe Valley to Melbourne transmission system

- 2.1 The existing transmission connection to Melbourne from the Latrobe Valley consists of three single circuit 500 000 volt lines, terminating at South Morang Terminal Station (SMTS) to the north of Melbourne and three double circuit 220 000 volt lines terminating at Rowville Terminal Station to the east, as illustrated in Figure 2.1.
- 2.2 This transmission, connecting as it does to the Latrobe Valley brown coal generation, provides access to 4 200 MW of plant supplying some 82% of the energy generated annually for the entire State system. The average annual output of Latrobe Valley power generation is presently some 60% of its installed capacity, although for much of the year the output is in excess of 75% of installed capacity and can range up to about 85%. Higher average output is expected in future years with full service of the modern units at Yallourn W and Loy Yang and the reconditioning of Hazelwood.

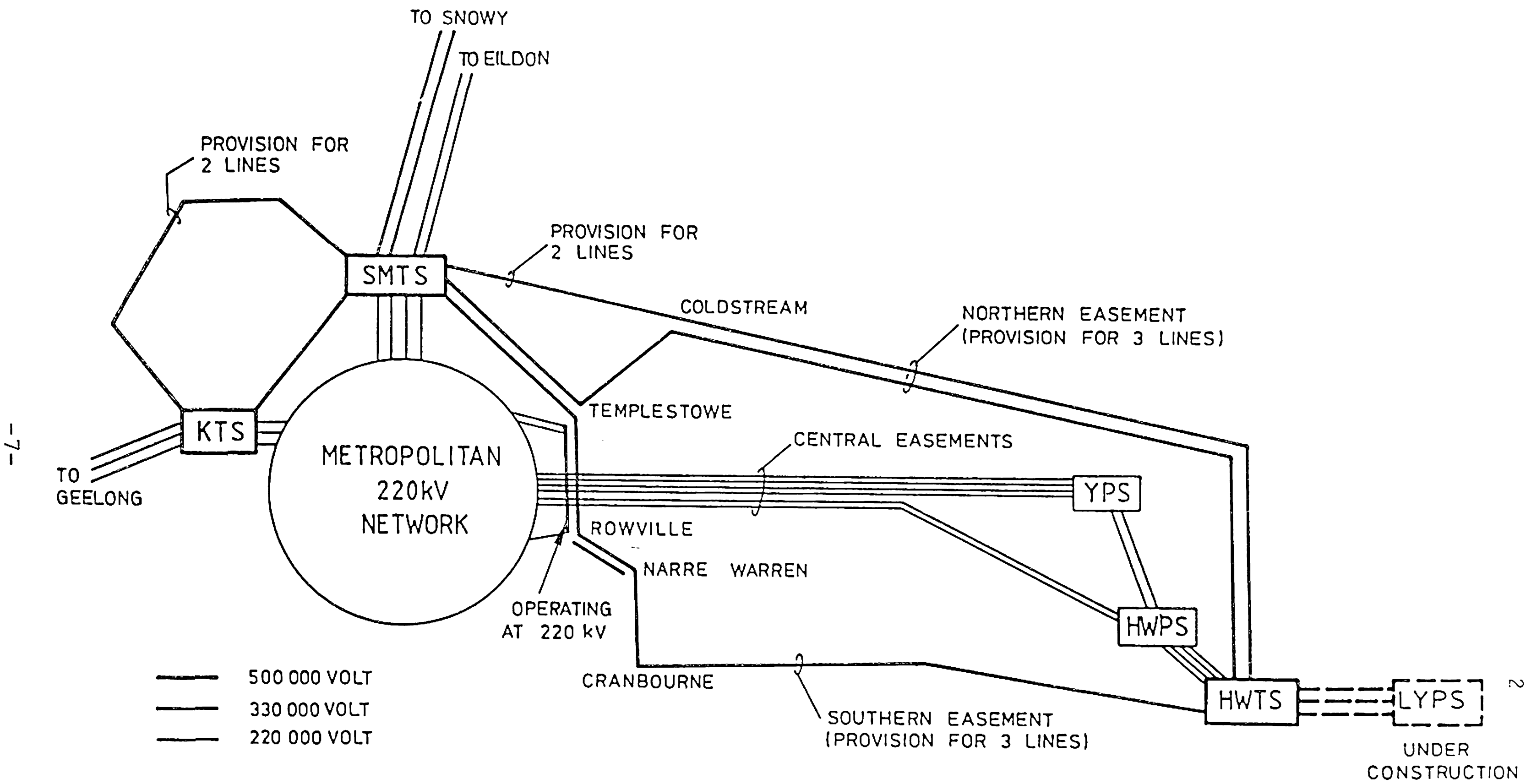


FIG 2.1
LATROBE VALLEY TO MELBOURNE TRANSMISSION - EXISTING

- 2.3 The net power export from the Latrobe Valley to Melbourne and the west of the state is maintained at a consistently high level throughout the year ranging up to approximately 80% of the Latrobe Valley installed generating capacity. The transmission system from the Latrobe Valley to Melbourne must have the capability to accept this, if excessive dependence on less economic generation or the drawdown of limited hydro reserve is to be avoided.
- 2.4 At present, this transfer capability is some 4700 MW, determined largely by stability considerations. Operation beyond this limit could result in widespread interruption to supply and possible system shutdown, following a line short circuit. The 4700 MW transfer capability is sufficient to permit access to the maximum available generation export level presently attainable from the existing Latrobe Valley power stations (i.e. Latrobe Valley generation less power station auxiliary and open cut supplies and supply to Gippsland).

Latrobe Valley generation expansion
to meet forecast growth

- 2.5 The SEC's planning for expansion of the State generating system is based upon long-term load forecasts which are regularly reviewed and represent the latest estimate of growth expected in the classes of electricity sales (ie. domestic, commercial and industrial).
- 2.6 The most recent forecast was presented in the "1982-1997 Long-term Electricity Forecasts", published by the SEC in early 1983.
- 2.7 This document shows the projection of demand and energy requirements of the generation for the range of future loads which have a reasonable probability of occurrence, given the uncertainty of present outlooks. However, for planning purposes, a base scenario has been chosen, about which the SEC is developing flexible plans.

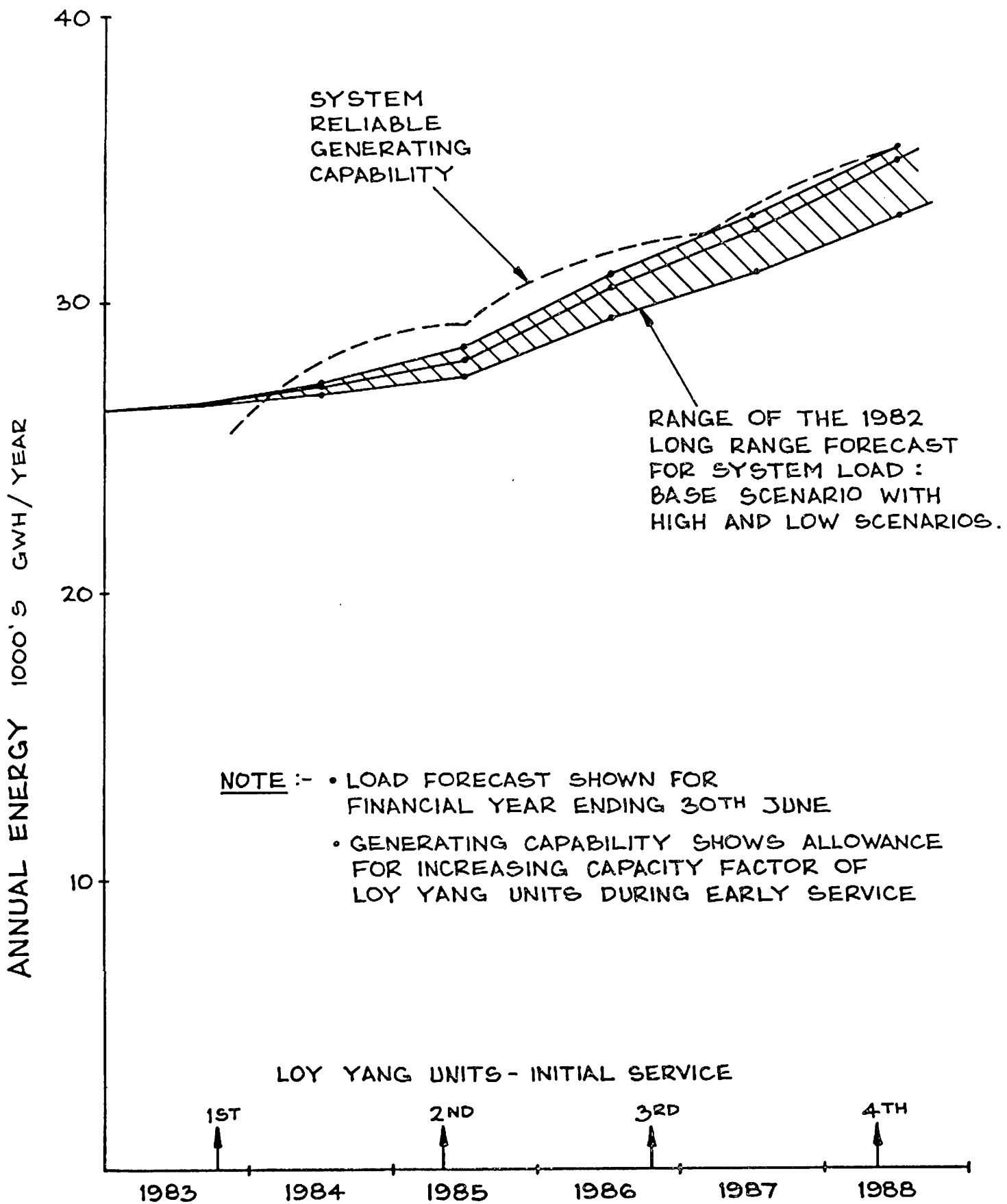


FIGURE 2.2 LOAD AND GENERATION FORECAST

- 2.8 To reliably meet this base scenario, generating units of the Loy Yang A Power Station project have been programmed at about 18 month intervals with the first unit scheduled for initial operation in October 1983. Figure 2.2 shows a comparison of the load forecast with the reliable energy generating capability of the Victorian system, with Loy Yang A units scheduled for initial operation in October 1983, May 1985, November 1986 and May 1988.
- 2.9 With the introduction of Loy Yang units to the above program, the installed generating capacity in the Latrobe Valley over the period to 1987/88 will increase from some 4 200 MW to 6 200 MW and, as illustrated on Figure 2.3, the maximum probable Latrobe Valley generation export level to Melbourne and to the west increases from the present level of about 3 300 MW to about 5 100 MW by 1987/88.

Power transfer capability of the Latrobe Valley
to the Melbourne transmission system and the
need for reinforcement

- 2.10 The power transfer capability of the present three 500 000 volt line and the three double circuit 220 000 volt lines from the Latrobe Valley to Melbourne, as mentioned previously and indicated on Figure 2.3, is 4700 MW determined by the requirement for the system to remain intact and capable of supplying system load following failure of a transmission line. During hot summer periods, the capability would be reduced to 4300 MW because of thermal limits on the older 220 000 volt transmission lines.
- 2.11 Thus, the generation to be exported from the Latrobe Valley with Loy Yang A Power Station in full service (5 100 MW) will considerably exceed the transfer capability of the existing transmission system (4 700 MW). Even during summer the reduced generation export of 4 600 MW will exceed the summer capability of the existing transmission system.

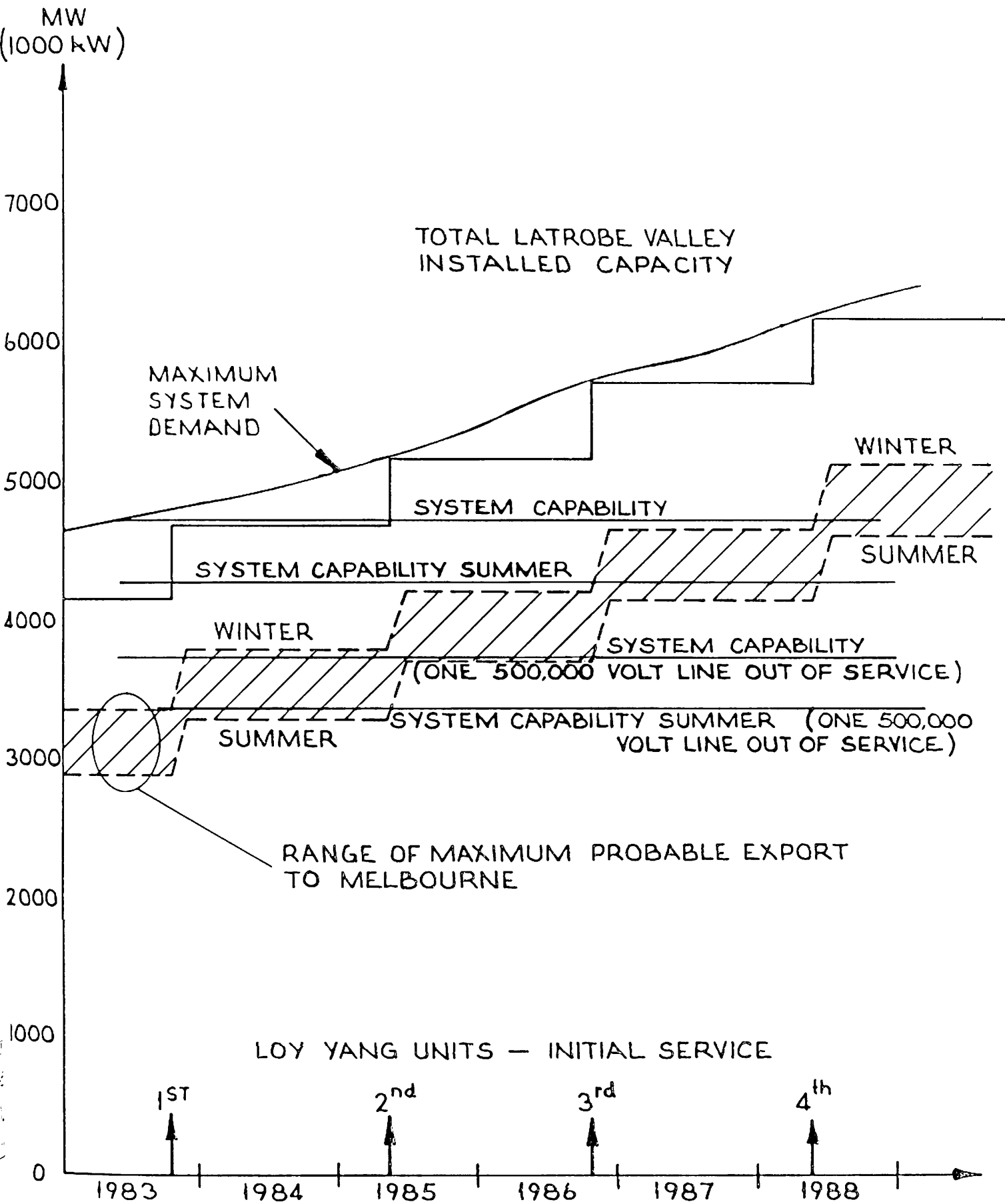


FIG.2.3 LATROBE VALLEY TO MELBOURNE TRANSMISSION SYSTEM CAPABILITY

- 2.12 It is quite evident therefore, that growth of generation in the Latrobe Valley will inevitably require reinforcement of the existing Latrobe Valley to Melbourne transmission system and it must be available before full output of Loy Yang A Power Station is obtained.
- 2.13 The transmission for the Latrobe Valley has been developed with 500 000 volt lines, each of which can transfer about 1 000 MW in normal service. This capability is appropriate to the successive installation of large generating units in the Latrobe Valley. It is logical therefore, with a large development such as the 4 000 MW Loy Yang project (A and B Power Stations) in progress, that the transmission be reinforced by a fourth 500 000 volt transmission line.
- 2.14 The termination of the fourth 500 000 volt transmission line requires reinforcement of the outer metropolitan transmission system.

Timing of the fourth 500 000 volt transmission line
and its termination in the metropolitan area

- 2.15 It can be seen from Figure 2.3 that the maximum probable generation exported from the Latrobe Valley will reach the capability of the existing transmission system with service of the third Loy Yang generator.
- 2.16 However, during construction of the fourth 500 000 volt transmission line, there will be extensive periods during which existing 500 000 volt lines will have to be taken out of service for reconnection. During these periods, as can be seen in Figure 2.3 (one line out-of-service condition), the transmission capability will be impaired by as much as 1 000 MW. Therefore, to avoid severe curtailment of the Latrobe Valley generation and its replacement by high cost generation elsewhere, and to allow construction to be organised with reasonable flexibility, the reinforcement needs to be completed prior to initial operation of the third Loy Yang generator presently planned for November 1986.

2.17 The program planned by the SEC for the approval processes, design, and construction of the proposed Coldstream to South Morang 500 000 volt transmission line follows as Figure 2.4. The program planned for sections of the fourth 500 000 volt transmission between Hazelwood, Cranbourne and Narre Warren follows as Figure 2.5.

Role of the Coldstream Terminal Station

2.18 Characteristics of terminal stations:

The SEC use the term "terminal station" for all stations terminating transmission lines. The stations serve two distinct roles -

(i) Main Transmission Terminal Stations which receive bulk power from generating points and supply other load terminal stations.

In the metropolitan area, the stations of this type are -

- . Keilor in the west;
- . South Morang in the north;
- . Rowville in the east.

(ii) Load Terminal Stations which provide supply to the 66 000 volt subtransmission network.

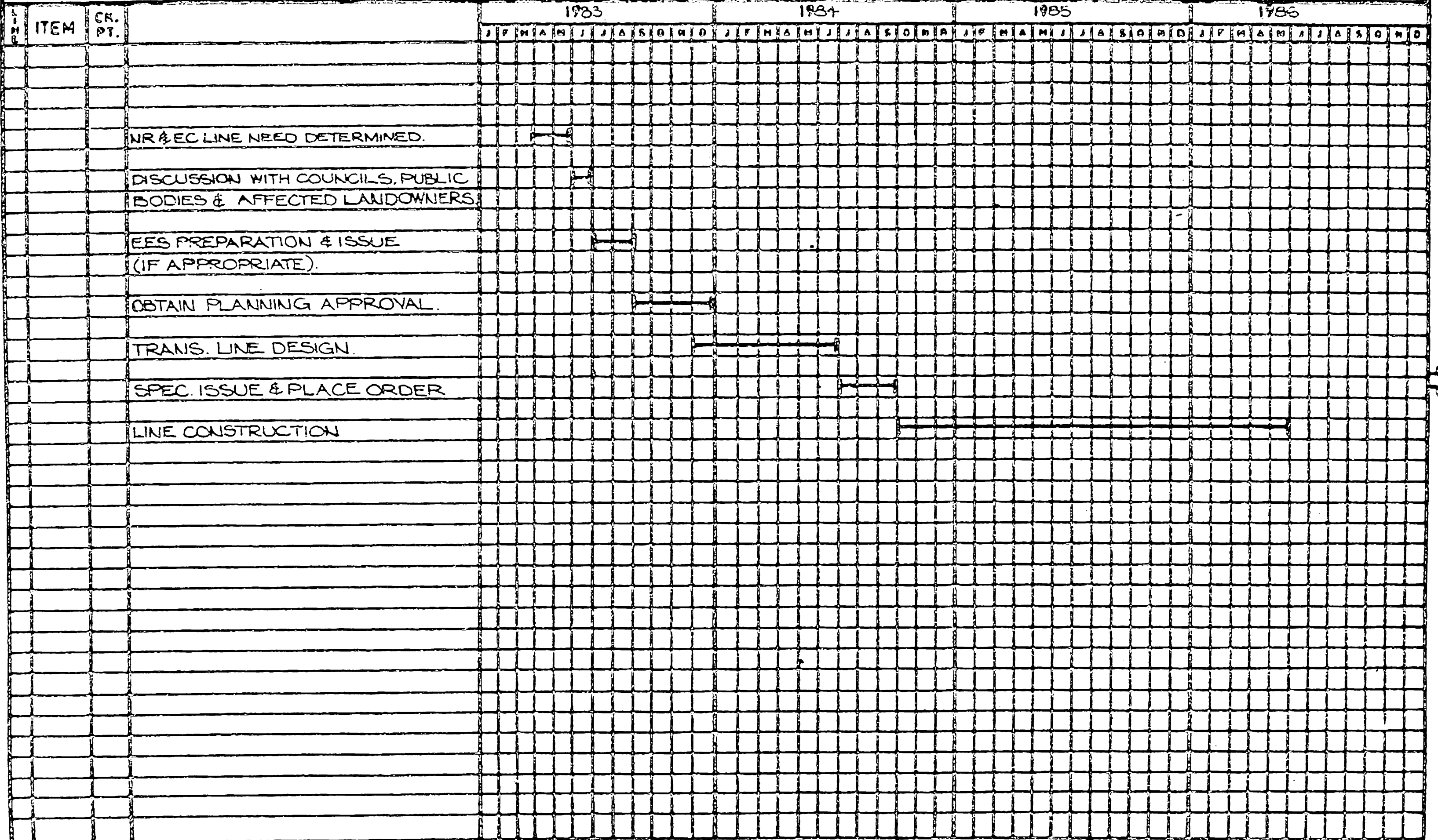
2.19 To supply the 66 000 volt subtransmission network from the 220 000 volt transmission lines, the twelve stations mentioned in Section 1 of the SEC Submission to the Committee in November 1982 are of this type. Their characteristics are detailed in Section 4 of that Submission.

2.20 Two of the existing 500 000 volt transmission lines from the Latrobe Valley to South Morang are routed via the site reserved for a future Coldstream Terminal Station - refer Figure 2.6. This station has been

PROJECT

PROGRAM FOR 500KV COLDSTREAM - SOUTH MORANG TRANSMISSION LINE (ON EXISTING ROUTE)

FIG. 2.4



CODE : Δ ISSUE SPEC.

\triangle SPEC. OR QUOTE RETURNABLE

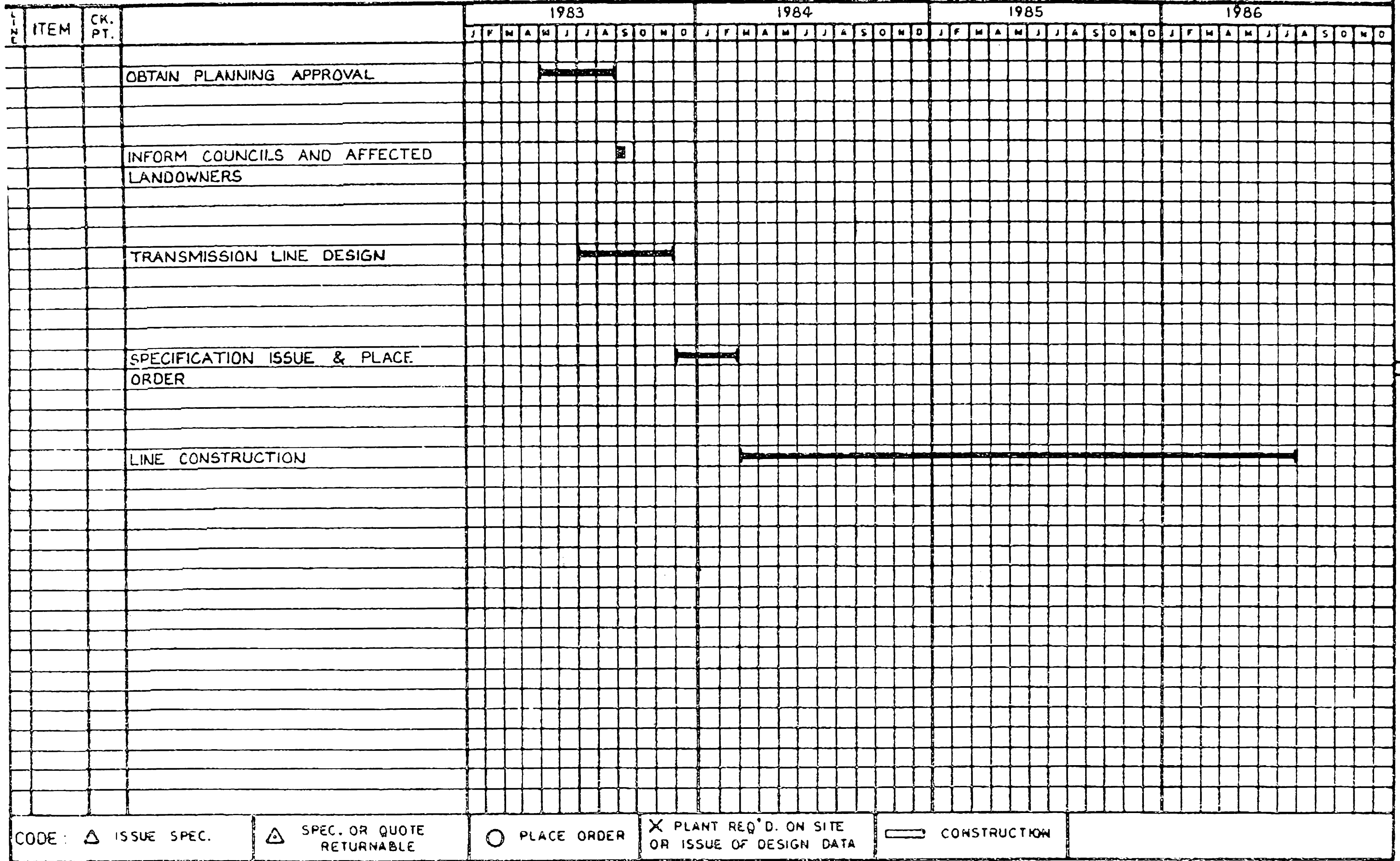
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X PLANT REQ'D. ON SITE OR ISSUE OF DESIGN DATA

— CONSTRUCTION



PROJECT PROGRAM FOR 500KV HAZELWOOD - CRANBOURNE - NARREWARREN (ON EXISTING ROUTE) FIGURE 2.5



-15-

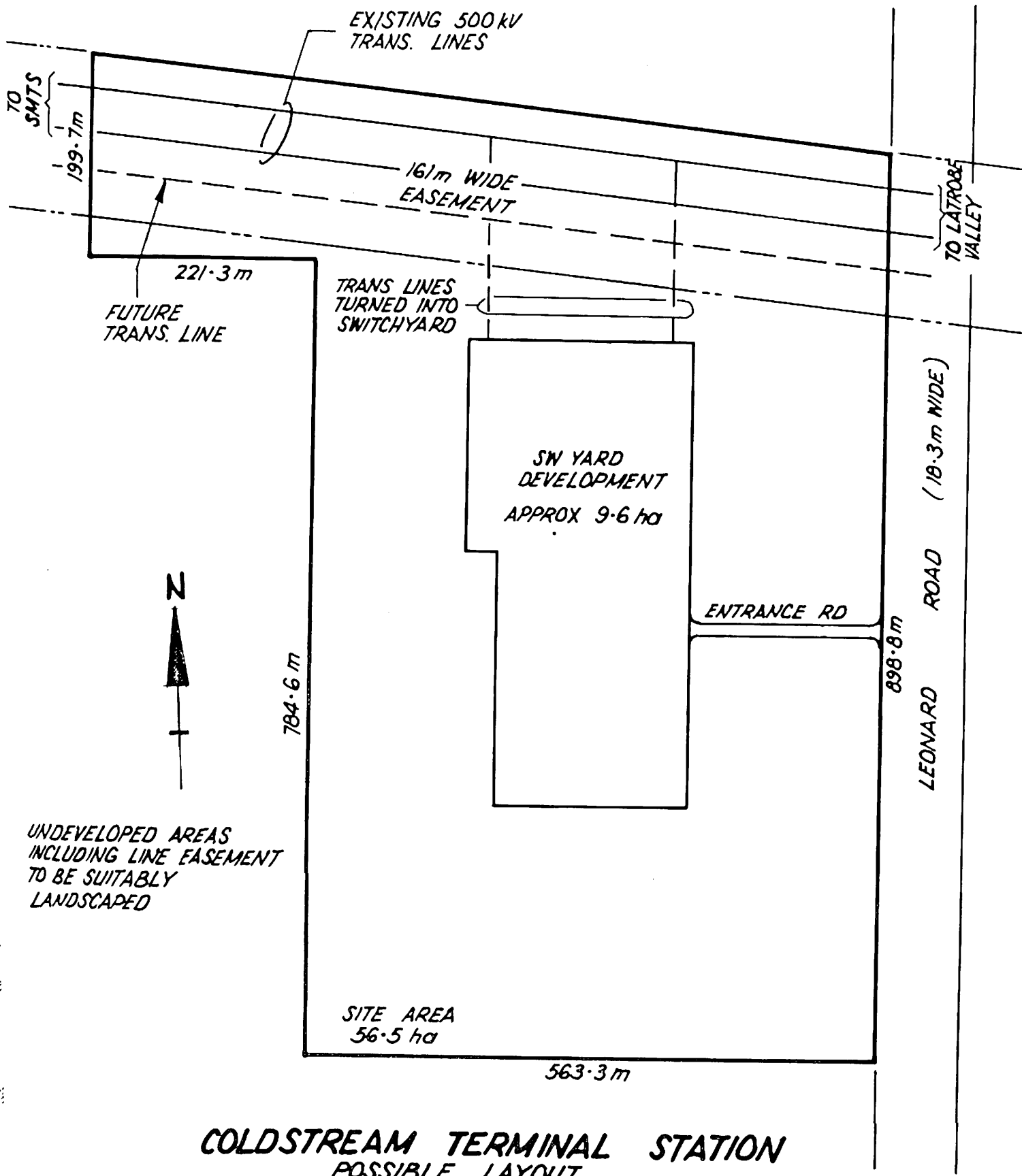
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planned to act as a termination of the 500 000 volt transmission lines from the Latrobe Valley and for development beyond the fourth 500 000 volt transmission line, of which the proposed Coldstream to South Morang transmission line forms a section; that is, Coldstream is of the first type described previously. It would serve ultimately as a direct supply point for the metropolitan 220 000 volt subtransmission system but would not provide supply to the 66 000 volt subtransmission network. Of the total site area of 56.5 Ha, the switchyard and building development would occupy approximately 9.6 Ha.

The remaining area, including the easement, will be landscaped.

SUBMISSIONS BY PARTIES OTHER THAN THE SEC IN RELATION
TO THE NEED FOR REINFORCING TRANSMISSION TO THE 500 000
VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

- 2.21 Four submissions were made on the question of need to the Committee. The first submission was specifically related to the need for the Coldstream to South Morang line and was made by a Mr. R.F. English. Mr. English made a written submission and appeared before the Committee on 26 April 1983. Mr. English's written submission was made after he had read the evidence submitted by the SEC on 1 and 8 December 1982. He pointed out that the SEC Submission, in his opinion, provided very little proof of the need for a fourth line to South Morang.
- 2.22 As a result of this submission the SEC addressed the question of need in more detail in their submission of 26 April 1983. During the hearing of evidence from Mr English he requested the opportunity to raise further questions in relation to the SEC's Submission of 26 April. It was agreed that those questions could be raised in writing to the Committee and that the Committee would request the SEC to reply in writing to Mr English. These questions by Mr English and the reply from the SEC are attached to this Report as Appendices 1, 2, 3 & 4.
- 2.23 A submission by the Conservation Council of Victoria made the following points in relation to the question of need:



COLDSTREAM TERMINAL STATION
POSSIBLE LAYOUT

SCALE 1:5000

- (i) Steps towards energy efficiency as outlined in the first report of the Australian Conservation Foundation's Sunday Ebbott Energy Project should be initiated immediately; and
- (ii) The resultant reduction in load growth would make further transmission capacity and improved security unnecessary.

2.24 A submission by the Ministry for Conservation indicated that they had not been able to fault the logic presented by the SEC for the forward planning needs of the transmission system supplying the metropolitan area, and recommended that the options put forward by the SEC should be adopted as the basis for further detailed evaluation of the alternative methods of transmission including the preparation of environment effects statements for each of the proposed lines.

2.25 The Merri Yarra Municipal Protection Committee (MYMPC) made the following comments regarding projected load increases.

It referred to Section 1.2 of the SEC Submission in which it is stated that accurate long term forecasts are not realistic. Indeed it has been shown that the Commission's overall forecasts for power requirements in the State have been over-exaggerated. It would seem therefore, that an independent survey of likely load growth within the metropolitan area in general, and the central business district and inner eastern suburbs in particular, should be undertaken to provide an alternative assessment to that already given by the SEC. The MYMPC does not believe that historical methods alone of assessing likely load increases are appropriate in today's rapidly changing social, economic and technical environment. Careful and prudent Government planning action and energy management could have a considerable bearing on the ultimate load growth.

DISCUSSION

2.26 The need for the transmission line and in particular the point in time at which the line should be constructed would normally be dictated in the first instance by forecasts of electricity demand for areas of Victoria away from the Latrobe Valley and Gippsland.

- 2.27 Because of the uncertainty which currently exists about the future economic environment, the SEC has produced electricity demand forecasts which indicate a range of possible requirements. These forecasts were prepared late in 1982 and are to some extent already out of date as the degree of economic certainty has not improved during the last six months. The Committee examined this area and concluded that little would be gained in relation to the Committee's Terms of Reference from engaging independent experts to produce alternative load forecasts at this time.
- 2.28 The Government is committed to the construction of the Loy Yang Project and the generating plant at Loy Yang will rank amongst the most efficient and lowest operating cost plants within the SEC system. As a consequence, there will be considerable advantage in operating this Station and using power from this source in preference to power from the gas-fired Newort and Jeeralang Power Stations or from the old standby equipment in the metropolitan area irrespective of any increase in load demand. In addition there will be situations where the hydro-generation capacity will either be unavailable or need to be conserved because of shortages of water. In this situation it will be necessary to maximise the input to the system from the Latrobe Valley.
- 2.29 The SEC has indicated that the principle upon which they operate the transmission system is that for the probable range of generation conditions, the system must be able to remain stable and supply the electricity demand if one transmission line between the Latrobe Valley and Melbourne is lost due to a fault. In addition the system is designed to remain stable for overage generating conditions following loss of a line when another line is out of service for maintenance purposes (including the repair of earlier fault conditions). The Committee agree that this is a sound operating principle.
- 2.30 The SEC has also indicated that construction of the proposed transmission line involves taking existing transmission lines out of service for certain periods so that they can be reconnected into new sections of transmission line. (see 2.16)

- 2.31 The SEC point out that it would be desirable to start the installation of the new line well in advance of the initial operating date for the third Loy Yang generator (currently proposed for May 1986) so as to minimise the risks to the stability of the supply system during the construction period. The Committee also agrees that this is a reasonable precaution to take.
- 2.32 If the load demand should increase at the rate predicted by the SEC or at a higher rate, and the fourth transmission line is not in service when the third Loy Yang generator comes into service, it will not be possible to fully utilise the installed capacity at Loy Yang. It will also become progressively more difficult to take lines out of service to install the fourth line as the load increases.
- 2.33 The Committee note that the information put forward by the SEC on the question of transmission capacities between the Latrobe Valley and Melbourne has simplified a very complex problem. A detailed review of the transmission requirements and SEC's evidence would require the assistance of experts over a considerable period of time.
- 2.34 The Committee believes that the SEC's case is fairly self evident on this occasion and that it would be more appropriate for a detailed review of the transmission system between Latrobe Valley and Melbourne to be conducted when the foreshadowed fifth transmission line is being considered, as many additional factors will need to be considered at that time including the Coldstream Terminal Station. It is estimated currently that this fifth line would be required in service by about 1990; detailed consideration of the factors involved should therefore occur in about 1985. The need for a review will be discussed more fully in the Committee's final Report on the overall Terms of Reference due to be presented to Parliament by 31 March 1984.

CONCLUSIONS

- 2.35 The Committee concludes that the transmission capacity between the Latrobe Valley and the outer metropolitan area must be adequate to transmit all the additional available export energy from the new power generating plant being constructed in Latrobe Valley. Otherwise, it will not be possible to fully utilise this more efficient generating plant to:
- (i) Optimise the operating costs of the electricity supply system;
 - (ii) Compensate for any short term failure of other sources of power supply such as the Newport Power Station, the Snowy River Hydro Electric Scheme or Victorian Hydro Generation; and
 - (iii) Meet any increase in demand that may occur.

RECOMMENDATION

- 2.36 The fourth 500 000 volt transmission line between the Latrobe Valley and the Melbourne Metropolitan area should be constructed and in service by the time the third Loy Yang generating unit becomes operational.

CHAPTER THREE

ALTERNATIVES FOR EFFECTING TRANSMISSION REINFORCEMENT TO THE 500 000 VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

THE CASE PUT FORWARD BY THE STATE ELECTRICITY COMMISSION

Existing Latrobe Valley to Melbourne transmission and metropolitan termination

- 3.1 The existing transmission system from the Latrobe Valley to the Melbourne metropolitan areas consists of three 220 000 volt double circuit lines and three 500 000 volt single circuit lines as shown in Figure 2.1. The 220 000 volt lines terminate at the Rowville Terminal Station and supply the eastern metropolitan area, whilst the 500 000 volt lines terminate at the South Morang Terminal Station and supply the northern and western metropolitan areas.
- 3.2 Two of the 500 000 volt lines were established in the late 1960s on a northern easement in conjunction with the Hazelwood Power Station and supply the western metropolitan area from the Keilor Terminal Station (KTS). The lines were routed via Coldstream and South Morang with one line being on a direct Coldstream to South Morang easement and the other routed via Templestowe to provide for later development of supply for the north-eastern metropolitan area. The easements from Coldstream to South Morang were each approved with capacity for a second circuit, thereby providing for the four incoming 500 000 volt lines to South Morang.
- 3.3 The third 500 000 volt line was established in late 1982 on a southern easement via Cranbourne, Narre Warren and Templestowe, in

conjunction with commercial service of the completed Yallourn W Power Station and in preparation for service of the initial Loy Yang A units. The planning permission for the section of this line between Hazelwood and Cranbourne included easement provision for two further 500 000 volt lines. The section between Cranbourne and South Morang was established on an existing easement.

Planning for the fourth 500 000 volt line
and its termination in the metropolitan area

- 3.4 The further 500 000 volt line from Hazelwood to Melbourne is planned to be established on the southern 500 000 volt easement adjacent to the existing 500 000 volt line from Hazelwood to Templestowe. The section of the line between Narre Warren and Templestowe has already been constructed and the Rowville to Templestowe part of this section is temporarily in service at 220 000 volts. Figure 3.1 shows the route of the fourth 500 000 volt lines through to Templestowe (the route is dotted). A number of options are available for termination of the fourth 500 000 volt line in the metropolitan area but the SEC's preferred arrangement is to bring all four 500 000 volt circuits from the Latrobe Valley into the South Morang Terminal Station. This has the advantage of avoiding the early development of a third major 500 000 volt terminal station. Segregation of the four circuits to South Morang onto two separate easements provides the required degree of security against total loss of supply from a single event.
- 3.5 To achieve connection of the fourth 500 000 volt transmission line into South Morang, the SEC propose to take the existing second 500 000 volt line (the southern circuit on the northern easement) directly into South Morang from Coldstream, so as to free up the section between Templestowe and South Morang for inclusion as part of the fourth 500 000 volt line. The short section on the northern easement between Templestowe and Coldstream would then be left out-of-service until the future establishment of new 500 000 volt switching stations at Templestowe and Coldstream.

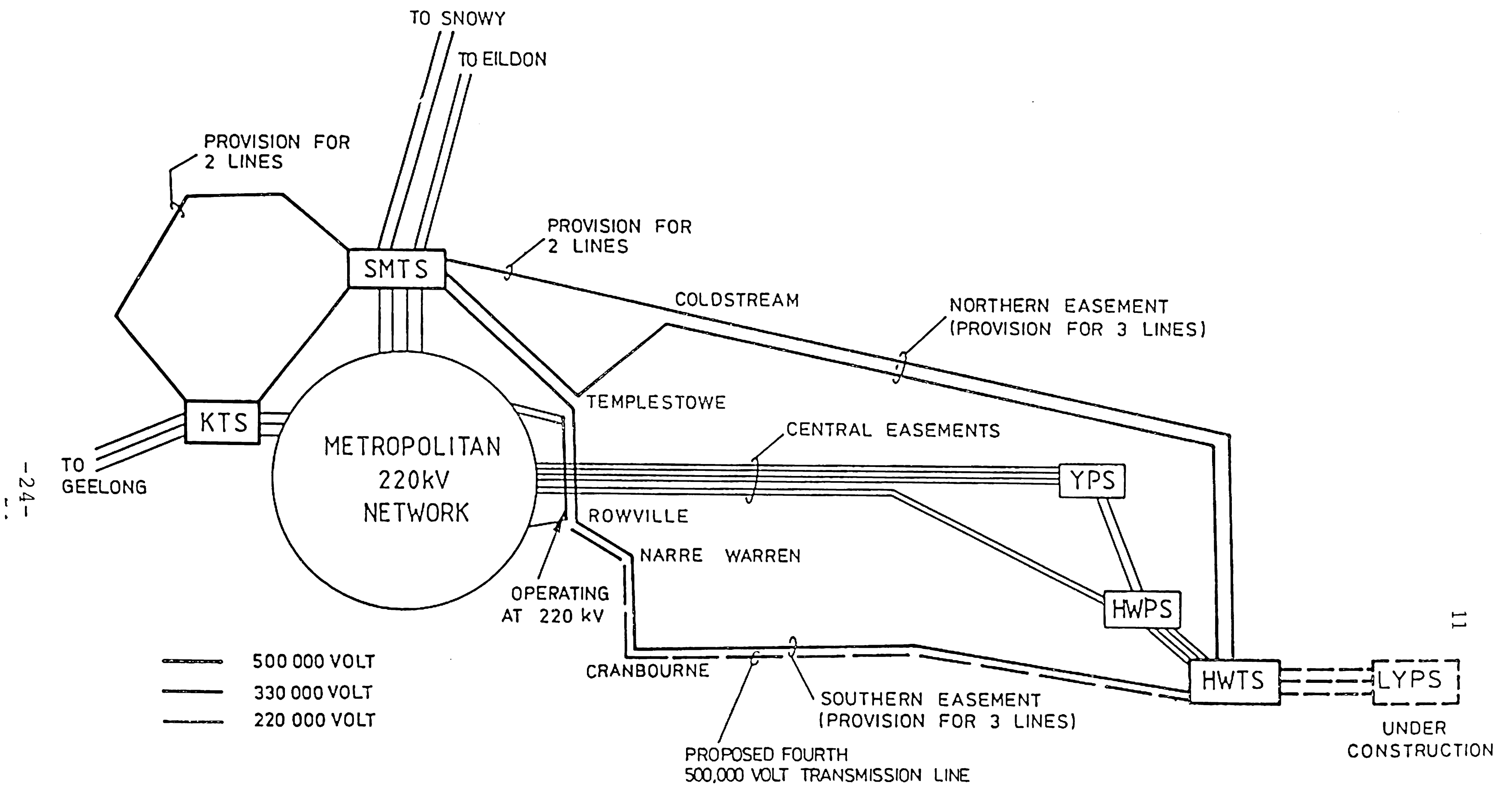


FIG 3.1
 LATROBE VALLEY TO MELBOURNE TRANSMISSION - PROPOSED
 (INCLUDING PROPOSED FOURTH 500,000 VOLT TRANSMISSION LINE)
 (LATROBE VALLEY TO MELBOURNE)

3.6 Figure 3.2 shows this preferred termination arrangement as option LV1. Two other feasible options, LV2 and LV3, are discussed involving connections to existing terminal stations and this is followed by a discussion of the possibility of developing new terminal stations at Templestowe, Coldstream and Narre Warren as termination points for the fourth transmission line.

SECs preferred option LV1:
Second Coldstream to South Morang line
(Figure 3.2 top right)

3.7 This option, which is the SEC's preferred proposal, requires construction of a second single circuit 500 000 volt line of some 26km in length between Coldstream and South Morang on the same easement as the first (northern-most) 500 000 volt line. The second 500 000 volt line would then be connected via this new circuit directly into South Morang.

3.8 The capital cost of this line on the existing easement, which is the shortest available route, is estimated to be some \$11 million.

Option LV2: Establish a Coldstream
to Donnybrook line - (Figure 3.2 bottom left)

3.9 This option would require a new single circuit 500 000 volt line from Coldstream to Donnybrook, by-passing South Morang, to establish a Hazelwood to Donnybrook line by using one of the existing Hazelwood to Coldstream lines on the northern easement. As for the preferred option LV1, the fourth line would be connected to South Morang using the Templestowe to South Morang line section of the second 500 000 volt line currently routed through Templestowe.

3.10 Three circuits would be switched at South Morang and one would be switched at a new terminal station at Donnybrook.

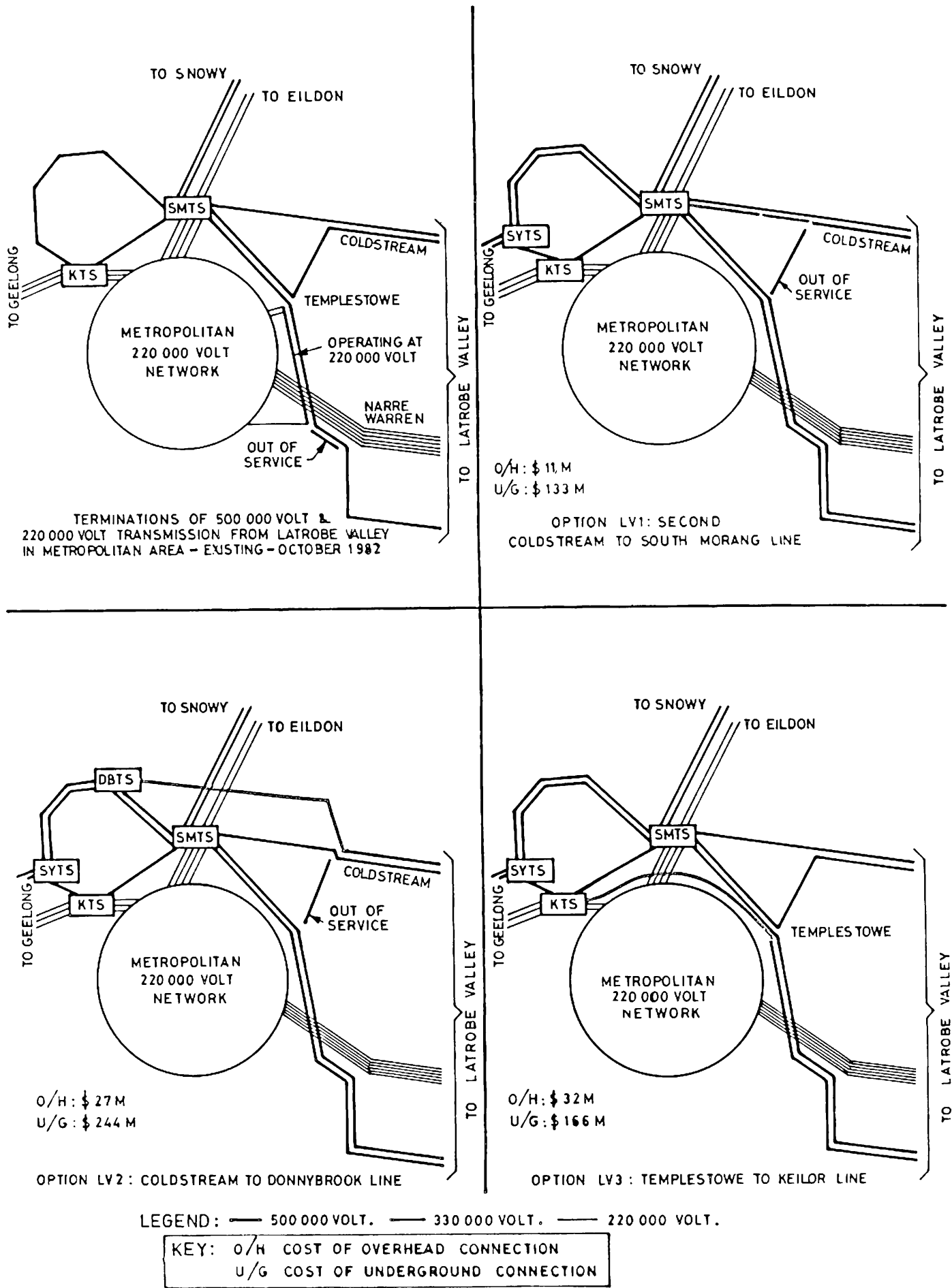
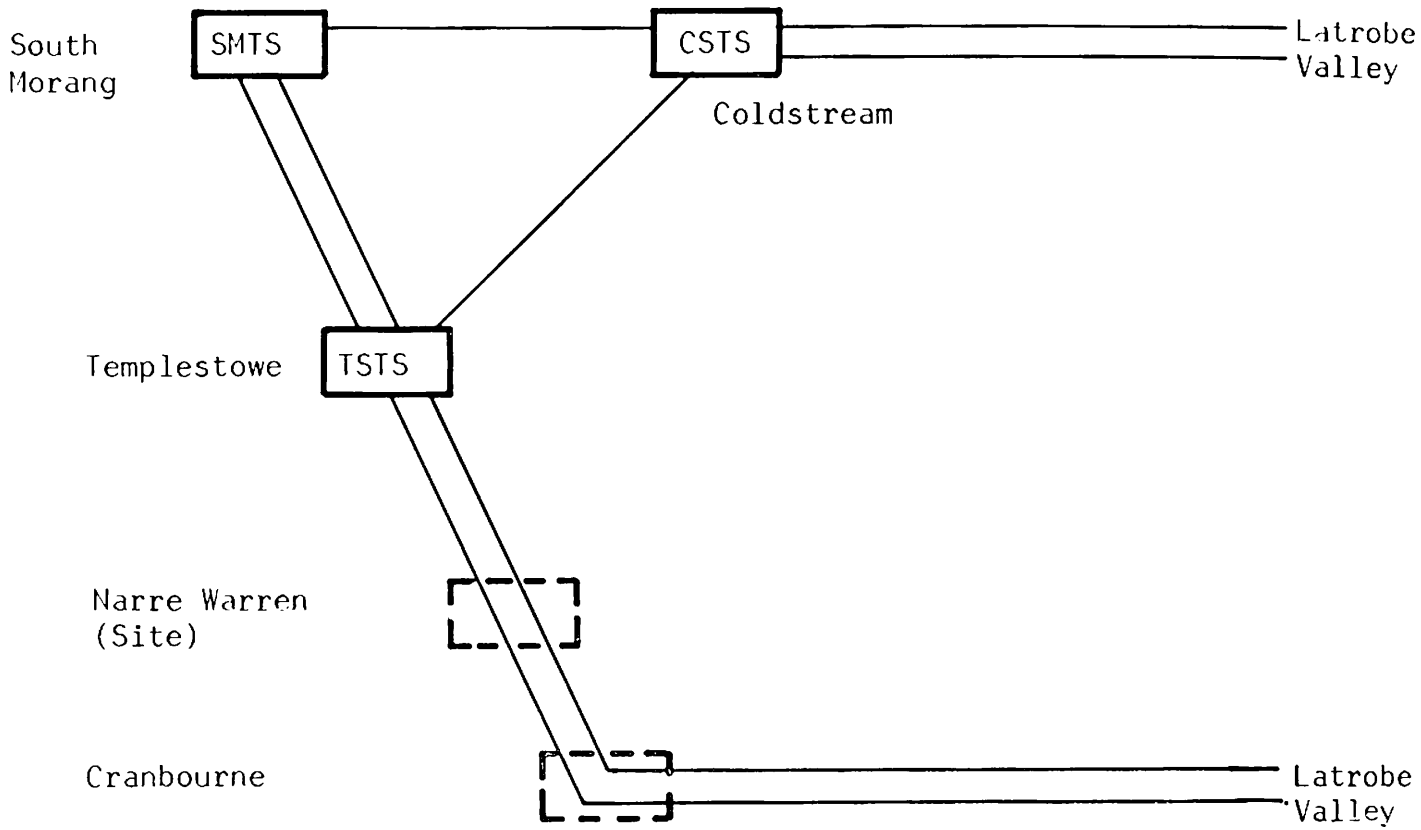


FIG. 3-2
 OPTIONS FOR TERMINATION OF TRANSMISSION FROM LATROBE VALLEY IN THE METROPOLITAN AREA

- 3.11 This arrangement has the advantage of diversifying the termination of the four 500 000 volt lines.
- 3.12 On the other hand, because of the greater length involved in this option it would cost some \$18 million and also involve the establishment of a new Donnybrook Terminal Station at an additional cost of \$9 million.
- 3.13 The total cost of the option would therefore be \$27 million. Moreover, the connection from Coldstream to Donnybrook would require a new easement to be taken over a longer route to the north of Melbourne with inevitably more protracted processes for approval and with longer periods being needed for design and construction.

Option LV3: Establish a Templestowe to Keilor line
(Figure 3.2 bottom right)

- 3.14 This option would require a new single circuit 500 000 volt line from Templestowe to Keilor, allowing the fourth 500 000 volt line to be brought directly into the Keilor Terminal Station.
- 3.15 This arrangement (as for option LV2) also has the advantage of diversifying the termination of the four 500 000 volt lines from the Latrobe Valley.
- 3.16 Again, because of the greater length involved in this option compared to the Coldstream to South Morang option, the cost would be some \$17 million for the 500 000 volt line and some \$15 million for reconstruction of the existing 220 000 volt line on the easement. The total cost of the option would therefore be \$32 million. The existing easement over which this Templestowe to Keilor connection would be established is already occupied by two double circuit 220 000 volt lines which would have to be reconstructed to allow introduction of the 500 000 volt line on the easement with attendant impairment of security during the necessary lengthy period the 220 000 volt lines would be out-of-service.



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE
 BY ESTABLISHMENT OF TEMPLESTOWE & COLDSTREAM TERMINAL STATIONS

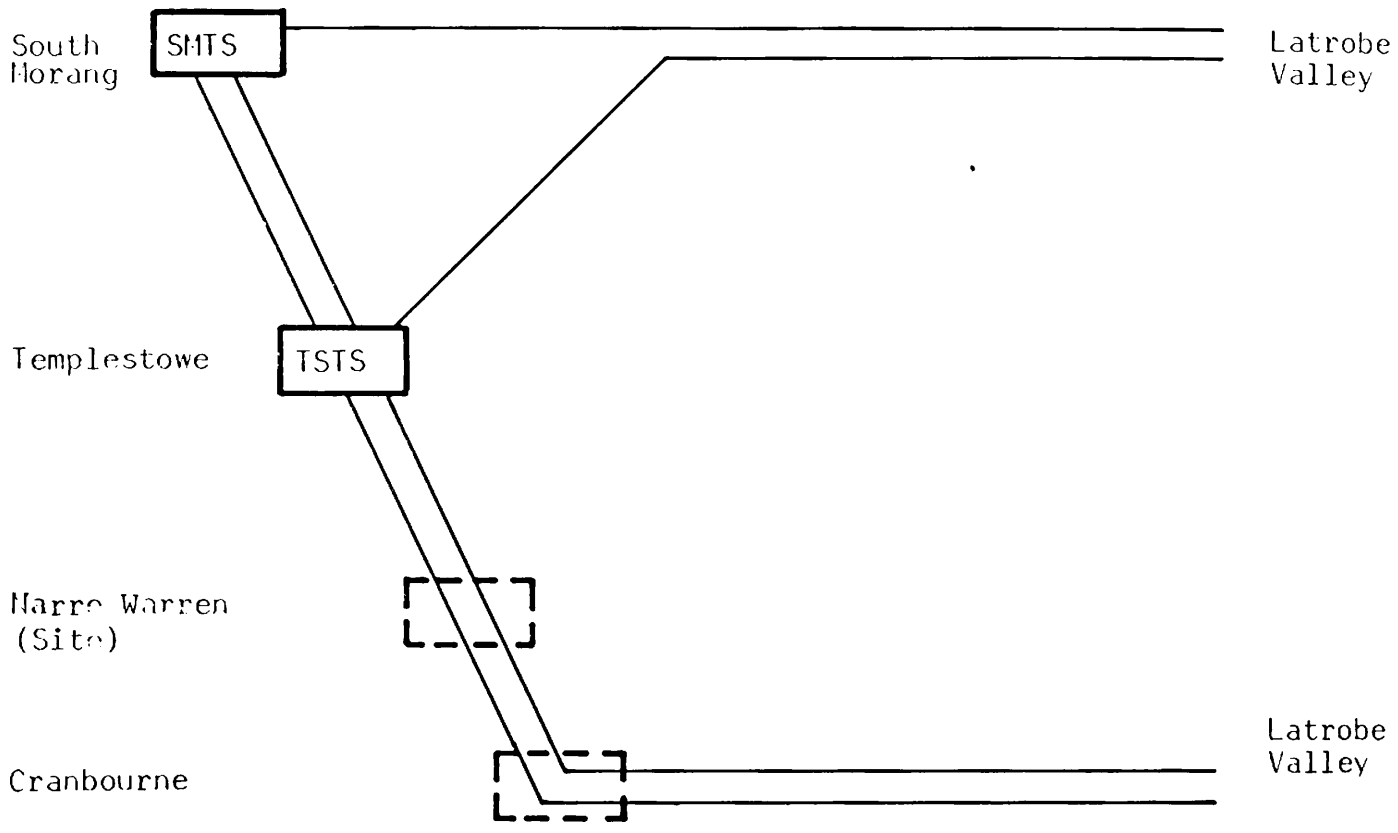
Figure 3.3

Undergrounding

- 3.17 Any of the foregoing options for establishing the fourth 500 000 volt line could be accomplished by underground cable connections.
- 3.18 The SEC estimates the Coldstream to South Morang connection would cost some \$133 million to underground; to underground the Coldstream to Donnybrook line would cost some \$224 million; and undergrounding of the Templestowe to Keilor option would cost around \$166 million. These costs are for minimum rating connections only and to bring the capacity up to the full rating of the equivalent connected overhead lines the SEC estimates that these costs would almost double.

The Development of Templestowe and Coldstream Terminal Stations

- 3.19 It would be possible to establish a terminal station to switch the 500 000 volt lines at Templestowe and the fourth line could be terminated here. Figure 3.3 illustrates the connections. This arrangement has the advantage that it diversifies some switching away from South Morang, but it has a very serious drawback. If one of the lines between Templestowe and South Morang were to be taken out of service for maintenance, failure of the remaining circuit between Templestowe and South Morang would leave three Latrobe Valley 500 000 volt lines disconnected from the metropolitan load centre.
- 3.20 To overcome this problem, it would be necessary to simultaneously develop switching at the Coldstream Terminal Station site. This arrangement as discussed in Section 3.4 of the SEC November 1982 Submission, and shown in Figure 3.4 diversifies switching away from both South Morang and Templestowe. With three short lines into South Morang from Templestowe and Coldstream, loss of any two lines will not result in isolation of Latrobe Valley lines from the load centre. One circuit would remain, a tenuous connection, but nonetheless capable of carrying the load because of its relatively short length.



TERMINATION OF FOURTH 500 000 VOLT
TRANSMISSION LINE AT TEMPLESTOWE

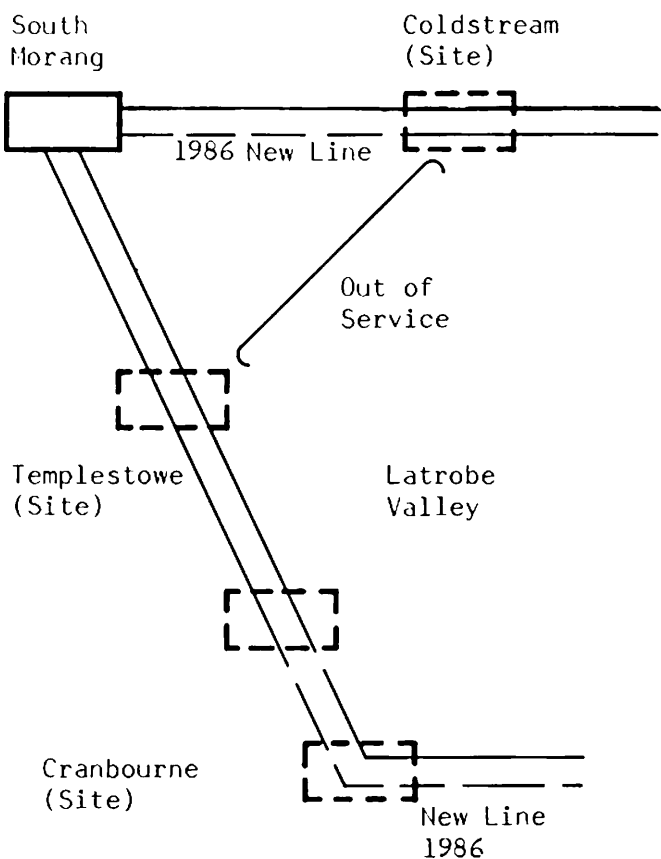
Figure 3.4

- 3.21 With the foregoing terminal station arrangement, which would cost around \$24 million, it would be possible to defer the \$11 million Coldstream to South Morang line by about three to four years to coincide with service of the first Loy Yang B Station unit.
- 3.22 This option can do no more than just delay requirement for the line.
- 3.23 One of the alternatives for later connecting the fifth Latrobe Valley 500 000 volt line to the metropolitan load centre, is to establish Coldstream and Templestowe Terminal Stations and terminate the line at Coldstream. By this time it would be essential to have the second Coldstream to South Morang 500 000 volt line in service. Figure 3.5 illustrates the connections.
- 3.24 If the SEC proposal for the 1986 connection of Coldstream and South Morang were adopted the Coldstream and Templestowe Terminal Stations would be needed in about 1991 if the fifth 500 000 volt Latrobe Valley to Melbourne line were erected on the northern easement.
- 3.25 Conversely, if the Coldstream and Templestowe Terminal Stations were developed in 1986, the Coldstream to South Morang 500 000 volt line would be needed by about 1989 to 1990 to maintain adequate transmission capability, with the fifth line following within a year or two and terminating at Coldstream.

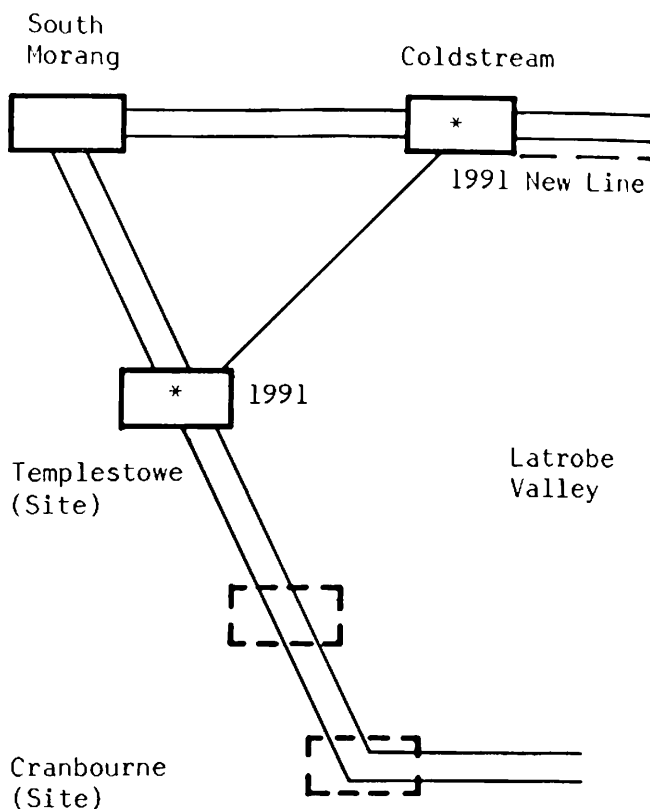
Development of the Narre Warren Terminal Station

- 3.26 It might be thought that another way of terminating the fourth 500 000 volt Latrobe Valley to Melbourne line would be the early establishment of a further 500 000/220 000 volt transformation point to the east of Melbourne.

FOURTH 500 000 VOLT TRANSMISSION LINE

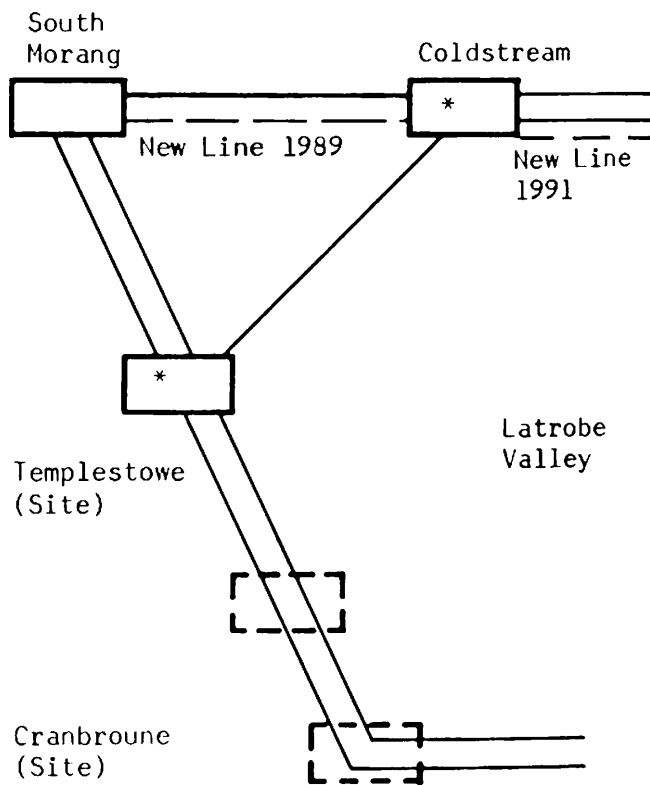
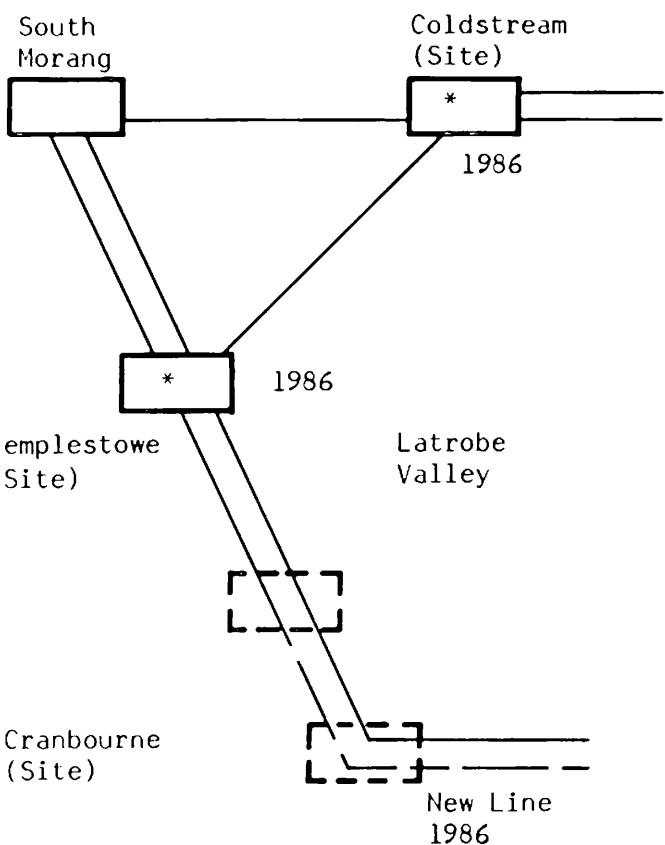


FIFTH 500 000 VOLT TRANSMISSION LINE



(a) SECV Proposal.

* Switching Station.



(b) Early Establishment of Coldstream and Templestowe.

* Switching Station.

FIGURE 3.5: TRANSMISSION LINE & TERMINAL STATION ARRANGEMENTS FOR FOURTH & FIFTH 500 000 VOLT TRANSMISSION LINES FROM LATROBE VALLEY

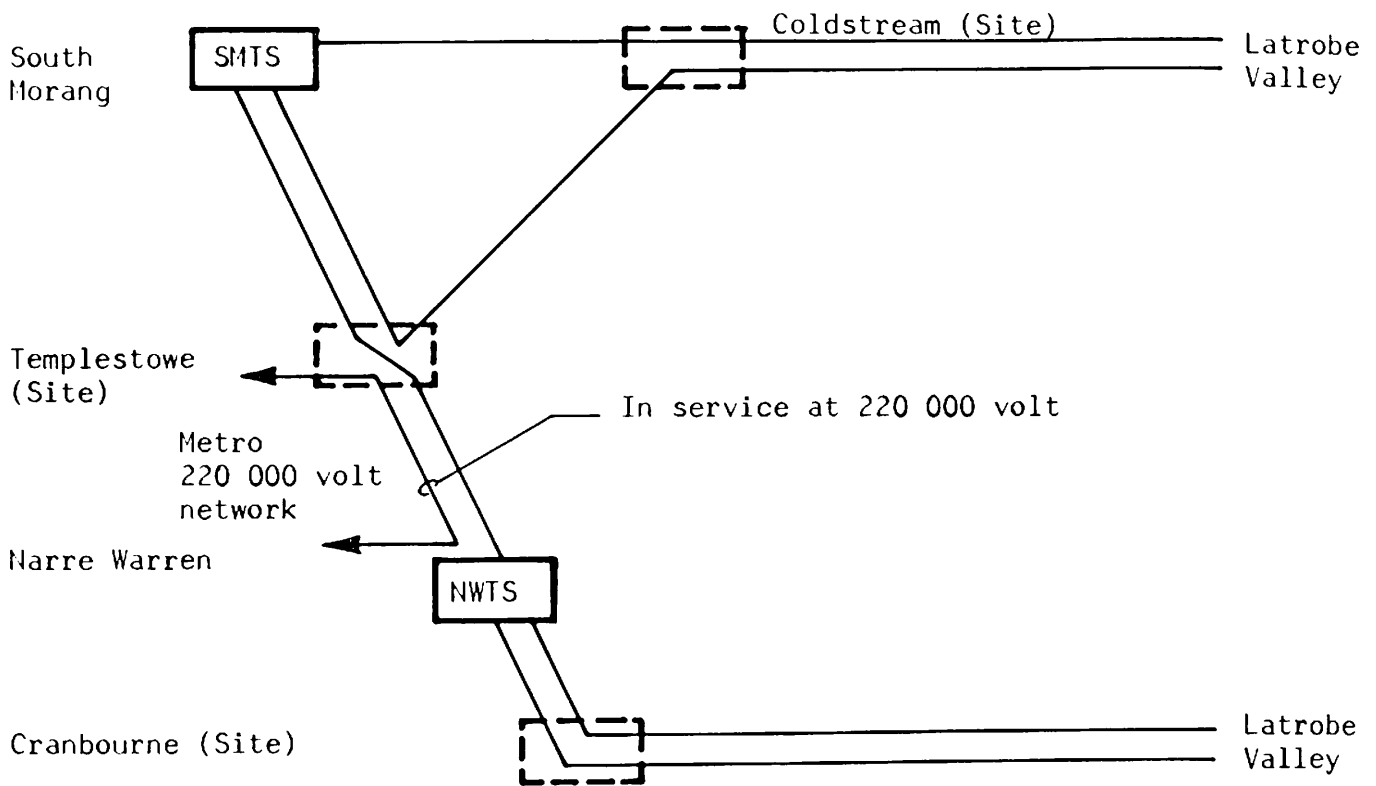
- 3.27 The timing of the next transformation point will of course depend on load growth, but it will almost inevitably be located to the east of Melbourne at Narre Warren. However, because of the strong 220 000 volt transmission system from the Latrobe Valley to Rowville, development of Narre Warren is not required before the early 1990s.
- 3.28 It would be possible to advance development of this transformation point, and to terminate the fourth 500 000 volt line at the Narre Warren Terminal Station (NWTs). However, this would leave only a single 500 000 volt connection from Narre Warren to South Morang and the system would be insecure against failure of this circuit (refer to Figure 3.6). Moreover, the minimum development of Narre Warren as a transformation point would cost around \$35 million and there would be the further cost of rearranging the 220 000 volt transmission lines into Rowville.
- 3.29 It is not, therefore, an effective alternative to the requirement for the Coldstream to South Morang line to allow termination of the fourth line at Narre Warren (refer to Figure 3.7).

Summary of the SEC Case

- 3.30 In summary, the completion of the 500 000 volt line from Coldstream to South Morang forms an integral part of the strategy for terminating the 500 000 volt lines from the Latrobe Valley. Connection of this line will be required in the long term even if other alternatives are implemented in the short term to avoid an immediate commitment to construction of this line.

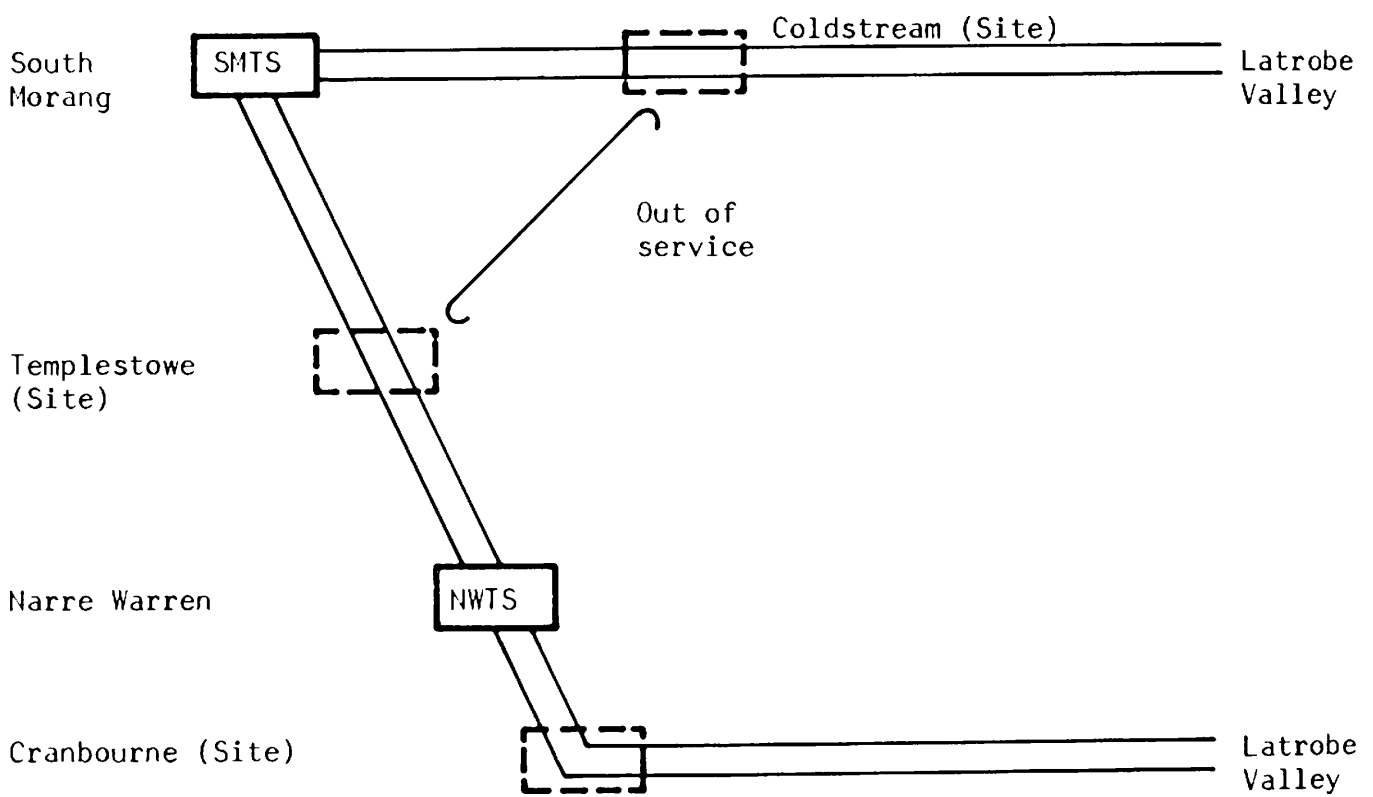
SUBMISSIONS AND EVIDENCE FROM OTHERS ON ALTERNATIVE ROUTES

- 3.31 A letter from the Minister of Conservation to Mr E.C. Stokes, Acting Chief Engineer of Transmission Development at the SEC, was produced as evidence by the Ministry for Conservation at the public hearing on 26 April 1983 (Appendix 5).



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE AT NARRE WARREN TRANSFORMATION STATION

Figure 3.6



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE AT SOUTH MORANG AND TRANSFORMATION AT NARRE WARREN

Figure 3.7

This letter requested that the SEC examine alternative routes and the environmental effects of the Coldstream Terminal Station in an Environment Effects Statement. Similar statements were made in submissions and evidence by the following:

- Upper Yarra Valley and Dandenong Ranges Authority
- Mr. R.F. English
- Shire of Healesville
- Bend of Islands Conservation Association
- Conservation Council of Victoria

3.32 During the course of evidence being given to the Committee the following emerged :

- . Mrs. J. Mattiske representing the Bend of Islands Conservation Association indicated her Association's concern regarding the impact of the proposed line on the ecology of the recently created Environment Living Zone at the Bend of Islands and in particular on the billabongs of the Yarra River in the Conservation Zone. The Association was concerned about the proposed route, the procedures to be adopted in finalising the route and the method of construction of the line, but had not given consideration to alternative routes.
- . Mr. P Machin, Shire Engineer of the Shire of Healesville indicated his Council's concern regarding the impact of the line on the Environmental Living Zone and that his Council supported the need for an Environment Effects Statement to examine the optional routes and conditions that should be applied to the construction of the line. Mr. Machin indicated that if there were no existing transmission lines along the proposed route, his Council would strongly oppose the proposed line. However, as a transmission line and easement already existed he believed that if, on economic grounds, it was prudent to place a second transmission line along the easement, his Council would not oppose the proposal. His Council would, however, be highly concerned to ensure that adequate conditions were applied as a condition of approval of the construction of the line.

Mr. G.N. Prattley, Director of the Upper Yarra Valley and Dandenong Ranges Authority indicated that of the alternatives put forward by the SEC, only the preferred route and the alternative option LV2 would have an impact within the area covered by his Authority. He made the following statement (at p. 124 of the Minutes of Evidence):

"I think it is fair to say that, potentially, the northern route to Donnybrook (LV2) would have made a major impact and require a further crossing of the Yarra River. It would involve further lining of the Christmas Hills escarpment and run close to the vicinity of the King Lake National Park. At that superficial level it is the view of the Authority that the alternative (LV2) would have a greater impact than the duplication of the existing lines"

Mr. Prattley went on to voice his concern for the impact of the line on the Environmental Living Zone and supported the need for an Environment Effects Statement.

Mr. English, a resident of the Bend of Islands Environmental Living Zone, has a house and property immediately adjacent to the proposed transmission line easement. Apart from expressing doubt that a need has been established for the line, which has been dealt with earlier in this Report, Mr. English was concerned that the alternatives put forward by the SEC were not options in the mind of the SEC.

Mr. English was concerned about the effect on people and animals caused by high frequency radiation which he believed might be emitted by the power lines. He also mentioned the possibility of other electrical effects and cited these potential electrical effects as being a good reason for undergrounding the line.

Mr. English questioned the advisability of having two transmission lines within the one easement. He felt that the potential for loss of both lines simultaneously was increased in the event of a bush fire or extreme wind storm, and that the Environmental Living Zone was a high fire risk area.

As mentioned in Paragraph 2.22 of this report, the Committee agreed to further questions by Mr. English being raised in writing with the SEC. This correspondence is attached to this report as Appendices 1,2,3 and 4.

Mr. English raised two alternative options; the first was to replace the 220 000 volt Latrobe Valley to Rowville transmission lines by 500 000 volt lines; the second was to modify the SEC route LV3 so that it went from Templestowe to South Morang (instead of Keilor) via upgraded 220 000 volt transmission lines.

The SEC's reply to the first alternative was that with present and predicted loading on the system, it would not be possible to take a 220 000 volt double circuit line out of service for an extended period until additional 500 000 volt transmission capacity and both 220 000/500 000 volt and 500 000/220 000 volt transformation capacity had been installed. It was planned that this should happen at some time in the future: However, premature conversion of these lines would lead to considerable additional capital expenditure at an earlier date than was absolutely essential.

The SEC's reply to the second alternative was that the cost of this alternative would be \$21 million compared with \$11 million for the proposed route LV1. There would also be very considerable difficulty in finding an easement between Thomastown and South Morang.

In a final letter (Appendix 4) Mr. English indicated that he was still not satisfied with the basis of the SEC's planning and that he would prefer the adoption of alternatives which would avoid the construction of the proposed line between Coldstream and South Morang. He believed that the long term advances in technology would allow the existing overhead line through the Environmental Living Zone to be replaced by an underground line.

Mr. English suggested that the Committee should obtain independent advice on the costing of alternatives and that the Committee should investigate ways and means of having the SEC's long term planning improved and a proper energy conservation program introduced into their planning approach.

- 3.33 All the municipalities, through which the proposed line would pass, expressed support for the selection of the SEC preferred route LV1 in preference to option LV2.

DISCUSSION

Cost of alternatives

- 3.34 The evidence put forward by the SEC clearly indicates that the SEC proposal for the routing and termination of the fourth 500 000 volt transmission line from the Latrobe Valley to Melbourne including the reconnection of existing transmission lines, is the most economic of all the alternatives put before the Committee.

Security of alternatives

- 3.35 Options LV2 and LV3 provide advantages of diversification of termination points for the four 500 000 volt lines from the Latrobe Valley to Melbourne. The preferred option LV1 results in all four lines originating from the Hazelwood Terminal Station and terminating at the South Morang Terminal Station. In addition the supplies from the Victorian Hydro Stations and from the Snowy River Hydro Electric System also terminate at the South Morang Terminal Station.
- 3.36 At the present time, approximately 1 700 MW are transmitted from the Latrobe Valley at 220 000 volts via the central easements to Rowville

and 500 MW can be generated at Newport Power Station. Thus not all the power supplies to Melbourne pass through the South Morang Terminal Station.

- 3.37 The terminal stations at Hazelwood and South Morang are constructed and laid out in such a way that the majority of possible faults or incidents in the terminal stations can be overcome or bypassed in a very short period of time. The interconnection of the two terminal stations by four transmission lines over two widely separated easements provides a high degree of reliability in the actual interconnection. In the longer term the Committee considers that the terminal networks in the Latrobe Valley and in the outer metropolitan area should be designed so that a major disaster at South Morang or Hazelwood Terminal Stations will not totally disrupt the metropolitan power supply system. The Committee considers that the most appropriate time for the terminal networks to be formally reviewed would be coincident with the review of the proposed fifth 500 000 volt line from the Latrobe Valley to Melbourne foreshadowed by the SEC in their Submission. (See 2.35)

Environmental Impact of Alternatives

- 3.38 Of the three initial options put forward by the SEC, (LV1, LV2 and LV3) the preferred route (LV1), and route (LV3) have the least environmental impact. Route (LV1) follows an easement which already has an identical 500 000 volt transmission line running along it. Route LV3 follows an existing easement occupied by two double circuit 220 000 volt transmission lines, the new 500 000 volt transmission line could replace one of the existing 220 000 volt lines and the other 220 000 volt line could be updated.
- 3.39 The easement for the preferred route (LV1) passes through sensitive areas in the Bend of Islands Environmental Living Zone and considerable care will have to be taken with the design and construction of the line.
- 3.40 As was pointed out by Mr. Prattley of the Upper Yarra Valley and Dandenong Ranges Authority, route LV2 could involve a further crossing of the Yarra River, a further line cutting across the Christmas Hill

escarpment and the line might also pass close to the Kinglake National Park. However, route LV2 has not been defined by the SEC other than in a conceptual sense. It would be quite feasible for this route to pass along the easement proposed for LVI and then to diverge as it approached the South Morang Terminal Station, by-passing the Terminal Station and continuing on to Donnybrook.

- 3.41 Likewise, construction of the LV3 alternative could be achieved by construction of the LVI line and utilising the existing Templestowe to South Morang line freed by the construction of the LVI line to by-pass South Morang and continue on to the Keilor Terminal Station.
- 3.42 Both the options for routing just identified would minimise the costs of the LV2 and LV3 options but in both cases the environmental effects would be greater than in the case of LVI, because of the additional lengths of line from South Morang to Donnybrook or Keilor.
- 3.43 The other alternatives put forward by the SEC which involve the early development of terminal stations at Coldstream, Templestowe or Narre Warren might delay the requirement for the transmission line between Coldstream and South Morang at some considerable additional economic cost.
- 3.44 The various alternatives raised by Mr. English in Appendices 1 and 4 which might avoid or delay the construction of the Coldstream to South Morang Line, would result in considerable cost penalties being incurred if they were adopted at this stage of the transmission system development.

CONCLUSIONS

- 3.45 The Committee concludes that:
- (i) The arrangements proposed by the SEC for routing and terminating of the fourth 500 000 volt transmission line from the Latrobe Valley to the outer Melbourne Metropolitan Area,

(including the reconnection of existing transmission lines) would appear on balance to be the most favourable of the alternatives for reasons of cost, security of supply to the outer metropolitan area and potential environmental impact;

- (ii) The undergrounding of part or all of this transmission line cannot be economically justified; and
- (iii) As the effects of radiation associated with electrical fields were adequately addressed in the Portland Transmission Line Inquiry this aspect does not require further reporting or investigation at this time.

RECOMMENDATIONS

- 3.46
- (i) The feasible route to be subjected to detailed examination of environmental issues should be that proposed by the SEC running along the same easement as the existing line from Hazelwood to South Morang between Coldstream and South Morang (route LV1).
 - (ii) The Environment Effects Statement to be prepared on the proposed Coldstream to South Morang line at the request of the Minister for Conservation should examine in detail the environmental effects of the SEC proposed Coldstream to South Morang 500 000 volt transmission line. The Statement should also examine in principle only, the relative environmental impact of alternative transmission lines discussed in this Report.

CHAPTER FOUR

ALTERNATIVE PROCESSES FOR OBTAINING PLANNING APPROVAL TO CONSTRUCT THE LINE FROM COLDSTREAM TO SOUTH MORANG

THE CASE PUT FORWARD BY THE SEC

4.1 Suggested alternative processes that could be adopted to give approval for construction of the Coldstream to South Morang line are outlined in the following paragraphs:

- On the basis of the line being constructed adjacent to the existing line and in the existing easement.
- On the basis of the line being constructed on an alternative route.

Construction adjacent to the existing line within the existing easement

4.2 Easement provision was made at the time the first 500 000 volt line was established between Coldstream and South Morang in 1969 for a second line to be constructed adjacent to the first line. Responsible authorities and landowners were made aware of this provision so that planning in the areas affected could take account of the ultimate development. The route of the line in the Eltham area was subject to a public hearing conducted by the Town and Country Planning Board.

4.3 To construct the second line in the easement, it is necessary to obtain planning approval. In the past, this would have been achieved using the established planning procedures with application for permit being made to the responsible authorities along the route.

- 4.4 The responsible authorities in this case are the various Shire Councils, the Melbourne and Metropolitan Board of Works and the Upper Yarra Valley and Dandenong Ranges Authority, as listed in Figure 4.1.
- 4.5 This list also indicates the planning zones through which the proposed line would pass. It should be noted that planning scheme amendments will be required for the proposed line in the Shire of Healesville, Stream Reserve, Environmental Living and Conservation Zones before permits could be issued.
- 4.6 Public involvement is provided for, through the requirements of the planning procedures.
- 4.7 In addition to the formal procedures, it has been the SEC's practice to hold discussions with councils and council officers, to inform landowners affected by the proposals and to comply with any council requirements for informing ratepayers in their municipalities.
- 4.8 The steps in the procedure which would apply if the SEC traditional processes were followed, are to:
- (i) Discuss the proposal with the Ministry for Conservation for its assessment on the need for an Environment Effects Statement;
 - (ii) Discuss the proposal with the Melbourne and Metropolitan Board of Works, Upper Yarra Valley and Dandenong Ranges Authority (if appropriate) Shire Engineers and determine any special considerations requiring attention in the application for permit;
 - (iii) Address meetings of Councils to explain proposals;
 - (iv) Apply to the Melbourne and Metropolitan Board of Works and each Shire Council for permits and issue of Environmental Effects Statement (if required);

PLANNING SCHEME ZONES
 FOR PROPOSED 500 000 VOLT TRANSMISSION LINE
 COLDSTREAM TO SOUTH MORANG

FIGURE 4.1

| | Within MMBW Planning Boundary | | | Within Upper Yarra Valley and Dandenong Ranges Authority | |
|---|-------------------------------|-------------------------|-----------------|--|--------------------|
| | Shire of Whittlesea | Shire of Diamond Valley | Shire of Eltham | Shire of Healesville | Shire of Lillydale |
| Reserved Light Industrial | X | | | | |
| Corridor A | X | X | | | |
| Conservation A | X | X | | | |
| Existing Public Open Space | X | | | | |
| Landscape Interest A | | X | X | | |
| Public Purposes Lilydale Sewerage Authority | | | | | X |
| Reserved Living | | X | | | |
| Extractive Industry | | | | | X |
| Stream Reserve | | | | X | |
| Extractive Ind Buffer Zone | | | | | X |
| Public Purposes MMBW | | | | X | |
| Rural Zone | | | | | X |
| Environmental Living | | | | X | |
| Conservation | | | | X | |
| General Farming 1 | | | | | X |
| General Farming 2 | | | | | X |

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- (v) Inform the public and affected landowners of proposal and conduct any additional public information sessions, such as public meetings, as required by the Shires;
- (vi) Receive a Notice of Determination issued by the responsible authorities;
- (vii) Follow the planning appeals procedure if appeals are received; and
- (viii) Issue permits depending on outcome of appeals.

4.9 This procedure is set out diagrammatically in Figure 4.2 and is essentially a process which utilises the existing planning procedures, whereby the SEC would apply for approval to construct the line from each of the responsible authorities.

4.10 An alternative process was indicated in the Minister for Conservation's letter (Appendix 5) in this case. The Minister suggested that:

- (i) The SEC would prepare and issue the Environment Effects Statement on the proposal for public comment; and
- (ii) The Minister for Planning and Conservation would establish an independent panel under the provisions of the Environmental Effect Act 1978 and the Town and Country Planning Act 1961 to receive submissions, conduct public hearings and make a recommendation to the Minister for Planning and Conservation on any special measure required in the design, construction and provision for maintenance of the line to protect the environment.

COLDSTREAM TO SOUTH MORANG 500 000 VOLT LINE

POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL USING EXISTING PLANNING PROCEDURES

| | |
|--|--|
| INVESTIGATION OF IMPACT ON ENVIRONMENT, PUBLIC LANDOWNERS | SEC in consultation with - <ul style="list-style-type: none"> . Responsible planning authorities . Ministry for Conservation . Public authorities . Community groups . Landowners |
| PREPARATION OF EES | SEC in consultation with Ministry for Conservation |
| EES ISSUED FOR PUBLIC COMMENT | SEC in consultation with Ministry for Conservation |
| APPLICATION TO RESPONSIBLE AUTHORITIES FOR PERMIT | SEC |
| ADVERTISEMENT AND DISCUSSION ON PROPOSAL AS REQUIRED BY INDIVIDUAL RESPONSIBLE AUTHORITIES | SEC |
| ANALYSIS OF PUBLIC COMMENT ON EES | SEC and Ministry for Conservation |
| ASSESSMENT OF ENVIRONMENTAL EFFECTS | Minister for Conservation |
| DEVELOPMENT OF CONDITIONS ON PERMIT | Individual responsible authorities in consultation with SEC and Ministry for Conservation |
| NOTICE OF DETERMINATION | |
| APPEAL HEARINGS (IF OBJECTIONS RECEIVED) | |

- 4.11 The Minister for Planning and Conservation would then recommend to the Governor in Council that the line be exempt from further planning procedures under section 35(d) of the Town and Country Planning Act 1961. This procedure is set out diagrammatically in Figure 4.3.
- 4.12 Both processes allow a similar level of public participation; however, the second process provides a more co-ordinated approach to the consideration of the whole route. As the route passes through five Shires and is covered in an overall planning sense by the MMBW and the Upper Yarra Valley and Dandenong Ranges Authority, the normal planning process would require individual negotiations with each of these bodies and could involve protracted discussion on permit conditions and a planning scheme amendment in the Shire of Healesville and hearings on planning scheme amendment submissions by an independent panel, and be further complicated by appeals and hearings by the Planning Appeals Board.

Construction of the proposed line on a new route

- 4.13 To construct the line on a new route would require the establishment of a new easement with the associated environmental analysis and public inquiry to determine a suitable route.

This procedure would be identical to that set out in Figure 4.3.

COLDSTREAM TO SOUTH MORANG 500 000 VOLT LINE

POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL
USING INDEPENDENT PANEL

INVESTIGATION OF IMPACT
ON ENVIRONMENT, PUBLIC
LANDOWNERS

SEC in consultation with -

- . Responsible planning authorities
- . Ministry for Conservation
- . Public authorities
- . Community groups
- . Landowners

PREPARATION OF EES

SEC in consultation with
Ministry for Conservation

EES ISSUED FOR
PUBLIC COMMENT

SEC in consultation with
Ministry for Conservation

INDEPENDENT PANEL ESTABLISHED
UNDER EE ACT AND T&CP ACT

Minister for Conservation
and Planning

PUBLIC INFORMATION
AND DISCUSSION

SEC in consultation with -

- . Responsible planning authorities
- . Ministry for Conservation
- . Public authorities
- . Community groups
- . Landowners

ANALYSIS OF COMMENT AND REVIEW
OF PROPOSAL

SEC and Ministry for Conservation

SEC SUBMISSION TO PANEL RELEASED

PANEL HEARING

PANEL RECOMMENDATION TO MINISTER

MINISTER FOR PLANNING RECOMMENDS TO
GOVERNOR IN COUNCIL THAT PROPOSAL
BE EXEMPT FROM FURTHER PLANNING
PROCEDURES

Procedure for approval of the section of the
fourth 500 000 volt transmission line between
Hazelwood and Narre Warren

- 4.14 Evidence was provided by the SEC which detailed the approval processes already followed, or to be followed, for the Hazelwood to Narre Warren section of the fourth 500 000 volt transmission line between the Latrobe Valley and the outer Melbourne Metropolitan area. This evidence will be considered in the final report of the Committee in relation to the overall terms of reference.

SUBMISSIONS AND EVIDENCE FROM OTHERS
ON ALTERNATIVE PROCESSES FOR PLANNING APPROVAL.

- 4.15 Written submission were made by the following on the possible processes for planning approval for the proposed transmission line.

Ministry for Conservation
Upper Yarra Valley and Dandenong Ranges Authority
Shire of Eltham
Shire of Healesville
Shire of Lillydale
Shire of Whittlesea
Conservation Council of Victoria
Bend of Islands Conservation Association

- 4.16 In addition, Mrs. J. Mattiske from the Bend of Islands Conservation Association; Mr. G.N. Prattley, Director of the Upper Yarra Valley and Dandenong Ranges Authority; Mr. P. Machin, Shire Engineer of the Shire of Healesville; and Mr. I. Cowdell, Assessment Officer from the Ministry for Conservation gave evidence on this matter. All those who gave evidence agreed that an Environment Effects Statement was necessary and that it would be desirable to have a single inquiry looking at planning approval for the whole line.

- 4.17 The question of the use of section 35(d) of the Town and Country Planning Act 1961 was discussed in some detail with Mr. Prattley who indicated that, in his opinion, the Regional Strategy Plan was prepared under the separate legislation of the Upper Yarra Valley and Dandenong Ranges Authority Act 1976 and therefore the powers of the Governor in Council provided in section 35(d) of the Town and Country Planning Act, to exempt certain works from planning controls on the recommendation of the Minister for Planning, did not apply to the Regional Strategy Plan. Mr. Prattley indicated however, that the preface to the Regional Plan states that the Authority recognises the process whereby proposals such as those for major utility installations are subject to oversight by Parliamentary Committees or the State Co-ordination Council.
- 4.18 Mr. Prattley went on to agree that should an independent panel be appointed to make recommendations to the Minister for Planning, the Authority would accept this approach, provided that the Authority had the opportunity to make a submission to the panel.
- 4.19 Mr. Machin, Shire Engineer from the Shire of Healesville, expressed a personal comment that it would be more desirable to have a single panel review the proposed line, rather than allowing all the Councils to be involved in separate review processes, provided that the Governor in Council was able to specify conditions to be applied to the exemption relating to the construction of the line.
- 4.20 In a letter dated 17 March 1983, to the Committee the Shire of Lillydale made the following comments:

"In relation to planning methodology..... my Council wishes the maximum public involvement in a planning process so that those people affected by such installations (transmission lines and terminal stations) will have an opportunity to express their views to the appropriate tribunals."

The Shire also indicated that it would be gravely concerned if the large area of land acquired for the Coldstream Terminal Station which is at a significant point in the general landscape, were to be developed in ways other than those indicated by the SEC at this time .

- 4.21 In a letter dated 22 April 1983, the Shire of Eltham indicated that it had examined the two alternative approval processes set out by the SEC in its paper of March 1983 and advised that the Council re-affirmed its previous advice that it believes the SEC should apply to the Council for the relevant planning permit. The Council was not represented at the hearing on 26 April.
- 4.22 Mrs. Mattiske from the Bend of Islands Conservation Association indicated that her Association had discussed the alternative but had not expressed a preference for the approval process to be used. Mrs. Mattiske felt that the members generally would agree that an independent panel would both expedite the process and examine the problems in a better way. The Association had expressed a desire that an Environment Effects Statement be produced.
- 4.23 Mr. Cowdell from the Ministry for Conservation presented the letter from the Minister for Conservation to Mr Stokes of the SEC (Appendix 5) as evidence. The letter states:

"In commenting on the possible approval procedures put up by your Commission to the Natural Resources and Environment Committee, I would indicate that at this stage my preference is for assessment of the Environment Effects Statement by a panel appointed by me. The model for this is the Rosedale - Bairnsdale transmission line enquiry currently being examined by such a panel. A panel could have regard to planning matters, and my assessment would be provided to the Minister of Planning and other decision-makers after receipt of the panel's report.

I am hoping that the Natural Resources and Environment Committee will include in its recommendations an indication of the best method of catering for the requirements of all the responsible authorities involved in this exercise."

- 4.24 Mr. Cowdell also provided the Committee with information on the composition of the panel associated with the Rosedale to Bairnsdale Transmission Line Inquiry.

CONCLUSIONS

4.25 The Committee concludes that:

- (i) The normal planning approval processes would be unnecessarily complex and lengthy in the case of the proposed Coldstream to South Morang Transmission Line.
- (ii) The most appropriate procedure in this case, if and when, it has been determined that it is appropriate for a transmission Line to follow the proposed route between Coldstream and South Morang, would be for the Minister for Planning to request the Governor in Council to exempt the line from planning controls under section 35(d) of the Town and Country Planning Act 1961. This request would follow the preparation of an Environment Effects Statement by the SEC and the holding of a public inquiry by an independent panel appointed by the Minister for Conservation under Section 9 of the Environment Effects Act 1978.
- (iii) In view of the sensitive areas through which the proposed transmission line may pass it may be important that conditions be applied to the process of construction of the transmission line along the route eventually selected. These conditions could take the form of conditions upon which the Governor in Council agrees to exempt the transmission line from planning control or could be agreed between the Minister for Planning and the Minister for Minerals and Energy as a condition of the Minister for Planning applying to the Governor in Council for exemption of the transmission line from planning controls.
- (iv) It is unlikely that the Upper Yarra Valley and Dandenong Ranges Regional Strategy Plan will require any amendment to allow the transmission line to be constructed along the existing easement as the proposed inquiry procedure falls within the general intent of procedures set out in the Regional Strategy Plan for approval of major utility installations.

- (v) The Melbourne Metropolitan Planning Scheme falls under the ambit of the Town and Country Planning Act 1961 and use of section 35(d) of this Act would exempt the transmission line from the requirements of the Melbourne Metropolitan Planning Scheme.

RECOMMENDATIONS:

- 4.26 (i) An Environment Effects Statement (EES) should be prepared by the State Electricity Commission;
- (ii) The EES should be advertised and made available to the general public and in particular to landholders along the route of the proposed line. The advertisement should make clear the approval procedure which will be followed;
- (iii) The Minister for Conservation should appoint an independent panel in accordance with section 9 of the Environment Effects Act 1978, and should consider limiting the terms of reference of this panel so that matters already examined in this Report are not unnecessarily re-examined. The panel should be asked to recommend to the Minister for Planning whether or not the proposed line should be approved, and if so, what conditions, if any, should be applied to the construction of the line;
- (iv) On receipt of the independent panel's recommendations the Minister for Conservation should make his assessment as required by the Environment Effects Act 1978 and provide it to the Minister for Planning;
- (v) Having received the Minister for Conservation's assessment, and providing that approval of the proposed line has been recommended by the independent panel and agreed to by the Minister for Planning, the Minister should seek the formal

agreement of the Minister for Minerals and Energy and the State Electricity Commission, that the Commission will abide by conditions to be applied to the construction of the line as specified by him; and

- (vi) If such an agreement is obtained the Minister for Planning should apply to the Governor in Council for the construction of the transmission line to be exempt from planning control under section 35(d) of the Town and Country Planning Act 1961.

ACKNOWLEDGEMENTS

4.27 This is the first Report the Committee has had the honour to present to Parliament, and the supporting inquiry and deliberations have proved a most stimulating, demanding and rewarding exercise for all Committee Members.

This inquiry has also been characterised by a great deal of involvement by several Government Bodies, various municipalities, community groups and individuals and for this the Committee is most appreciative.

The Committee also thanks its staff for the work performed in the conduct of the inquiry and in assembling this Report.

Finally, the Committee thanks the Hansard staff for the reporting of the various public hearings.

Committee Room
2 June 1983

APPENDIX 1

Skyline Road
KANGAROO GROUND 3097

28 April 1983

The Secretary
Natural Resources & Environment Committee
Parliament House
MELBOURNE VIC 3000

Dear Sir

RE : COMMITTEE HEARING 26.4.83 RE
COLDSTREAM TO SOUTH MORANG 500KV LINE

In response to the S.E.C. submission to the hearing of the 26 April, would you please direct the following queries to the SEC. I appreciate the opportunity to pursue these questions through your Committee and trust that this will help expediate answers and enable your Committee to reach its deadlines.

1. Section 1.1

- (a) What is the cost of upgrading only one of the 220KV double circuit lines terminating at Rowville Terminal Station, to 500KV?
Cost of upgrading two of the 220KV lines?
Cost of upgrading the three of these 220KV lines to 500KV?
- (b) If the Latrobe Valley Brown coal power stations output is currently in excess of 75% of installed capacity for much of the year i.e. 3150MW, would this represent average daily demand at generators or peak demand at generators? What does "much of the year" refer to, over the past two years, where output is in excess of 75% of installed capacity. (i.e. for how many hours per month).

2. Section 1.2

On page 4. the present maximum generation in the Latrobe Valley is 3300MW. In the "Long Term Forecasts", maximum demand at generators in 1982 was 4600MW.

- (a) Therefore, is approximately 1300MW of peak demand supplied from other plant?
- (b) Have the forecast growth in maximum demand at generators been inflated in 1985/86 by approximately 250MW and 1987/88 by approximately 500MW to cater for the Alcoa Portland demand?

- (c) Does the S.E.C. have a definite committment to meet a demand of (ref. 2(b) above) 250MW in 1985/86 and 500MW in 1987/88 for the Portland smelter?
- (d) Is the daily peak, winter demand one of the reasons for the Latrobe Valley generation export level escalating to 5100MW by 1987/88?
- (e) Does the S.E.C. have any plans to either spread or decrease the heavy load that peak winter demands place on the system? If yes, what are the plans?

3. Section 1.3

- (a) Could you give details of failure of the 500KV lines over the past 12 months, showing the day and time and the time taken to get them back into service?
- (b) What demand at the generator can Newport, Richmond, MCC, Anglesea and the hydro supplies provide if a 500KV line fails?

4. Section 1.4

- (a) Can you explain how during construction works, one 500KV line temporarily taken out of service reduces the systems existing capacity by 1000MW?
- (b) Can you describe the extensive periods that a 500KV line would be taken out of service for reconnection?

Could you advise the approximate hours and for approximately how many days would be involved?

Do these periods have to coincide with the time the peak winter demand occurs?

5. Section 2.1

Comment on page 10. re the Coldstream to Templestowe line "to provide for later development of supply for the north-eastern metropolitan area". Does the S.E.C. expect a future growth in some sector of the N-E metro. area?

If yes, in what specific area? If further growth is expected does this mean the Templestowe Terminal Station will need eventual upgrading?

6. Section 2.5

- (a) If an Environmental Effects Statement is prepared in terms of Exhibit 5., will option LV3 - Templestowe to Keilor Line, be included in any study.
- (b) Has the upgrading of this 220KV line to 500KV been considered as a viable early alternative? This to be then followed by other options under LV3?
- (c) Is it possible to feed this 500KV line from Templestowe into ^anearer Terminal Station in the metropolitan area?
- (d) How long would the 220KV line be out of service and could these periods be planned to avoid peak demand periods?

7. Section 2.6

- (a) Are detailed costings available for undergrounding, say the Templestowe to Keilor option?
- (b) Is there a full research programme being undertaken by the S.E.C. to improve the technology for undergrounding high voltage transmission lines?

8. Exhibit 6.

- (a) Templestowe & Coldstream Terminal Stations. With the reference to one of the lines between Templestowe and South Morang being taken out of service for maintenance, is that maintenance likely to occur during a period of maximum peak demand or are these periods avoided?
- (b) Regarding the comment of the termination of the single 500KV line at Narre Warren, has the extension of this line by constructing an additional 500KV line to Templestowe from Narre Warren plus the upgrading of the Templestowe to South Morang 220KV line to 500KV, been considered, and what is the cost?

Thanking you for your consideration with these queries.

Yours faithfully



R.F. ENGLISH

APPENDIX 2

13 May 1983

COLDSTREAM TO SOUTH MORANG 500 000 VOLT TRANSMISSION LINE

RESPONSE TO QUESTIONS RAISED BY MR R F ENGLISH

Q1 (Section 1.1)

a We understand the intent of this question concerns upgrading of 220 000 volt double circuit current transmission lines to 500 000 volt to establish whether the fourth 500 000 volt transmission line could be constructed on the "central easement" from the Latrobe Valley to Melbourne. This easement is indicated in Figure 1.1 attached, extracted from the SEC Submission on the Coldstream to South Morang transmission line.

Planning for the transmission from the Latrobe Valley to Melbourne is based on integrated development of three easements, northern, central and southern, as indicated on Figure 1.1. This arrangement has been planned to ensure supply would not be unduly dependent on any single easement which could be interrupted by, for example, a bushfire. For this reason, the fourth 500 000 volt line has been planned to be developed on the southern easement to give a balanced easement loading.

The central easement has been planned to be ultimately redeveloped with 500 000 volt transmission lines to maximise the use of the existing easements. This will require demolition of the 220 000 volt transmission lines and replacement with new 500 000 volt towers. The 220 000 volt towers could not be converted to 500 000 volt operation. The 220 000 volt transmission lines presently transfer the Yallourn power station output and some power from Hazelwood and Jeeralang to Melbourne and each double circuit line carries about 600 MW. The central easement 220 000 volt transmission lines cannot be demolished until equivalent additional capacity is provided by 500 000 volt transmission.

Hence, the 500 000 volt transmission and the associated Coldstream to South Morang line has to be developed prior to any reuse of the central easement.

b This question concerns the role of Latrobe Valley plant in meeting system load in particular system peak load and whether the proposed transmission line is associated with these peaks.

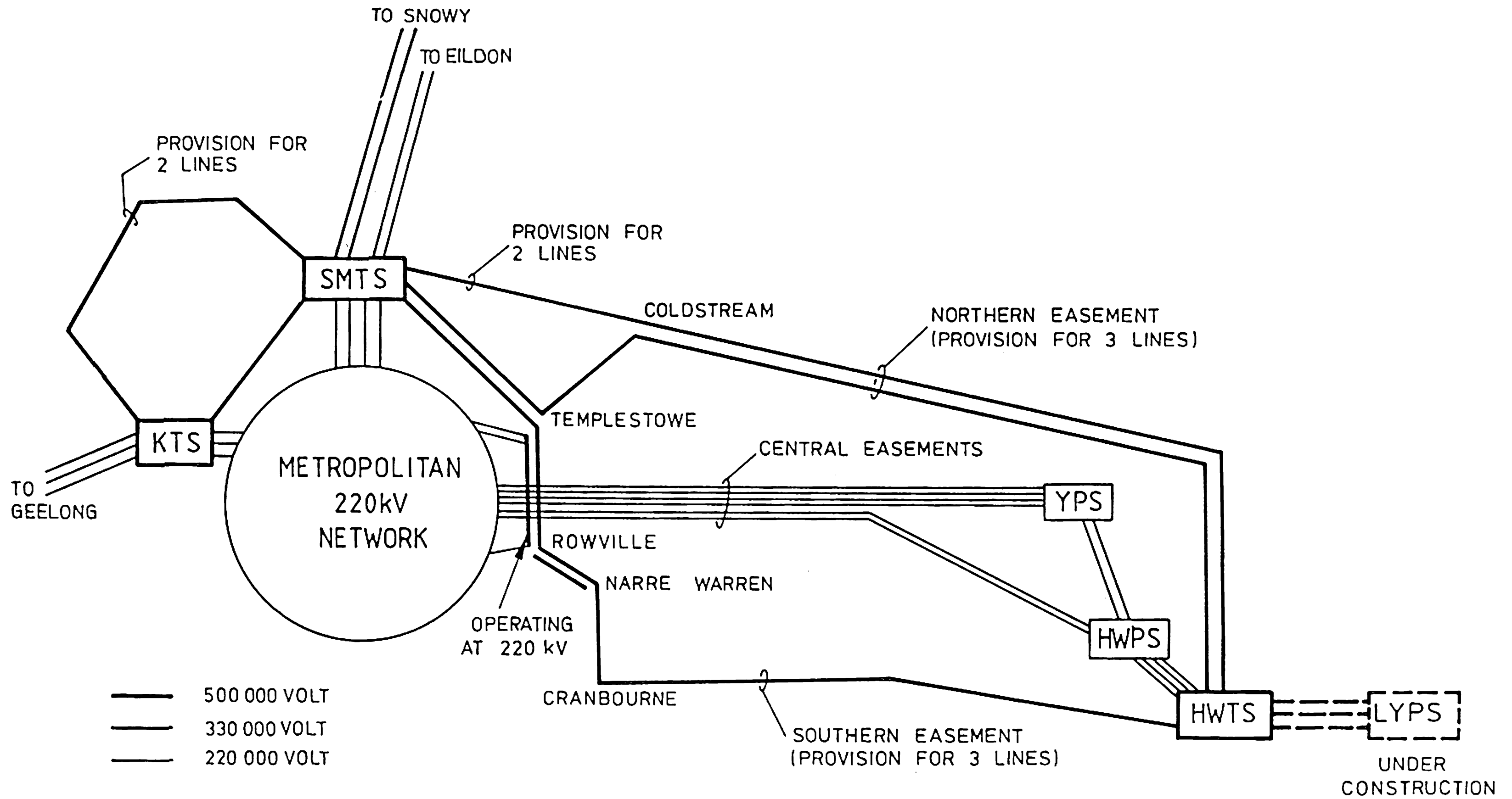


FIG 1.1

LATROBE VALLEY TO MELBOURNE TRANSMISSION - EXISTING

The Latrobe Valley power stations as indicated in the SEC Submission, generate at present 82% of State demand for electrical energy. These power stations therefore run at a sustained high output.

The output of the brown coal plant meets the overall system demand for energy and is not affected by the system peak demand. The peaks are met by operation of the 500 MW gas plant at Newport, 450 MW of Victorian hydro and draw from Snowy up to the entitlement of 1100 MW.

In 1981/82 an output of 3150 MW (75% of installed plant in the Latrobe Valley) was required for more than 75% of the time.

The planning for the Coldstream to South Morang section of the fourth line is based on these loading considerations.

Q2 (Section 1.2)

a As discussed in Section 1(b) peaking demand is met by -

- . gas stations;
- . Victorian hydro;
- . Snowy Mountains.

This generation is adequate to meet the peaking demand and is used within the constraints of available gas allocation, water storages and irrigation requirements.

Adequate reserve is available from the above plant to cover the normal expected outage of Latrobe Valley plant.

At the 1982 peak demand of 4618 MW, 3152 MW was provided from Latrobe Valley plant and 1466 MW was supplied from other sources on that particular day.

1300 MW is indicative of high load winter days and is a variable figure on any particular day, depending on system load and availability of Latrobe Valley generation plant. On this day of system peak load the Latrobe Valley output was of a similar level to the average Latrobe Valley output during the year.

b The SEC load forecasts indicated in "1982-1997 Long Term Electricity Forecasts" includes provision for supply to Alcoa at Portland of 250 MW in 1985/86 and a further 250 MW in 1987/88.

c The SEC has a contractual obligation to have provision for supply to Alcoa from October 1983.

d As explained in 1b Latrobe Valley brown coal plant is progressively installed to meet overall energy requirements and operates at a sustained high level. The level of Latrobe Valley brown coal generation basically does not change with the daily variation in demand and is essentially not affected by the system peak load.

e The SEC tariff policy for many years has included off peak rates as an incentive to reduce peak demands by transferring load to the periods of reduced demand where otherwise the brown coal plant would be under utilised. This approach has led to widespread use of off peak storage hot water systems, rather than instantaneous systems and it is intended to continue this policy. Typically, the average Victorian system load is 85% of the peak load on weekdays. This is a higher average loading than achieved on other mainland Australian States. Other possible methods of load management are kept under review.

Q3 (Section 1.3)

a The 500 000 volt transmission lines have been designed to be highly reliable in view of their importance to the system in transferring Latrobe Valley generation. In the 10 years since service, the lines have experienced an average of two failures per annum.

The outage times have averaged five hours with a maximum of two days.

The system must be operated within line loadings determined by the possibility of a line failure. If the system was operated beyond this capability, a line failure could cause loss of system stability leading to a cascade shutdown of total supply to Victoria and possibly parts of NSW.

b Reserve generation is held in Newport and the Hydro stations to enable the Latrobe Valley generation to be reduced following line outage to the system capability with a 500 000 volt transmission line outage to the system capability with a 500 000 volt transmission line out of service. This capacity is normally adequate for the 1000 MW reduction in capability. The supply to Alcoa can be partially interrupted for limited periods to assist in off loading the Latrobe Valley transmission until rescheduling can be completed. These measures have been taken into account in selecting the date for completion of the fourth line construction.

Richmond power station which used oil fuel has been retired and the MCC station, which has a very high operating cost is too small to provide effective standby. It is to be retired after the 1983 winter. Anglesea power station is operated continuously by Alcoa to meet their requirements at Pt Henry and is not available as standby.

Q4 (Section 1.4)

a The transmission system as discussed in 3a must be operated within its capability including provision for line failure to minimise the possibility of total shutdown due to loss of synchronism.

During line construction with one line out of service, the effective electrical coupling between the Latrobe Valley and the rest of the system is markedly reduced. Hence, the power transfer level at which the system could remain stable is reduced and in the present instance this reduction corresponds to 1000 MW

b A number of reconnections involving the existing 500 kV lines are required to connect the new Coldstream to South Morang line into the system and to connect existing line sections between South Morang, Templestowe, Rowville, Narre Warren and Cranbourne, to the proposed new line from Hazelwood.

To achieve the final arrangement approximately five outages of existing lines of up to 15 days duration each will be required with an approximate total time of 8 weeks.

The work for each of the outages will be planned to co-ordinate as far as possible with system loading and generation availability requirements to avoid the possibility of security risks to the system due to loss of transmission capacity and/or the need for extended operation of uneconomic generation.

Q5 Section 2.1

The SEC has made provision for load development in Templestowe-Doncaster and surrounding areas. This provision consists of space on the Templestowe terminal station site for 500 000 volt switching and transformation and provision for development of Doncaster terminal station with 220 000 volt switching and transformation. The load growth in these areas is 3 to 5% per annum and is one of the highest load developments in the metropolitan area. There is no requirement to develop the Templestowe terminal station as a load supply point within the next 10 years on present indications.

Q6 Section 2.5

a The question of feasible options which should be subject to detailed environmental analysis is a matter which is expected to be decided by the Committee.

b The options included in the SEC Submission are all viable. The complications involved with LV3 of rebuilding the existing lines was mentioned on the SEC Submission and included in the cost estimates. The 220 000 volt lines cannot be upgraded to 500 000 volt. The option would involve demolition of the existing lines, and erection of a new 500 000 volt transmission line and a new 220 000 volt transmission line.

c The 500 000 volt line from Templestowe in Option LV3 could not be terminated at a station nearer to Templestowe than Keilor, i.e. South Morang as there is no available easement.

d Reconstruction of such 220 000 volt lines require successive outages for over a total period of possibly 12 months, taking into account the level Latrobe Valley generation at any particular time.

Q7 Section 2.6

a Costings for undergrounding of all options are included in the

SEC submission. For example for the Coldstream to South Morang line the cost for overhead is estimated at \$M11 and for underground at \$M133.

b The SEC is actively involved in development of techniques for undergrounding high voltage lines. Extensive undergrounding of 66 kV lines is used in the central business district and cable entries to stations has been utilised at 220 000 volt. A short section of the third and the proposed fourth 500 000 volt transmission utilises the latest technology of a SF6 duct or pipe to cross under other transmission lines.

The SEC keeps in constant contact with major manufacturers of high voltage cable and with other authorities utilising cable.

As indicated in the Commission submission the cost of underground cable is extremely high and manufacturers throughout the world are all seeking ways to minimise costs.

Q8 Exhibit 6

a In general, routine maintenance of major lines from the Latrobe Valley is scheduled for periods of reduced generation. However, as the Latrobe Valley plant is operated at sustained high levels to meet system energy demands, there is only limited flexibility for such maintenance consistent with keeping transmission costs to a minimum.

b The 220 000 volt connection from South Morang to Templestowe includes the 220 000 volt lines from South Morang to Thomastown.

These lines are currently heavily utilised to transfer Latrobe Valley and Snowy power to the metropolitan area and could not be removed from service without first constructing transmission to replace them. This would need to be on another easement.



State Electricity Commission of Victoria

Monash House 15 William Street Melbourne
Box 2765Y GPO Melbourne 3001
Telephone 6150433
Telex 31153
Cable & Telegraphic Address: Electrocom Melbourne

Our Reference
ht

1 June 1983

Mr R F English
Skyline Road
KANGAROO GROUND VIC 3097

Dear Mr English

In my letter of 16 May 1983, I provided answers to your questions (28 April 1983) regarding the development of the 500 kV supply to Melbourne. The answers set out details to give an understanding of the basis for the current planning.

The following specific information amplifies the previous answers and is provided in response to your request for specific details not included in the original reply:

QUESTION 1(a)

Replacement of each 220 000 volt double circuit line in the central easement with a 500 000 volt line would mean that 600 MW of power currently transferred to Melbourne by each line would need to be transported by the 500 000 volt network.

The elements in the rebuilding would be -

- . establishing additional transformation in the Latrobe Valley and metropolitan area to transfer power from Yallourn stations through the 500 000 volt network;
- . demolition of a 220 000 volt line;
- . construction of a 500 000 volt line.

In order to transfer 600 MW to the 500 000 volt network, 500 000/220 000 volt station developments would first be required in order to prevent unacceptable restrictions on Latrobe Valley power output following commissioning of the first LYPS unit. These developments would take at least three and a half years. That is, demolition could not commence until at least 1988 and construction of the line could not then be completed until at least 1989. The required date for the fourth 500 000 volt line for Loy Yang power is November 1986, and, therefore, reconstruction of a 220 000 volt line is not an alternative to the proposed fourth 500 000 volt line and the associated Coldstream to South Morang line.

The Commission does plan to replace the 220 kV transmission by 500 kV transmission in the longer term but the existing 220 kV transmission is a valuable asset and early replacement would have significant economic penalties.

For example, if at this time, replacement had been planned, the costs for establishing new 500/220 transformation in the Latrobe Valley and the metropolitan area for the first such 500 kV line and which would not otherwise be required for some ten years would be \$M40.

In addition to the cost of approximately \$M3 for demolishing the 220 kV line, for the first 220 kV line replacement, a further cost of \$M7 would be incurred to demolish and replace existing 66 000 volt lines (including 132 000 volt lines operating at 66 000 volt).

That is, notwithstanding the unacceptable service date, a total of approximately \$M50 would be required to be spent some ten years earlier than otherwise required to replace the first 220 kV double circuit line with a 500 kV line and the net effective increase in transmission capacity would only be 400-500 MW.

Construction of the fifth 500 kV line would then be required in advance of the planned date.

Some \$M13 would be required for 500/220 kV transformation not otherwise required for early replacement of each of the second and third 220 kV lines.

It is for these reasons that the SEC has not planned the replacement of the 220 kV transmission until a much later stage so that maximum utilisation can be made of existing 500 kV and 220 kV transmission resources.

QUESTION 3(a)

In view of the high reliability required for transmission lines supplying large blocks of load, failure statistics are normally quoted over extended periods of experience and the experience for any one year is unrepresentative. For the last twelve months one fault has occurred on the overhead 500 kV lines from the Latrobe Valley during normal service.

| | |
|-------------------|---------------------|
| Time: | 0931 hours |
| Date: | March 4, 1983 |
| Restoration Time: | 9 hours, 25 minutes |

This compares with the long term average experienced by the Commission previously indicated of two failures per annum, with a restoration time of five hours each.

QUESTION 7 (a)

Costing of underground options is based on the average rates per kilometre for undergrounding a 500 kV line in the metropolitan area as given in Table 4.1 of the November 1982 Report.

These costs are based on SEC knowledge of the world market for 500 kV cable supply and installation.

For the Templestowe to Keilor option, the costing was based on the total of cable supply and installation for a distance of about 32 km costing \$M166 as indicated in the Figure 3.2 of the November 1982 Report. The cost elements comprise approximately 56% for the supply of cable, 14% for trenching and laying, 20% for jointing and terminations and 10% for reactive compensation and station works.

QUESTION 8(b)

Connection of the fourth 500 000 volt line to the metropolitan network by a 500 000 volt line from Narre Warren to South Morang via Templestowe would entail -

- . use of the 500 000 volt line section from Narre Warren to Templestowe currently operating at 220 000 volt (as planned for the SEC proposal);
- . replacement of the two 220 000 volt lines from Templestowe to Thomastown by one higher rated line and construction of a 500 000 volt line on the easement released;
- . construction of a 500 000 volt line from Thomastown to South Morang. The existing 220 000 volt lines could not be demolished at this stage due to their continued high loading. The acquiring of new easement for 500 000 volt transmission in the Thomastown to South Morang area was considered impractical by the SEC.

The total cost of the connection would be at least \$M21 if easement could be made available, compared with \$M11 for the Coldstream to South Morang connection.

...

...

As an overall comment, SEC transmission planning has proceeded on the basis of integrated use of the three easements from the Latrobe Valley to Melbourne which have been established in order to cater for the long term power transfer requirements from the brown coal power stations.

The third (southern) easement was approved following a public inquiry by the Parliamentary Public Works Committee in 1979 which included detailed consideration of a full range of environmental issues. The fourth 500 kV line has been planned to use this approved southern easement consistent with power transfer requirements, segregation of the transmission lines from the Latrobe Valley for security purposes and at the most economic cost by maximum utilisation of existing 500 kV and 220 kV assets. The proposed use of the existing Coldstream to South Morang Easement for a section of the fourth 500 kV line is part of this overall easement planning.

Yours sincerely



I P Bates
ACTING CHIEF ENGINEER,
TRANSMISSION DEVELOPMENT

APPENDIX 4

Skyline Road,
KANGAROO GROUND. 3097.

2 June 1983.

The Secretary,
Natural Resources & Environment Committee,
100 Exhibition Street,
MELBOURNE. 3000.

Dear Sir,

re: Coldstream to South Morang 500 kV Line

Following the receipt this day of answers to my questions to the SEC on 28 April 1983, I would like to advise the Committee that I am not at all satisfied with the information and reasons that the SEC have given for the construction, by 1986, of the second Coldstream to South Morang 500 kV line.

My reasons are as follows -

1. The decision to take the Coldstream to Templestowe 500 kV line out of service until at least the fifth 500 kV line is constructed and required: This would probably be in at least 25 years or more if the 220 kV lines are progressively up-graded after 10 years (1993) as quoted in the SEC's answer to my question 1(a). As the Coldstream to Templestowe line is approximately 20 kilometres long, and based on \$470,000 per km (page 57 of the November 1982 SEC submission), this would mean a \$9 million asset would remain idle and depreciating for 25 years.

This appears to me to reflect a gross planning error in the SEC's long term plans "to scar the landscape with 500 kV power lines".

2. I disagree with the need to plan for the construction of a fourth 500 kV line from Hazelwood to Melbourne as soon as 1986, for the following reasons:
 - (a) In answer to 2(b) to my questions of 28 April 1983 the SEC stated that they are planning for a 250 MW demand from Alcoa at Portland in 1985/86. This should not be necessary as they say they have sufficient provision to supply Alcoa with power as required in October 1983, from the existing transmission network and generating plant. Therefore, these facilities should be sufficient to provide, if required, 250 MW in 1986 to the Alcoa

Portland smelter if it ever proceeds. (Unless Alcoa was to be supplied by running Jeeralang continuously - this point was made at the meeting on 31 May 1983).

- (b) The need to provide so much extra margin, if one 500 kV line is out of service and another 500 kV line fails. Over the past three years there has only been the one failure on 4 March 1983. From the information that I have been able to obtain, I believe the system could easily accommodate this sort of failure for a short period of one day.
- (c) The 1981 SEC Annual Report stated that the Coldstream to South Morang line was due for construction in 1986. This date appears to have been retained. I doubt the accuracy of it in view of the following:

- In the 1982 SEC Annual Report on Page 31, it was stated that "The main transmission line works will be adjusted to the delayed generation program and the Alcoa development at Portland".

- In the long term electricity forecasts, the anticipated growth rate fell to 3.8%.

- (d) In 1987/88, based on the SEC's inflated figures, the overall shortfall would only be 400 MW, if one line was out of service. Because of the points raised in (c) above, this shortfall would really be a surplus of 1100 MW.

3. Alternative means of connecting the fourth 500 kV line into the Metropolitan system should be given much closer investigation, because of the effect the Coldstream - South Morang line would have on -

- (a) The unique Environmental Living Zone.

- (b) The chance of both 500 kV lines through the area failing when the bush fires come through the ELZ. The ELZ is situated in a very fire-prone area and residents are all prepared for when the fires next come through the area. We do not think the SEC will be like prepared if they place two lines through the area.

4. I have not been wholly convinced of the basis for costing of all of the SEC's alternative proposals and I would prefer to see the Committee obtain independent advice in this regard.

My main reasons for this are the following comments on costing of the Coldstream to South Morang second 500 kV line and the lack of costing for my alternative (a) below.

Page 31 of the 1983 SEC Annual Report refers to the Coldstream to South Morang line extending for 30.4 km i.e. at \$470,000 per km (Page 57, November 1982 Report). This is a cost of \$14.3 million and no cost is included for leaving the Coldstream to Templestowe line idle for 25 years. This would be equal to \$31.5 million in interest at 14% on \$9 million; a total cost more in the region of \$45 million.

The alternatives I favour are -

- (a) The up-grading of the Templestowe to Thomastown to Keilor line to 500 kV. At the meeting on 31 May 1983, this option was stated to be a simple possibility, as a large section of the line apparently has suitable towers to enable up-grading to 500 kV. I believed the SEC intended to give me full details of this option in writing today. After numerous phone calls to them today, I still could not obtain the information. This would diversify the termination of the 500 kV lines. Instead of directing the four 500 kV lines to South Morang, it would mean one would terminate at Keilor. This to me would be an excellent strategy to protect the system if South Morang was damaged by fire or lightning.
- (b) The termination of the fourth line at Templestowe and eventual establishment of the Templestowe and Coldstream Terminal Stations. I disagree that this option would only provide "breathing space" until 1989 or 1990 (Exhibit 6, page 2) because of my doubts about demand growth and flexibility in the transmission system. If the "breathing space" extended to 1993, the up-grading of the 220 kV lines in the central corridor could commence as they reached the end of their life (see SEC's reply to Question 1(a)). This up-grading would then replace the need for a separate fifth 500 kV line.
- (c) This alternative is based on development of the Narre Warren transformation station (Page 2, Exhibit 6). I find it difficult to comprehend that the insecurity which would arise would be any different to any other rare failure, especially when South Morang will still be served by two 500 kV lines on the Northern Easement. This option cost of \$35 million is far less than the \$45 million real cost for the South Morang - Coldstream line.

SUMMARY

I have found the time available, after the SEC makes any information available, ridiculously short. However, I appreciate the consideration the Committee has given me to query the planning of the SEC.

I would like to inform you of my personal viewpoint on the following two matters:

- (a) The eventual effect of the existing 500 kV line through the ELZ will be reduced in time, as I believe that when the existing line approaches the end of its life span alternative means of transmission will be available through advances in technology (cheaper undergrounding). These alternative transmission means will not, I hope, have such a severe impact on the environment.
- (b) I believe the Committee should investigate ways and means of having the SEC's long term planning improved and a proper energy conservation programme introduced into their planning approach. (This may be achieved if they were merged with the Gas & Fuel Corporation - similar to Western Australia).

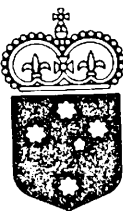
The way the SEC has been producing alternative last minute alternatives which appear to be hastily costed, is a further indication of their lack of long term planning research.

Thank you for your consideration.

Yours sincerely,

(R. F. English)

APPENDIX 5



The Ministry
for Conservation

240 Victoria Parade,
East Melbourne, Victoria.

Telephone 6514011

Postal address: Box 41,
East Melbourne, Vic. 3002.

2/CEFD
ED 22/4

Mr. E.C. Stokes,
Acting Chief Engineer,
Transmission Development,
State Electricity Commission,
Box 2765Y,
G.P.O.,
MELBOURNE, 3001.

22 APR 1983

Dear Mr. Stokes,

Thank you for your letter of 30 March 1983 concerning the proposed second Coldstream to South Morang 500,000 volt transmission line.

I have considered the material enclosed with your letter, and officers of the Ministry for Conservation have inspected the route and have held brief discussions with officers of the Melbourne and Metropolitan Board of Works and Upper Yarra Valley and Dandenong Ranges Authority. As a result I can now indicate that this proposal is one for which I consider an Environment Effects Statement should be prepared.

Consequently, I suggest that your Commission and the Ministry for Conservation discuss the content of an Environment Effects Statement. I note that the section of line over which the Environment Effects Statement is required would be the actual section to be duplicated, i.e. from a point approximately 4.5 km west of the proposed Coldstream Terminal Station. In addition, alternative routes should be examined, and the environmental effects of the proposed Coldstream Terminal Station addressed.

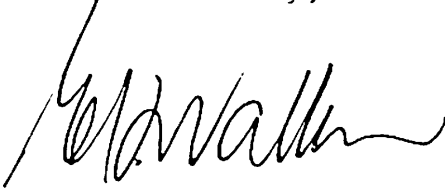
In commenting on the possible approval procedures put up by your Commission to the Natural Resources and Environment Committee, I would indicate that at this stage my preference is for assessment of the Environment Effects Statement by a panel appointed by me. The model for this is the Rosedale - Bairnsdale transmission line enquiry currently being examined by such a panel. A panel could have regard to planning matters, and my assessment would be provided to the Minister of Planning and other decision-makers after receipt of the panel's report.

I am hoping that the Natural Resources and Environment Committee will include in its recommendations an indication of the best method of catering for the requirements of all the responsible authorities involved in this exercise.

.../2

I have forwarded a copy of this letter to the Secretary of the Natural Resources and Environment Committee.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Evan Walker', written in a cursive style.

EVAN WALKER,
MINISTER FOR CONSERVATION

APPENDIX 6

SUBMISSIONS RECEIVED

State Electricity Commission
Ministry for Conservation
Upper Yarra Valley and Dandenong Ranges Authority
Mr. R.F. English
Shire of Healesville
Bend of Islands Conservation Association
Conservation Council of Victoria
Shire of Eltham
Shire of Lillydale
Merri Yarra Municipal Protection Committee

APPENDIX 7

LIST OF WITNESSES

| | | |
|-------------------|---|---|
| Mr. I.P. Bates |) | |
| Mr. P.J. Wallace |) | |
| Mr. A.C. Spicer |) | Representing the State |
| Mr. H.G. Thorpe |) | Electricity Commission |
| Mr. R.G.W. Evans |) | |
| Dr. J.P. James |) | |
| Mr. R.F. English | | |
| Mrs. J. Matiske | - | Representing the Bend of Islands Conservation Association |
| Mr. P. Machin | - | Representing the Shire of Healesville |
| Mr. G.N. Prattley | - | Representing the Upper Yarra Valley and Dandenong Ranges Authority |
| Mr. I. Cowdell | - | Representing the Ministry for Conservation |

7
31. 6

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

SECOND REPORT

STATE ELECTRICITY COMMISSION PROPOSAL

FOR

220 000 VOLT TRANSMISSION LINES

FROM RICHMOND TO BRUNSWICK VIA CLIFTON HILL AND

FROM FISHERMEN'S BEND TO NEWPORT

Ordered to be Printed

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

MEMBERSHIP

The Honourable R. I. Knowles, M.L.C. (Chairman)

Dr. G. M. Vaughan, M.P. (Deputy Chairman)

The Honourable W. R. Baxter, M.L.C.

Mr. C. W. Burgin, M.P.

The Honourable D. E. Henshaw, M.L.C.

Mr. G. R. Ihlein, M.P.

Mr. M. J. McDonald, M.P.

Mr. W. D. McGrath, M.P.

Mr. D. K. McKellar, M.P.

The Honourable B. A. Murphy, M.L.C.

The Honourable B. T. Pullen, M.L.C.

Mr. E. M. P. Tanner, M.P.

COMMITTEE STAFF

Mr. M. R. Knight - Director of Research

Mr. G. H. Westcott - Secretary

* * * * *

INNER METROPOLITAN TRANSMISSION LINES INQUIRY SUB-COMMITTEE

The Honourable R. I. Knowles, M.L.C. (Chairman)

The Honourable W. R. Baxter, M.L.C.

The Honourable D. E. Henshaw, M.L.C.

Mr. M. J. McDonald, M.P.

Mr. D. K. McKellar, M.P.

The Honourable B. T. Pullen, M.L.C.

* * * * *

TERMS OF REFERENCE

PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

P R E A M B L E

In presenting this Report to the Parliament, the Committee indicates that the Report was agreed to by a majority of Members present at the meeting when the Report was adopted.* This Report is accompanied by a minority report by the Honourables B. T. Pullen, M.L.C., B. A. Murphy, M.L.C. and D. E. Henshaw, M.B.E., M.L.C., Dr. G. M. Vaughan, M.P., and Messrs. G. R. Ihlein, M.P. and M. J. McDonald, M.P., in accordance with S4N(4) of the *Parliamentary Committees Act* 1968.

* * *

* See Extracts from the Proceedings at p.395 et seq for votes upon which Divisions were taken.

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* * *

SUMMARY OF RECOMMENDATIONS

The Need for the Development of the Transmission System Serving the Central Business District and the Inner Metropolitan Area

2.43 The Committee recommends that:

- (1) The security of supply to the Central Business District and inner metropolitan area from Richmond and West Melbourne Terminal Stations should be improved.
- (2) As a secondary objective, any measures taken to improve the security of supply to Richmond and West Melbourne Terminal Stations should take into account where possible:
 - (i) the need to provide for potential future load changes in specific parts of the inner metropolitan area; and
 - (ii) the need to provide additional alternative interconnection capacity between the 500 000 volt and 220 000 volt systems in the metropolitan area.

Alternatives Available to Improve the Security of Supply to the Central Business District and Inner Metropolitan Area

3.94 The Committee recommends that the security of supply to the Central Business District and the inner metropolitan area from Richmond and West Melbourne terminal stations should be improved by connecting the Richmond Terminal Station to the Brunswick Terminal Station and the Newport Power Station to the Fishermen's Bend Terminal Station. In both cases the connections should be made at 220 000 volts.

Detailed Consideration of the Proposed Richmond - Clifton Hill - Brunswick Line

4.61 The Committee recommends that -

- (1) The Brunswick Terminal Station should be connected to the Richmond Terminal Station by a 220 000 volt transmission system.

The transmission system should consist of the following -

- (a) A single circuit pole mounted line between the Richmond Terminal Station and the site of the future Clifton Hill Terminal Station:

This line should generally follow the route of the existing 66 000 volt line between the Richmond Terminal Station and the Brunswick Terminal Station except that it should be diverted to run between Madden Grove and the railway line in the vicinity of the Richmond Terminal Station. Residents affected by the recommended diversion may not be aware of this proposal and the Committee recommends that this diversion be subject to further review.

Use of lattice towers to replace individual pole supports should only be considered if it can be clearly demonstrated that the visual impact is reduced. Alternative designs and location of the supports should be further reviewed in depth.

- (b) An underground cable between the Clifton Hill Terminal Station site and a point north of Queen's Parade adjacent to the railway line.
- (c) A single circuit pole mounted line connecting the cable end north of Queen's Parade to the Brunswick Terminal Station:

This line should generally follow the route of the existing 66 000 volt line between the Richmond Terminal Station and the Brunswick Terminal Station.

Use of lattice towers to replace individual pole supports should only be considered if it can be clearly demonstrated that the visual impact is reduced. Alternative designs and location of the supports should be further reviewed in depth.

- (2) The existing 66 000 volt transmission line between the Richmond Terminal Station and the Brunswick Terminal Station and all other high voltage distribution lines in the vicinity of the existing easement should be removed including the 66 000 volt and 22 000 volt lines adjacent to the Esplanade.
- (3) With respect to the Brunswick to Richmond connection, the only matters which should be subjected immediately to further review are -
 - (a) The precise location and nature of the overhead line support system within the general parameters specified in the previous recommendations.
 - (b) Other practical mitigating measures to minimise the visual impact of the overhead line and the associated terminal stations.
 - (c) The route in the vicinity of Madden Grove.

Detailed Consideration of the Proposed Newport to Fishermen's Bend Line

5.22 The Committee recommends that -

- (1) The Newport Power Station should be connected to the Fishermen's Bend Terminal Station by a 220 000 volt double circuit overhead transmission line following the route proposed by the State Electricity Commission and included in this report as Figure 18;
- (2) With respect to the Newport to Fishermen's Bend connection, the only issues which should be subjected to further review are alternative designs of the two major support towers adjacent to the Yarra River and alternative designs of supports between the Yarra River and Fishermen's Bend Terminal Station; and
- (3) Such alternative designs should be aimed at minimum environmental impact, particularly by relating the form and materials used in adjacent structures and prominent landscape features in the vicinity including the West Gate Bridge.

Alternative Processes for Obtaining Planning Approval

6.21 The Committee recommends that -

- (1) The Government should make a decision in respect of the recommendations contained in this report up to this point before any further public review of those matters is entered into.
- (2) Following a decision by the Government in relation to earlier recommendations contained in this report, the State Electricity Commission should prepare, advertise and make available separate Environment Effects Statements in respect of the proposed connections between Richmond and Brunswick terminal stations and between Newport and Fishermen's Bend terminal stations.
- (3) The Environment Effects Statements should in each case -
 - (a) Briefly set out the case put forward to this inquiry for the connection, the conclusions reached by this inquiry and the decisions then made by the Government; and

- (b) Examine the relative environmental effects of the remaining options as set out in paragraphs 4.61(3) and 5.22(2).
- (4) Following receipt of comments upon the Environment Effects Statements, the Minister for Planning and Environment should appoint independent panels under Section 9 of the *Environment Effects Act 1978*.
- (5) Upon receipt of the recommendations of the panel, the Minister for Planning and Environment should prepare and supply his assessments of the environmental effects to the Minister for Minerals and Energy as required by the *Environment Effects Act 1978*.
- (6) Upon receipt of the assessments of the Minister for Planning and Environment, the Minister for Minerals and Energy should indicate to the Minister for Planning and Environment his decision on the detailed works to be installed by the SEC and the additional ancillary mitigating works to be carried out as part of each project.
- (7) The Minister for Planning and Environment, having received the decision of the Minister for Minerals and Energy on the works to be carried out by the SEC, should apply to the Governor in Council under Section 35(d) of the *Town and Country Planning Act 1958* for exemption of the works from planning controls.

* * * * *

The Natural Resources and Environment Committee, appointed pursuant to the provisions of the *Parliamentary Committees Act 1968* (No. 7727) has the honour to report as follows:

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

CHAPTER ONE

INTRODUCTION

TERMS OF REFERENCE

- 1.1 On 26 October 1982 the Committee was directed by His Excellency the Governor in Council:

To consider, make recommendations and make a final report to Parliament before 31 March 1983 on -

1. *the forward planning needs for the development of the State Electricity Commission of Victoria transmission system servicing the metropolitan area;*
2. *the criteria to be adopted in locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in part or full in the light of land use, economic and environmental constraints; and*
3. *the processes for assessment and approval of power lines to minimise duplication of permits and maximise public input.*

1.2 On 23 March 1983, following a request by the Committee for an extension of time to fully examine all of the matters addressed by the three terms of reference, the Minister for Minerals and Energy requested the Committee to report progressively in accordance with the following:

(a) *By May 1983:*

Report on the State Electricity Commission's (SEC) proposal for a 500 000 volt transmission line from Coldstream to South Morang, addressing -

- *under the first term of reference, the need for reinforcing transmission to the 500 000 volt terminal stations in the outer metropolitan area;*
- *under the second term of reference, the feasible route to be subject to detailed examination of environmental issues;*
- *under the third term of reference, the recommended processes for assessment and approval of the route in this instance.*

(b) *By July 1983:*

Report on the SEC's proposals for interconnecting 220 000 volt transmission lines between terminal stations at Richmond and Brunswick via Clifton Hill and between Fishermen's Bend and Newport, addressing -

- *under the first term of reference, the needs for the development of the transmission system serving the central business district and the inner metropolitan area;*
- *under the second term of reference, the feasible options and alternative routes to be subjected to detailed examination of environmental aspects;*

- *under the third term of reference, the recommended processes to be adopted for the assessment and approval of routes in this instance.*

(c) *By March 1984*

Report in relation to future transmission requirements generally, addressing -

- *under the second term of reference, the general criteria for locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in the light of land use, economic and environmental constraints:*
- *under the third term of reference, the processes for assessment and approval of future power lines to minimise duplication of permits and maximise public input.*

1.3 On 29 March 1983, His Excellency the Governor in Council ordered that the Committee make its final Report to Parliament before 31 March 1984.

PURPOSE OF THIS REPORT

1.4 This report specifically addresses the State Electricity Commission's (SEC) proposal for 220 000 volt transmission lines from Richmond to Brunswick via Clifton Hill and from Fishermen's Bend to Newport.

The Committee has received many submissions which relate both to this proposal and to the Committee's overall Terms of Reference and these were taken into account in arriving at the recommendations contained in this report. However, detailed discussion of the broader aspects of those submissions, particularly with respect to the processes for assessment and approval has been omitted from this report and will be contained in the Committee's final report.

PROCEDURE FOLLOWED BY THE COMMITTEE

- 1.5 Following the Order in Council of 26 October 1982, the Committee advertised the terms of reference in the national press on 22 November 1982 and called for submissions to be made to the Committee by 4 February 1983. The Committee then appointed a Sub-committee to conduct the inner metropolitan transmission lines aspect of this Inquiry.
- 1.6 Public hearings were held at Parliament House on 1 and 8 December 1982 at which the SEC presented its main submission and initial evidence. Following these public hearings, the SEC provided further detailed information as requested by the Committee, including a survey of world transmission practice.
- 1.7 On 9 February 1983, the Committee inspected the routes of the transmission lines and terminal station sites proposed by the SEC for the 500 000 volt and 220 000 volt transmission proposals. Representatives of local municipalities were present on those inspections.
- 1.8 On 23 March 1983, the Committee requested the SEC to provide further submissions in respect of the following matters:
- The need for interconnection of the 220 000 volt inner metropolitan terminal stations.
 - The effect of total loss of supply to part or the whole of the Central Business District and inner metropolitan areas.

In respect of the second of the above matters, the Committee requested that the SEC obtain detailed information from the municipal councils and Government departments concerned, and that the information collected by the SEC be compiled into a report for submission to the Committee.

The Committee indicated that opportunities would be given to those contributing information to verify the contents of the report and to make submissions on the report to the Committee.

It was also suggested that the SEC's written submissions on the above topics be made available to, and discussed with, interested parties prior to formal presentation to the Committee, so that the formal hearings could concentrate on controversial aspects which had not been resolved in the proposed discussions.

1.9 On 19 May 1983, the Committee appointed British Electricity International Ltd. (BEI) in conjunction with Willing Allot and Kennedy as consultants and requested that they:

- (1) Assess the feasible alternative electrical options to improve the level of security of electricity supply to the defined area, such that loss of a double circuit 220 kV transmission line supplying terminal stations in the defined area will not cause loss of supply to the load;
- (2) Review the proposals contained in Section 2 of the SEC submission;
- (3) Develop feasible routes and estimate costs for each of the options determined in (1), including consideration of overhead or underground connections and environmental factors;
- (4) Develop and cost alternative routes to demonstrate the costs of protecting aspects of the environment without conducting a detailed environmental analysis;
- (5) In assessing the feasibility of the proposed routes, take account of the services administered by other responsible authorities, design standards of the SEC and geotechnical factors for underground cable options, and include any necessary consultation with relevant statutory bodies; and

(6) Report on the criteria used for assessment of alternative electrical options for securing the electricity supply to the defined area and for determining the routing/undergrounding of the options in relation to environmental factors.

1.10 On 23 May 1983, a team of consultants from BEI arrived in Melbourne and commenced work. The consultants held discussions with Government departments and with the members of the Merri Yarra Municipal Protection Committee (MYMPC) which represented all of the councils along the route of the proposed 220 000 volt Richmond to Brunswick transmission line.

1.11 On 5 and 6 July 1983, public hearings were held at which the consultants tabled and explained their report; the SEC produced further evidence as requested, and evidence was received from the MYMPC and the City of Williamstown.

1.12 This report now proceeds to address the Terms of Reference in relation to each of the proposed lines.

1.13 Appended to this report are -

(1) Report by British Electricity International Ltd. on reliability of the 220 000 volt transmission system supplying the Melbourne central business district and inner metropolitan area (Appendix 1);

(2) Report by British Electricity International Ltd. on the environmental considerations of the proposed Brunswick to Richmond line along the Merri Yarra Park (Appendix 2);

(3) Submission from the Merri Yarra Municipal Protection Committee (Appendix 3);

- (4) Letter dated 10 August 1983 from the Merri Yarra Municipal Protection Committee to the Committee suggesting an alternate route (Appendix 4);
- (5) Report by the State Electricity Commission commenting on the alternate route suggested by the Merri Yarra Municipal Protection Committee (Appendix 5);
- (6) Letter and report from the Chairman, Melbourne and Metropolitan Board of Works on the proposed lines (Appendix 6);
- (7) Report by the State Electricity Commission commenting on the MMBW report (Appendix 7);
- (8) Survey of the effect of total loss of electricity supply to inner Melbourne - Volume 1 - Analysis of Survey Results (Appendix 8);
- (9) Survey of the effect of total loss of electricity supply to inner Melbourne - Volume 2 - Report of Survey Results (Appendix 9);
- (10) A list of submissions received* (Appendix 10);
- (11) A list of witnesses (Appendix 11); and
- (12) Minutes of Evidence.*

* Minutes of Evidence and submissions not printed.

CHAPTER TWO

THE NEED FOR THE DEVELOPMENT OF THE TRANSMISSION SYSTEM SERVING THE CENTRAL BUSINESS DISTRICT AND THE INNER METROPOLITAN AREA

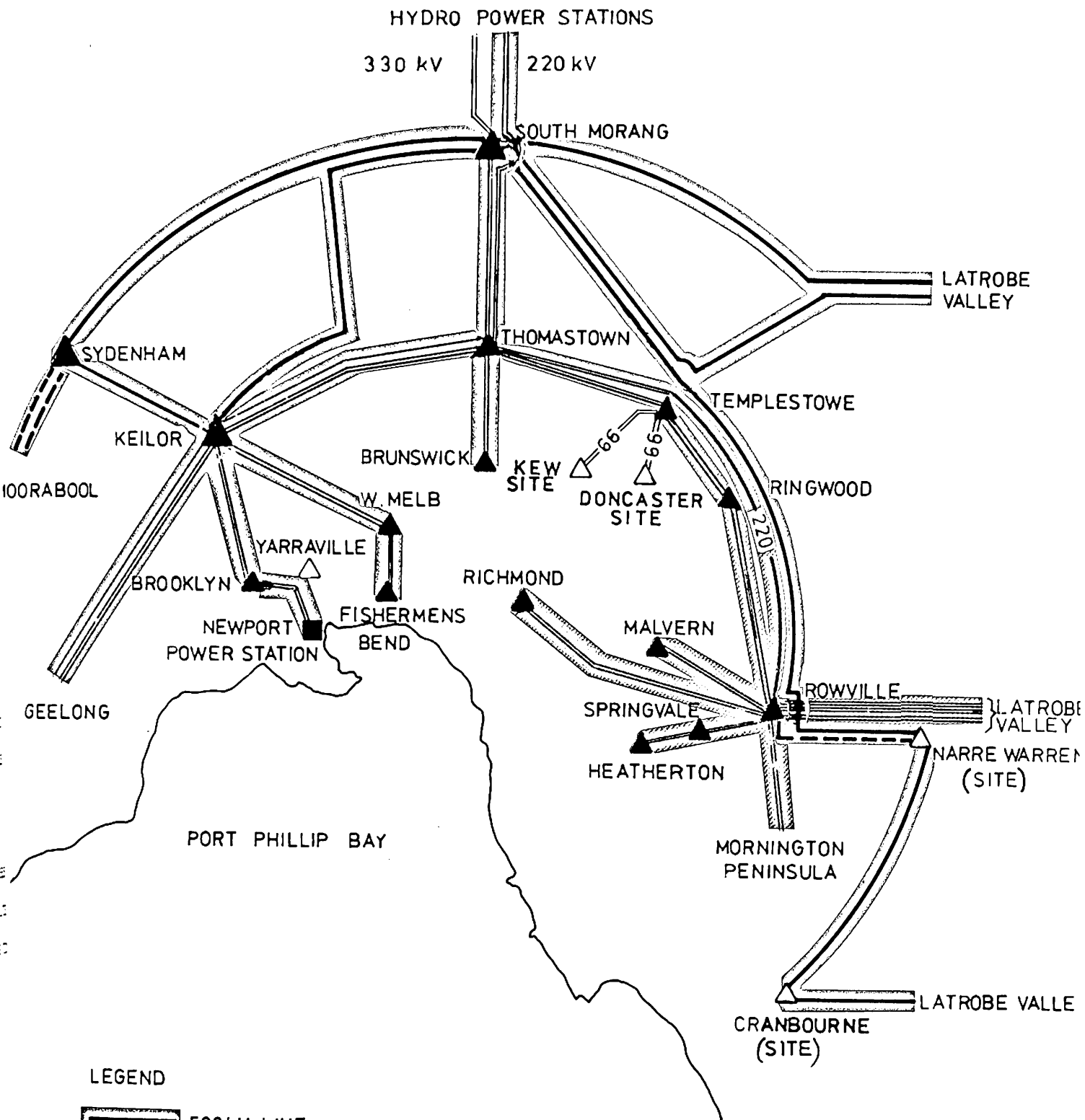
THE EXISTING TRANSMISSION SYSTEM

- 2.1 The existing 220 000 volt transmission system supplying the Melbourne metropolitan area (illustrated in Figure 1) comprises a ring around the outer metropolitan area and radial supplies from the ring to terminal stations in the metropolitan area.
- 2.2 The radial 220 000 volt supplies have been developed to the periphery of the inner Melbourne area within the feasible availability of easements. Supply within the inner metropolitan area is provided by a 66 000 volt sub-transmission system. The 66 000 volt lines have been established as overhead construction on streets in the inner urban areas.
- 2.3 Within the Central Business District (CBD) and immediately adjacent areas the supply is fully underground. Sub-transmission voltages of 66 000 volts and 22 000 volts are used to distribute electricity via underground cables to sub-stations located throughout the CBD.

EXTRACTS FROM THE CASE PUT FORWARD BY THE SEC FOR DEVELOPMENT OF THE TRANSMISSION SYSTEM

Current supply to inner Melbourne and risks of failure

- 2.4 The terminal stations at Richmond and West Melbourne which supply the CBD and major areas of the inner metropolitan area are each supplied by a single tower - double circuit line. The load supplied from these stations has developed both in size and importance to the stage where the SEC believes that dependence on a single tower line is no longer acceptable.



LEGEND

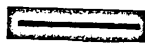
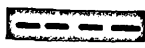
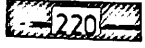
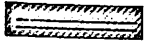
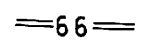


-  500 kV LINE
-  500 kV LINE (AWAITING SERVICE)
-  500 kV LINE OPERATING AT 220 kV
-  220 kV LINE (DOUBLE CIRCUIT)
-  220 kV LINE (DOUBLE CIRCUIT) OPERATING AT 66 kV
-  TERMINAL STATION
-  POWER STATION

FIGURE 1
 EXISTING 500,000 VOLT AND 220,000 VOLT
 RING NETWORK SUPPLYING
 THE METROPOLITAN AREA

2.5 The tower lines each have two circuits to enable load to be supplied during maintenance of one circuit or during the failure of one circuit. The probability of failure of both circuits is small, but could occur either due to an event affecting both circuits or for a failure affecting one circuit during maintenance of the other circuit.

2.6 The period of blackout prior to restoration of supply would depend on the cause of failure and could range from a few minutes up to three days for severe damage to a tower. Events that could cause prolonged loss of supply include:

- Lightning and wind storms;
- Vehicular crash and a possible fire due, for example, to a collision between a petrol or gas tanker and a tower;
- Train derailment;
- Aircraft or helicopter crash;
- Sabotage or vandalism;
- Failure of line fittings or conductors; and
- Fires.

2.7 Three events causing total interruption of supply to a major area of inner Melbourne have occurred over the past ten years. Areas affected have included parts of the CBD and industrial centres in the western suburbs. Supply was interrupted for periods from 4 to 46 minutes. Two of the events interrupted the supply to the West Melbourne Terminal Station but, fortunately, the supply loss did not occur at a critical time. The third event interrupted supply to the Brooklyn Terminal Station and caused disruption of industrial processes for half an hour with substantial production losses.

2.8 These total failures of the supply have been caused by either:

- events which affected both circuits; or
- failure of the remaining circuit during maintenance of the other circuit.

- 2.9 Over the past 10 years, the rate of non scheduled outages of one circuit of the 31 double circuit metropolitan lines (total circuit length 401 km) including those restored by auto reclose, has been 2.07 outages/100 km/annum. Duration of the outages range from the auto-reclose time of a few seconds to an outage which lasted for 11 hours 12 minutes with an average outage time of 78 minutes. Supply has been maintained during these outages by the remaining circuit of the double circuit supply.
- 2.10 Scheduled outages for maintenance purposes average five per line per annum with durations ranging from one hour to 152 hours and averaging 15.6 hours. Again, during these periods the associated supply area is vulnerable to complete black-out if the remaining circuit is lost.

Consequences of interruption of supply

- 2.11 The SEC believes that the consequences of a blackout to a large portion of the inner metropolitan area would be very severe as the area is characterised by high density living and concentrated commercial, retail and industrial development.
- 2.12 The SEC assessed that an interruption of supply to a major area of inner Melbourne could occur once in every 10 to 20 years with the existing transmission system. Examination of the practices used in overseas cities indicates that, because of the widespread community hardship and economic loss which could occur during such extensive blackouts, this risk is seen to be unacceptable.
- 2.13 The effects of a blackout to the areas supplied by Richmond or West Melbourne terminal stations (which includes loads supplied from Fishermen's Bend Terminal Station), caused by loss of supply to these terminal stations, would be much greater than the effects of localised loss of supply caused by failure of the low voltage supply system, because it would affect all activities and services dependent on electricity within a high proportion of the CBD and inner metropolitan area.

- 2.14 A lower voltage supply failure could interrupt the supply to, for example, a single high rise residential building. This event could, amongst other contingencies, require the freeing of people trapped in lifts and could be handled by emergency services.
- 2.15 If the electricity supply was disrupted due to a failure of a 220 000 volt line, the effect could be widespread and the resources of the emergency services would not be adequate to simultaneously cover emergencies in all affected high-rise buildings as well as provide other emergency services which would include freeing people trapped in the underground railway system and dealing with the traffic chaos caused by failure of traffic lights and street lighting.

Quantification of effects of loss of supply

- 2.16 The effects of a widespread blackout would vary with time.
- 2.17 To provide quantification of the effects of a blackout, the SEC, on behalf of and at the request of the Committee has carried out a survey of the municipal councils in the inner Melbourne area and government authorities having overall responsibility for essential services. A summary of the survey findings is attached as Appendices 8 and 9.
- 2.18 Specific examples quantified by the survey for a prolonged blackout include the following:
- (a) Community hardship due to -
- trapping of people in lifts in high-rise buildings;
 - absence of domestic lighting, heating, food preparation and refrigeration;
 - cessation of public transport;
 - inability to obtain fuel for private transport; and
 - increased criminal activity.

(b) A threat to public health due to -

- cessation of water supply services in high-rise buildings including services for sanitation;
- restriction of hospital services;
- loss of drug and blood supplies (where these are not protected by emergency generating capacity);
- lack of heating in premises housing the sick, aged and very young;
- overflow of sewage due to cessation of pumping; and
- flooding of low-lying properties due to cessation of MMBW drainage pumps.

(c) A risk to public safety due to -

- failure of fire-fighting facilities in large buildings;
- failure of fire and police alarms;
- absence of traffic lights; and
- absence of public lighting.

(d) Interruption of equipment and operations such as -

- refrigeration of specimens in hospitals' laboratories;
- refrigerated food storage;
- railway freight handling and wagon sorting;
- railway operations; and
- ship loading and cargo handling.

(e) Economic loss due to interruption of -

- public transport;
- commercial activity; and
- industry, particularly continuous processes.

Experience of effects of loss of supply

2.19 To date, failures of the 220 000 volt supply to the inner metropolitan area have not occurred at critical times. However, the experience of localised supply interruptions indicates the possible scale of disruption if the individual experiences were repeated simultaneously for a widespread black-out of a whole area supplied from a terminal station. The following were actual occurrences:

(a) Loss of supply to flats

A five-hour interruption of supply to the twin towers block of flats at Park Towers in South Melbourne caused major disruption for the 1 200 occupants. Cooking, lighting and lifts immediately ceased and water supply and sewerage ceased within one hour. Panic set in when children arrived home from school and could not gain access to their homes.

There are 48 high-rise blocks in the inner metropolitan area with 25 000 occupants of which half could be affected by a single 220 000 volt line failure.

(b) Loss of supply to tramway services

Tramway services were interrupted over a wide area following a failure at the SEC substation at Deepdene which interrupted supply to the MMTB substations at Deepdene, East Kew and Camberwell. This caused overload of the MMTB substation at Kew and the melting of a feeder cable at the substation with consequent low voltages. Trams could barely move and the whole tramway system was disrupted.

(c) Loss of supply to industrial areas

- ICI - Momentary "dips" in voltage have caused interruption of the production of plastic film. It normally takes one hour to re-establish the production and a complete interruption of supply would cause production loss for several hours after restoration of supply.
- Altona Petrochemical Company and Union Carbide were interrupted in 1982 by the loss of the double circuit 220 000 volt line to Brooklyn with \$500 000 of lost production at Union Carbide alone.
- Allbright and Wilson - employees have been sent home during local interruptions and production has been delayed for two or three shifts for local supply failures.

If the 220 000 volt supplies to Brooklyn were to fail, these and other industries could be simultaneously shut down, resulting in very large losses in wages and production.

(d) Loss of supply to commercial premises

A complete shutdown of a substation in the CBD at 6.00 a.m. on a weekday affected accommodation buildings, with people being trapped in darkened bedrooms and meals being delayed. Traffic signals and street and public lighting were also affected. Supply was not fully restored for several hours and in the interim there was traffic chaos and late opening of commercial and retail buildings.

Failure of the 220 000 volt line supply to Richmond or West Melbourne Terminal Stations could affect up to two-thirds of all the buildings in the CBD and bring most of the City's commercial activity to a virtual standstill.

TABLE 1 : COMPARISON OF SUPPLY PRACTICE TO CITIES

| City | Year of Data | Load CBD-City kW x 1000 | Load Density: CBD-City kW x 1000 | E.H.V. Supply to City Volt x 1000 | Number of E.H.V. Stations | Size of Each Station kW x 1000 | E.H.V. Circuits Per Station | Number of Separate Easements Per Station | Load Lost For Double Circuit Outage % CBD Load |
|--------------|--------------|----------------------------|-------------------------------------|--------------------------------------|---------------------------|-----------------------------------|-----------------------------|--|---|
| Melbourne | 1982 | 315 1115 | 90 5-8 | 220 | 2 | 400 | 2 | 1 | 30-70 |
| Proposed | 1985 | | | | 2 | 400 | 3 | 2 | 0 |
| Sydney | 1975 | 325 640 | 150 - | 132 | 3 | 200 | 4-8 | 2-4 | 0 |
| Perth | 1982 | 135 900 | 45 - | 132 | 3 | 200,120 | 2-3 | 1-3 | 20 |
| Brisbane | 1982 | 100 - | 115 - | 110 | 2 | 120 | 2 | 1 | 50 |
| Adelaide | 1982 | 140 - | 28 12.5 | 275,132 | 2 | 234,90 | 3 | 3 | 0 |
| Hobart | 1982 | 30 90 | 65 - | 110 | 3 | 120 | 2-3 | 2-3 | 0 |
| London | 1972 | - 3460 | 50+ 12-50 | 132,66 | 10+ | 180,90 | 4 | 2 | 0 |
| Liverpool | 1972 | - 800 | - - | 132 | 3+ | 120 | 2-3 | 2-3 | 0 |
| Glasgow | 1972 | - 800 | 39 8-39 | 275 | 5 | 120 | 2 | 1 | 10 |
| Chicago | 1972 | 780 4550 | - - | 138,69 | 5+ | 200 | 4 | 2 | 0 |
| New York | 1982 | 3612 8400 | 850 14 | 132 | 4 | 260 | 4-12 | 2-4 | 0 |
| Memphis | 1982 | 840 2100 | 8 1 | 161 | 4 | - | 7-12 | 3-4 | 0 |
| Vancouver | 1976 | - 1283 | 134 7 | 230,69 | 2 | 170 | 4 | 2 | 0 |
| Paris | 1972 | 1100 3400 | - 5.2 | 225 | 15 | 100 | 2-5 | 2 | 0 |
| Hamburg | 1982 | - 500 | 100 - | 110 | 4 | 220,110 | 2-4 | 2 | 0 |
| Stockholm | 1969 | - - | - - | 220 | 5 | - | 2-6 | 2 | 0 |
| Amsterdam | 1981 | 250 - | 30 - | 150 | 2 | - | 4 | 1-2 | 0 |
| Rotterdam | 1981 | 300 - | 10 - | 150 | 4 | - | 2-13 | 2-6 | 0 |
| Vienna | 1981 | 850 1200 | 50 - | 220 | 2 | - | 6 | 3 | 0 |
| Johannesburg | 1982 | 250 1162 | 65 - | 275 | 2 | - | 3 | 3 | 0 |
| Tokyo | 1975 | 1536 6872 | 62 12 | 275 | 6 | - | 4-6 | 2 | 0 |
| Nagoya | 1975 | - 1822 | - 6 | 154 | 3+ | - | 2 | 2 | 0 |
| Osaka | 1975 | - 3760 | - 18 | 275 154 | 3+ | - | 2 | 2 | 0 |

SOURCE: Data based on survey of engineering literature and direct correspondence with electrical utilities by SEC.

2.20 Taken together, these individual incidents provide a graphic picture of the potential simultaneous effects on the community and domestic, public, industrial and commercial activity if the 220 000 volt electricity supplies to Richmond and West Melbourne Terminal Stations were to fail for an extended period.

Transmission practice throughout the world for inner urban areas

2.21 It is normal practice throughout the world for major transmission stations in inner urban areas to be supplied by at least three circuits separated on to at least two easements. The implementation of this practice in Europe, North America and Japan is indicated on Table 1.

Cost of loss of supply

2.22 The disruption caused by a widespread blackout would have a number of associated cost elements. The factors directly causing these costs would include:

- (a) Lost production;
- (b) Re-start of industrial plant;
- (c) Repair of damaged plant in factories, commercial premises and homes;
- (d) Replacement of spoiled food, both commercial and domestic;
- (e) Repair of flood damage; and
- (f) Loss of trade and wages.

2.23 The survey carried out for the Committee by the SEC indicated representative areas in which costs would occur for a prolonged outage for up to three days.

2.24 It is difficult to determine actual costs, but these examples are consistent with indicative costs using the value of energy not supplied as estimated by electricity supply authorities in Europe, North America and Japan.

(i) Public Bodies

| | |
|---|-------------------|
| Department of Housing (for repair of sewerage systems to 25 blocks of high-rise flats). | \$500 000 |
| Health Commission (repair to one hospital) | \$560 000 |
| Victorian Railways (customer loss and food spoilage) | \$600 000 |
| Port of Melbourne Authority (loss of traffic and spoilage of cargo). | Up to \$4 700 000 |

(ii) Representative Industries

| | | |
|----------------------------|--------------|-------------|
| Metal products/Fabrication | (3 examples) | \$2 400 000 |
| Petrochemical | (8 examples) | \$2 000 000 |
| Chemical | (4 examples) | \$2 000 000 |
| Textiles | (1 example) | 40 000 |
| Food | (1 example) | 100 000 |
| Light Industry | (1 example) | 200 000 |

On the basis of these representative direct costs, the effect of a prolonged outage in the Richmond area might, by way of example, comprise:

| | |
|--|-------------|
| Flat and domestic losses | \$1 000 000 |
| Essential services and commercial activity | 2 000 000 |
| Textile, food and light industries | 4 000 000 |
| Heavy industries | 1 000 000 |
| | <hr/> |
| TOTAL | \$8 000 000 |
| | <hr/> |

Similarly, in the West Melbourne area, the cost might conservatively increase by an additional \$5 000 000 due to the high industrial load component and freight handling by ship, road and rail, giving a total of \$13 000 000.

2.25 On this basis, it is evident that the cost of a prolonged supply loss to the Richmond or West Melbourne Terminal Station would exceed the cost of the proposed 220 000 volt lines planned by the SEC.

2.26 Further indirect costs would also be incurred, for example, for -

- hospitalisation of persons injured;
- repair of damaged vehicles; and
- losses due to criminal activity and vandalism.

SEC's case supporting need for reinforcement of the metropolitan transmission system

2.27 Officers appearing on behalf of the SEC stated that they believed that the security of the existing 220 000 volt radial supply to inner Melbourne is no longer adequate. Easement provision was made some years ago to provide a physically separate supply to each of the inner metropolitan terminal stations with the expectation that at a later date tie lines would be established between adjacent radial supplies. The tie lines would reduce the risk of a total supply loss to these inner metropolitan stations to a practical minimum.

2.28 The SEC believes that these tie lines should now be constructed in view of the increased inner Melbourne load and the increased dependence of the inner Melbourne area on electricity for its safe functioning. This belief is supported by -

- the relatively high probability of a total supply failure with the existing arrangements;
- the level of direct costs which can result from a total supply loss; and
- the traumatic consequences to the community caused by a total loss of supply.

OTHER SUBMISSIONS AND EVIDENCE RELATING TO THE NEED
FOR DEVELOPMENT OF THE TRANSMISSION SYSTEM

THE MERRI YARRA MUNICIPAL PROTECTION COMMITTEE

2.29 The Merri Yarra Municipal Protection Committee (MYMPC) was formed by eight municipal councils in response to the proposal by the SEC to construct a 220 kV transmission line between Richmond and Brunswick. These councils are -

Brunswick City Council
Northcote City Council
Fitzroy City Council
Collingwood City Council
Kew City Council
Richmond City Council
Hawthorn City Council
Prahran City Council

2.30 The MYMPC made a very detailed written submission to the inquiry (which is included in this report as Appendix 3) and later gave evidence .

2.31 The MYMPC questioned the need for the proposed development of the transmission system but indicated that it did not have the expertise to evaluate this aspect of the situation properly. It suggested in its written submission that the Committee should engage independent consultants to assess the need.

2.32 Later in evidence to the inquiry, and after the consultants had been engaged and their report had been made public, the MYMPC indicated that many of its members doubted the premises on which the SEC forecasts were made and believed that in the brief given to BEI sufficient weight was not given to BEI counter-checking such forecasts.

COLLINGWOOD RESIDENTS ASSOCIATION

2.33 The Association indicated in a written statement that they believed that the SEC had not satisfactorily justified the need for the Richmond to Brunswick Transmission Line.

CONSERVATION COUNCIL OF VICTORIA

2.34 The Conservation Council of Victoria made the following comments in a written submission in relation to the need for development of the transmission system -

- (1) *Steps towards energy efficiency outlined in the first report of the Australian Conservation Foundation's Sunday Ebbot Energy Project should be initiated immediately; and*
- (2) *The resultant reduction in load growth would make further transmission capacity and improved security unnecessary.*

CITY OF MELBOURNE

2.35 The City of Melbourne strongly supported the SEC's proposals to increase the security of supply to the inner metropolitan area.

MINISTRY FOR CONSERVATION

2.36 Officers of the Ministry for Conservation made the following comments:

The Ministry has examined the SEC's arguments in some detail and has not been able to fault the logic presented.

EXTRACTS FROM THE REVIEW BY THE CONSULTANTS

2.37 The consultants, British Electricity International Limited (BEI), were provided with full details of the SEC system, including load flows and historical records of faults. In respect of the need to improve the security of supply to the inner metropolitan area, the consultants made the following comments and recommendations -

(1) 220 000 volt planning concept

A particular feature of the Melbourne metropolitan supply system is the extensive reliance on double circuit 220 000 volt radial feeds, e.g. Keilor to West Melbourne; Fishermen's Bend or Rowville to Richmond. Such a network configuration is unusual for a city of the size and importance of Melbourne as major sections of the Melbourne metropolitan area are vulnerable to extensive system blackout following either a simultaneous double circuit outage or a single circuit outage when one circuit is already out for maintenance. Furthermore, the use of double circuit radial feeds does not facilitate an efficient use of capacity since maximum utilisation is limited to 50% of circuit capacity to comply with security of supply standards.

Fortunately, to date, there have been no major prolonged 220 000 volt double circuit outages but it would be unwise to assume that this good record will continue since the adverse consequences of an extended blackout to the central business district are all the time becoming more severe as the dependence on electricity increases.

An indication of the consequences of an extended electricity failure may be obtained from the experience of a total loss of supply at substation LQ in the CBD area on 9 May 1980.

Details of the consequences of the loss of supply on this occasion are given below and reinforce the consultants' view that there are sound reasons to improve the current levels of security to the inner metropolitan area:

Central business district power failure - 9 May 1980

On 9 May 1980, total loss of supply to zone substation LQ in the CBD occurred between the hours of 0600 - 0730 and 0800 - 1000.

Outage of this substation, the largest in the CBD (3 x 60 MVA), is indicative of possible consequences for loss of supply in the whole CBD.

The outage at 0600 hours mainly affected accommodation buildings with people being trapped in darkened bedrooms and meals being late. Street and public lighting were also seriously affected.

The outage at 0800 hours caused traffic chaos and some commercial and retail buildings remained closed until power was restored.

Outages of longer periods over a wide area would have severe consequences in terms of public health and safety, commercial operations and security.

The following list of essential services located within the City of Melbourne supply area indicates the extent and magnitude of these consequences:

Many of Victoria's large public hospitals

Commonwealth Serum Laboratories

Newspapers - Age, Herald and Sun

*Headquarters and control centres for essential services
Public Transport - tramways, railways and airlines
Radio communications - local, interstate and overseas
Research establishments with long term work
Sewerage and flood control pumping.*

In addition to these essential supplies, a large number of high and medium rise commercial buildings and large retail establishments would be affected through loss of supply to passenger lifts, mechanical plant for ventilation, PABX telephones and computer operations, cash registers, security lighting and alarms.

A long term outage within the central business district could force the evacuation of many buildings causing a breakdown of normal operations and massive trading losses.

(2) 220 000 volt security analysis

Using computer programmes (developed within the United Kingdom supply industry) in conjunction with detailed information obtained from the SEC on historical plant equipment failure rates, it has been possible to make an independent assessment of the current reliability of supplies to the central business district and the improvement in reliability which would flow from introducing a third 220 000 volt circuit. The absolute figures obtained from this analysis on reliability of supply should be treated with caution because of difficulties regarding the accuracy of the fault data employed.

The relative improvements in reliability computed can be treated with confidence.

Tables 2 and 3 list the results of the reliability of analysis and give the improvement in reliability attributable to various reinforcement schemes. It is immediately apparent that there is a major improvement in security resulting from any scheme which introduces a third 220 000 volt circuit to either West Melbourne or Richmond terminal stations. (The alternative means of providing the third 220 000 volt circuits are discussed in detail in the following sections of this report and the detailed report on the reliability analysis is attached as Appendix 1.)

(3) BEI conclusion and recommendation

The present 220 000 volt supply arrangements to Melbourne make extensive use of radial double circuit lines with no provision for an alternative supply in the event of a double circuit outage. This network configuration puts load at risk for either a double circuit outage or single circuit outage with one circuit already out for maintenance. Reinforcement with additional 220 000 volt circuits is necessary to bring security of supply to terminal stations such as West Melbourne, Fishermen's Bend, Richmond and Brunswick up to international standards appropriate to the central business district of a major city.

TABLE 2

RESULTS OF RELIABILITY ASSESSMENT FOR RICHMOND TS ONLY (NEIGHBOURING STATIONS EXCLUDED)

| Ref No | Richmond Reinforcement Option | Frequency of Loss of all 220 kV Supplies to Richmond TS (Once Every n Years) | Average Duration of Interruption (Hours) | Average kWh Lost at Richmond TS Per year | |
|--------|---|--|--|--|--------------------------|
| | | | | Excluding Load Transfer | With Post-Fault Transfer |
| - | Prior to reinforcement. | 9 | 3.7 | 32 200 | 23 500 |
| R1 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Brunswick - double overhead circuit | 270 | 2.4 | 280 | 205 |
| R2 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Kew - double overhead circuit | 267 | 2.4 | 285 | 208 |
| R3 | Richmond to Malvern - single overhead circuit | 251 | 2.4 | 315 | 230 |
| R5 | Richmond to Fishermen's Bend - single cable circuit | 215 | 3.0 | 500 | 365 |
| CSD 1 | Richmond to Clifton Hill - double overhead circuit Clifton Hill to Brunswick - double overhead circuit | 2750 | 2.2 | 17 | 12 |
| CSD2 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Brunswick - single overhead circuit | 170 | 2.4 | 460 | 340 |

TABLE 3

RESULTS OR RELIABILITY ASSESSMENT FOR WEST MELBOURNE TS ONLY (NEIGHBOURING STATIONS EXCLUDED)

| Ref No | West Melbourne Reinforcement Option | Frequency of Loss of all 220 kV Supplies to West Melbourne TS (Once Every n Years) | Average Duration of Interruption (Hours) | Average kWh Lost at West Melbourne TS Per Year | |
|--------|---|--|--|--|--------------------------|
| | | | | Excluding Load Transfer | With Post-Fault Transfer |
| - | Prior to reinforcement. | 14 | 4.9 | 40 800 | 30 200 |
| W1 | Fishermen's Bend to Newport - double overhead circuit | 3500 | 2.1 | 12 | 9 |
| W2 | West Melbourne to Yarraville - double overhead circuit | 4600 | 2.2 | 11 | 8 |
| W4(a) | West Melbourne to Brunswick - double overhead circuit | 6500 | 2.2 | 7 | 5 |
| (b) | West Melbourne to Brunswick - double cable circuit | 7100 | 3.5 | 15 | 11 |
| (c) | West Melbourne to Brunswick - single cable circuit | 510 | 5.7 | 480 | 350 |
| W5 | Fishermen's Bend to Richmond - single cable circuit | 350 | 6.0 | 550 | 410 |

DISCUSSION AND CONCLUSION

- 2.38 The case put forward by the SEC for development of the transmission system serving the CBD and inner metropolitan area is primarily based on the need to improve the security of supplies to this inner area.
- 2.39 Other secondary reasons for development of the system were put forward during the course of the inquiry and these included:
- (1) The long-term possible need for load distribution centres at Clifton Hill and Yarraville;
 - (2) The need to provide standby interconnection capacity between the 500 kV and 220 kV systems in the metropolitan area if the double circuit 220 kV transmission line between Rowville and Thomastown is lost due to an accidental event; and
 - (3) The possibility of energy savings because of improved sharing of transmission line capacities.
- 2.40 British Electricity International Ltd., the consultants employed by the Committee, found that a strong case existed for developing the transmission system.
- 2.41 The Committee requested the SEC to carry out a survey of the potential effects of loss of supply to the inner area of Melbourne. The results of this survey indicated that the potential effects were significant.
- 2.42 The Committee accepts the need expressed by the SEC and supported by BEI for improving the security of supplies to Richmond and West Melbourne.

RECOMMENDATION

2.43 The Committee recommends that:

- (1) The security of supply to the Central Business District and inner metropolitan area from Richmond and West Melbourne Terminal Stations should be improved.
- (2) As a secondary objective, any measures taken to improve the security of supply to Richmond and West Melbourne Terminal Stations should take into account where possible:
 - (i) the need to provide for potential future load changes in specific parts of the inner metropolitan area; and
 - (ii) the need to provide additional alternative inter-connection capacity between the 500 000 volt and 220 000 volt systems in the metropolitan area.

* * * * *

CHAPTER THREE

ALTERNATIVES AVAILABLE TO IMPROVE THE SECURITY OF SUPPLY TO THE CENTRAL BUSINESS DISTRICT AND INNER METROPOLITAN AREA

EXISTING SUPPLY ARRANGEMENT

3.1 This was described in paragraphs 2.1 to 2.3.

EXTRACTS FROM THE CASE PUT FORWARD BY THE SEC

Proposals for establishing the lines

3.2 The SEC plan to improve the security of supplies to the inner metropolitan area is based on the principle of establishing 220 000 volt transmission tie lines between the existing adjacent radial transmission lines to West Melbourne, Newport, Richmond and Brunswick terminal stations in order to provide an alternative route for supply to each of the stations in the event of failure of one of the radial supplies.

3.3 The existing terminal stations which would be made secure by the building of the tie lines are -

Inner Western Area - West Melbourne, Fishermen's Bend, Brooklyn.

Inner Eastern Area - Richmond, Brunswick.

3.4 The critical CBD load is supplied from Richmond and West Melbourne.

3.5 The existing terminal stations are being progressively equipped to their planned capacity of 400 MW as the load on each station increases.

3.6 The proposed tie lines also make provision for a secure transmission supply to future terminal stations at Clifton Hill in the east and Yarraville in the west.

3.7 Specifically, the SEC plans indicated on Figure 2 are for the construction of 220 000 volt connections between -

(1) Newport to Fishermen's Bend (\$7 M.)

- to secure the critical West Melbourne load;
- to secure supply to Fishermen's Bend and Brooklyn terminal stations;
- to provide capability for secure supply to the future Yarraville Terminal Station.

(2) Richmond to Clifton Hill to Brunswick (\$7 M.)

- to secure the critical Richmond load;
- to secure supply to Brunswick Terminal Station;
- to provide capability for secure supply to the future Clifton Hill Terminal Station.

Capacity of the lines

3.8 The rating of the proposed tie lines was determined to meet initial development of the load, but also to be compatible with longer term requirements. For example, for the Richmond to Brunswick line, the capacity was selected as 800 MW to provide for supply to -

- Richmond and Clifton Hill for loss of the Richmond supply;
- Brunswick and Clifton Hill for loss of the Brunswick supply.

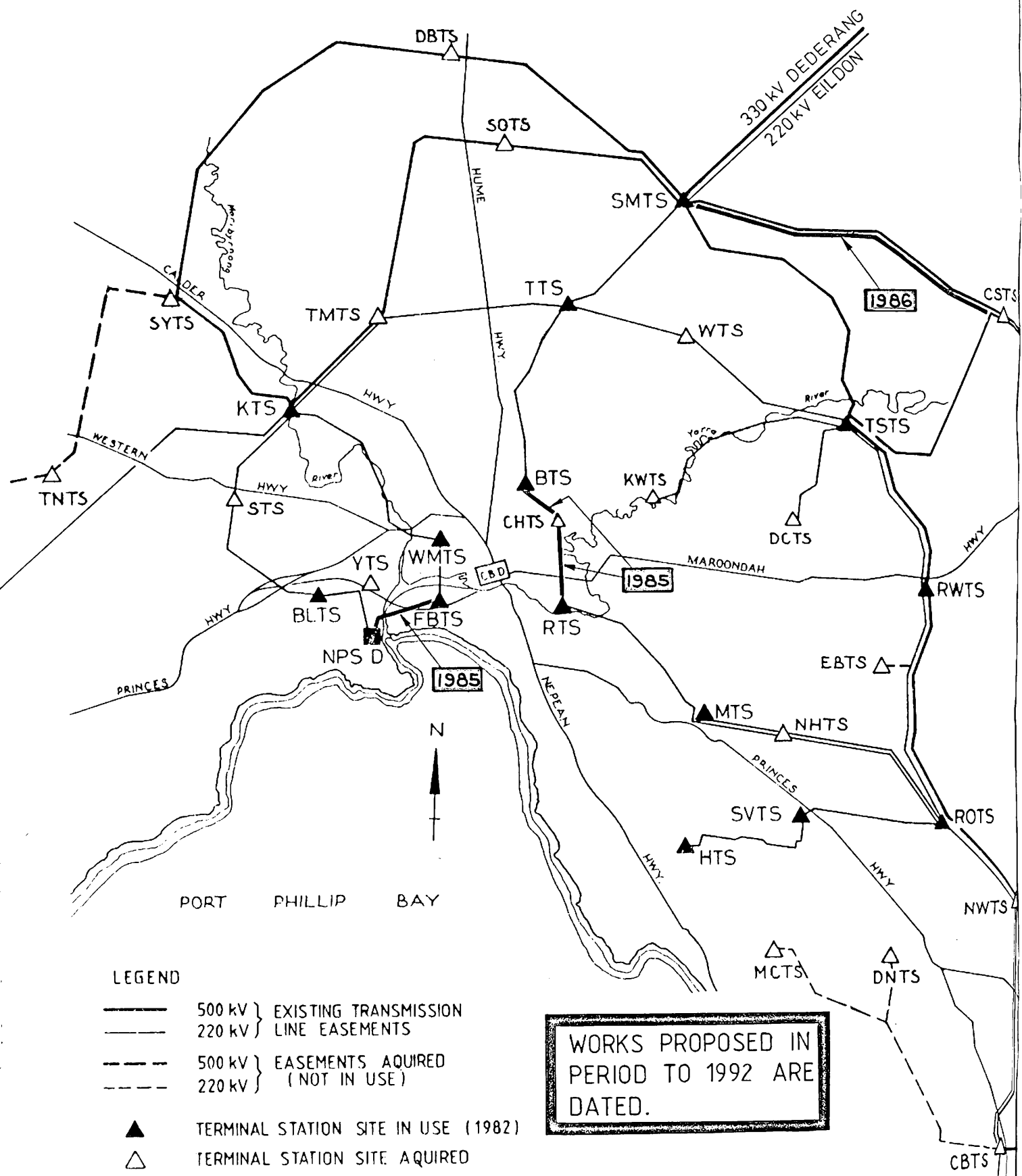


FIGURE 2
 PLAN OF METROPOLITAN TRANSMISSION
 EASEMENTS AND TERMINAL STATIONS

REFER TABLE 4 FOR TERMINAL STATION NAMES

TABLE 4.

KEY TO TERMINAL STATION ABBREVIATIONS

| <u>Abbreviation</u> | <u>Terminal Station Name</u> | <u>Abbreviation</u> | <u>Terminal Station Name</u> |
|---------------------|----------------------------------|---------------------|----------------------------------|
| BLTS | Brooklyn | NHTS | Notting Hill |
| BTS | Brunswick | NWTS | Narre Warren |
| CBTS | Cranbourne | ROTS | Rowville |
| CHTS | Clifton Hill | RTS | Richmond |
| CSTS | Coldstream | RWTS | Ringwood |
| DBTS | Donnybrook | SMTS | South Morang |
| DCTS | Doncaster | SOTS | Somerton |
| DNTS | Dandenong | STS | Sunshine |
| EBTS | East Burwood | SVTS | Springvale |
| ERTS | East Rowville | SYTS | Sydenham |
| FBTS | Fishermen's Bend | TMTS | Tullamarine |
| HTS | Heatherston | TNTS | Truganina |
| HWTS | Hazelwood | TSTS | Templestowe |
| KTS | Keilor | TTS | Thomastown |
| KWTS | Kew | WMTS | West Melbourne |
| MCTS | Mordialloc | WTS | Watsonia |
| MTS | Malvern | YTS | Yarraville |

KEY TO POWER STATION ABBREVIATIONS

| <u>Abbreviation</u> | <u>Power Station Name</u> |
|---------------------|-------------------------------|
| HWPS | Hazelwood |
| LYPS | Loy Yang |
| NPS | Newport D |
| YPS | Yallourn |

3.9 A short-term emergency rating of 1100 MW has also been selected to provide for full development of the terminal stations to their ultimate capacity of 600 MW per station.

3.10 These continuous and short-term ratings are also consistent with the capacity required to secure the whole metropolitan area against loss of the double circuit line between Rowville and Thomastown.

Longer term considerations

3.11 The 220 000 volt supplies, formed by establishing the planned tie lines, have the capability to supply the inner Melbourne metropolitan load for the foreseeable future. No further 220 000 volt overhead transmission lines are planned for supply of the inner metropolitan area.

Alternative transmission connections

3.12 Alternative transmission connections which could secure the supplies to Richmond and West Melbourne were put forward by the SEC and are shown in Figures 3 and 4.

3.13 The SEC indicated that the alternative connections are of higher cost than their preferred connections. They would require longer transmission routes than the preferred connections and, in some cases, would require underground cable as no easement is available for overhead transmission lines.

3.14 The alternative connections would not secure all the terminal stations supplying the inner metropolitan area nor provide for development of future terminal stations. The performance of each in terms of stations secured and future terminal stations supplied is indicated on Table 5.

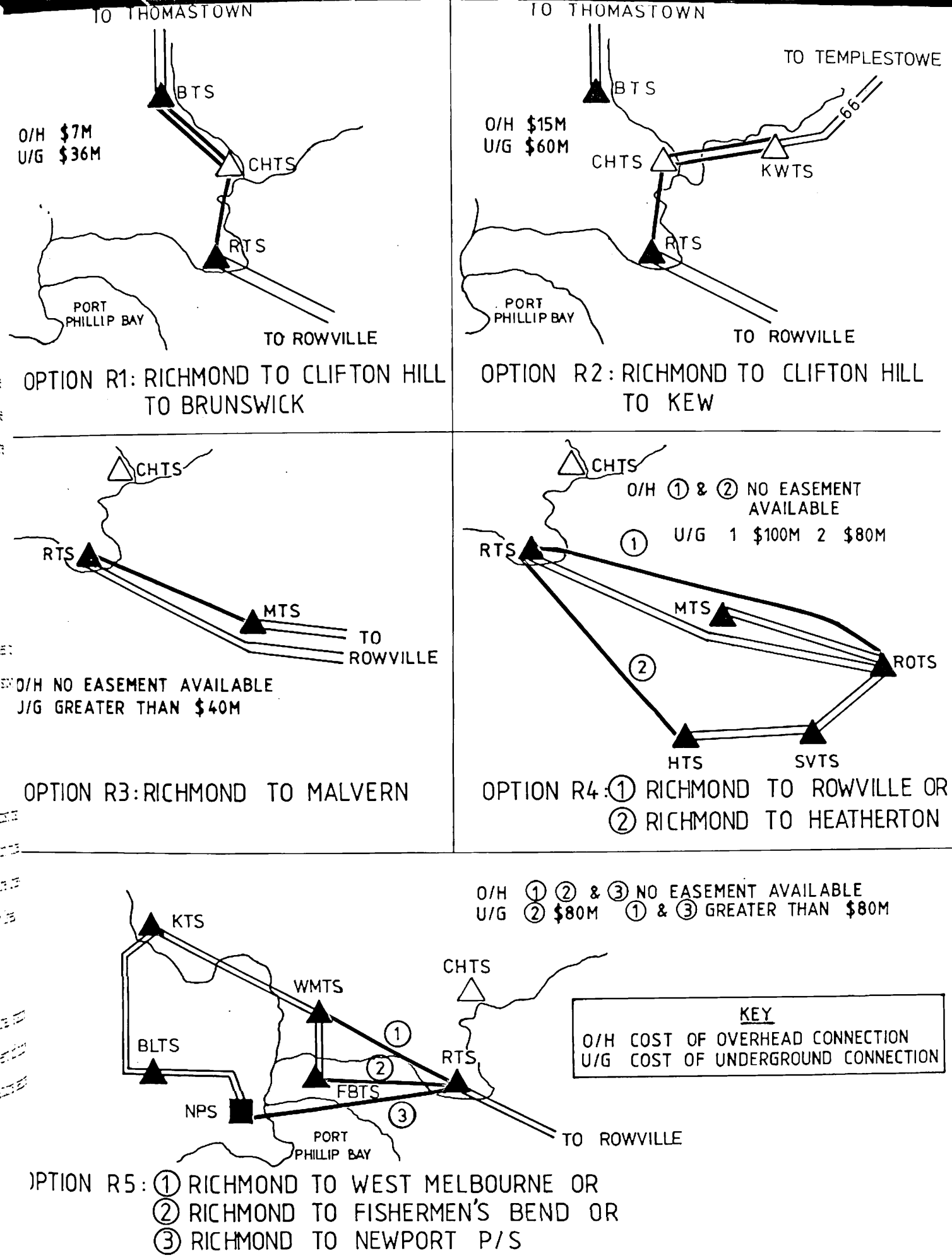
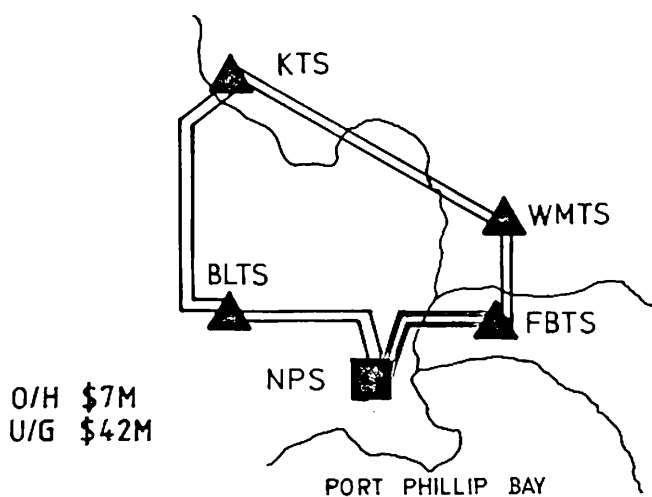


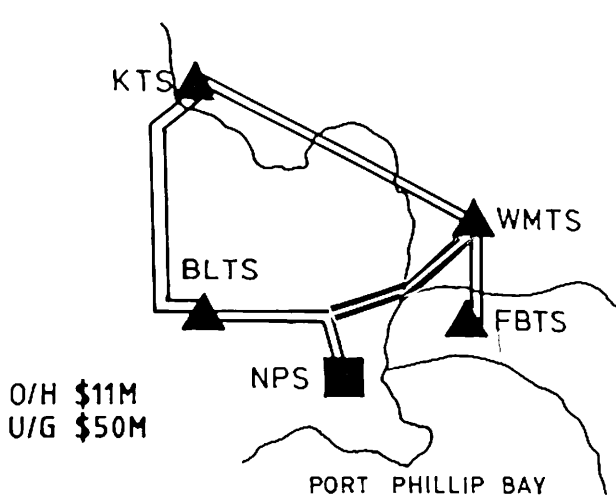
FIGURE 3
 OPTIONS FOR REINFORCEMENT OF
 220,000 VOLT TRANSMISSION TO
 RICHMOND TERMINAL STATION

REFER TABLE 4 FOR TERMINAL STATION NAMES



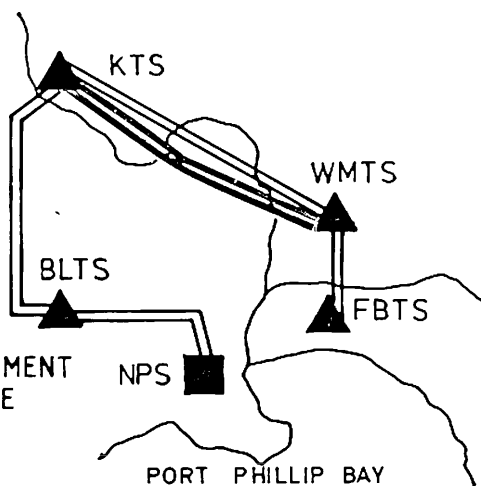
O/H \$7M
U/G \$42M

OPTION W1: FISHERMEN'S BEND TO NEWPORT P/S



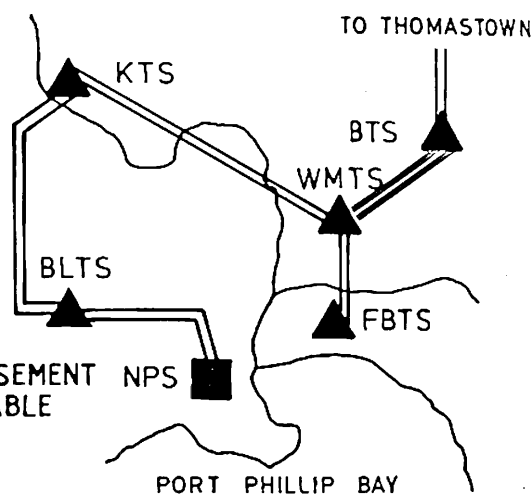
O/H \$11M
U/G \$50M

OPTION W2: WEST MELBOURNE TO YARRAVILLE



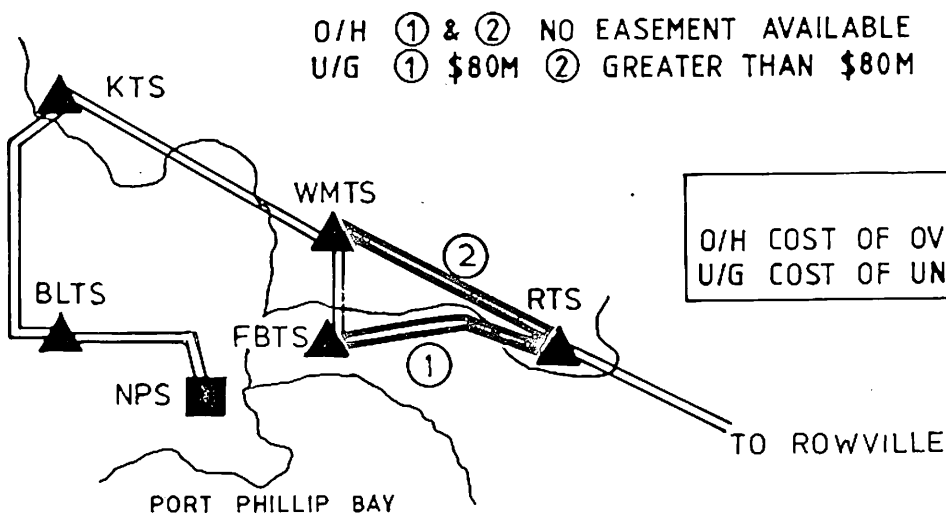
O/H NO EASEMENT
AVAILABLE
U/G \$100M

OPTION W3: WEST MELBOURNE TO KEILOR



O/H NO EASEMENT
AVAILABLE
U/G \$60M

OPTION W4: WEST MELBOURNE TO BRUNSWICK



O/H ① & ② NO EASEMENT AVAILABLE
U/G ① \$80M ② GREATER THAN \$80M

KEY
O/H COST OF OVERHEAD CONNECTION
U/G COST OF UNDERGROUND CONNECTION

OPTION W5: ① FISHERMEN'S BEND TO RICHMOND or
② WEST MELBOURNE TO RICHMOND

FIGURE 4

OPTIONS FOR REINFORCEMENT OF 220,000 VOLT TRANSMISSION TO W/MELBOURNE TERMINAL STATION

REFER TABLE 4 FOR TERMINAL STATION NAMES

TABLE 5 : SEC PLAN AND OVERVIEW OF OPTIONS

| | Terminal Station Secured | | | | | Provision for Terminal Station | | Security for Outer 220 kV Ring |
|--|--------------------------|------------------|----------|-----------|----------|--------------------------------|--------------|--------------------------------|
| | West Melbourne | Fishermen's Bend | Brooklyn | Brunswick | Richmond | Yarraville | Clifton Hill | |
| SEC Plan (R1 and W1) | X | X | X | X | X | X | X | X |
| Options for Securing Eastern Inner Metropolitan Area | | | | | | | | |
| R1 Richmond-Clifton Hill-Brunswick | | | | X | X | | X | X |
| R2 Richmond-Clifton Hill-Kew | | | | | X | | X | X |
| R3 Richmond-Malvern | | | | | X | | | |
| R4 1 Richmond-Rowville | | | | | X | | | |
| R4 2 Richmond-Heatherton | | | | | X | | | |
| R5 1,W5 2 Rich-W/Melb | X | | | | X | | | X |
| R5 2,W5 1 Rich-Fish Bend | X | X | | | X | | | X |
| R5 3 Richmond-Newport | | | X | | X | X | | X |
| Options for Securing Western Inner Metropolitan Area | | | | | | | | |
| W1 Fish Bend-Newport | X | X | X | | | X | | |
| W2 W/Melb-Yarraville | X | | X | | | X | | |
| W3 W/Melb-Keilor | X | | | | | | | |
| W4 W/Melb-Brunswick | X | | | X | | | | |
| W5 1 Fish Bend-Richmond | X | X | | | X | | | X |
| W5 2 W/Melb-Richmond | X | | | | X | | | X |

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3.15 If the alternative connections were implemented then additional transmission works would be required at a later date to provide adequate security for the new load centres. In particular, it is predicted that additional transmission lines would be required to improve the security of supply to Brooklyn and Clifton Hill in about 1990 - four years after the new lines are put into service.

Possible use of underground cables for the Richmond to Brunswick tie

3.16 The costs of underground alternatives are much greater than for the overhead alternatives. For example, for the Richmond to Brunswick line to provide the same capacity as the SEC's preferred overhead development, underground cabling would cost \$36 M. compared with \$7 M. for the overhead proposal. This cost increase is considered by the SEC to be excessive for the improvement obtained in environmental impact.

3.17 An underground cable installation between Richmond and Brunswick could be constructed in stages to provide the required capacity as load develops. The minimum initial development would be one 400 MW cable to secure the Richmond load only. This cable would not have the capacity of the proposed overhead line to provide security for supply to the whole of the metropolitan area for failure of the Rowville to Thomastown double circuit 220 000 volt line. The initial cost of an underground cable installation would be about \$32 M., comprising \$12 M. for the cable and \$20 M. for the minimum development of Narre Warren 500 000/220 000 volt Terminal Station, compatible with 500 000 volt system requirements. This latter expenditure would be advanced at least ten years prior to the estimated date when it would be required to meet the predicted load growth. A further expenditure of \$24 M. would be required for installation of the full cable capacity between Richmond and Brunswick as load developed in the inner metropolitan area.

- 3.18 Routing a cable connection via the CBD would require a 50 per cent longer cable than a direct connection from Richmond to Brunswick. Some off-setting reduction could be achieved in costs for the next sub-transmission reinforcement between Clifton Hill and the CBD currently predicted to be required by about the year 2000.
- 3.19 The cost for the minimum rated cable routed via the CBD would be about \$6 M. above the \$12 M. cost of a directly routed cable (refer paragraph 3.17). A 220 000 volt terminal station in the CBD would cost about \$2 M. more for land than a 66 000 volt substation in the same area. This increased cost of \$8 M. would be offset by a reduction of \$4.5 M. for the reduced 66 000 volt sub-transmission requirements and by \$2 M. in reduced 66 000 volt substation requirements and transmission losses. Hence, the capital cost for the minimum rated cable routed via the metropolitan area and a minimum development of the Narre Warren 500 000/220 000 volt terminal station would have an initial cost of \$38 M. with an off-setting saving of \$4.5 M. which would only be realised when the load in the CBD had increased to a level which is currently estimated to occur about 15 years later.

Possible augmentation of the 66 000 volt network to provide an alternative supply to terminal stations

- 3.20 The 66 000 volt sub-transmission supply network is reconnected at intervals as the load develops so as to share load amongst the terminal stations and make maximum use of available assets. Re-connection of loads to different terminal stations can also be used to transfer load away from a terminal station with a failed transformer. Such transfers would take at least a day.
- 3.21 Typically, 25 per cent of a terminal station load could be transferred away in this manner.

- 3.22 The capacity of the existing 66 000 volt sub-transmission network is therefore inadequate for either total or rapid restoration of terminal station supply following failure of a double circuit 220 000 volt line.
- 3.23 If the 66 000 volt sub-transmission was to be up-graded to allow it to be connected to alternative sources of supply, it would require significant augmentation of the existing sub-transmission network with dedicated tie lines for emergency inter-connection of adjacent terminal stations. These 66 000 volt tie lines could not be connected directly to the 66 000 volt load network because of the excessive current that could flow under fault conditions. Additional transformers would be necessary at each terminal station to allow the tie lines to be connected into the 220 000 volt supply to the station.
- 3.24 For a 66 000 volt alternative to the 220 000 volt Richmond to Brunswick line, 7 to 8 overhead 66 000 volt lines would be necessary to provide 800 MW of transfer capacity to supply the area loads for loss of the 220 000 volt supply. As well, an additional 800 MW of transformers would need to be installed at each of the Brunswick and Richmond Terminal Stations.
- 3.25 In the shorter term (to about 1990), for loads up to about 400 MW at Richmond, four 66 000 volt lines and a 400 MW transformer at both Richmond and Brunswick Terminal Stations would be required. These works would have a cost of about \$18 M.
- 3.26 However, this minimum connection could not provide the transfer capacity required to secure the whole metropolitan load for failure of the double circuit line from Rowville to Thomastown and Narre Warren Terminal Station. This would have to be established at a cost of \$20 M. That is, the initial cost using 66 000 volt tie lines would be \$38 M. and further expenditure of \$18 M. for additional lines and transformers would be required as load developed.

3.27 Apart from being highly uneconomic to transfer large blocks of power at lower voltage, the 66 000 volt lines could not be realistically accommodated on streets, in addition to the lines for load supply. Also, the additional transformers would require further land at the terminal stations and increase their visual impact.

Environmental considerations

3.28 The SEC, in putting forward its proposals, considered -

- compatibility with existing land usage, including proximity to residential areas;
- visibility;
- economic factors;
- proximity to other SEC lines; and
- flexibility ease of operation and maintenance.

3.29 The SEC considers that environmentally acceptable solutions to achieve the connections from Brunswick to Richmond and Newport to Fishermen's Bend are possible. Treatments of varying degrees can be considered, some involving community judgement and additional costs. At the extreme, undergrounding sections of the line could be considered; however, this is very expensive. The SEC submitted that in the final analysis there must be a weighing up, in conjunction with the public and interested groups, of what is a reasonable financial cost for the community to pay having regard to the community's judgement of the effects of various treatments.

3.30 The SEC has undertaken detailed environmental investigations and independent assessments have been carried out. Some of the major considerations for the two lines proposed are set out in the following sections.

3.31 The SEC indicated that it is now in a position to prepare an Environmental Effects Statement in accordance with the requirements of the Ministry for Conservation. The SEC also indicated that it would be pleased to work with the responsible planning authorities or their nominated representatives (for example, the MYMPC), the Ministry for Conservation and other public bodies to develop suitable treatments for the overhead lines in the areas which have been identified as being sensitive, for presentation in the Environmental Effects Statement.

EXTRACTS FROM THE REVIEW BY THE CONSULTANTS

OPTIONS FOR FUTURE DEVELOPMENT

220 000 volt Substation Security

General

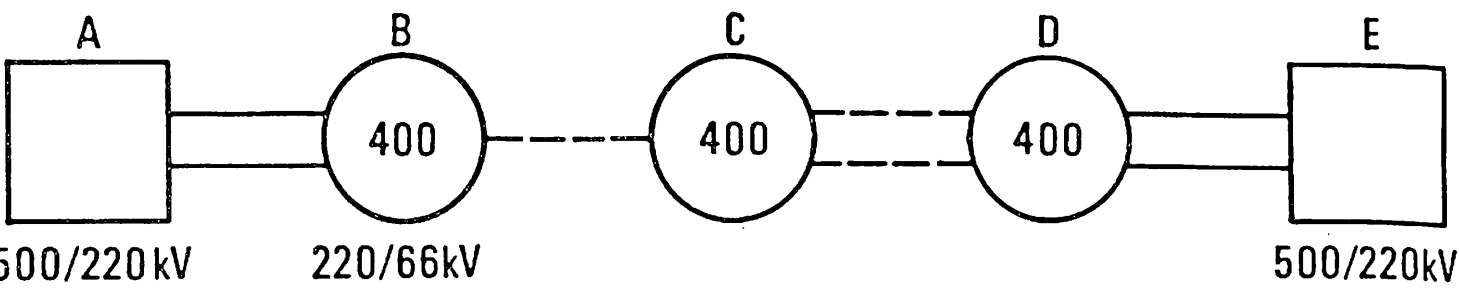
3.32 The present 220 000 volt supply arrangements to Melbourne are characterised by single double circuit tower lines supplying key 220 000 volt terminal stations such as Richmond, Brunswick, West Melbourne and Fishermen's Bend. There are four main options which can be considered for securing these key 220 000 volt terminal stations against a double circuit outage namely -

(1) Loop Concept (See Figure 5)

The main SEC proposals all embody the loop transmission concept which is illustrated in Figure 5. Using this concept, terminal stations B and D (e.g. Richmond and Brunswick) can be secured against a double circuit outage (AB or DE) by the construction of new circuits BC and CD. The advantages of this concept are:

- (a) Fault level infeed from 500 000/220 000 volt stations at A and E can be controlled to limit the fault level to within the switchgear interrupting capacity by controlling the number and impedance of 500 000/220 000 volt transformers;
- (b) The capacity of the connections BC and CD can be reduced to 400 MW thus permitting the use of either light duty aesthetic overhead lines or a single 220 000 volt cable (1000 mm² rating 400 MVA);

EXAMPLE OF A 1200MW LOOP

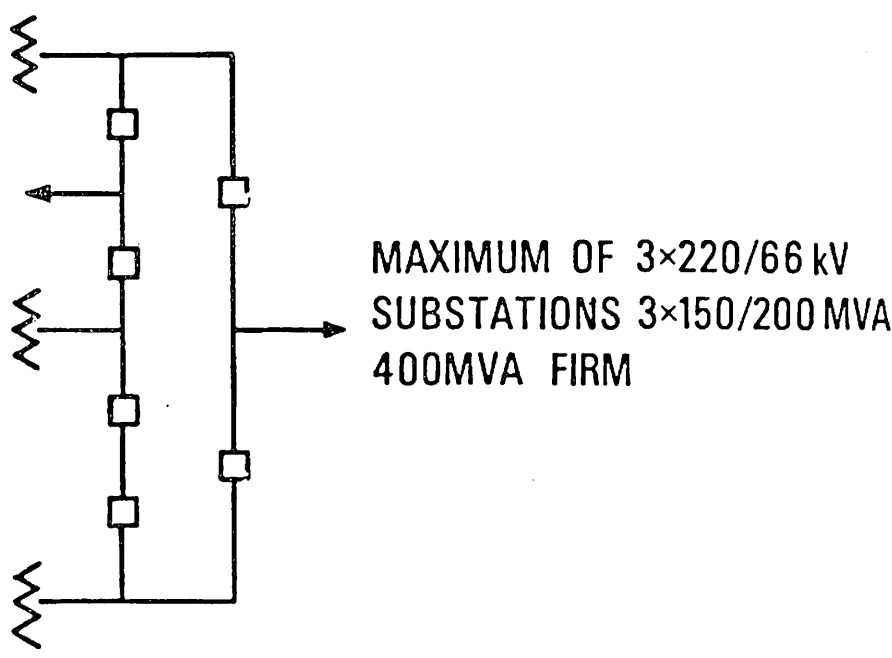


POSSIBLE STATION FACILITIES

AT A AND E - 500/220kV SUBSTATIONS

MAXIMUM OF 4x1000 MVA 500/220 TRANSFORMERS AT A AND E

AT B



TRANSMISSION FACILITIES

| | | | |
|----------------|------------|--------------------------------------|-------|
| A - B | ————— | B - C | ----- |
| D - E | OVERHEAD | C - D | |
| 800 MW | CONTINUOUS | 400MW CABLE | |
| 1100MW | EMERGENCY | 1000mm ² OIL FILLED CABLE | |
| CONDUCTOR TYPE | | OR 1 - FINCH - LIGHT DUTY LINE | |
| 2 - FINCH | | | |

FIGURE 5

EXAMPLE OF A 1200MW LOOP TRANSMISSION CONCEPT APPROPRIATE TO MELBOURNE

- (c) The new circuit BD can be routed to accommodate future 220 000 volt substations (e.g. Clifton Hill or inner CBD substation); and
- (d) The utilisation factor of the connections AB and DE is improved.

(2) Tapped Radial Transmission Concept (See Figure 6)

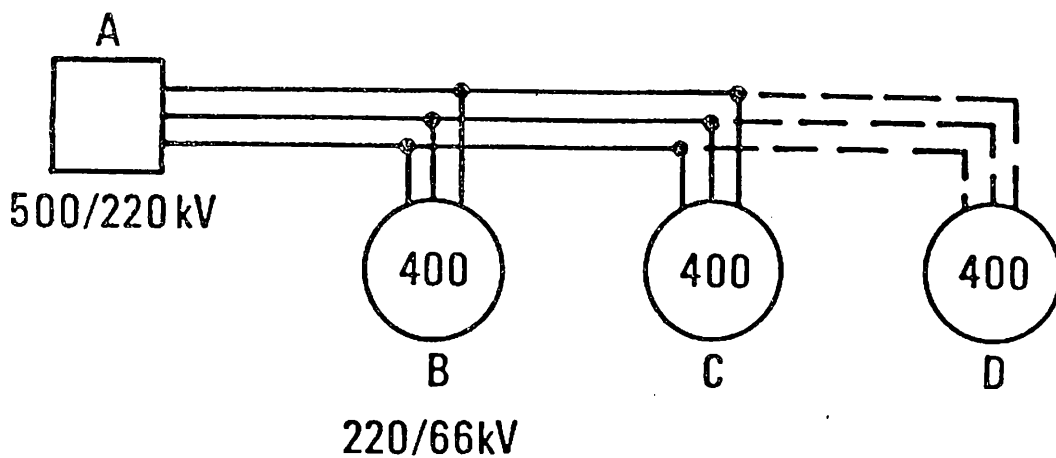
An alternative transmission concept which has been used by the SEC for its alternative proposal R3 is the tapped radial transmission concept.

Using this concept supplies to terminal stations B, C and D, can be secured against a double circuit outage by the construction of a third circuit ABCD.

Advantages of this concept if optimised are -

- (a) Minimum use of 220 000 volt switchgear;
- (b) A tapered concept is possible permitting the use of light duty aesthetic pole-type line or cable (rating 400 MW) for sections CD (e.g., Malvern - Richmond);
- (c) 220 000 volt fault level is easily contained; and
- (d) Maximum 220 000 volt line loadings are easily predictable.

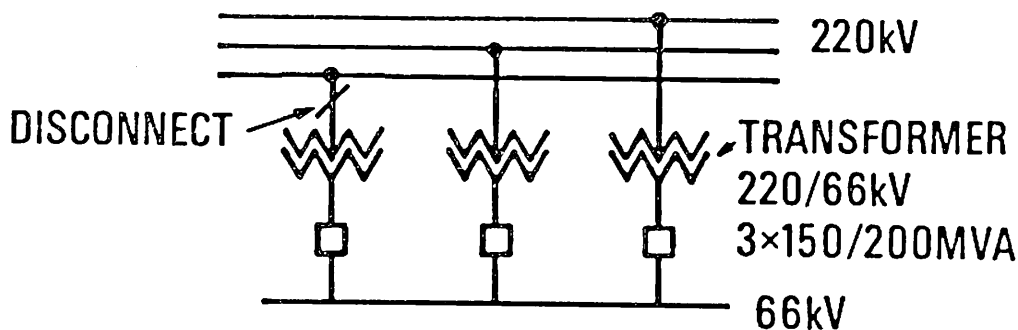
EXAMPLE OF A 1200 MW TAPPED SYSTEM



STATION FACILITIES

AT A 500/220kV SUBSTATION

AT B,C,D



TRANSMISSION FACILITIES

A ——— B
B ——— C

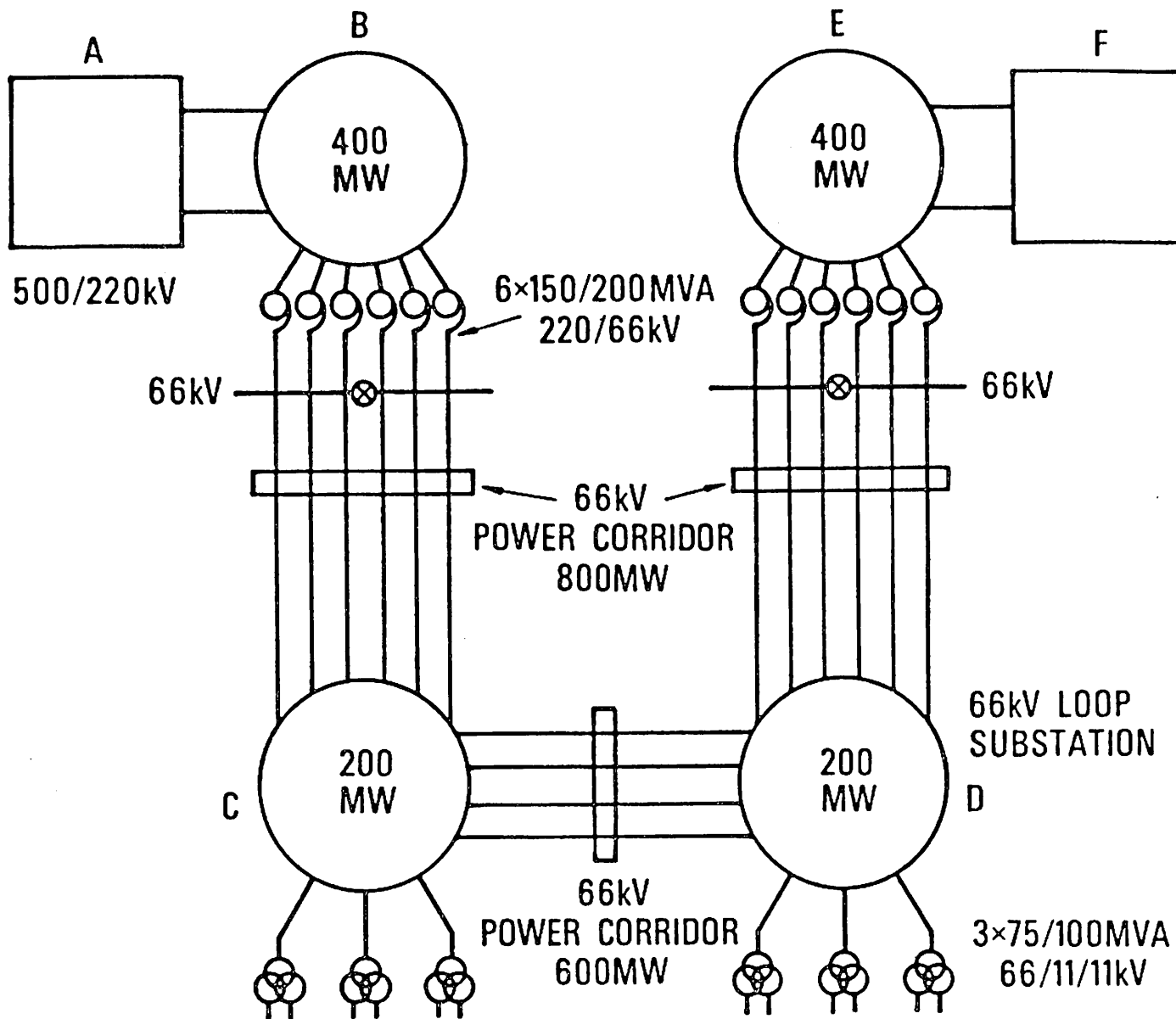
OVERHEAD

C - - - - - D CABLE

800MW CONTINUOUS
1100MW EMERGENCY
CONDUCTOR TYPE
2-FINCH

400MW CABLE
1000mm² OIL FILLED CABLE
OR 1-FINCH LIGHT DUTY LINE

FIGURE 6
EXAMPLE OF A 1200MW TAPPED TRANSMISSION CONCEPT
APPROPRIATE TO MELBOURNE



| POSSIBLE STATION FACILITIES | POSSIBLE TRANSMISSION FACILITIES |
|--|---|
| AT A AND F- 500/220kV STATION | AB } 220kV OVERHEAD CIRCUIT |
| AT B AND C- 6×220/66kV - 150/200MVA 220kV LOOP SUBSTATION | EF- } 2-FINCH 800MW NORMAL 1100 MW EMERGENCY |
| AT C AND D- 3×66/11/11kV - 75/100MVA 66kV LOOP SUBSTATION | BC } 66kV CABLE ED } 6×150MVA CD 66kV CABLE 4×150MVA |

FIGURE 7 EXAMPLE OF A 1200MW 66kV INTERCONNECTION CONCEPT APPROPRIATE TO MELBOURNE

(3) 66 000 volt Interconnection (See Figure 7)

Some of the objectors to the SEC 220 000 volt proposals have suggested that 220 000 volt terminal stations could be secured against double circuit 220 000 volt outages by the use of 66 000 volt cable interconnections. A possible concept which matches the capacity of the 1200 MW transmission system is shown in Figures 5, 6 and 7.

The basic problem with 66 000 volt interconnections is the high cost of providing capacity at 66 000 volts. It will be noted, for example, that in the event of a double circuit outage AB, it is necessary for substations B, C, D and E to be supplied via the 220 000/66 000 volt transformation capacity. The 66 000 volt costs and the 66 000/11 000 volt substation costs render the concept of full 66 000 volt interconnection uneconomic compared with 220 000 volt interconnections.

(4) Limited 66 000 volt Transfer Capacity (See Figure 8)

Even though the concept of full 66 000 volt interconnection is uneconomic, nevertheless, a substantial 66 000 volt network already exists which should be used to the maximum possible degree to mitigate the effects of an extended power failure caused by a double circuit 220 000 volt outage.

In the event of a complete loss of supply to West Melbourne, for example, it is desirable that priority loads existing in the CBD area should be transferred to 66 000 volt circuits fed from healthy 220 000 volt substations at Richmond or Fishermen's Bend.

The SEC have already recognised the merit of such a transfer facility and an arrangement such as that shown in Figure 8 has been proposed with a view to achieving up to 60% supply of priority loads from adjacent CBD stations in the event of a prolonged power failure.

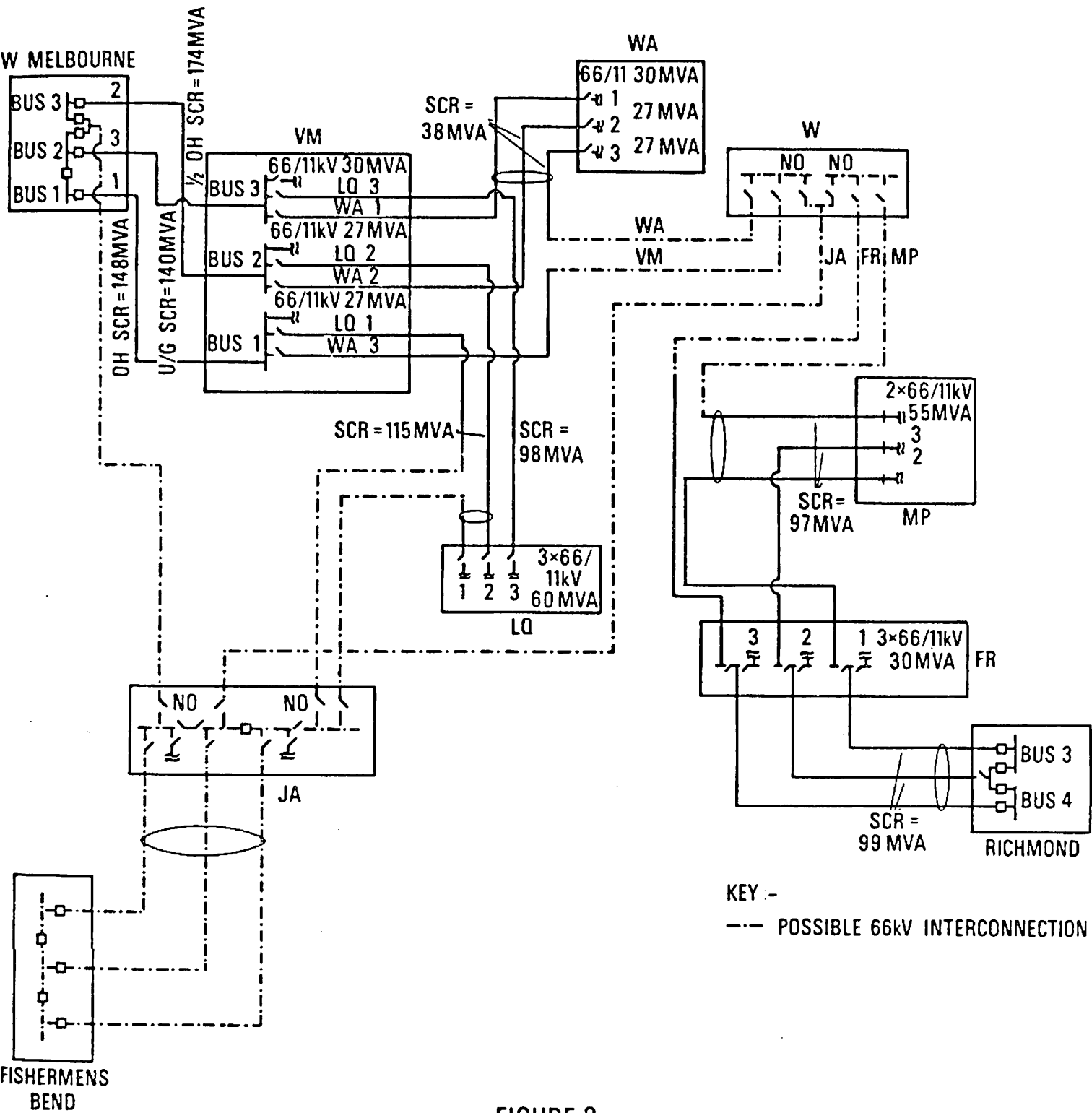


FIGURE 8

POSSIBLE 66kV SUBTRANSMISSION OFF LOAD TRANSFER ARRANGEMENTS BETWEEN W MELBOURNE/FISHERMENS BEND/RICHMOND TERMINAL STATIONS

TABLE 6

COMPARATIVE COSTS OF OVERHEAD AND UNDERGROUND TRANSMISSION LINES

FOR METROPOLITAN CONDITIONS (EXCLUDING EASEMENTS)

| SECV Costs | | | | Ratio Underground Cable/ Overhead Line | Thermal Rating MVA | Cost/MVA km Australian \$ |
|---|------------------------------------|--|---|--|--------------------------|------------------------------|
| 500 000 volt single circuit transmission line consisting of four conductors/phase. | \$470 000/km | Underground transmission line to transmit equivalent electric power. | \$10 200 000/km, including reactive compensation. | 21.7 | 3500 | 134 OHL 2 915 U/G |
| | | 500 000 kV sulphur hexafluoride cable of equivalent capacity. | \$8 000 000/km | 17.0 | 3500 | 2 286 SF6 |
| 220 000 volt double circuit transmission line consisting of two conductors/phase on towers. | \$450 000/km | Underground transmission line to transmit equivalent electric power. | \$8 200 000/km, including reactive compensation. | 18.2 | 1600 | 282 OHL 5 125 U/G |
| 220 000 volt single circuit transmission line consisting of two conductors/phase on towers. | \$250 000/km | Underground transmission line to transmit equivalent electric power. | \$4 100 000/km, including reactive compensation. | 16.4 | 800 | 312 OHL 5 125 U/G |
| 220 000 volt double circuit transmission line consisting of two conductors/phase on poles. | \$900 000/km | Underground transmission line to transmit equivalent electric power. | \$8 200 000/km, including reactive compensation. | 9.1 | 1600 | 562 OHL 5 125 U/G |
| 220 000 volt single circuit transmission line consisting of two conductors/phase on poles. | \$500 000/km | Underground transmission line to transmit equivalent electric power. | \$4 100 000/km, including reactive compensation. | 8.2 | 800 | 625 OHL 5 125 U/G |
| 220 000 volt double circuit transmission line, single conductor per phase on towers. | \$260 000/km | Underground equivalent. | \$4 100 000/km including reactive compensation. | 15.8 | 800 | 325 OHL 5 125 U/G |
| 220 000 volt single circuit transmission line, single conductor per phase on towers. | \$150 000/km | Underground equivalent. | \$2 050 000/km, including reactive compensation. | 13.7 | 400 | 375 OHL 5 125 U/G |
| 66 000 volt on poles in streets. | \$46 000/km | Underground equivalent. | \$1 100 000/km | 23.9 | 120 | 383 OHL 9 166 U/G |
| 22 000 volt or 11 000 volt on poles in streets. | \$26 000/km | Underground equivalent. | \$100 000/km | 3.8 | 12-22 kV | 2 167 OHL 8 333 U/G |
| | | | | | 7-11 kV | 3 714 OHL 14 285 U/G |
| Low voltage on poles in streets. | \$26 000/km and \$120 per service. | Underground equivalent. | \$100 000/km and \$800 per service. | 3.8 | 0-25 MVA | - - |

The rates are subject to variation depending on structure, location, geological and other factors.

220 kV conductor is "PAW PAW" 54/3.75 A1, 19/2.25 steel.

Philosophy of an economic supply

- 3.33 The economics of electricity supply are influenced by certain fundamental cost relationships and a sympathetic formulation of transmission supply alternatives requires some understanding of these relationships.

Overhead circuit versus underground cable costs

- 3.34 Overhead transmission circuits are always substantially less expensive than cable. This is particularly true at the higher transmission voltages. Reference to Table 6, for example, shows that based on SEC costs (which are representative of international experience) the ratio of overhead to underground cable costs will be of the order of 1/18 at higher voltages dropping to 1/4 at voltages of 11 000 volts and 22 000 volts. (Note, however, that 66 000 volt overhead transmission is very economic).
- 3.35 Furthermore, power transmission capability increases substantially with voltage. Thus a standard SEC heavy duty lattice steel 220 000 volt line can transmit 1600 MVA as compared to a power transfer of only 7 MVA for an 11 000 volt distribution circuit.
- 3.36 It follows therefore, on the grounds of economy, that if overhead transmission is to be limited on grounds of amenity, it will be more effective to concentrate limited funds on undergrounding distribution circuits (11 000 volt and 22 000 volt) and to develop a few high capacity 220 000 volt circuits.
- 3.37 Where cable is used it will be expensive and it is important that cable capacity is closely matched to need.

Economies of scale

- 3.38 It is generally the case that the unit costs of electrical plant decrease with increasing capacity. The relationship can be observed from Table 6 which relates to overhead transmission and cable costs, and the relationship is even stronger for transformers.
- 3.39 It follows that for a stated transformer capacity it will be more economic to provide a few large substations rather than a large number of small substations.

Cost penalty of double transformation

- 3.40 In terms of substation costs, it is always substantially more expensive to have double transformation, e.g., 220 000/66 000/11 000 volts, than a single transformation, e.g. 220 000/11 000 volts. For these reasons many utilities are choosing to eliminate the intermediate voltage in urban areas where overhead line is no longer practical. In the United Kingdom 132 000/11 000 volts is becoming commonplace in urban areas, replacing 132 000/66 000/11 000 volts.
- 3.41 For Melbourne, BEI recommends that consideration be given to 220 000/22 000 volt networks if overhead 66 000 volt construction is to be limited.

Maximisation of 66 000 volt offset benefits

- 3.42 Although, based on initial costs, the concept of an inner city substation fed by a light duty cable (400 MVA) may appear uneconomic, there would be significant offset benefits to be achieved in eliminating 66 000 volt cable and 66 000/11 000 volt substations. All schemes should be evaluated on total long term system costs discounted at a suitable discounted cash flow rate (e.g. 5%).

TABLE 7 : STATION LOAD PREDICTIONS (SEC)

| Station | Firm Cyclic Rating (MVA) | Winter | | | | Summer | | | |
|---|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|
| | | 1983 | 1986 | 1992 | 2000 | 1983/84 | 1986/87 | 1991/92 | 1999/2000 |
| INNER WESTERN AREA | | | | | | | | | |
| | Winter/ Summer | | | | | | | | |
| . Brooklyn 66 kV 22 kV TOTAL | 244/233 ¹ 70/62 | 230 50 280 | 265 45 310 | 365 30 395 | 430 ³ | 210 45 255 | 245 44 285 | 315 25 340 | 420 ³ |
| . Fishermen's Bend 66 kV | 180/172 ² | 160 | 165 | 210 | 400 ³ | 150 | 155 | 205 | 400 ³ |
| . West Melbourne 66 kV 22 kV TOTAL | 375/342 153/134 | 260 70 330 | 290 75 365 | 300 85 385 | 470 ³ | 275 80 355 | 300 90 390 | 325 105 430 | 470 ³ |
| TOTAL AREA LOAD | | 770 | 840 | 990 | 1300 | 760 | 830 | 975 | 1290 |
| INNER EASTERN AREA | | | | | | | | | |
| . Richmond 66 kV 22 kV TOTAL | 357/307 131/113 | 240 75 315 | 255 80 335 | 280 90 370 | 405 ³ | 235 65 300 | 250 70 320 | 285 75 360 | 390 ³ |
| . Brunswick 22 kV | 132/108 | 80 | 80 | 85 | 100 ³ | 60 | 60 | 65 | 80 ³ |
| TOTAL AREA LOAD | | 395 | 415 | 455 | 505 | 360 | 380 | 425 | 470 |

NOTES: 1 Additional 150 MVA transformer capacity to be installed in 1984/85.

2 Additional 150 MVA transformer capacity to be installed in 1987/88.

3 Allocation of total area load to individual stations made by BEI.

BEI REVIEW OF SYSTEM EXPANSION NEEDS

3.43 Before reviewing the SEC reinforcement proposals and the BEI alternatives, it is appropriate to re-state the system design need which justifies any reinforcement. These are briefly discussed below.

Demand forecast

3.44 The principal dynamic element justifying new transmission reinforcement is system demand growth. The SEC's best estimate of system demand growth is shown in Table 7.

3.45 For the purposes of making a tentative assessment of the ability of the 220 000 volt reinforcement proposals to secure loads forecast in the year 2000, load has been allocated to individual substations by BEI in this year.

3.46 Of particular interest are the load projections for the CBD obtained from the Melbourne City Council. These are shown in Table 8 and supporting notes which give a separate CBD load forecast with a possible allocation of demand growth against individual 66 000/11 000 volt substations.

Security

3.47 This aspect was examined by the Consultants and their detailed comments are contained in Chapter 2. They concluded that the present 220 000 volt supply arrangements to Melbourne make extensive use of radial double circuit lines, with no provision for an alternative supply in the event of a double circuit outage. This network configuration puts load at risk for either a double circuit outage or single circuit outage with one circuit already out for maintenance. Reinforcement with additional 220 000 volt circuits is necessary to bring security of supply to terminal stations such as West Melbourne, Fishermen's Bend, Richmond and Brunswick up to international standards appropriate to the CBD of a major city.

TABLE 8 : CBD SUBSTATION LOADING PREDICTIONS (MCC)

| Station | | Firm Cyclic Rating (MVA) | | Winter | | | | Summer | | | | |
|------------------------------|-------------|--------------------------|-------------------|--------|------|------|--------|--------|-------|-------|----------|-----|
| | | 1983 | Planned to 2000 | 1983 | 1986 | 1992 | 2000 * | 83/84 | 86/87 | 91/92 | 99/2000* | |
| WESTERN CBD | 66 kV | JA VM LQ | - (60 in 1987) | 120 | - | - | 28 | - | - | 35 | 110 | |
| | | | 60 | 60 | 46 | 43 | 51 | 45 | 45 | 57 | 50 | |
| | | | 120 | 120 | 63 | 76 | 68 | 88 | 107 | 107 | 105 | |
| | Total 66 kV | | 180 | 300 | 109 | 119 | 137 | | 133 | 152 | 199 | 265 |
| | 22 kV | | 140 | 140 | 70 | 75 | 83 | | 76 | 87 | 103 | 149 |
| Total 66 kV and 22 kV | 320 | 440 | 179 | 194 | 230 | | 209 | 239 | 302 | 414 | | |
| EASTERN CBD | 66 kV | EGW WA FR MP | - | 120 | - | - | - | - | - | - | 20 | |
| | | | 60 | 60 | 27 | 31 | 36 | 35 | 40 | 50 | 55 | |
| | | | 60 | 60 | 35 | 38 | 45 | 43 | 50 | 63 | 65 | |
| | | | 60 | 120 | 32 | 35 | 41 | 39 | 46 | 57 | 95 | |
| | Total 66 kV | | 180 | 300 | 94 | 104 | 122 | | 117 | 136 | 170 | 235 |
| 22 kV | 20 | 20 | 9 | 10 | 11 | | 12 | 14 | 17 | 21 | | |
| Total 66 kV and 22 kV | 200 | 320 | 103 | 114 | 133 | | 129 | 150 | 187 | 256 | | |
| TOTAL CBD LOAD (EAST & WEST) | | 520 | 760 | 282 | 308 | 363 | | 338 | 379 | 489 | 670 | |
| GROWTH RATE | | Historical Projected | | 31% | 29% | 29% | | 4.8% | 4.7% | 3.5% | | |

* BASED ON INFORMATION SUPPLIED BY MELBOURNE CITY COUNCIL. WINTER LOADS NOT INCLUDED FOR 2000 SINCE SUMMER LOADS DOMINATE.

SUPPORTING NOTES TO TABLE 8

CBD Maximum Demand (MD) Predictions - Based on exponential extrapolation of recorded summer MDs from 1971 to 1982, a growth rate of 4.44% and an MD of 483 MW by 1992 is predicted. Beyond 1992 to 2000 a slightly reduced growth rate of 4% is used.

Major loading changes - committed major projects for the next three years gives an expected increase of 27 MW in confirmation of growth rate. These projects are not the only source of load growth.

Air-conditioning for high quality office accommodation - Air-conditioning represents an average of 65% of a total building MD. Most new floor space is air-conditioned and the majority of renovations includes air-conditioning. Renewable office space amounts to about 1/3 of presently occupied floor space.

CBD space use - Between 1977 and 1982 'total floor space' including vacant space increased by 377,000 square metres (5.6%). More significantly, the 'occupied floor space' increased by 553,000 square metres (10.35%) over the same time. This is an annual average increase of 110,000 square metres.

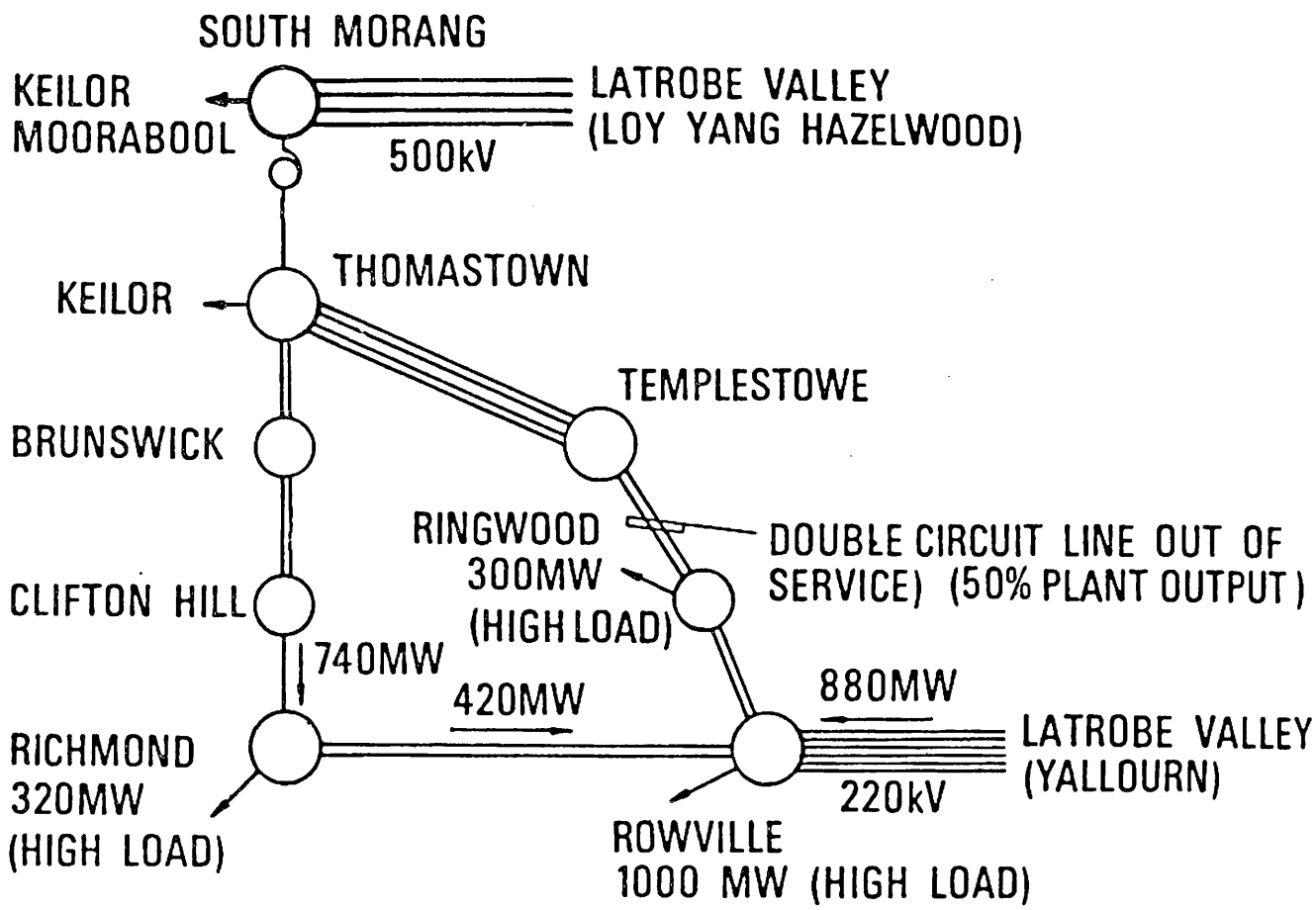
Building electrical load density - The average load density for occupied space in the CBD in 1982 was 39 VA/SqM. Renovation of existing buildings added 30 VA/SqM to this load density bringing the average load density for renovated building space to 69 VA/SqM. The average load density for newly constructed building space was 76 VA/SqM.

Conditions of buildings - good quality office accommodation is fully air conditioned. There is a large pool of office space which is up-gradable by renovation, thereby adding to the electrical demand. Almost 1/3 of the total office space presently occupied is up-gradable. Additionally, other building categories such as shops and entertainment have an even higher proportion of 'low standard' accommodation. Renovation of buildings in the CBD is not expected to saturate in the foreseeable future.

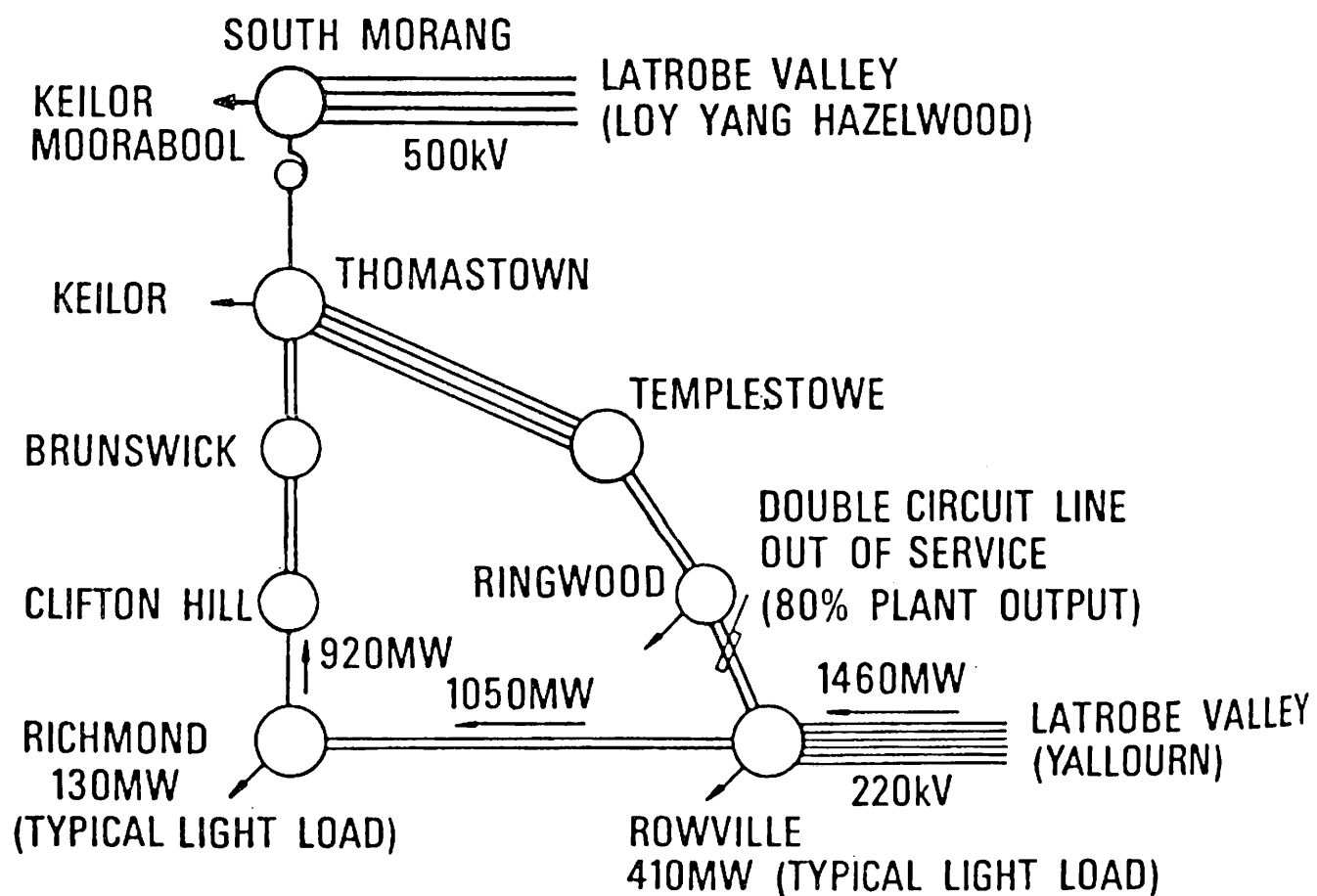
System considerations

- 3.48 It is important to recognise that the SEC proposal for the reinforcement of Richmond Terminal Station has an additional important role in terms of accommodating the imbalance between Yallourn 220 000 volt connected generation and local 220 000 volt connected load. The network arrangements are illustrated in Figure 9.
- 3.49 It will be noted that potentially high Clifton Hill to Richmond circuit loadings can occur either as a result of high Yallourn generation and low local load or low Yallourn generation and high local load combined with certain circuit outages.
- 3.50 The SEC has identified the maximum load flows which can result on the Brunswick to Clifton Hill and Clifton Hill to Richmond circuits as 1100 MW. These are summarised in Table 9.

FIGURE 9 SYSTEM LOAD FLOW CONDITIONS PRODUCING HIGH BRUNSWICK TO RICHMOND CIRCUIT LOADING



a) LOW GENERATION HIGH LOAD SCENARIO



b) HIGH GENERATION LIGHT LOAD SCENARIO

TABLE 9.

LOAD FLOW ON
BRUNSWICK-CLIFTON HILL-RICHMOND CIRCUITS
FOR OUTAGES OF DOUBLE CIRCUIT TRANSMISSION

| Line Section | Double Circuit Outage | Load Flow MW | |
|---------------------------|-------------------------------|--------------|-------------|
| | | Initial | Development |
| Brunswick to Clifton Hill | Rowville-Ringwood Templestowe | 920 | 1100 |
| | Rowville to Richmond | 400 | 800 |
| Clifton Hill to Richmond | Rowville-Ringwood Templestowe | 920 | 1100 |
| | Thomastown to Brunswick | 100 | 800 |

The situation which gives rise to the potential overloading disappears in the mid 90's with the establishment of a 500 000/220 000 volt switching facility at Narre Warren near Rowville. Hence the rating of the Brunswick-Clifton Hill-Richmond circuits could be held at the cheaper 400 MVA rating by the early construction of the switching facility at Narre Warren.

BEI REVIEW OF SEC 220 000 VOLT PROPOSALS

Objectives

3.51 The transmission reinforcements proposed by the SEC are to meet the following objectives, namely -

- (1) Secure the double circuit supply to the inner metropolitan terminal stations particularly West Melbourne, Fishermen's Bend, Brunswick and Richmond by separate 220 000 volt supplies especially when their loads exceed 300 MW;
- (2) Development of existing terminal stations as 400 MVA 66 000 volt supply points;
- (3) Provide for connection to a future new station at Clifton Hill on an existing site; and
- (4) Secure Yallourn 220 000 volt connected generation against an outage of the double circuit line between Rowville and Thomastown.

Main SEC proposals

3.52 The various alternative proposals identified by the SEC are all technically sound and escalate in cost with increased use of cable and/or additions to the transmission route lengths.

3.53 The SEC proposed options R1 and W1 represent the best technical and least-cost solutions, but do present environmental problems.

- 3.54 The proposal designated R1, to connect Brunswick to Richmond via Clifton Hill with the connection made by a 220 000 volt overhead line along the Merri-Yarra Valley clearly involves some loss of visual amenity. This is despite endeavours by the SEC to ameliorate its impact with the removal or re-positioning of 66 000 volt overhead lines in the area.
- 3.55 The Option W1 reinforces the Keilor to Brooklyn and Newport Power Station radial circuit, and the Keilor to West Melbourne and Fishermen's Bend radial circuit by interconnection between the Newport Power Station and Fishermen's Bend Terminal Station. The proposed overhead line is the best technical and economic solution of all the options proposed for this connection, but would entail an overhead river crossing for the 220 000 volt lines in close proximity to the West Gate Bridge. A cable alternative to the river crossing would cost an additional \$11 000 000.
- 3.56 In order to quantify the extent of the improvement in security attributable to the proposed SEC reinforcements R1 and W1 assessments were made of the level of security both before and after reinforcement. The following results were obtained:

OPTION R1 - RICHMOND - CLIFTON HILL - BRUNSWICK

(Extracted from Table 2)

| | Average interval between occasions when supply lost (years) | Duration of interruption (hours) | Average Loss of demand (kWhrs/annum) |
|------------------------|---|----------------------------------|--------------------------------------|
| Prior to reinforcement | 9 | 3.7 | 32 200/23 500 |
| After reinforcement | 270 | 2.4 | 280/205 |

- (1) The figures show that for Option R1 the preferred reinforcement reduced the probability of loss of supply by a factor of 30.
- (2) Reduces the expected average duration of such a loss from 3.7 hours to 2.4 hours.
- (3) Reduces the expected annual average loss of energy to the Consumer arising from such a fault from 32 200 kWhrs to 280 kWhrs.

OPTION W1 - FISHERMEN'S BEND TO NEWPORT P.S.

(Extracted from Table 3)

| | Average interval between occasions when supply lost (years) | Duration of interruption (hours) | Average Loss of demand (kWhrs/annum) |
|------------------------|--|--|--|
| Prior to connection | 14 | 4.9 | 40 800/30 200 |
| After connection | 3 500 | 2.1 | 12/9 |

- (1) The figures show that for Option W1 the preferred connection reduces the probability of loss of supply by a factor of 250.
- (2) Reduces the average duration of a fault from 4.9 hours to 2.1 hours.
- (3) Reduces the expected annual average loss of energy per fault from 40 800 kWhrs to 12 kWhrs.

This analysis has been extended to examine the costs and benefits of installing the above options and the results are contained in Table 10. The report detailing how Table 10 was derived is attached as Appendix 1

TABLE 10

SUMMARY OF COSTS AND SAVINGS FOR REINFORCEMENT
OPTIONS R1 AND W1 ESTIMATED BY BEI

Units - \$ million (Australian)

| | Richmond Option R1 | West Melbourne Option W1 |
|---|-----------------------|-----------------------------|
| Capital Cost | 7 | 7 |
| Less capitalised value of kWhr saved because of reduction in supply failures | 6 | 13 |
| Less capitalised value of net savings in variable losses because of better line capacity utilisation | 6 | 15 |
| Plus capitalised value of additional fixes, losses and operating costs | 3 | 3 |
| Total net cost of project | -2 | -18 |
| | | |
| Estimated Internal Rate of Return | 7% | 20% |
| <p>Cost savings: \$2 per kW interrupted + \$10 per kWhr curtailed.</p> <p>Load growth: Richmond Terminal Station - 1.3% per year. West Melbourne Terminal Station - 1.3% per year.</p> <p>Costs and savings capitalised at 5% over 40 years.</p> | | |

SEC Alternatives

3.57 In the opinion of BEI the alternative options proposed by the SEC are technically sound and enhance the security of 220 000 volt supplies to Richmond and West Melbourne terminal stations.

Reinforcement of Richmond Terminal Station

3.58 The Option R2 is based on the same principle as Option R1 save that the connection for security to Richmond Terminal Station is made through Clifton Hill Terminal Station from Kew Terminal Station instead of from Brunswick Terminal Station. Technically this proposal is directly comparable with Option R1 but on the SEC scenario incurs additional cost of \$8 M. because of prematurely establishing the Kew Terminal Station.

3.59 Options R3 and R4 represent the alternative transmission philosophy of radial feeders. These radial feeders are established into the Richmond Terminal Station from either Malvern, Rowville or Heatherton terminal stations and, whilst they secure supplies to each of these latter terminal stations (ignored in all other options as loads are below SEC 300 MW security threshold level), the costs of easements and transmission line construction would be far higher than those given for options R1 and R2.

3.60 Option R5 depicts three alternatives for interconnection of the Richmond Terminal Station to various terminal stations associated with Keilor Terminal Station and hence the 500 000 volt system. The interconnection of the two main terminal stations supplying the CBD of Melbourne would put an unnecessarily high load on the circuits and risk the integrity of supplies to both terminal stations by associating them. Furthermore, this interconnection does not provide for the securing of the Brooklyn Terminal Station. The latter alternative, with connection between Richmond Terminal Station and the Newport Power Station overcomes some of these objections but at great cost and Option R5 is still technically inferior to all other proposals.

Reinforcement of West Melbourne Terminal Station

- 3.61 The Option W2 connects the Yarraville Terminal Station with the West Melbourne Terminal Station, and replaces the overhead line crossing of the Yarra River close to West Gate Bridge by a crossing of the Maribyrnong River at some distance from the bridge. This may be a more acceptable solution environmentally, but would be technically inferior in that the Fishermen's Bend Terminal Station with its industrial supplies would still be at risk with the loss of the double circuit supplying it. In any event, this is something which would have to be resolved on present load growth predictions within about 8-10 years.
- 3.62 Option W3 consists of a purely radial connection from the Keilor Terminal Station to the West Melbourne Terminal Station. This still leaves the issue of reinforcement of Fishermen's Bend to a later date and also leaves Brooklyn Terminal Station unsecured. To obtain the security offered by Option W1, the cost of a further radial connection to Brooklyn Terminal Station and the subsequent environmental problems should be considered as part of this option. Option W3 is, as it stands, technically inferior and certainly more costly than Option W1.
- 3.63 Option W4 has a double circuit connection between the West Melbourne Terminal Station and the Brunswick Terminal Station. No easements are available for overhead lines; hence, if cable is used the additional cost can only be offset by routing through the CBD to supply future loads and produce offsetting economies in lower voltage transmission. Brooklyn Terminal Station still requires reinforcement in the near future at additional cost. Total cost of Option W4 is well in excess of options W1 or W2.
- 3.64 Option W5 is similar to W4 and nearly identical with R5 and suffers the disadvantages listed for those options.

BEI ALTERNATIVES

Concepts

3.65 BEI supports the technical objectives for transmission reinforcements given by the SEC and adds the following further requirement -

transmission reinforcement proposals should form a part of a long term development strategy giving the overall least cost expansion commensurate with environmental standards.

3.66 Other concepts can be summarised as follows -

- (1) In environmentally sensitive areas the use of overhead lines should be minimised by employing a few high capacity 220 000 volt routes with aesthetic pole-type construction. Where possible adjacent distribution should be undergrounded to offset the adverse effect of the new 220 000 volt construction;
- (2) Economical use of cable with cable ratings matched to system need;
- (3) Economies of scale accruing from the use of a few large substations; and
- (4) The long term aim of eliminating two levels of transformation particularly in the dense load areas such as the CBD; i.e. displacement of 66 000 volt transmission.

Comments/Counter proposals to SEC main proposals

3.67 Using the design concepts outlined above, BEI reviewed the SEC's proposals and the comments pertaining to the SEC's plans, namely options R1 and W1 and the variations described by options R2 and W2.

Richmond Terminal Station reinforcement

- 3.68 The connection between the Brunswick Terminal Station and the Richmond Terminal Station has been stipulated at a higher capacity (1100 MVA) than is necessary in the long term (minimum rating of 400 MVA needed ultimately) in order to accommodate power flows under outage conditions. The adoption of a smaller size cable would result in cheaper cable costs for Option R1 provided alternative arrangements can be made for the outage conditions postulated by the SEC. SEC alternative arrangements which involve the early establishment of a 500 000/200 000 volt terminal station at Narre Warren are costed at \$20 M.
- 3.69 Thus, total costs of the BEI proposal are \$14 M. for the Brunswick/Richmond cable plus the advancement of expenditure of \$9 M. at Narre Warren by ten years.
- 3.70 The Brunswick Terminal Station to Clifton Hill Terminal Station connection also merits examination as this could initially be installed as a single circuit until the Clifton Hill Terminal Station is developed, when a second circuit would be needed. The timing of this second stage could strongly influence investment decisions and would require further investigation.
- 3.71 The costs of \$36 M. for the cable alternative proposed by the SEC are reduced to approximately \$27 M. if only the 5.5 km section of the route along the Merri Creek is cabled. This is still nearly four times the cost of the SEC plan using overhead lines.
- 3.72 Accepting Option R2 as a viable alternative to Option R1, the same argument applies in the initial use of a single circuit connection between the Kew Terminal Station and Clifton Hill Terminal Station. The addition of a single 66 000 volt overhead circuit to support the demand at Kew would

forestall the establishment of 220 000 volt plant there until the late 1990's. BEI estimates the cost of this alternative at \$11.4 M. compared with \$15 M. for SEC proposal R2. Support at Brunswick would be required at some long term future date with the replacement of the Brunswick to Clifton Hill circuits by Clifton Hill to Kew circuits.

- 3.73 Consideration of alternatives for options R3, 4 and 5, yield no significant improvement and are not considered economically viable.

West Melbourne reinforcement

- 3.74 The SEC plan W1 to reinforce West Melbourne by an interconnection between Fishermen's Bend Terminal Station and Newport Power Station is technically the best of the options put forward by the SEC for reinforcing this area. The main objection to this proposal would be on aesthetic grounds that the overhead line crossing of the Yarra River would detract from the view of the West Gate Bridge.
- 3.75 The counter-proposal outlined in Option W2 is to move the river crossing up-river to counter objections to the lower crossing. This Option W2 does not provide for security of supplies between West Melbourne and Fishermen's Bend terminal stations where a third circuit would be required to overcome the security problem and it is doubtful whether the extra cost of at least \$4 M. can be justified.
- 3.76 The other Options W3, 4 and 5 for this reinforcement are considered to be very much less effective in securing supplies in the area and are estimated to cost considerably more than Option W1 planned by the SEC. BEI offers no further alternatives to the SEC proposals.

Alternatives

3.77 Other factors which might be considered by the SEC in the final transmission reinforcement proposals include -

- (1) the use of a light duty overhead line designed to ameliorate environmental intrusion and visual impact; and
- (2) the use of a naturally cooled cable installation consisting of two 1600 mm² conductor 220 000 volt cables per phase giving in winter conditions a rating equal to the three conductor cable outlined by the SEC. Savings in losses and on the initial cost of the cable as well as reduced reactive compensation may result with a reduction from three to two conductors in the cable.

3.78 The above alternatives are only proffered as starting points for a detailed feasibility study of specific transmission reinforcement proposals and to indicate where cost savings may be made in the preparation of a final proposal.

220 000 volt cable - Richmond to Central Business District to Brunswick

3.79 Although the cost of a 220 000 volt cable between Richmond and Brunswick is inherently more expensive than an overhead line, it is possible to reduce the effective cost of the proposal by routing cable via the CBD in order to accommodate a future CBD substation.

3.80 Creation of a 220 000/22 000 volt substation at the load centre of the CBD can achieve substantial offsetting benefits in terms of eliminating the long term need for 66 000 volt circuits from Clifton Hill to the CBD and avoiding the need for CBD 66 000/11 000 volt substations.

BEI LINE ROUTE AMENITY ASSESSMENT

3.81 Option W1 - Newport Power Station to Fishermen's Bend Terminal Station

- (1) The proposed high level 220 000 volt transmission crossing of the Yarra River would require a major engineering structure but one that is an appropriate element in an industrial landscape;
- (2) The proximity to the West Gate Bridge is the main concern;
- (3) The most appropriate overhead alternative would be to re-align the route of the crossing parallel to but further away from the bridge; and
- (4) A cable crossing of the Yarra River is technically feasible but is considered expensive. An increase from \$2.1 M. to \$11.6 M. for the crossing is envisaged.

3.82 Option W2 - Yarraville Terminal Station to West Melbourne Terminal Station

This is an alternative to Option W1.

This proposal is aimed at avoiding the overhead line crossing of the Yarra River proposed in Option W1. A high crossing of the Maribyrnong River, although set against the industrial background of Footscray, would be opposed relatively strongly in view of residential and recreational facilities on the west bank of the River. In this respect it probably has less to commend it than the original proposal.

3.83 Option R1 - Overhead line from Richmond Terminal Station to Brunswick Terminal Station via Clifton Hill

This has been the subject of a report by Melbourne University to the SEC on the results of their computer studies using the VIEW H and PREVIEW programmes. The final report has not been seen by the consultants. However, a draft report indicates that the proposed 220 000 volt line would cause some deterioration to visual amenity along its route but this would not be inordinate.

BEI's views can be summarised as follows -

- (1) The number of times the proposed route crosses the Merri Yarra Valley (16 in all) should be reduced; such crossings cause the greatest visual impact and should be kept to a minimum;
- (2) Other lower voltage overhead lines on the route should be undergrounded;
- (3) This undergrounding could give a freedom to re-align the proposed route with the view to reducing visual impact especially as occasioned by (1) above; and
- (4) Detailed tree planting and landscaping proposals would further reduce the impact.

It was considered that successful application of the above would reduce the overall deterioration of the environment to an acceptable minimum. These modifications have not been costed because of the details and the need to re-survey a route. A more detailed assessment by BEI is included as Appendix 2.

3.84 Option R2 - Overhead line from Kew to Clifton Hill

This would require a new easement through parkland and recreational land and along the Eastern Freeway. Such a line would intrude on the view of those using these facilities as well as many residential properties from Kew to the south of the Freeway. It will also cross the Yarra Bend National Park. In these respects it is doubtful if its impact could be much reduced by alignment or other treatment. It is considered to be more damaging to the environment than the Brunswick-Clifton Hill circuit which it would displace.

3.85 Option R3 - Richmond Terminal Station to Malvern Terminal Station

The route between Malvern and Richmond terminal stations was reviewed "on the ground". It was clear that no possibility existed for a further overhead line to be constructed.

BEI CONCLUSIONS

3.86 The principal conclusions reached and recommendations made by the consultants are summarised below. Other aspects of the consultants' review will be dealt with in the Committee's final report.

Conceptual conclusions

Environmental attitudes

Melbourne is at a watershed with regard to the evolution of public attitudes to the environment. Recent legislation which places statutory environmental duties on the SEC reflects increasing public interest in environmental matters and presages a need for further dialogue between the SEC and representative public bodies on environmental and land use issues.

Design basis of existing power system

The design basis for all the existing electrical system and proposed SEC reinforcements are technically sound and follow good international practice. For the most part, however, the present network designs are in accordance with previous legislation and reflect a least cost planning approach. If the community is prepared to fund less visually intrusive designs there is scope for developing alternative concepts which would have greater public acceptance.

Resource limitations and priorities

A central issue which must be addressed at an early stage is the extent of funding which can be made available for amenity improvement, the manner in which these costs should be apportioned between the SEC, Government and representative bodies, and the procedures and guidelines which should be drawn

up to obtain the most appropriate and equitable use of these resources. It is probable that a resolution of these issues will require new debate between interested parties and an equitable resolution of priorities.

Characteristics of the existing system

Security of 220 000 volt networks

The present 220 000 volt supply arrangements to Melbourne make extensive use of radial double circuit lines with no provision for an alternative supply in the event of a double circuit outage. This network configuration puts load at risk for either a double circuit outage or single circuit outage with one circuit already out for maintenance. Reinforcement with additional 220 000 volt circuits is necessary to bring security of supply to terminal stations such as West Melbourne, Fishermen's Bend, Richmond and Brunswick up to international standards appropriate to the CBD of a major city.

220 000 volt transmission reinforcements proposed by SEC

SEC preferred overhead line transmission reinforcements

The transmission reinforcements proposed by the SEC are technically sound and reflect an optimum selection in terms of potential overhead line solutions. Specifically, the proposed 220 000 volt transmission reinforcements achieve the following objectives -

- (1) Secure supplies to West Melbourne, Fishermen's Bend, Brunswick and Richmond terminal stations against a double circuit outage;
- (2) Provide for future supplies to the Clifton Hill Terminal Station; and

- (3) Provided it is rated at 1100 MW, the proposed Richmond - Brunswick 220 000 volt circuit provides security for outlets to the Latrobe Valley generation connected at 220 000 volts. The alternative would be a 500 000/220 000 volt transformer reinforcement at Narre Warren.

SEC alternatives

The various alternative proposals identified by the SEC are all technically sound but do not generally make the most economic use of cable or provide the least cost system expansion when compared with the SEC's preferred option.

Alternative 220 000 volt system reinforcements proposed by BEI

220 000 volt cable from Richmond to Brunswick via Central Business District

If an overhead line routed from Richmond to Brunswick via Clifton Hill is not acceptable, an attractive cable alternative would be to route a 220 000 volt cable from Richmond to Brunswick via the CBD. This policy would pave the way for a future CBD 220 000/22 000 substation thus eliminating the need for the Clifton Hill Terminal Station and avoiding the need for 66 000 volt cables from Clifton Hill Terminal Station into the CBD.

Adoption of 220 000/22 000 volt network strategies

A major improvement in the environmental impact of existing sub-transmission strategies might be achieved by adopting 220 000/22 000 volt network strategies as opposed to the existing 220 000/66 000/11 000 volt policies. This arrangement might avoid the need for a costly, extensive and environmentally intrusive 66 000 volt overhead line or cable network and the associated 66 000/11 000 volt substations.

Economic use of 220 000 volt cable

Because of the high cost of 220 000 volt cable, it is seldom attractive to adopt 220 000 volt cable ratings which match those of overhead lines particularly in the early years of development.

Major cost savings can be made in the SEC cable alternatives by adopting policies which install cable capacity strictly according to need.

BEI RECOMMENDATIONS

3.87 In respect of the proposals by the SEC to reinforce the transmission network into Melbourne and construct circuits to secure the inner 220 000 volt terminal stations BEI made the following recommendations -

- (1) *The proposal W1 to connect the Fishermen's Bend Terminal Station to the Newport Power Station using a 220 000 volt overhead crossing of the Yarra River south of West Gate Bridge is regarded as the best solution. Further consideration should be given to the precise route of this line; and*
- (2) *The proposal R1 to connect the Brunswick and Richmond terminal stations via Clifton Hill using overhead circuits is considered the best solution. In this respect, the SEC must make strenuous efforts to reduce the environmental impact of this line (see later statement) and reduce the clutter of lower voltage circuits in the area by suitably re-routing or undergrounding.*

DISCUSSION AND CONCLUSIONS

- 3.88 Evidence submitted by the SEC and investigations by the consultants, BEI, have both indicated that the necessary improved security of supply to the CBD and inner metropolitan area would best be achieved by the connection of the Richmond Terminal Station to the Brunswick Terminal Station and by the connection of the Newport Power Station to the Fishermen's Bend Terminal Station.
- 3.89 These connections would also allow for the future development of terminal stations at Clifton Hill and Yarraville to supply any possible long term load growth which may occur in the CBD, the inner metropolitan area and the inner western industrial areas.
- 3.90 In addition, the connection between Richmond and Brunswick reduces the risk of the 500 000 volt and 220 000 volt transmission systems from the Latrobe Valley becoming electrically separated from each other in the Melbourne metropolitan area. The connection provides a back-up circuit to the 220 000 volt double circuit, single tower line between Rowville and Thomastown. Separation of the two systems without the Richmond to Brunswick link at a time when load transfer was occurring between Rowville and Thomastown would result in major load shedding in the metropolitan area and the shut-down of some generating plant in the Latrobe Valley.
- 3.91 The Consultants, BEI, have also shown that the linking of Richmond and Brunswick and Newport and Fishermen's Bend would result in considerable energy savings because of the reduction in transmission losses due to a more even load sharing across the available transmission capacity.

3.92 Interconnection of Richmond and Brunswick Terminal Stations at 66 000 volts was examined by both the SEC and the consultants, BEI. The cost of such an interconnection would initially be of the order of \$38 M. and would eventually rise to \$56 M. if the load increased. Four lines would be required initially, eventually rising to eight. The visual impact of these lines would be considerable.

The Committee is of the opinion that a 220 000 volt interconnection has considerable advantages over a 66 000 volt interconnection between Richmond and Brunswick.

3.93 On the basis that the need to reinforce the security of supplies to Richmond and West Melbourne has been established, as discussed in the previous chapter of this report, the Committee concludes that the best way of achieving this is to link the Richmond Terminal Station to the Brunswick Terminal Station and the Newport Power Station to the Fishermen's Bend Terminal Station at 220 000 volts.

RECOMMENDATION

3.94 The Committee recommends that the security of supply to the Central Business District and the inner metropolitan area from Richmond and West Melbourne terminal stations should be improved by connecting the Richmond Terminal Station to the Brunswick Terminal Station and the Newport Power Station to the Fishermen's Bend Terminal Station. In both cases the connections should be made at 220 000 volts.

CHAPTER FOUR

DETAILED CONSIDERATION OF THE PROPOSED RICHMOND- CLIFTON HILL-BRUNSWICK LINE

EXTRACTS FROM THE CASE PUT FORWARD BY THE SEC

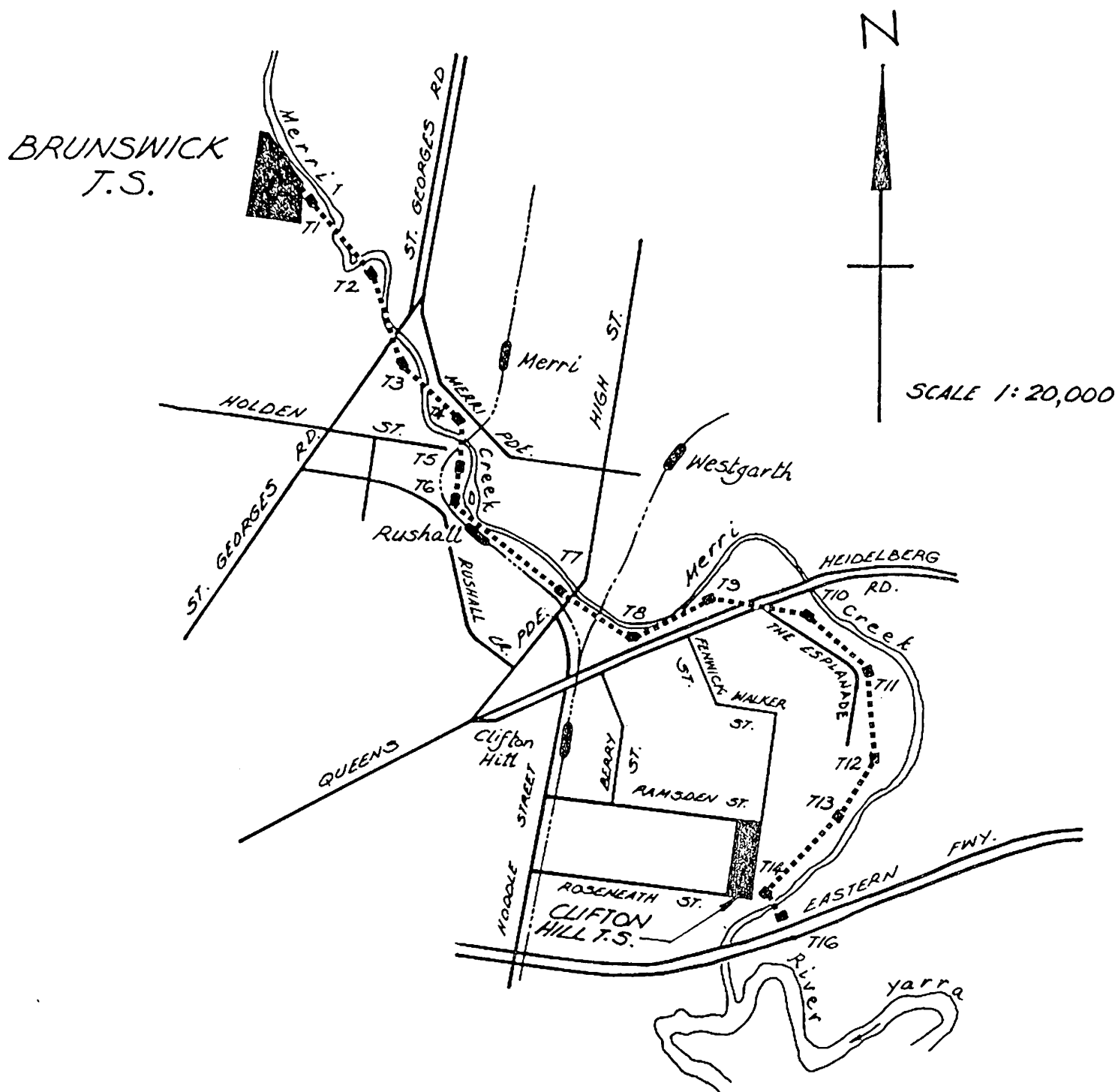
4.1 The SEC proposes that the connection would be achieved by up-grading an existing easement which, at present, contains a 66 000 volt line. The route passes mainly through parklands and open space along the Yarra River Valley and Merri Creek and is shown in Figures 10 and 11. Figure 10 shows the proposed section between Brunswick and the Clifton Hill Terminal Station. Proposed structure locations and their type, i.e., lattice-braced tower, lattice-braced mast or pole are indicated.

Development of the SEC proposal

4.2 The proposal was developed following detailed consideration of each of the factors outlined by the SEC in paragraph 3.28 of this report supported by discussions with municipal councils and public bodies. As a result of these considerations, approximately \$2 M. is included in the design to minimise the environmental impact of the line. However, further detailed analysis of the environmental and social impact of the proposal may justify modifications to structure types and location, minor variations to the route in specific locations or even a totally new easement for some sections of the line.

4.3 Some of the design factors associated with different types of structures which affect the visual impact or aesthetic appeal of a line and which must be considered in development of alternatives are -

- lattice-braced structures are an inherently stronger structure than poles with the result that a line can be designed with less structures per unit length than with a pole line (typically, in



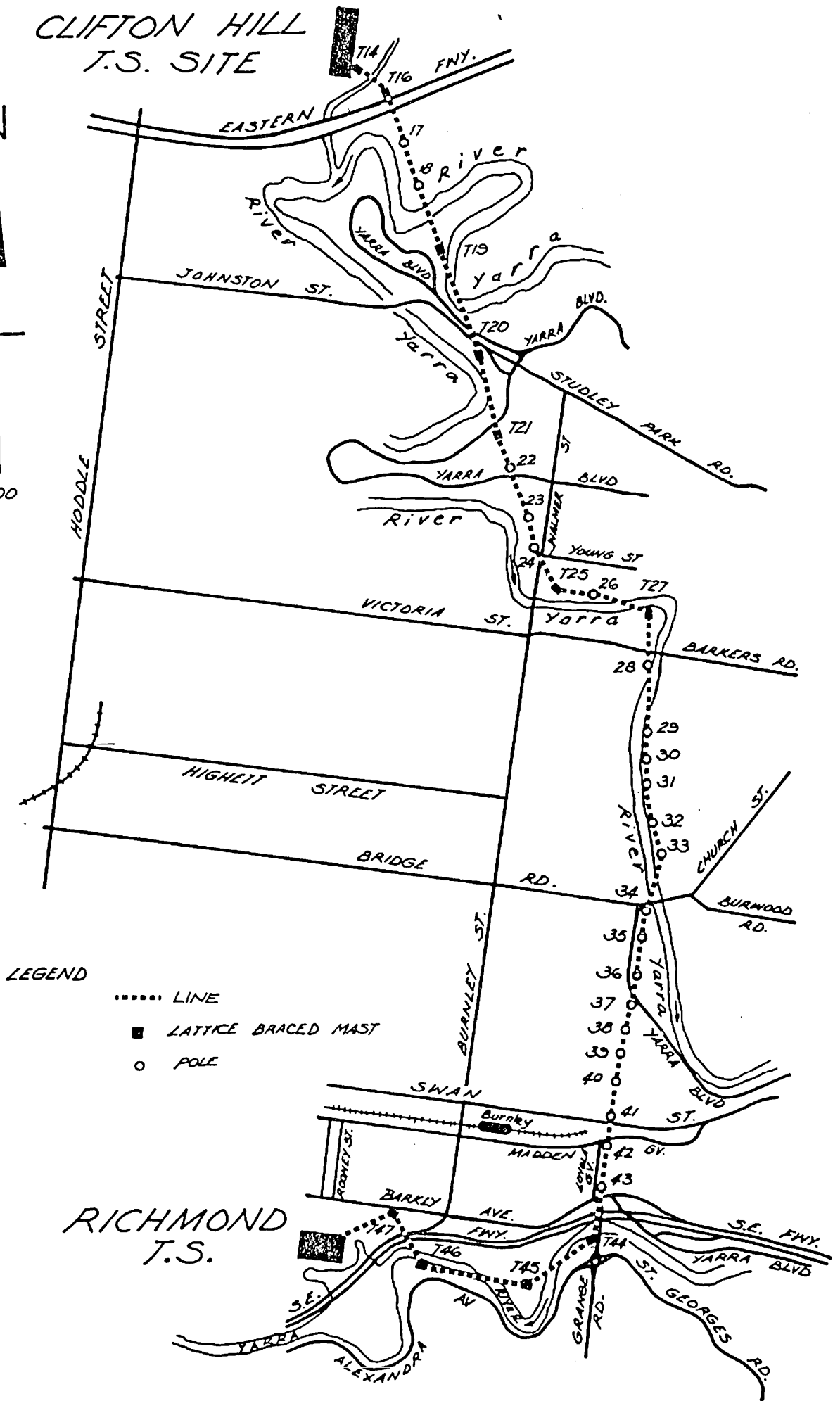
- LEGEND
- LINE
 - TOWER
 - POLE

PROPOSED 220 kV TRANSMISSION LINE
 BRUNSWICK T.S. - CLIFTON HILL T.S.
 FIGURE No.10

CLIFTON HILL
T.S. SITE



SCALE 1: 20,000



PROPOSED 220 kV TRANSMISSION LINE
CLIFTON HILL T.S. - RICHMOND T.S.
FIGURE N° 11

open areas twice the number of structures are required with poles);

- lattice-braced structures are usually taller than poles, as the longer span lengths which are possible require taller structures to maintain the required clearance at the centre of the span;
- the use of pole-type structures routed along suburban roadways requires closer spacing than in open areas to limit the swing of conductors under wind and thereby maintain an easement width which does not unduly affect private property;
- poles in suburban streets would encroach more than two metres into the carriageway; however, parking between poles would be allowable; and
- to achieve the required strength, pole-type structures must be relatively large - between 1.2 to 1.8 metres at the base and are therefore relatively dense structures with a long radius of visibility.

Land use

- 4.4 The proposal by the SEC establishes the 220 000 volt line within the existing easement and replaces the 66 000 volt line. This will minimise additional tree pruning and the effect on existing land use.
- 4.5 The easement, as at the present time, would be available for normal recreational activities, gardening or urban farming purposes and, as such, all existing land use along the route will not be altered. Only minor tree lopping is required. Concerns that the proposed line would reduce the available open space or prevent existing recreation or play-ground activities are incorrect.

Visibility and economics

4.6 As outlined, additional costs of \$2 M. have been included in the proposed design for the line to reduce the impact by providing for the following -

- (1) The use of a combination of a compact pole design and small lattice-braced masts in the single circuit section between Clifton Hill and Richmond, so that the height increase of the new structures with respect to those existing would be minimised. In particular, the new poles or structures will replace the existing structures in approximately the same locations, e.g. a 26 metre pole would replace the existing 16 metre pole at the boundary of Richmond High School;
- (2) The minimising of lattice-braced structures on the double circuit section; and
- (3) The removal of the existing 66 000 volt sub-transmission lines.

4.7 The 8 km of 66 000 volt line which occupies the easement at present is part of the sub-transmission system supplying substations from Richmond and West Melbourne terminal stations.

4.8 Removal of the line from the easement will be achieved by:

- re-arranging the connections of the sub-transmission and distribution network; and
- up-grading 4.2 km of existing pole lines to multiple circuit lines.

Figures 12 and 13 show the up-graded sections of line comprising -

- (1) 0.5 km in Park Street, Northcote;
- (2) 1.7 km in Langridge, Nicholson, Elizabeth and Church Streets;
- (3) 0.3 km in Young Street; and
- (4) 1.7 km in Coppin Street and Murphy Street.

Independent landscape assessment

4.9 An independent analytical study carried out for the SEC by the Melbourne University School of Environmental Planning provides a quantification of the visual impact of the proposed line with respect to the existing situation and the effect of a number of alternative treatments of structures and route location modifications.

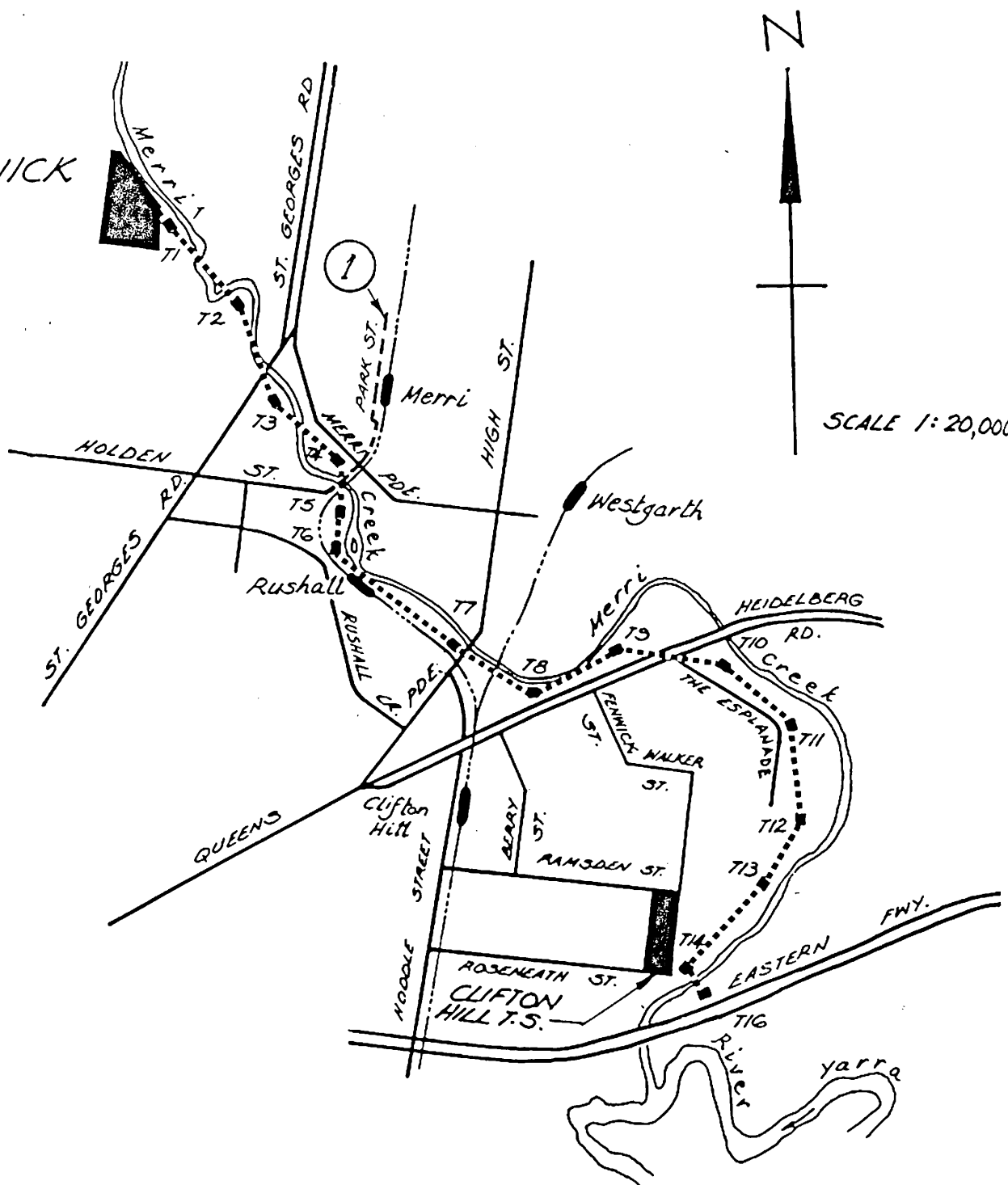
4.10 The conclusions of this study state the following -

- (1) In many areas, the SEC proposed line will result in a lower visual impact than the existing transmission lines in the area; and
- (2) In other sections, an increased visual impact will result from the proposed lines.

4.11 In general terms, moving along the route from Brunswick to Richmond these areas are -

- (1) Between Brunswick Terminal Station and Heidelberg Road - decrease in impact;

BRUNSWICK
T.S.

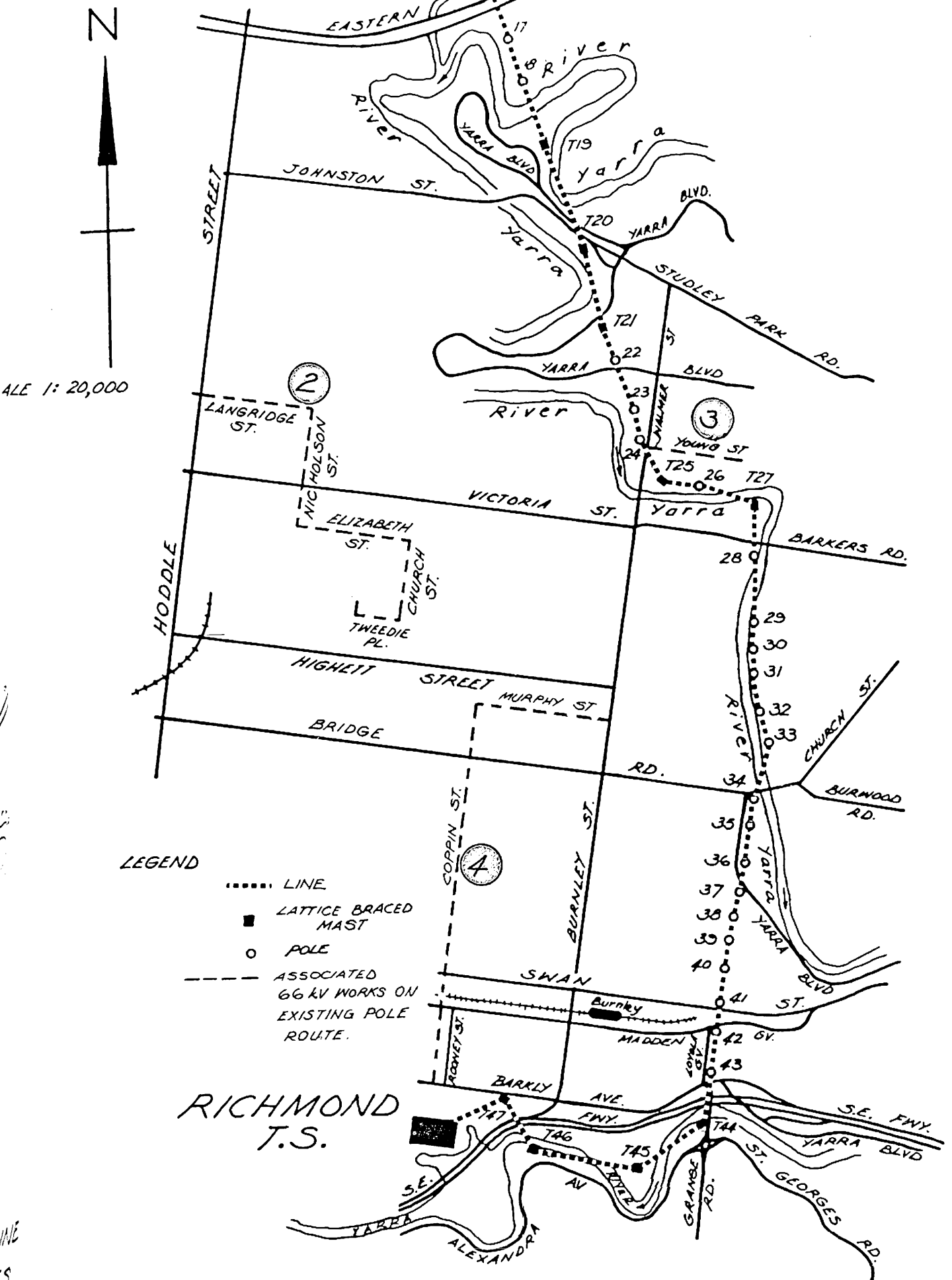


LEGEND

- LINE
- TOWER
- POLE
- - - ASSOCIATED 66 kV WORKS ON EXISTING POLE ROUTE .

PROPOSED 220 kV TRANSMISSION LINE
BRUNSWICK T.S. - CLIFTON HILL T.S.
FIGURE No. 12

CLIFTON HILL T.S. SITE



PROPOSED 220 kV TRANSMISSION LINE
 CLIFTON HILL T.S. - RICHMOND T.S.
 FIGURE N° 13

- (2) From Heidelberg Road to Clifton Hill Terminal Station along the Merri Creek and to the Freeway - increase in impact;
- (3) Across Studley Park to Walmer Street footbridge - little change in impact; and
- (4) Walmer Street footbridge to Richmond Terminal Station - small increase in impact.

Basis of University assessment

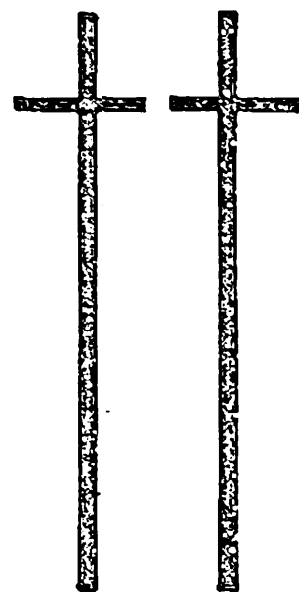
- 4.12 The analysis utilises a computer based technique which, from mapping data inserted into the computer, provides a measure of the visibility of the transmission line from surrounding areas. The screening effects of buildings and other structures are taken into account in the analysis; however, vegetation is ignored, giving a pessimistic result in some areas.
- 4.13 Various types of structures are given a relative impact value in accordance with their perceived impact with a four circuit lattice-braced tower having the highest impact ranging through to a low voltage single circuit pole having the lowest value. (Refer Figure 14)
- 4.14 These impact values are highest only when an observer is close to the structures; the impact is presumed to decrease with distance. The distance at which each structure effectively "disappears" is taken as the basis for calculating the rate of decrease of impact.
- 4.15 The lattice-braced tower (type 4) which is proposed on the Brunswick to Clifton Hill section of the line becomes invisible to an observer at a radius of 600 metres, whereas the poles (type 2) proposed for the Brunswick to Richmond section are visible up to 1600 metres.

The five structures tested are illustrated below.

Impact values are taken from University Report.

TYPE 1

Low Voltage
Single Circuit
Poles
Impact Value 0.1



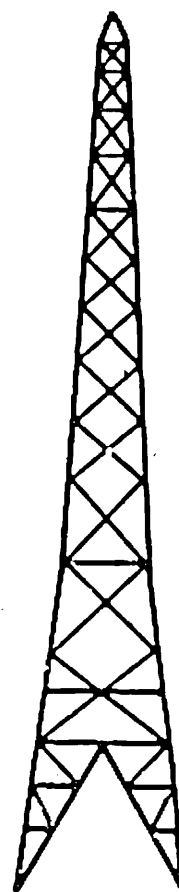
TYPE 2

220 kV
Single Circuit
Pole
Impact Value 0.2



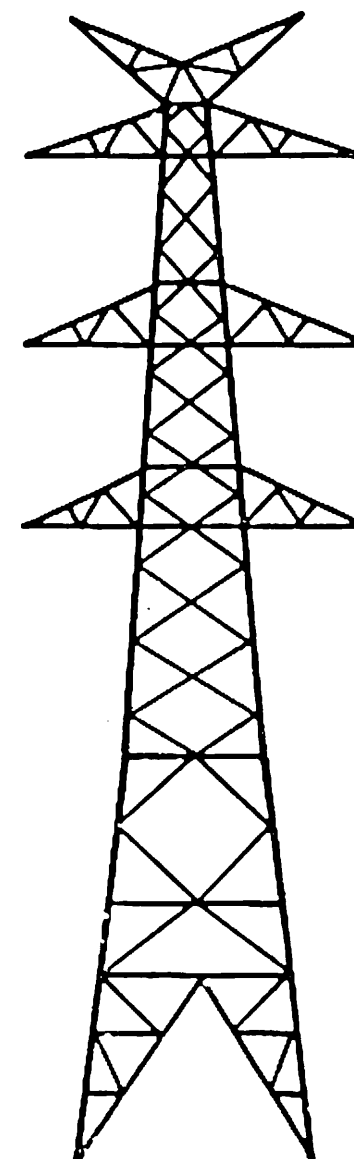
TYPE 3

220 kV
Single Circuit
Mast
Impact Value 0.4



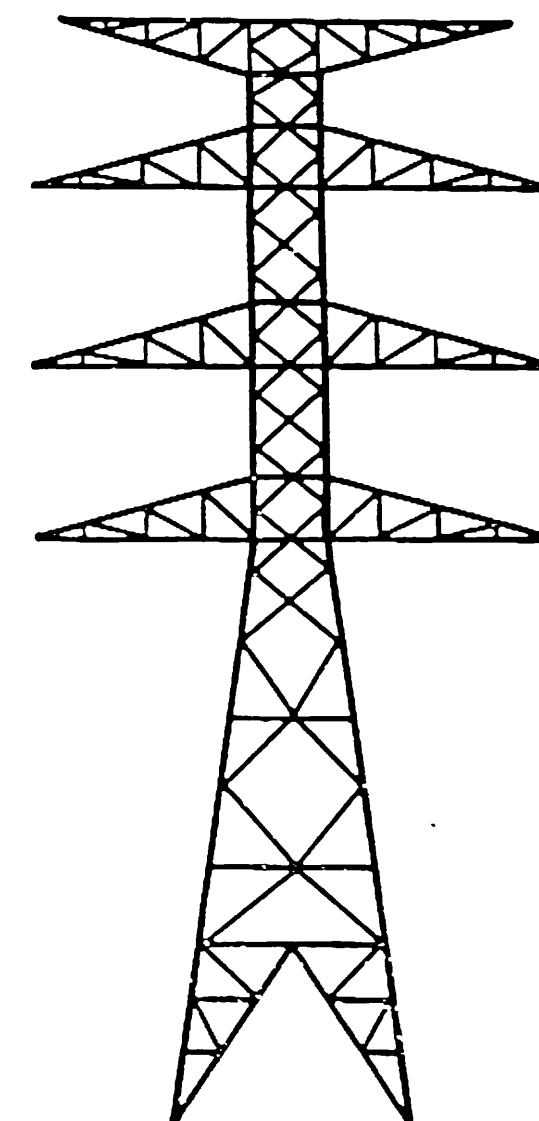
TYPE 4

220 kV
Double Circuit
Tower
Impact Value 0.7



TYPE 5

High Voltage
Four Circuit
Tower
Impact Value 1.0



(Not Used On
Brunswick-Richmond Line)

Figure 14

Illustration of results

- 4.16 One output of the analysis is in the form of a number-coded map of the route showing the level of impact with respect to the existing situation. For convenience, the numbers are coloured to produce a colour pattern ranging from dark blue through to light blue, indicating an improvement over the existing situation and yellow to red, light green to dark green corresponding to an increasing level of impact over the existing situation.
- 4.17 Figure 15 from the landscape assessment shows the difference between the existing and proposed conditions illustrating the above conclusions.
- 4.18 The dark blue and light blue areas between Brunswick and Heidelberg Road show the improvement due to the smaller number of towers and re-arrangement of existing 66 000 volt lines in this area.
- 4.19 The red and yellow around The Esplanade shows an increase in impact which is the most significant for the whole route.
- 4.20 In practice, screen vegetation is not included in the analysis and, due to the relatively open area from which the line is viewed, this would lessen the impact in this area to some extent.
- 4.21 The SEC would undertake suitable tree planting for screening and integration of the line into the landscape treatment of the parklands.
- 4.22 The yellow and red between Walmer Street and Richmond indicates an increase in impact. Near Richmond Terminal Station, the impact reduces slightly due to removal of existing structures.

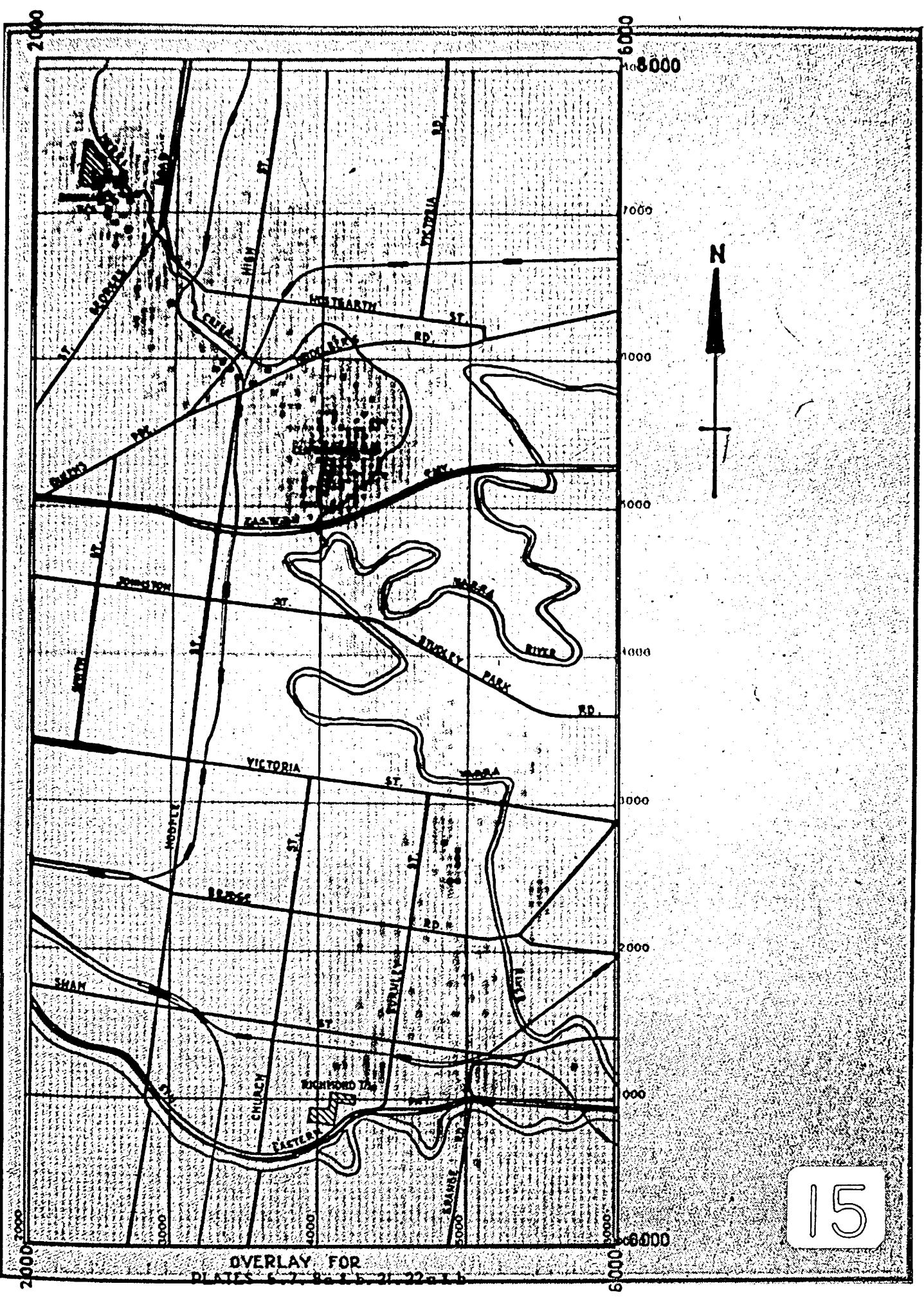


FIGURE 15 : 50 m GRID, DIFFERENCE BETWEEN EXISTING AND PROPOSED CONDITIONS, POTENTIAL IMPACT

4.23 The analysis is based on using the existing easement. It is possible that variations to the structure, design and location of poles or lattice-braced towers, painting where appropriate, and flat construction to reduce overall height or variations of the easement, may give improvements.

Possible action to reduce the impact of the proposal between Heidelberg Road and Clifton Hill Terminal Station and between Walmer Street and Richmond Terminal Station

4.24 In these two areas, identified by the Melbourne University Study as suffering an increase in impact, some alternative treatments of the line have been investigated by the SEC. Details of the treatments designed to minimise the impact are outlined below and are shown diagrammatically on Figures 16 and 17 -

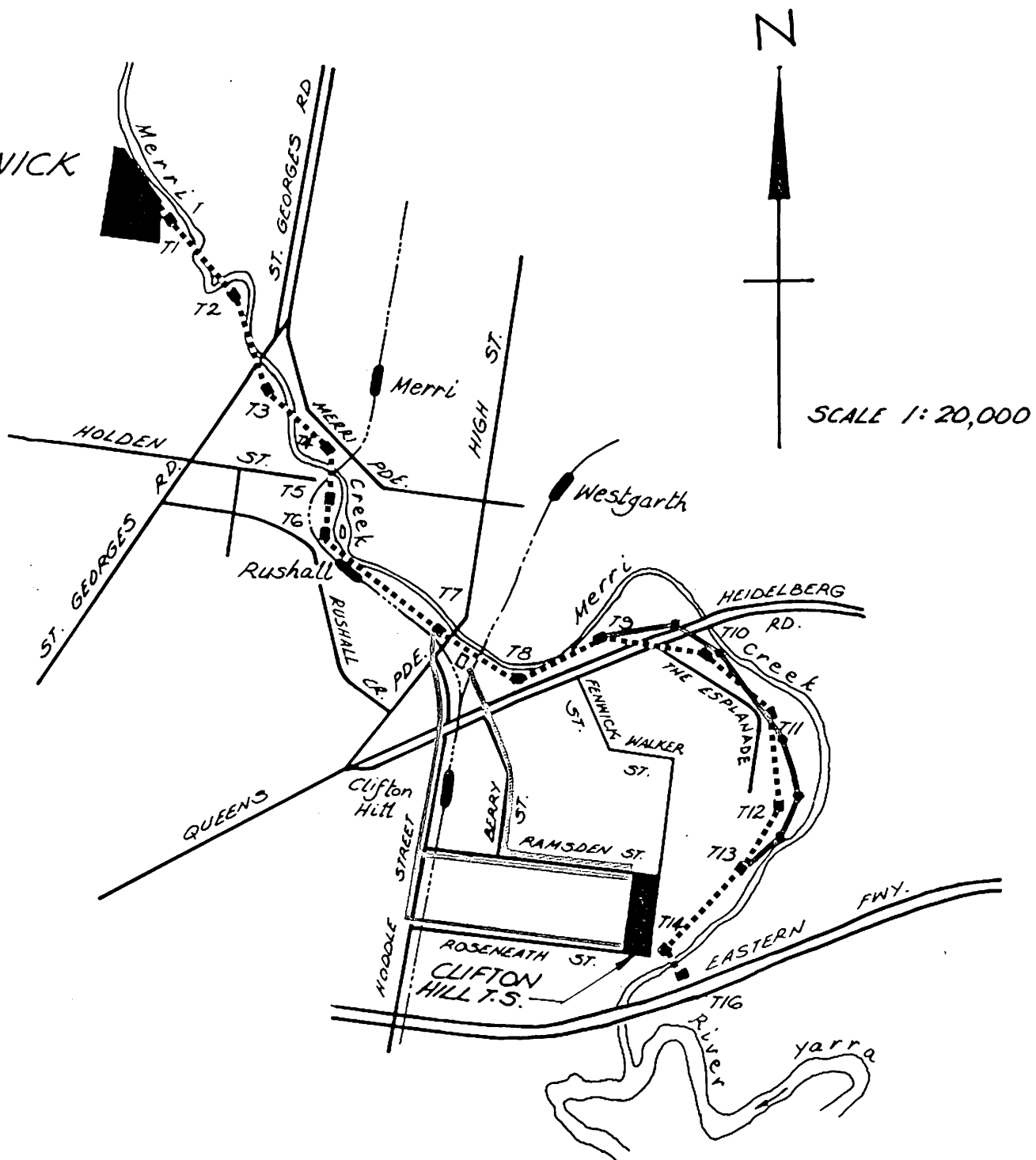
(1) In the Esplanade area -

- by-pass The Esplanade by constructing pole lines along street routes;
- construct the line on poles in place of lattice-braced towers on the proposed route;
- re-locate other 66 000 volt assets away from the parkland; and
- underground a section of the line.

(2) Walmer Street to Richmond -

- re-locate the route into Richmond Terminal Station along the railway line; and
- use lattice-braced towers in place of poles in the Pridmore Park area.

BRUNSWICK
T.S.



LEGEND

- TOWER LINE
- TOWER
- POLE
- POLE LINE ALTERNATIVE
- ▨ POLE LINE ALTERNATIVE
- ▬ UNDERGROUND CABLE

PROPOSED 220 kV TRANSMISSION LINE
BRUNSWICK T.S. - CLIFTON HILL T.S.
FIGURE N° 16

4.23 The analysis is based on using the existing easement. It is possible that variations to the structure, design and location of poles or lattice-braced towers, painting where appropriate, and flat construction to reduce overall height or variations of the easement, may give improvements.

Possible action to reduce the impact of the proposal between Heidelberg Road and Clifton Hill Terminal Station and between Walmer Street and Richmond Terminal Station

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(1) In the Esplanade area -

- by-pass The Esplanade by constructing pole lines along street routes;
- construct the line on poles in place of lattice-braced towers on the proposed route;
- re-locate other 66 000 volt assets away from the parkland; and
- underground a section of the line.

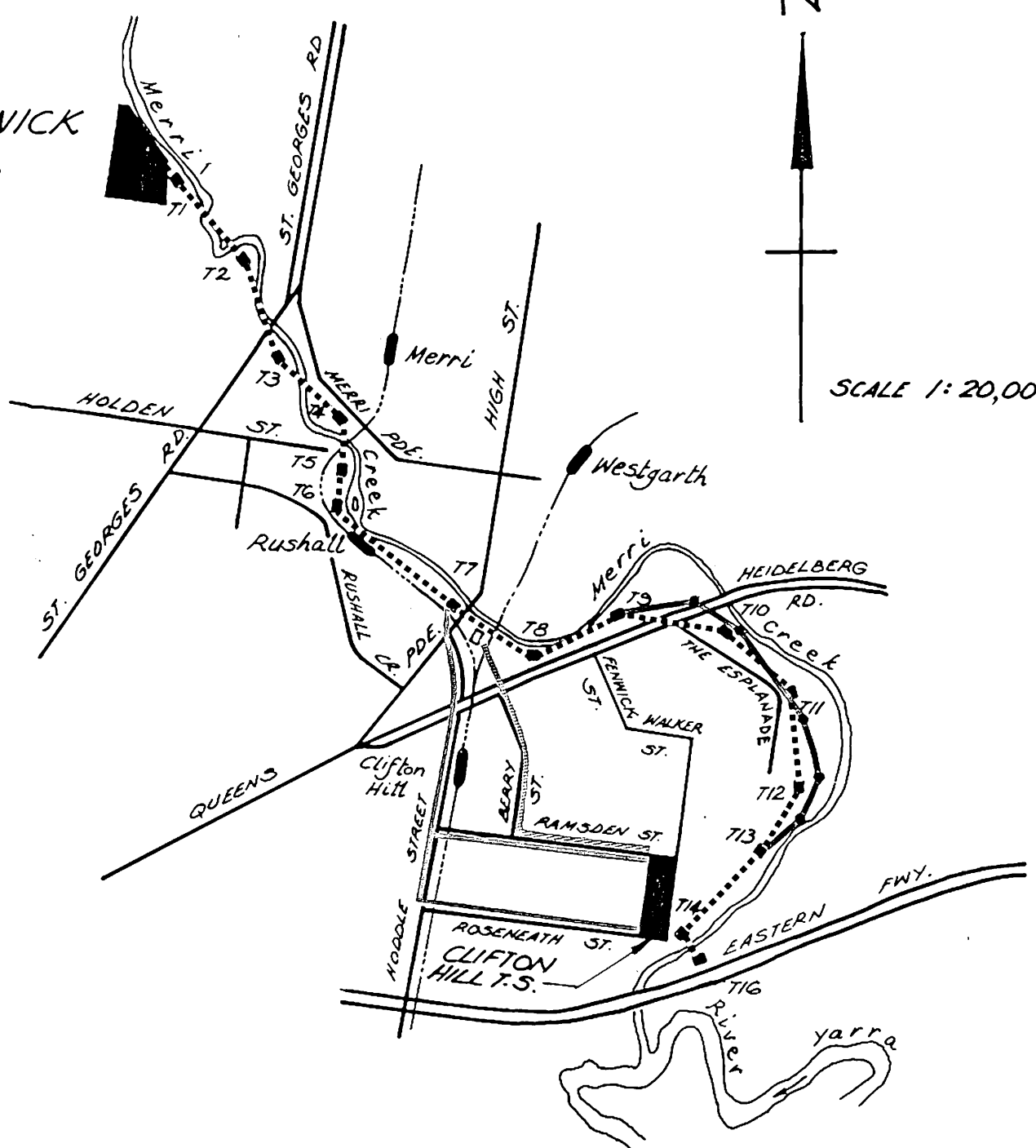
(2) Walmer Street to Richmond -

- re-locate the route into Richmond Terminal Station along the railway line; and
- use lattice-braced towers in place of poles in the Pridmore Park area.

BRUNSWICK T.S.



SCALE 1:20,000



LEGEND

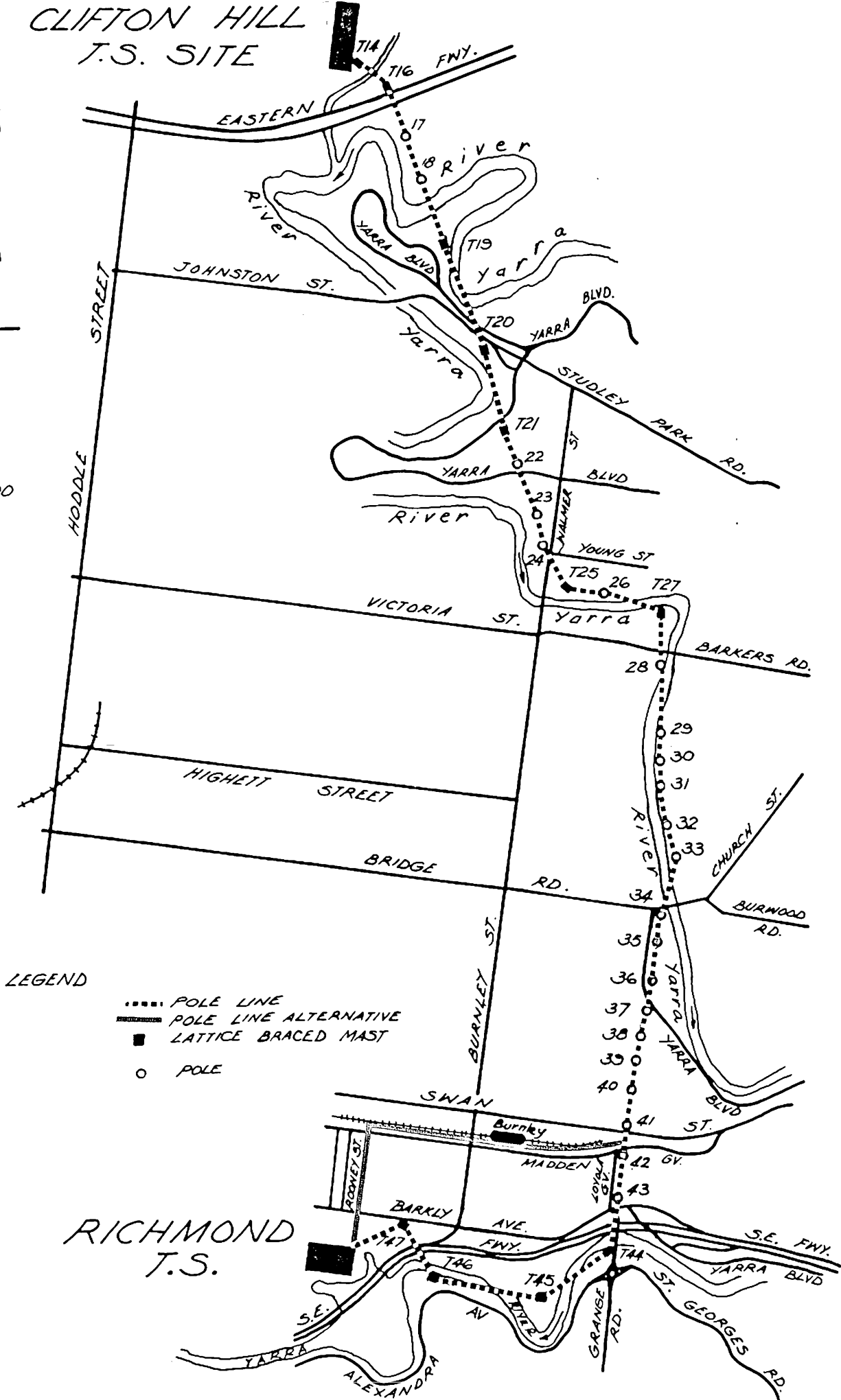
- TOWER LINE
- TOWER
- POLE
- POLE LINE ALTERNATIVE
- ▨ POLE LINE ALTERNATIVE
- ▩ UNDERGROUND CABLE

PROPOSED 220 kV TRANSMISSION LINE
 BRUNSWICK T.S. - CLIFTON HILL T.S.
 FIGURE No. 16

CLIFTON HILL
T.S. SITE



SCALE 1: 20,000



PROPOSED 220 kV TRANSMISSION LINE
CLIFTON HILL T.S - RICHMOND T.S.
FIGURE N^o. 17

4.25 Other variations have also been tested and are covered in detail in the landscape assessment. However, these are essentially variations on the alternatives outlined above.

Evaluation by the SEC of possible alternative treatments

4.26 Undergrounding of the line between Structure T7 and the Clifton Hill Terminal Station

This would remove the impact from The Esplanade. However, a single circuit underground cable of equivalent rating to a single circuit of the overhead line would cost \$4.1 M. extra. The line cost of \$7 M. included an amount of \$2 M. for environmental treatment. An additional \$4.1 M. would give a total cost of \$11.1 M. which would virtually double the basic cost of the transmission works necessary to provide the required increase in security of supply for the Richmond Terminal Station.

Expenditure of this magnitude is not considered justified by the SEC having regard to -

- (1) The purpose for which the works are intended - that is the provision of essential redundancy to ensure an adequate security of supply to Richmond Terminal Station, and for which and significant additional expenditure from that proposed is unlikely to give a satisfactory return on investment;
- (2) Benefits which can be achieved with other relatively low cost treatments;
- (3) The relatively small difference in the impact of the line in the Esplanade area from other sections of the line. This does not warrant singling out the Esplanade section for such costly treatment; and

- (4) The advice by BEI that more benefit can be achieved for the whole community by expenditure in areas where more is achieved per dollar spent, i.e., lower voltage assets should be undergrounded before considering expensive undergrounding of 220 000 voltage lines.

4.27 Use of pole-type structures between the Brunswick Terminal Station and High Street

Due to the constraints along the route with urban development along either side of the creek, rail crossings and road crossings, high strength structures are required and up to 20 poles approximately 1.8 metres diameter at the base would be required in place of the proposed 7 lattice-braced structures. Cost increase would be in the order of \$0.5 M.

This treatment is not considered a viable option by the SEC as it would greatly increase the visual impact of the line.

4.28 Investigate alternative lattice-braced "pole equivalent" structure types for use along the Esplanade and in the Clifton Hill to Richmond section

The use of lower height lattice-braced structures with a similar spacing to poles potentially has a smaller radius of visibility than a solid pole-type structure. This results in a reduced overall visual impact in spite of the higher "impact rating" resulting from a lower level of community acceptance of such structures.

A major factor in the low level of acceptance of normal lattice structures is their relatively large size, both in height and base width. Use of this sized tower is aimed to reduce the total number of structures but also tends to put them out of scale with a residential urban environment.

If lattice structures were spaced similarly to poles, the overall height and width of the structure could be significantly reduced. The design of structure may then be considered more aesthetically pleasing because it would -

- be more in scale with the environment; and
- have a reduced visual impact, compared with the pole-type structure.

The SEC considered that these structures could be provided at a cost marginally below the additional costs which have been indicated for provision of poles.

4.29 Development and implementation of a total landscape plan for the Esplanade area (Hall Reserve) to optimise integration of the line with recreational sporting and children's play facilities

The SEC could fund the design and implementation of this landscape plan in conjunction with a landscape consultant (e.g., Melbourne University School of Environmental Planning) and with the local community. This would provide a total environmental treatment which, together with the treatments already proposed and facilities which could be incorporated, would provide a community asset superior to that which currently exists and from which the transmission line would not detract. The SEC considered that this could be achieved in the area defined by the allocation of an additional \$0.3 M. expenditure.

4.30 Construct a single circuit line instead of the proposed double circuit line from Brunswick to Clifton Hill.

The SEC proposal for the Brunswick to Richmond line is to route it via the site of the future Clifton Hill Terminal Station. This will be required in the mid 1990's for an alternative supply point for the CBD and the eastern part of inner Melbourne. The connection from Brunswick to Clifton Hill is

proposed to be double circuit, with a single circuit from Clifton Hill to Richmond to ensure that the supply to the Clifton Hill Terminal Station would be preserved for line losses during normal service and during circuit maintenance.

The consequences of adopting a single circuit from Brunswick to Clifton Hill to reduce the environmental impact would be as follows -

- The full utilisation of the available easement for provision of the required overhead transmission lines would not be realised;
- The development of the Clifton Hill Terminal Station would be limited to a supply of 200 MW compared with the planned 400 MW; and
- Significant expenditure would be required around the years 2000 to 2005 to provide a third supply point for the inner Melbourne loads in addition to the existing supplies from Richmond and West Melbourne. It is intended that this third supply point be Clifton Hill in the event of a single circuit line being used between Richmond and Brunswick and output from Clifton Hill being limited to 200 MW; then overhead lines or cables must be used to take supply directly from the Brunswick Terminal Station to the inner Melbourne area.

Notwithstanding the above constraints, the initial saving for the adoption of a single circuit overhead connection between Brunswick and Clifton Hill would be approximately \$0.6 M.

Summary by the SEC

4.31 These and other alternatives considered are summarised in Table 11.

TABLE 11
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|---|---|--|
| <p>A. BRUNSWICK TO CLIFTON HILL</p> <p>A1. Lattice-braced towers</p> <p>A2. Lattice-braced towers replaced with poles</p> <p>A3. Lattice-braced towers replaced with lattice-braced pole equivalents</p> | <ul style="list-style-type: none"> • Land use on easement unchanged. • Land use of easement unchanged over existing 66 000 volt line in some areas, minimal change or improvement in other areas. • Includes \$0.3 M. for removal of existing 66 000 volt line. • 29 poles required to replace 14 lattice-braced structures • 1.8 metres diameter at base of pole. • Visual impact of line between High Street and Brunswick increased. • As for A2 except that visual effects could be significantly reduced. | <p>\$2.7 M.</p> <p>\$3.9 M. (\$1.2 M. increase)</p> <p>\$3.19 M. (\$1.2 M. increase)</p> |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|--|---|--|
| <p>A4. Steel pole lines along streets to avoid the Esplanade either: Double circuit in Hoddle Street parkland or: Single circuit in Roseneath and Ramsden streets</p> | <ul style="list-style-type: none"> • Encroach 2 metres into carriageway in Roseneath and Ramsden streets. • Some re-location of existing services of other authorities would be required. • More structures required to minimise conductor swing. • Increased visual impact compared with the proposed route. • Disruption to community activities and use of streets during construction and maintenance. | <p>\$2.7 M. (No increase)</p> |
| <p>A5. Poles to replace three towers along the Esplanade</p> | <ul style="list-style-type: none"> • More structures, less height but solid (1.2-1.8 metres base diameter). • Land use in area unchanged. • Increase in visual impact over a wider area due to increased number of structures and wider radius of visibility of poles; however, structures are lower and could be considered more aesthetically satisfactory. Lattice-braced "pole equivalents" may improve situation even further (at no additional cost). • Access for construction and maintenance satisfactory, minimal disruption to community activities. | <p>\$2.9 M. (\$0.2 M. increase)</p> |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|--|--|-----------------------------------|
| A6. As for A1 or A4 plus re- location of other 66 000 volt assets away from open land near the Esplanade | <ul style="list-style-type: none"> • Reduce overall easement in open land by removal of approximately 23 existing 22 000 and 66 000 volt structures. • Visual impact significantly reduced compared with proposal along open areas of the Esplanade. | \$3.0 M. (\$0.3 M. increase). |
| A7. As for A6 plus relocation of other high voltage distribution assets along the route and general landscaping along easement. | <ul style="list-style-type: none"> • Offsetting improvements. | \$3.38 M. (\$0.68 M. increase) |
| A8. As for A7 plus development and implementation of total plan for Hall Reserve to integrate recreational, sporting and children's play facilities. | <ul style="list-style-type: none"> • Offsetting improvements. | \$3.68 M. (\$0.98 M. increase) |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|--|---|--|
| <p>A9. Underground section from Tower 7 to Clifton Hill site through streets in surrounding areas. Double circuit overhead line from Tower 7 to Brunswick Terminal Station on lattice-braced towers.</p> | <ul style="list-style-type: none"> • Disruption to normal community activities and street use during construction and maintenance. Normal use at other times. • Visual impact of line removed from the Esplanade area. | <p>\$6.8 M. (\$4.1 M. increase)</p> |
| <p>A10. Single circuit overhead line from Clifton Hill to Brunswick on lattice-braced towers</p> | <ul style="list-style-type: none"> • Reduction in visual impact from Clifton Hill to Brunswick. • Full utilisation of easement not realised. • Clifton Hill Terminal Station limited to 200 MW (vs 400 MW). • Further expenditure in 2000-2005 of \$3 M. for further line to up-grade Clifton Hill to 400 MW. | <p>\$2.1 M. (\$0.6 M. decrease)</p> |
| <p>A11. Single circuit overhead line from Clifton Hill to Brunswick on poles.</p> | <ul style="list-style-type: none"> • As for A10. | <p>\$3.2 M. (\$0.5 M. increase)</p> |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|---|--|----------------------------------|
| A12. As for A9 but single circuit overhead line from Tower 7 to Brunswick Terminal Station on poles. | <ul style="list-style-type: none"> • As for A9. • Reduction in visual impact from Tower 7 to Brunswick. • Full utilisation of easement not realised. • Clifton Hill Terminal Station limited to 200 MW (vs 400 MW). • Further expenditure 2000-2005 to up-grade Clifton Hill to 400 MW. | \$7.1 M. (\$4.4 M. increase). |
| A13. As for A11 but including re-location of 66 000 volt assets and other distribution assets between Clifton Hill and Brunswick. | <ul style="list-style-type: none"> • As for A11 with additional offsetting factors to improve visual amenity. | \$7.8 M. (\$5.1 M. increase). |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|--|---|---|
| <p>B. CLIFTON HILL TO RICHMOND</p> <p>B1. Poles and lattice-braced masts.</p> <p>B2. Re-locate route from Pole 41 via Madden Grove and through SEC depot.</p> | <ul style="list-style-type: none"> • Land use on easement unchanged. • Small increase in visual impact over existing 66 000 volt line. • \$1.4 M. included for use of poles instead of lattice-braced towers. • \$0.3 M. included for removal of existing 66 000 volt line. <ul style="list-style-type: none"> • Located between road kerb and railway fence along Madden Grove - however, industrial and railway landscape would generally minimise overall impact. • Reduction of overall visual impact along Yarra River with elimination of four river crossings. Increased impact for residents in Madden Grove; however, industrial and railway landscape would generally minimise overall impact. • Access for maintenance and construction satisfactory but requires co-ordination with Metropolitan Transit Authority. | <p>\$3 M.</p> <p>\$3 M. (No increase).</p> |

TABLE 11 (cont'd)
 MAJOR SPECIFIC ALTERNATIVES CHOSEN FOR TREATMENT

| Treatment | Comments | Cost |
|--|--|-----------------------------------|
| B3. Poles over whole route except for T45-T47 (i.e. replace 7 lattice masts with poles). | <ul style="list-style-type: none"> • Minimal effect on existing land use. • Uniformity of structures except for T45-T47 where long spans across Yarra River require lattice structures. Overall visibility of line increased due to increase in radius of visibility of poles over towers; however, poles may be considered more aesthetically acceptable than lattice-braced masts. | \$3.12 M. (\$0.1 M. increase). |

ASSESSMENT BY CONSULTANTS

4.32 The consultants made the following assessment of the proposed Richmond to Brunswick transmission line -

This has been the subject of a report by Melbourne University to the SEC on the results of their computer studies using the VIEW H and PREVIEW programmes. The final report has not been seen by the consultants. However, a draft report indicates that the proposed 220 000 volt line would cause some deterioration to visual amenity along its route but this would not be inordinate.

BEI's views can be summarised as follows -

- (1) The number of times the proposed route crosses the Merri Yarra Valley (16 in all) should be reduced; such crossing causes the greatest visual impact and should be kept to a minimum;*
- (2) Other lower voltage overhead lines on the route should be undergrounded;*
- (3) This undergrounding could give a freedom to re-align the proposed route with the view to reducing visual impact, especially as occasioned by (1) above; and*
- (4) Detailed tree planting and landscaping proposals would further reduce the impact.*

BEI considered that successful application of the above would reduce the overall deterioration of the environment to an acceptable minimum. These modifications have not been costed because of the details and the need to re-survey a route. (A more detailed assessment by BEI is included as Appendix 2.)

SUBMISSIONS AND EVIDENCE (OTHER THAN BY THE SEC)

4.33 The following bodies made written submissions in relation to the proposal and alternative methods of securing supply to the Richmond Terminal Station, particularly in relation to the preferred alternative proposed by the SEC -

The Merri Creek Co-ordinating Committee
Collingwood Residents Association
The Melbourne and Metropolitan Board of Works
Ministry for Conservation
Merri Yarra Municipal Protection Committee

4.34 The municipal councils, the Merri Creek Co-ordinating Committee and the Collingwood Residents' Association were vigorously opposed to the SEC's proposal to run the 220 000 volt transmission line along the Yarra River and Merri Creek Valleys and nominated the Merri Yarra Municipal Protection Committee (MYMPC) as the body putting forward the detailed case against the proposal on their behalf.

4.35 The initial submission of the MYMPC included a detailed survey of the proposed routes. The submission is included in this report as Appendix 3 and the following points are extracts -

(1) Route survey

The MYMPC was supported by volunteer groups of citizens, architects and planners who studied and reported on sections of the proposed route.

The reports by the volunteer groups were presented on standard survey sheets and required assessment of the following ten items on a scale rating for each item of 0 (Ideal) to 10 (Maximum envisaged adverse impact).

- * Visual impact within park or riverside.
- * Visual impact outside park.
- * Effect of towers and lines on vistas within the park.
- * Effect of towers and lines on vistas outside the park.
- * Effect on urban natural setting of parks and surrounds.
- * Effect on vegetation.
- * Physical restriction.
- * Effect of inhibiting recreation activity (e.g. bike paths, sports ovals, etc.).
- * Effect on attractiveness to tourists.
- * Effect on commercial activity in park/river area.

In addition to these items, a further question reported on was -

- * The estimated number of dwellings with direct views to lines or towers.

The results of this survey were summarised as follows:

| <u>Proposed Tower Nos.</u> | <u>Percentage of Maximum Possible Impact</u> | <u>No. of Dwellings with Direct Views of Towers</u> |
|----------------------------|--|---|
| 1 - 7 | 64 | 245 houses (approx.) |
| 8 - 16 | 53 | 721 " " |
| 17 - 27 | 70 | 200 " " |
| 28 - 37 | 58 | 500 " " |
| 38 - 47 | 57 | 1500 " " |

The report indicated that the proposed 220 000 volt line will have a detrimental impact in the public parklands and riverside adjoining the municipalities of Brunswick, Northcote, Fitzroy, Collingwood, Kew, Hawthorn, Richmond and Prahran.

(2) Open space consideration

The 1954 MMBW Metropolitan Open Space Inventory recommends 3.5 acres passive open space per 1000 head of population.

The ratios of passive open space to population in the municipalities through which the proposed transmission line passes are:

| | | | | | |
|-------------|-----|-------|-----|------|------------|
| Hawthorn | 2.0 | acres | per | 1000 | population |
| Prahran | 1.2 | " | " | " | " |
| Fitzroy | 2.7 | " | " | " | " |
| Collingwood | 3.4 | " | " | " | " |
| Brunswick | 0.7 | " | " | " | " |
| Northcote | 2.5 | " | " | " | " |
| Richmond | 2.9 | " | " | " | " |

These ratios are well under 1954 recommended open space. Kew has 10.2 acres per 1000 population but this includes a large proportion of Yarra Bend Park.

(3) Other options

(a) Increased load requirements

Supply to the inner eastern suburbs and the eastern portion of the CBD could be up-graded with small disruption to the visual environment by the extension of the existing 220 000 volt line from the Templestowe Terminal Station to Kew via the future Kew Terminal Station to the new Clifton Hill Terminal Station.

Parkland is already alienated over the route from the Templestowe Terminal Station to the proposed Kew Terminal Station site adjacent to the Eastern Freeway/Burke Road interchange.

The 220 000 volt line from Kew to the proposed Clifton Hill Terminal Station should be underground. This proposal will allow up-grading of the supply to the inner eastern suburbs and the eastern CBD.

(b) Security of supply

The MYMPC believes that security to the supply could be improved by up-grading and modernising the existing circuitry and switchgear within the inner eastern suburbs and the CBD.

In particular, the CBD should yield a number of options for up-grading any present easement.

An independent study should be undertaken of the existing CBD and inner eastern suburbs distribution networks to determine the costs associated with up-grading those networks.

Consideration should also be given to the routing of overhead lines along railway easements, where overhead wires are already a feature of the landscape.

Whilst the MYMPC do not wish to see visual environment of parklands destroyed, they equally do not wish to see the visual environment of inner suburban streets destroyed any more than they are to date. The value of the visual environment compared with the cost of finding alternative routes, or underground cables, needs to be weighed carefully.

(4) General

The local and regional value of the public open spaces which go to making this area a valuable metropolitan inner area are becoming increasingly recognised. Recent public campaigns such as the Age's "Give the Yarra a Go" have achieved popular support and acceptance. For the first time a modest but concerted effort is being made to clean up river banks, and to create access to the inner urban Merri Creek and Yarra Valley with reforming of banks, planting, creation of cycle tracks and the like. For the first time in over a century there is seen to be the promise of giving back industrialised and despoiled stretches of the Merri Creek and Yarra River to the people. At this juncture it is most unfortunate that a major service authority sees the Merri Creek and Yarra valleys as a line of least resistance which provides an opportunity for it to easily route new power transmission lines.

The proposed 220 000 volt overhead system will be disastrous not only for the Yarra Valley but also for the proposed development of the Merri Creek Valley for recreational use.

There are options which can achieve the SEC's objective of securing the services which do not pass through public parklands and which have a less detrimental effect on the environment.

4.36 In giving evidence before the Committee, the MYMPC repeated much of what was contained in its written statement and indicated that all the municipal councils along the route of the proposed transmission line were totally opposed to the proposal. Councillors and representatives of the councils pointed out the large amount of money and effort being put into cleaning up and improving these sections of the Yarra River and Merri Creek and the very densely populated surrounding areas which relied upon the open spaces surrounding the river and creek for recreational purposes.

- 4.37 The MYMPC indicated that they were prepared to work with the SEC to find a better solution to the perceived problem.
- 4.38 Following the public hearings, the MYMPC came forward with an alternative proposal which is attached as Appendix 4. This proposal involves an overhead line running down the median strip of Hoddle Street/Punt Road from the vicinity of Queen's Parade to the vicinity of the South Eastern Freeway; connections to Brunswick Terminal Station, Richmond Terminal Station and the future Clifton Hill Terminal Station are via overhead lines along the appropriate streets.
- 4.39 The SEC was requested to comment on this submission by the MYMPC and their comments are included in Appendix 5.
- 4.40 The Melbourne Metropolitan Board of Works (MMBW) made a submission on 26 July 1983 and this is included in this report as Appendix 6. The MMBW carried out a survey of the effect of the line on the landscape along the route of the proposed line and drew the following conclusions -
- *The 220 000 volt towers would have a significantly greater visual impact than the existing 66 000 volt towers and poles. In general, the impact of the 220 000 volt poles would be only slightly greater than that of the 66 000 volt towers, because although the former would be much taller, their form is more aesthetically acceptable than the latter.*
 - *Where existing towers and poles are surrounded by mature trees of similar height, their visual impact is greatly softened by screening and background effects. However, existing vegetation and even possible landscape planting would be of more limited ameliorative value in many situations with respect to the proposed, taller towers and poles.*

- *The impact of the proposed towers and poles would be especially severe where the sites are either in areas of high existing or potential landscape amenity or in close proximity to dwellings.*

4.41 A number of specially sensitive sites were identified by the MMBW and the alternatives put forward by the SEC for specific sections of the route were assessed as follows -

- (1) *Three alternatives have been proposed in the Clifton Hill area. One would involve connecting Tower 7 with the Terminal Station via a pole line along Hoddle Street (and then along either Ramsden or Roseneath Streets). This route would pass through an attractive area of open space bordering Hoddle Street and then along a largely residential street; clearly these intrusions constitute major disadvantages. A second option would connect Towers 9 and 13 via a series of poles generally sited below the edge of the valley slopes. This option has the advantages of greater separation from dwellings and the substitution of poles for towers, but it would involve greater intrusion within the Merri Creek environs. A third, quite expensive option, would involve an underground cable along Berry and Ramsden Streets; this approach would avoid major environmental intrusion.*
- (2) *At the Richmond end of the route, it has been proposed that a pole line could connect Pole 41 with the Terminal Station via Madden Grove and Rooney Street. This alternative has the advantage of avoiding further intrusion along the Yarra River in the vicinity of Alexandra Parade. However, the alternative pole line would be in close proximity to a number of houses (note that some concern has been expressed in the literature that exposure to high voltage power infrastructure may have adverse health effects). Clearly, undergrounding would be another option in this area.*

- (3) *While certain of the proposed alternatives for sections of the transmission route might reduce the potential environmental degradation associated with the transmission line, no specific alternatives have been advanced with respect to other sections of the route. In particular, major problems remain in the sections through the Studley Park area, near Young Street, in the vicinity of Burnley Oval, and the 'upstream' end along Merri Creek. Although landscape planting would have some ameliorative value in several situations, greater benefit could be gained by the substitution of poles for towers where possible, as well as through some changes in siting.*
- (4) *The Chairman of the MMBW, Mr. R. D. Marginson, in a covering letter concluded that the Board's report indicated, both in written and photographic form, the generally high landscape quality of the immediate river and creek valleys and demonstrated the significant impact which the proposed line would have on that sensitive area.*
- (5) *Whilst the area is already traversed by a 66 000 volt power line, this is not seen as sufficient justification by the MMBW for creating further detriment to the visual quality of these relatively narrow river and creek valleys.*
- (6) *In this respect, the proposal would constitute a major departure from the principles which have been enunciated on a number of occasions which aim to conserve and enhance the landscape quality of the Lower Yarra River. In particular, attention is drawn to Statement of Planning Policy No. 4 - Yarra River of 1971, and to the Yarra Development Act 1981.*

In all the circumstances, the MMBW recommended that more appropriate alternatives for power distribution should be sought.

4.42 The SEC was requested to comment on the MMBW submission by the Committee and their comments are included in Appendix 7.

4.43 Officers of the Ministry for Conservation made the following recommendations in their submission -

- (1) *The elements of location of transmission lines that are currently the major cause for concern are, as the SEC pointed out in its evidence, the visual impact and the related effect caused by the need to remove trees and other vegetation from the easement, together with any restrictions placed on land use in the easements.*
- (2) *The Ministry considers that more could be done by the Commission in managing its easements. One improvement might be to move towards a type of co-operative easement management, in which the Commission actively involved itself in multiple use of the easement.*
- (3) *If the Brunswick to Richmond line were to proceed on the SEC's original proposed easement, the Commission might involve itself in planning and promoting the landscaping and multiple use to which that corridor lends itself.*

DISCUSSION AND CONCLUSIONS

- 4.44 The most straight-forward and least costly method of connecting Richmond Terminal Station to Brunswick Terminal Station involves replacement of the existing 66 000 volt overhead transmission line by a 220 000 volt overhead line constructed within the same easement.
- 4.45 However, the line passes through public land adjacent to the Yarra River and Merri Creek which has considerable value as parkland and public open space. Much effort has been made over recent years to up-grade this area and the existence of overhead power lines through this area has a significant environmental impact which is seen by many as highly undesirable.
- 4.46 The Committee recognized that the minimum environmental effect would be achieved by undergrounding all of the connection between Richmond and Brunswick, either along the alignment generally proposed by the SEC or along an alignment via the CBD. These solutions were rejected by the Committee on the grounds that the costs were prohibitive.
- 4.47 The Committee examined in some detail a proposal by the MYMPC to route an overhead connection along Hoddle Street and concluded that, apart from the many practical difficulties in achieving this connection, the visual effects of such a large system along the street would be unacceptable, particularly in the vicinity of the high-rise Housing Commission flats, the pedestrian footbridge and the major road and rail intersections.

The Committee is of the opinion that the routing of a 220 000 volt overhead line along streets containing high density residential and commercial buildings would be neither environmentally nor economically acceptable. The possibility of using 66 000 volt overhead lines through the streets was discussed earlier in this report and rejected on similar grounds.

- 4.48 Detailed examination of the direct overhead route has revealed some improvements which can be made at no cost and other improvements which do carry certain costs or penalties but which may help minimise the visual effects of the proposed connection.
- 4.49 In the vicinity of the Richmond Terminal Station the transmission line can be routed adjacent to the railway line and parallel to Madden Grove. This will reduce the clutter of transmission lines along this section of the Yarra River but will impose some additional visual clutter on the inhabitants of Madden Grove. On balance, the Committee believes that the Madden Grove route is preferable, particularly as the line can be pole mounted.
- 4.50 The MMBW and the consultants, BEI, drew to the Committee's attention the possibility of purchasing the Carba Dry Ice factory site (estimated sale price \$1 M.). The Committee recognises that purchase of this site and demolition of some or all of the buildings could allow the proposed transmission line to be constructed in a less visually obtrusive manner. However, the Committee is of the opinion that such an option could not be justified on the grounds of reducing the visual intrusion of the proposed line alone, but that the primary objective of such a purchase would be to provide additional public open space. The purchase of this land should be investigated and, if appropriate, separately justified in the context of the need for public open space at this location by the appropriate authority (either the MMBW or the Collingwood City Council).
- 4.51 If a terminal station is eventually constructed at Clifton Hill, then it should be of indoor construction. Further, all lines feeding out of the terminal station should be arranged to minimise the visual impact of the lines with cable entries being used where appropriate to avoid a congested overhead clutter of lines in the vicinity of the station.

- 4.52 The section of Merri Creek adjacent to the Esplanade has been neglected for many years and considerable efforts have been made recently to tidy up and improve this area.

The Committee believes that the 220 000 volt line from Clifton Hill to Brunswick should be run underground in cable from Clifton Hill to a point on the far side of Queen's Parade adjacent to the railway line.

- 4.53 The section of cable from Clifton Hill to Queen's Parade would cost an additional \$4 M. but is seen to be justified as it will minimise the visual clutter at Clifton Hill Terminal Station and avoid traversing the area adjacent to the Esplanade.

The route length for a cable is considerably shorter than the route length for an overhead transmission line in this section and the cost differential between a cable and an overhead connection is therefore reduced.

- 4.54 As future load growth in the CBD and inner metropolitan area is relatively unpredictable at the present time, the Committee believes that Clifton Hill and Brunswick should be connected by a single circuit rather than by the double circuit proposed by the SEC.

- 4.55 The Committee therefore concludes that the connection from the cable termination adjacent to Queen's Parade to Brunswick Terminal Station should be made via a single circuit overhead line.

- 4.56 If the need eventually arises to improve the security of supply to the Clifton Hill Terminal Station by installing a third 220 000 volt line into Clifton Hill, then consideration should first be given to constructing this line as an extension of the Templestowe to Kew line using either overhead or underground connection depending upon the experience gained with the current proposal.

4.57 The Committee is of the opinion that aesthetically designed pole supports, although more expensive, should be used throughout the Brunswick to Richmond transmission line and that in a particular location the use of a lattice tower only be considered if it can be clearly indicated that the visual impact is reduced. Considerable further evaluation of the optimum pole design, pole heights and pole locations is necessary. The Committee has been shown a number of examples of tower and pole design and believes that considerable scope exists for improvement of the appearance of the transmission line supports. Care should also be taken to ensure that some uniformity of appearance is achieved along the length of the line.

4.58 The Committee is also of the opinion that the SEC should remove all existing high voltage distribution lines from the immediate vicinity of the easement along the entire route of the proposed 220 000 volt transmission line including the section of the route along Merri Creek Valley adjacent to the Esplanade.

However, these lines should not simply be transferred to adjacent streets and add clutter to these streets. The SEC should effect this change with the minimum of visual impact including the undergrounding of medium voltage lines as necessary.

4.59 The Committee recognises that even if the improvements suggested above are implemented, the 220 000 volt overhead transmission line will still result in environmental impacts of both a temporary and permanent nature.

The Committee also recognises that the Merri Creek and Yarra Valley are an important community resource and that much work has been and is being done by Government, the local municipalities and local communities working together to improve this resource.

If the effects of the line are to be minimised and offset by other improvements, such as tree planting, landscaping and pathways for pedestrians and bicycles, then the line details must be co-ordinated with the overall plans for the valley and a liberal interpretation should be placed on the scope of work covered by the SEC reinstatement and landscaping works.

The SEC has made some allowances in its proposals for such works. The Committee suggests that consideration be given to increasing this allowance to the extent necessary to ensure that a reasonable level of work is undertaken, in consultation with the local communities and municipalities, to offset the effects of this line.

4.60 The cost of the connection as modified by the amendments discussed above is estimated to be \$12.2 M.

RECOMMENDATIONS

4.61 The Committee recommends that -

- (1) The Brunswick Terminal Station should be connected to the Richmond Terminal Station by a 220 000 volt transmission system.

The transmission system should consist of the following -

- (a) A single circuit pole mounted line between the Richmond Terminal Station and the site of the future Clifton Hill Terminal Station:

This line should generally follow the route of the existing 66 000 volt line between the Richmond Terminal Station and the Brunswick Terminal Station except that it should be diverted to run between Madden Grove and the railway line in the vicinity of the Richmond Terminal Station.

Residents affected by the recommended diversion may not be aware of this proposal and the Committee recommends that this diversion be subject to further review.

Use of lattice towers to replace individual pole supports should only be considered if it can be clearly demonstrated that the visual impact is reduced. Alternative designs and location of the supports should be further reviewed in depth.

- (b) An underground cable between the Clifton Hill Terminal Station site and a point north of Queen's Parade adjacent to the railway line.
- (c) A single circuit pole mounted line connecting the cable end north of Queen's Parade to the Brunswick Terminal Station:

This line should generally follow the route of the existing 66 000 volt line between the Richmond Terminal Station and the Brunswick Terminal Station.

Use of lattice towers to replace individual pole supports should only be considered if it can be clearly demonstrated that the visual impact is reduced. Alternative designs and location of the supports should be further reviewed in depth.

- (2) The existing 66 000 volt transmission line between the Richmond Terminal Station and the Brunswick Terminal Station and all other high voltage distribution lines in the vicinity of the existing easement should be removed including the 66 000 volt and 22 000 volt lines adjacent to the Esplanade.

- (3) With respect to the Brunswick to Richmond connection, the only matters which should be subjected immediately to further review are -
- (a) The precise location and nature of the overhead line support system within the general parameters specified in the previous recommendations.
 - (b) Other practical mitigating measures to minimise the visual impact of the overhead line and the associated terminal stations.
 - (c) The route in the vicinity of Madden Grove.

CHAPTER FIVE

DETAILED CONSIDERATION OF THE PROPOSED NEWPORT TO FISHERMEN'S BEND LINE

EXTRACTS FROM THE CASE PUT FORWARD BY THE SEC

- 5.1 This connection would be achieved by constructing an overhead line on an existing easement which was obtained in 1970.
- 5.2 The general area through which the easement runs is industrial and is intended for future port development. Close to Fishermen's Bend, the route is parallel to the Westgate Bridge and, after crossing the river, joins an easement with an existing line a short distance from Newport Power Station (refer Figure 18).

Development of the SEC proposal

- 5.3 The proposal was developed following detailed consideration of each of the factors outlined by the SEC in paragraph 3.28 of this report, supported by discussion with affected municipal councils and public bodies.
- 5.4 The major environmental aspect would be the changed visual effects due to the relationship between the outlines of the West Gate Bridge and the outlines of the towers and catenary of the transmission lines.
- 5.5 Alternatives involving variation of the point of the river crossing were investigated, including locating the crossing closer to the Newport Power Station and the river mouth. This would involve constructing a high level crossing over the future extension of Webb Dock with a resultant increase in overall visual impact.

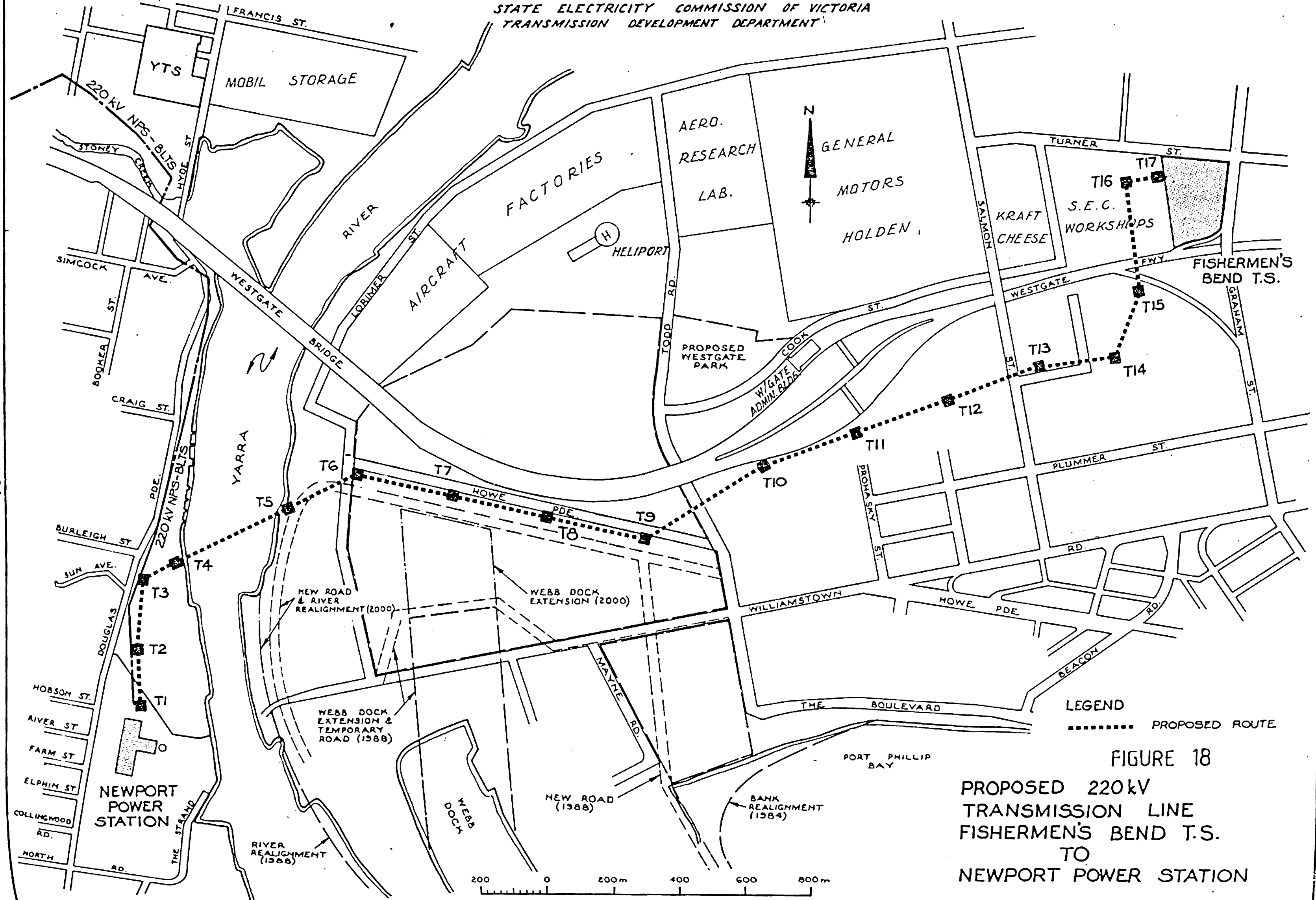


FIGURE 18
 PROPOSED 220kV
 TRANSMISSION LINE
 FISHERMEN'S BEND T.S.
 TO
 NEWPORT POWER STATION

- 5.6 A further alternative is the locating of the crossing closer to the Newport Power Station and the river mouth as above, but constructing a line along the east bank of the river to meet the existing easement, thus avoiding crossing Webb Dock. An existing double circuit 220 000 volt line is located on the western river bank between the bridge and the power station and this alternative would have the impact of establishing a similar line on the eastern bank.
- 5.7 Similarly, to arrange for the crossing to parallel the bridge, a section of line would be required along the east bank to join the existing easement.
- 5.8 The possibility of locating the crossing on the north side of the West Gate Bridge was also investigated. This would involve an additional line adjacent to the existing Brooklyn to Newport line part way along the western river bank towards the bridge and an underground section including an under-crossing of the freeway to the river crossing point. The line would be closer to the bridge than with other alternatives and an underground crossing beneath the bridge to join the existing easement would be required as existing development would preclude a route to Fishermen's Bend on the northern side of the freeway.
- 5.9 A further alternative of a "T" connection into the existing Brooklyn to Newport line near Yarraville Terminal Station was also considered. This would also involve a river crossing on the north side of the bridge and the associated underground crossing to join the existing easement.
- 5.10 An independent landscape assessment on the proposal was carried out by the Melbourne University Department of Environmental Studies. This study indicated that a crossing with a satisfactory visual impact could be achieved.

5.11 Undergrounding of the river crossing would require installation of ducts in the river bed to avoid damage to the cable by shipping. This would cost an additional \$11 M. and is not considered justified.

ASSESSMENT BY THE CONSULTANTS

5.12 The Consultants made the following assessment of the proposed Newport to Fishermen's Bend transmission line -

- (1) *The proposed high level 220 000 volt transmission crossing of the Yarra River would require a major engineering structure but one that is an appropriate element in an industrial landscape;*
- (2) *The proximity to the West Gate Bridge is the main concern;*
- (3) *The most appropriate overhead alternative would be to re-align the route of the crossing parallel to but further away from the bridge; and*
- (4) *A cable crossing of the Yarra River is technically feasible but is considered expensive. An increase from \$2.1 M. to \$11.6 M. for the crossing is envisaged.*

A more detailed assessment has been included as Appendix 1 to this report.

SUBMISSIONS AND EVIDENCE (OTHER THAN BY THE SEC)

5.13 Councillor R. M. J. Long and Mr. M. B. Hodges, City Electrical Engineer, both from the City of Williamstown, appeared before the Committee and gave evidence.

5.14 Councillor Long submitted that the additional costs of undergrounding the connection would be well justified and made the following comments (at page 240 and following) -

"Historically, the western suburbs have been treated as the dumping ground for industrial developers of Melbourne. After a long battle, Williamstown lost to some extent and had the power station imposed on it. We have already in the area close to the West Gate Bridge where this proposed line would be commencing to run across to the eastern side of the river a large conglomeration of tall, fairly ugly transmission pylons in what is to us a sensitive environmental area.

We find it objectionable that the total saving between the cost of an overhead line and an underground line which would be to the benefit of the City of Melbourne generally and particularly the central business district should be loaded on to us. That has become particularly relevant recently because we were approached by the Ministry of Planning to support the concept that the West Gate recreation park which had previously been intended to be concentrated on the eastern side of the river, the Port Melbourne side, should now extend well on to the western side and should run roughly from the Newport power station north and include all the land serving the Stony Creek, most of that land being in the City of Footscray but bearing directly on the aesthetic attractiveness of the Williamstown region.

If one looks out of the window of practically every house in the City of Williamstown, one looks at the chimney of the Newport power station which is approximately 180 metres high, and the towers of the bridge. I find the bridge reasonably attractive but if its lines were interfered with by massive pylons and transmission lines running across south of the bridge as is envisaged, the attractive quality of the bridge would be lost.

If one drives through the area I have talked about on the banks of Stony Creek, it looks shabby and not very attractive but if one stopped and got out of the car and spent some time there, one could see that it has great potential for being an attractive recreational area. It is one of the few areas in the metropolitan area which has some grading. It has some grading on the northern side and that piece of land links up, as you go west and meet the railway line at Williamstown to meet the city, with an extensive public golf course area which is an attractive and desirable recreation area for the western suburbs.

Most of the population of the northern part of Williamstown and the southern part of Footscray live in fairly small houses on small blocks of land and they are very intense residential developments. Many of the pockets of residential development are enclosed by fairly oppressive industrial operations. There is an enormous need for people who live in those circumstances to have a sense of open space.

Williamstown is very lucky in that it has a pleasant beach frontage and even some of the wharf frontage that looks back to the city from Williamstown is rather pleasant, but there is a limit to the amount of industrial activity that can go on before that pleasantness is lost. Indeed, I would hope there is every chance that the area we are talking about can be enhanced.

The Port of Melbourne Authority has a very ambitious programme for enhancing the waterfront and even extending further up the river. In the estuary of Stony Creek over the last three or four years since it has been cleaned up, we have noticed a massive increase in the amount of bird life in that estuary.

In terms of the psychological health of people in that area it is important to preserve the area as an open space with not too much crowding in on them from the skyline."

Mr. Hodges also made the following point -

"The second option W2 in this document shows an interconnection which effectively would tee off the existing system at a point north of the West Gate Bridge and continue through to the West Melbourne Terminal Station. I wonder whether an option of teeing off at that particular point and going through to the Fishermen's Bend Terminal Station was considered, as it is not shown in this submission. That would at least achieve keeping the Fishermen's Bend Terminal Station within the ring system.

Newport power station would then be a slight tee off rather than part of an overall ring system. Looking to the future, and again from the aesthetic point of view, Newport power station has a 30 year life and at the end of that 30 years one would assume the power station would be removed. This would mean the present transmission power line running from the bridge in a southerly direction to the power station would virtually become redundant as far as power supply from the station was concerned. But if the link to Fishermen's Bend is run from a point basically adjacent to the power station then the city has to continually put up with that transmission power line to the area and it would no longer be aesthetically acceptable."

- 5.15 The City of Port Melbourne submitted in writing that it was opposed to an overhead crossing between Newport and Fishermen's Bend.

DISCUSSION AND CONCLUSIONS

- 5.16 The available alternatives to the proposal put forward by the SEC involve either tunnelling under the river or an overhead transmission line to the north of the West Gate Bridge.
- 5.17 Tunnelling under the river is an extremely expensive operation added to which some possibility of an unpredictable escalation of costs exists because of the nature of the tunnelling exercise. The Consultants were of the opinion that two separate tunnels would be required; this would add considerably to the estimated costs.
- 5.18 The Committee believes that the cost of tunnelling under the Yarra River cannot be justified in the context of eliminating the visual effects of an overhead connection.
- 5.19 The concept of crossing the Yarra River to the north of the West Gate Bridge was examined by the Committee and it concluded that, from a visual standpoint, this affected different people and different viewing points but, more particularly, added more transmission lines to an already crowded situation adjacent to the west abutment of the bridge. The Committee concluded that no further consideration should be given to a crossing of the Yarra River north of the West Gate Bridge.
- 5.20 When examining the alternative routes for crossing the Yarra River south of the West Gate Bridge, the Committee concluded that when the future requirements of the Port of Melbourne Authority are taken into account the route proposed by the SEC was the only really practical route. This route has the advantage also of being very nearly the shortest route and therefore minimises the number and proximity of supports visible from the various vantage points.

5.21 The Committee is of the opinion that the issues which require further clarification are those which relate to the design of the two towers adjacent to the Yarra River and the use of lattice towers or pole supports along the remainder of the route. These aspects require considerable further evaluation and could result in the overall visual effects being more acceptable. Such alternative designs should be aimed at minimising environmental impact, particularly by relating the form and materials used in adjacent structures and prominent landscape features in the vicinity including the West Gate Bridge.

RECOMMENDATIONS

5.22 The Committee recommends that -

- (1) The Newport Power Station should be connected to the Fishermen's Bend Terminal Station by a 220 000 volt double circuit overhead transmission line following the route proposed by the State Electricity Commission and included in this report as Figure 18;
- (2) With respect to the Newport to Fishermen's Bend connection, the only issues which should be subjected to further review are alternative designs of the two major support towers adjacent to the Yarra River and alternative designs of supports between the Yarra River and Fishermen's Bend Terminal Station; and
- (3) Such alternative designs should be aimed at minimum environmental impact, particularly by relating the form and materials used in adjacent structures and prominent landscape features in the vicinity including the West Gate Bridge.

CHAPTER SIX

ALTERNATIVE PROCESSES FOR OBTAINING PLANNING APPROVAL

APPROVALS REQUIRED UNDER EXISTING PLANNING CONTROLS

- 6.1 In the case of the Richmond to Brunswick line, separate planning permits would have to be applied for and obtained by the SEC from each of the eight municipalities along the route.
- 6.2 In the case of the Newport to Fishermen's Bend line, permits would be required from two municipalities.
- 6.3 If the permits were refused or objections were raised to the issue of the permits, then the matter would be referred to the Planning Appeals Board for the hearing of appeals and determination. The Board would normally hear all the appeals related to a particular line concurrently.
- 6.4 The Minister for Planning and Environment could decide to "call in" the appeals in which case the Planning Appeals Board would hear the appeals but instead of making a determination would make recommendations to the Minister. The Minister would then consider the Board's recommendations and advise the Governor in Council to make the appropriate determination.
- 6.5 There is also a requirement that the procedures set out in the *Environment Effects Act* 1978 be followed and included within the above process, and this would require the SEC to prepare Environment Effects Statements for each of the proposed lines, public comment to be sought, and the Minister for Planning and Environment to provide his advice before the final decision is made.

ALTERNATIVE PROCESSES SUBMITTED IN EVIDENCE

EVIDENCE PUT FORWARD BY THE SEC

6.6 The SEC put forward two alternative methods of obtaining planning approval as follows -

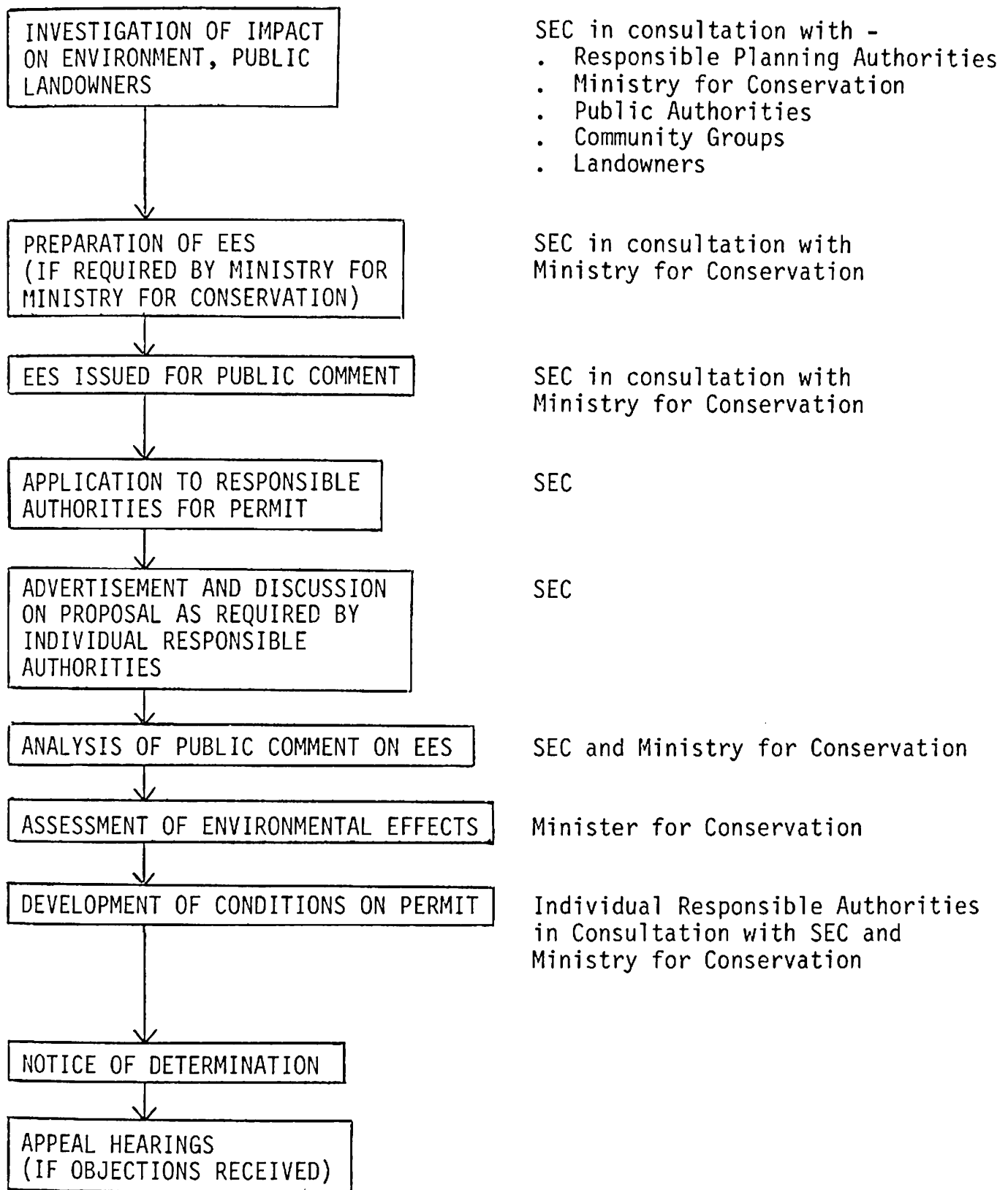
(1) Use of the normal planning procedures

Figure 19 shows a process which utilises the existing planning procedures whereby the SEC would apply for a permit to construct the line from each of the responsible authorities. The permit application would be for a defined route and treatment of the line, as developed from the feasible route and treatments defined by the Committee.

The route and treatment would be developed by the SEC in consultation with the Ministry for Conservation, municipal councils, public bodies, community groups and with the general public through comment on the Environment Effects Statement.

Where there is more than one responsible authority involved, this process provides a degree of independence of choice of route and treatment in specific areas. However, co-ordination of the requirements of several authorities can become difficult. The proposed route for the Newport to Fishermen's Bend line passes through only two municipalities and the major environmental issue is clearly defined. If the Committee generally accepts the proposed route for detailed examination, then the SEC believes that the normal planning processes outlined above would be satisfactory for this route.

FIGURE 19 : POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL USING EXISTING PLANNING PROCEDURES



(2) The use of an independent panel

Where a number of responsible authorities are involved with a route, a more co-ordinated approach to the public consideration of the whole route is desirable to ensure that the route detail and line treatment in specific areas are consistent with overall community interests.

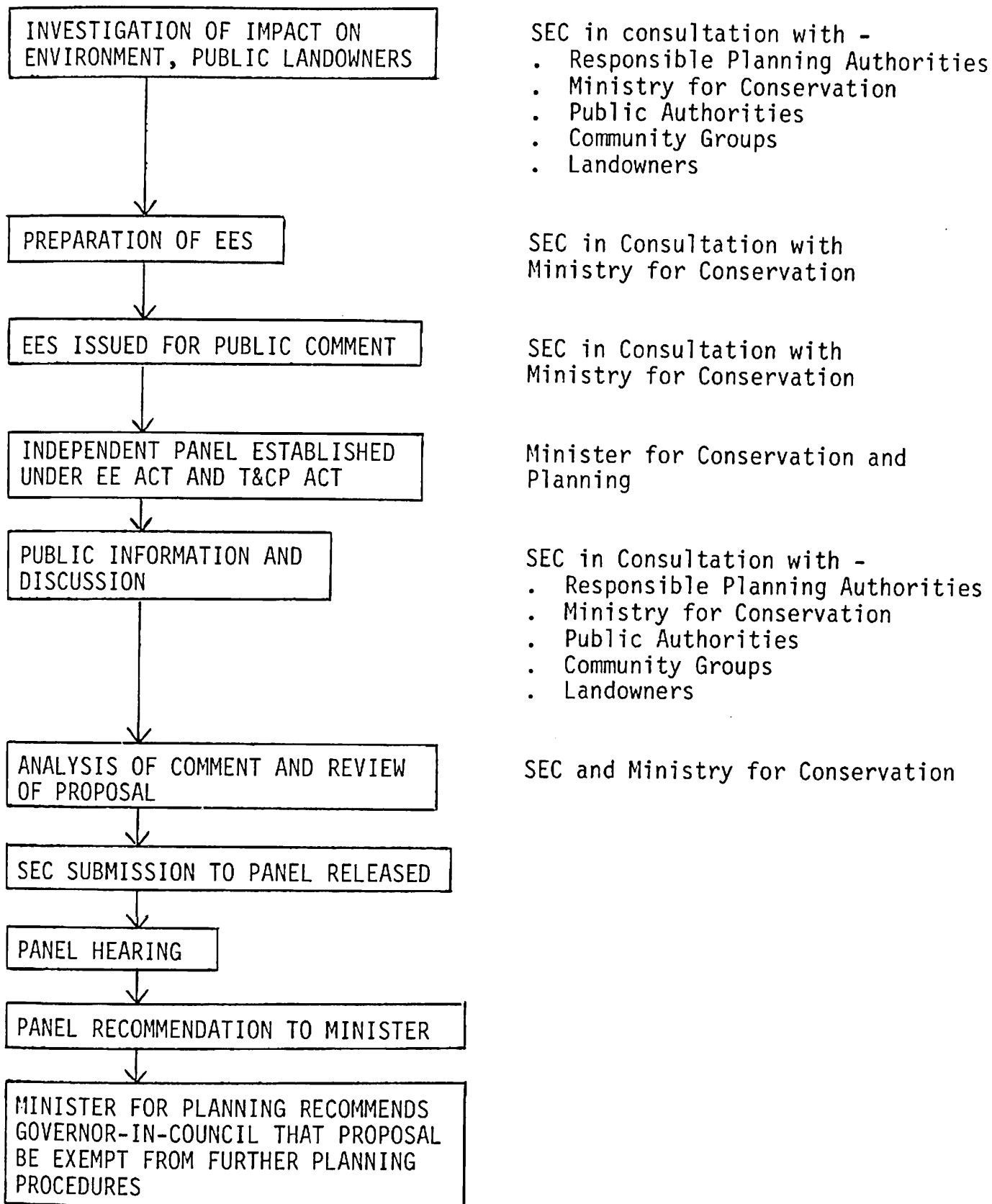
A process similar to that shown in Figure 20 could be appropriate in this case whereby an independent panel established under the provisions of the Environmental Effects Act 1978 and Town and Country Planning Act 1961 would conduct public hearings and make a recommendation to the Minister for Conservation on details of the route to be adopted.

The Minister for Planning would then recommend to the Governor in Council that the line be exempt from further planning procedures under Section 35D of the Town and Country Planning Act 1961.

The Richmond - Clifton Hill - Brunswick route passes through eight municipalities and the environmental issues associated with the urban waterways traversed by the existing easement are of overall community concern.

If the Committee recommends feasible alternatives and treatments to achieve the proposed connection, the SEC considers that the process shown in Figure 20 would be appropriate to provide a co-ordinated consideration of the environmental issues concerning the proposed Richmond to Brunswick line.

FIGURE 20: POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL USING INDEPENDENT PANEL



EVIDENCE AND SUBMISSIONS (OTHER THAN FROM THE SEC)

- 6.7 The Merri Yarra Municipal Protection Committee's submission is included in this report as Appendix 3 and contains a detailed review of possible assessment processes. In particular, this submission contains the following -

As an independent panel, the credentials of the individuals who comprise it are important. It is the MYMPC's recommendation that the panel should consist of three persons comprising a chairman and two other members. Each of them should be significantly distanced from the SECV and not only be, but be seen to be, independent from both the Commission and the State Government. Furthermore, they should have the necessary qualifications and ability to comprehend the problem, provide a proper determination and, when necessary, call on expert witnesses for further clarification. It is important that a lay person representing the community should sit on this panel.

This process does not obviate the need for an environmental effects statement but is a process where all information gathered in relation to the proposed development is called in to one panel for determination.

- 6.8 The Melbourne and Metropolitan Board of Works made the following submission:

In general, planning control over the construction of transmission lines in the metropolitan area only applies to lines carrying 220 000 volts or more. These major transmission lines are either prohibited or require a planning permit depending upon the zone or reservation in the Metropolitan Planning Scheme. All electrical substations operating at voltages in excess of 66 000 volts are similarly controlled under the Scheme, although the site of a large Terminal Station is more likely to be reserved in the Scheme for the purpose of the SEC.

By delegation of various zones to individual councils, responsibility for administration of the Scheme has been fragmented. The proposed Richmond to Brunswick line, for instance, requires eight municipal councils and the Board to be the responsible authority for parts of its length. Planning applications have to be lodged with all responsible authorities, each having individual requirements, advertising requests, separate decisions and rights of appeal.

Such multiple responsibility in the planning permit process is obviously unsatisfactory and would be improved by the inclusion of major transmission lines in the category 'metropolitan use' (as proposed in amendment 150 to the Scheme) and its exclusion from delegation. This action would streamline the planning process without neglecting consultation at the local level or the rights of objectors. In the absence at this stage of government approval to the concept of metropolitan uses, alteration to the deeds of delegation by the Minister to specifically exclude 'Major Transmission line' would achieve the same result.

The essential aim of the process for assessment and approval of power lines is:

- Firstly, maintain and improve existing planning procedures that would normally apply for permit determination and, additionally, establish an independent panel to investigate the proposal in its totality.
- Secondly, to ensure that all those affected by such a proposal be given the opportunity to participate in the decision-making process and, furthermore, to call on persons who will assist in making the best decision. Such participation should include the necessary ingredients of public input, accessibility and accountability.

In line with the above it would be necessary that an independent panel be established with inquisitorial powers and charged with the responsibility of obtaining sufficient technical information to equal the technical resources of the proponent (SECV). Accordingly, the panel should be given power to call a person, or persons, to give evidence and request such papers, files and documentation as it deems necessary.

It is imperative that this panel function as a public inquiry by allowing public input, accessibility and accountability.

A time period should be imposed on the panel for its determination although it may be necessary to allow the panel to request an extension of time, but only on the unanimous request of the panel. The panel should sit in a central location, preferably in the City, and advertise extensively in local and daily media for submissions in addition to notifying interested parties.

All persons should have the right to be heard, whether legal persons or unincorporated associations, and whether aggrieved or not aggrieved. Submissions should be allowed to be made either orally or in writing, or both.

As the proposal concerns the SECV, the right of questioning the Commission through the panel should be granted.

After hearing all submissions, the panel should provide a preliminary recommendation with detailed and comprehensive reasons for its recommendation. Such preliminary recommendation should be made public and subject to further submissions to the panel before a final recommendation is made.

The final recommendation should once again set out in detail all reasons and information relied upon, and it should be made public. The final recommendation should then be presented to the Government.

This process is obviously intended to act in addition to the normal planning process which the SECV must undertake before proceeding with its proposal.

Such action, however, would only partially resolve the problem within the metropolitan area. It is usual, for major works of this nature, for the developing authority to prepare an environmental effects statement designed to ensure proper consideration of environmentally significant proposals within existing decision-making processes. A requirement of the Environment Effects Act, however, is an assessment of the statement by the Minister for Conservation (or, under the new restructuring, the Minister for Planning and Environment) which effectively establishes at least criteria for the broad principles of the alternatives. It does not seem appropriate that these matters of principle should be open for re-consideration and appeal at the planning permit stage. Equally, there are legitimate concerns regarding the design and routing of the preferred option that should rightfully be canvassed through planning legislation.

It would appear that there is a need to examine all legislation affecting major works of the State Electricity Commission with a view to developing a process which balances the significance of the proposals to the State and the need for detailed public consultation at all levels. Ultimately, co-ordinated action through both the Environment Effects Act/SEC Act (subject to clearly set down consultation procedures) and the Planning Act may prove the most satisfactory to meet community need.

An alternative process which would meet some of the more pressing problems of the SEC but which falls short of the overall re-evaluation of all legislation might be:

- (1) Ministerial agreement, following consultation with all metropolitan councils to amendment of deeds of delegation to exclude 'major transmission line' from delegation, making the MMBW the sole responsible authority for such a use in the metropolitan area. There may also be a need for individual council's own planning schemes/Interim Development Orders to be amended to support this situation.
- (2) The applicant would go through the process of preparing an environmental effects statement.

- (3) *At the end of the assessment of the environmental effects statement, a firm transmission line should emerge and a planning application indicating this route should be lodged with the sole planning authority, the MMBW.*
- (4) *The application would be advertised in accordance with the provisions of the Town and Country Planning Act. The environmental effects statement would also be available for further public perusal at this stage. (The advertising period is usually 14 days but could be increased to 30 days depending on the circumstances.)*
- (5) *The MMBW would seek other public authorities' opinions.*
- (6) *At the completion of the advertising and consultation period, the MMBW would be in possession of the full range of opinions and relevant reports upon which to make a final resolution.*
- (7) *The MMBW would determine the application.*
- (8) *If objections exist, the matter would probably go before the Planning Appeals Board for determination. If thought warranted, the appeal could be called in by the Minister for Planning under either Section 21(4) or 35(d) of the Act. The exercise of Section 35(d) at this stage of the planning procedure is considered reasonable and would enable alternatives to be finally evaluated by Government.*

THE NEED FOR FURTHER REPORTING AND THE EXTENT
OF THE COMMITTEE'S RECOMMENDATIONS

- 6.9 By force of circumstance, the Committee has examined both the Richmond to Brunswick and Newport to Fishermen's Bend proposed connections in some detail.
- 6.10 The issues which arise once the fundamental technical questions have been answered are mainly, in the first instance, of a political nature. The issues relate to the value that the community should place on the environmental impact of the proposals and the amount of additional funds which the community is prepared to make available to mitigate against or eliminate the environmental impact. It would be irresponsible for a Parliamentary Committee to avoid these issues and to pass the political issues on for recommendation by an independent panel. In resolving these issues, a very thorough investigation and debate has occurred, although continuation of this debate may not have involved the general public as fully as should eventually be the case because of the expectation that detailed environmental effects statements would be prepared and further public inquiries would be held.
- 6.11 There are minor issues left which should be publicised and examined in more detail. These relate to the location and appearance of individual transmission line supports and some possible variation of the route of the Richmond to Brunswick line in the vicinity of Madden Grove.
- 6.12 Thus the Committee has decided to make detailed recommendations which will include a recommendation that the Government make a decision on the recommendations before any further detailed public review is entered into. This will limit the scope of future comment to those matters which need further detailed consideration before a final conclusion is reached.

6.13 This Committee's recommendations will also mean that the normal concept of the environment effects procedure will need to be modified in the light of what has already occurred. The Environment Effects Statement should summarise and report on the steps which have occurred and re-open for discussion only the fine tuning of the visual effects within the framework set by the Committee's recommendations. This should not be seen as a diminution of the powers of the *Environmental Effects Act 1978* but rather as an expansion of its intent. The entire process, including the Committee's inquiry, has led to examination of the proposals within a far wider context than has previously been the case.

DISCUSSION AND CONCLUSIONS

- 6.14 Following a decision by the Government about the Committee's earlier recommendations, it would be inappropriate for the SEC to make applications for planning permits or re-zoning of the land as these procedures would enable all the issues to be re-opened and the Government's decision to be questioned and rejected or made subject to an appeal.
- 6.15 The Committee believes that there is a need for the SEC to place more detail about its final proposals in the public arena and for the public to be able to participate in the selection of the remaining options.
- 6.16 The Richmond to Brunswick connection should be treated separately from the Newport to Fishermen's Bend connection and Environment Effects Statements should be produced by the SEC for both proposals. These Environment Effects Statements should be set out, as previously discussed, in Paragraphs 4.61(3) and 5.22(2). They should be advertised and made available for public comment.

- 6.17 Having received comments on the Environment Effects Statements, the Minister for Planning and Environment should then appoint independent panels under Section 9 of the *Environment Effects Act 1978* to hold public inquiries.
- 6.18 Upon receipt of recommendations from the independent panel the Minister for Planning and Environment should prepare and supply his assessments of the environmental effects of the lines to the Minister for Minerals and Energy.
- 6.19 Upon receipt of the assessments of the Minister for Planning and Environment, the Minister for Minerals and Energy should indicate to the Minister for Planning and Environment his decision on the detailed works to be installed by the SEC and the additional ancillary mitigating works to be carried out as part of each project.
- 6.20 The Minister for Planning and Environment, having received the decision of the Minister for Minerals and Energy on the works to be carried out by the SEC, should apply to the Governor in Council under Section 35(d) of the *Town and Country Planning Act 1958* for exemption of the works from planning controls.

RECOMMENDATIONS

6.21 The Committee recommends that -

- (1) The Government should make a decision in respect of the recommendations contained in this report up to this point before any further public review of those matters is entered into.
- (2) Following a decision by the Government in relation to earlier recommendations contained in this report, the State Electricity Commission should prepare, advertise and make available separate Environment Effects Statements in respect of the proposed connections between Richmond and Brunswick terminal stations and between Newport and Fishermen's Bend terminal stations.
- (3) The Environment Effects Statements should in each case -
 - (a) Briefly set out the case put forward to this inquiry for the connection, the conclusions reached by this inquiry and the decisions then made by the Government; and
 - (b) Examine the relative environmental effects of the remaining options as set out in paragraphs 4.61(3) and 5.22(2).
- (4) Following receipt of comments upon the Environment Effects Statements, the Minister for Planning and Environment should appoint independent panels under Section 9 of the *Environment Effects Act* 1978.

- (5) Upon receipt of the recommendations of the panel, the Minister for Planning and Environment should prepare and supply his assessments of the environmental effects to the Minister for Minerals and Energy as required by the *Environment Effects Act 1978*.

- (6) Upon receipt of the assessments of the Minister for Planning and Environment, the Minister for Minerals and Energy should indicate to the Minister for Planning and Environment his decision on the detailed works to be installed by the SEC and the additional ancillary mitigating works to be carried out as part of each project.

- (7) The Minister for Planning and Environment, having received the decision of the Minister for Minerals and Energy on the works to be carried out by the SEC, should apply to the Governor in Council under Section 35(d) of the *Town and Country Planning Act 1958* for exemption of the works from planning controls.

* * * * *

Committee Room
19 October 1983.

REPORT BY BRITISH ELECTRICITY INTERNATIONAL LTD.

CENTRAL ELECTRICITY GENERATING BOARD

Corporate Strategy Department

Development Strategy Branch

Report No: CS-DS/3/83

Subject: Reliability of the 220 kV Transmission System
Supplying the Melbourne Central Business
District and Inner Metropolitan Area

Prepared by: S.J. Argent - Special Studies Group

Approved by:



Date: 15 - 8 - 83

SUMMARY

1. The State Electricity Commission of Victoria, Australia has made proposals to reinforce the Melbourne 220 kV transmission system. British Electricity International were chosen to provide an independent assessment of these and other proposals.
2. The report commissioned by BEI, assesses using the TRIP program, the improvements in reliability of supply afforded by the proposed reinforcements. The report goes on to consider whether the favoured options are cost effective.
3. The report concludes by recommending two of the proposed reinforcement options, one for the Richmond Terminal Station and one for the West Melbourne Terminal Station, both of which are considered to be cost effective.

RELIABILITY OF THE 220 kV TRANSMISSION SYSTEM
SUPPLYING THE MELBOURNE CENTRAL BUSINESS DISTRICT
AND INNER METROPOLITAN AREA

Contents

1. Introduction.
2. The methods and assumptions employed and the scope of the assessment.
3. Comparison of Reinforcement Options.
 - 3.1 Richmond Terminal Station reinforcement.
 - 3.2 West Melbourne Terminal Station reinforcement.
4. Discussion of interruptions of supply of long duration.
5. Cost-effectiveness of the favoured reinforcement options.
6. Conclusion.
7. References.

Tables and Figures.

Appendix 1 - Results of reliability assessments.

- 2 - Cost Savings.
- 3 - Other costs of reinforcement.
- 4 - Relevent extracts detailing the SECV proposals.

MELBOURNE CENTRAL BUSINESS DISTRICT AND INNER METROPOLITAN AREA

1. Introduction

The inner Metropolitan Area of Melbourne, Australia is surrounded by a 220 kV ring from Rowville terminal station (sub-station) in the East through Ringwood, Templestowe and Thomastown terminal stations to Keilor terminal station in the West. The terminal stations within this ring are supplied by radial 220 kV overhead lines of double circuit construction (see figure 1). It is therefore possible that a single event, namely a double circuit fault on one of these radial circuits, can cause the loss of supply to all consumers connected to the terminal station concerned. This is mitigated in part by the possibility of temporarily transferring some consumer load to adjoining terminal stations if they still have supplies available.

Of particular importance within this area is the Central Business District (CBD) which is supplied by the West Melbourne and Richmond terminal stations both fed by radial double circuits. A power blackout in the CBD would have serious consequences, witness the New York city blackout in 1977, and therefore the State Electricity Commission of Victoria (SECV) has set out to ensure that the West Melbourne and Richmond terminal stations each have two independent sources of supply to ensure adequate security to the CBD. The SECV has identified several transmission reinforcement options and the CEGB have been asked, through British Electricity International (BEI), to assess the improvements in security of supply afforded by these options which are outlined in figures 2.1 and 2.2 (which also indicate the relevant capital cost estimates). Relevant extracts of the SECV proposals are attached as Appendix 4.

2. The Method and Assumptions employed and the Scope of the Assessment

The security of supply to Richmond and West Melbourne is a function of two components, the security of the Rowville to Keilor ring and the security of the circuits connecting Richmond and West Melbourne to this ring. For the purposes of this study the insecurity of the Rowville to Keilor ring was assumed to be comparatively small and therefore the problem reduces to assessing the probability of two, three or four 220 kV circuits being out of service at the same time and the average duration of these conditions. Once this information has been calculated it is possible to quantify the effects on consumers that result from each of the reinforcement options considered, taking into account such factors as expected load growth, (both normal and emergency) line ratings, and provisions for load transference via the 66 kV system.

The CEGB has developed a computer program, TRIP,¹ which assesses the probability of up to 4 circuits being out of service. It takes into account maintenance outages, the fact that overhead line faults are generally concentrated into short periods of adverse weather (e.g. lightning storms) so increasing the chances of overlapping outages and it recognises that double circuit faults and certain switchgear faults can cause the simultaneous outage of two circuits. The transmission fault data used within this program was constructed from SECV data where available, with additional information based on CEGB experience utilised where no Australian data was to hand. The data sources and assumptions made are outlined in Appendix 1.

The system configurations of the various options were derived from data supplied by SECV. It was assumed that if one of the terminal stations under consideration (West Melbourne or Richmond) lost its supply, then approximately

50 MW of demand could be manually transferred to the remaining terminal station. It was also assumed that the emergency line rating would cover the manual switching time involved. Although multiple line outages are generally of short duration the probability and consequences of events of longer duration, due to for example transmission tower damage, are discussed.

The use of a two state weather model (normal and adverse) when assessing the probability of multiple outages prevents the serious underestimation of risk inherent in using a single state weather model. A sophisticated model, however, requires more detailed input data and the assumptions made when translating SECV transmission fault data into a suitable form may lead to small inaccuracies in the final results. Certainly these inaccuracies are less than those that would arise from a single state model and since the main purpose is to compare options the results can be used with confidence.

3. Comparison of Reinforcement Options

3.1 Richmond Terminal Station reinforcement (refer Figure 2.1)

The results of the TRIP studies for the Richmond reinforcement options are shown Table 1. Option R4 (Richmond to Rowville or Richmond to Heatherton) was not specifically studied as it could be seen that the security of supply would be slightly worse than that afforded by option R3 because of the circuit length involved. Essentially all the options lead to a 20-fold improvement in the security of supply to Richmond with option R1 being marginally better than the others. Since line easements are available and the fact that this scheme also provides improved security for Brunswick and for the proposed terminal station at Clifton Hill, option R1 is to be favoured.

As an aid to comparison of the Richmond results with those calculated for West Melbourne, a four circuit arrangement into Richmond was assessed. This option CSD1 is a variant of option R1 where the proposed single overhead line circuit between Richmond and Clifton Hill is replaced by a double circuit line. This led to a further 10-fold increase in security of supply, bringing it up to the level that may be experienced by West Melbourne T.S. once it is reinforced. As the capital cost of this variant is unknown it is difficult to comment on its cost-effectiveness.

A further option considered, CSD2, was again a variant of option R1 and considered the reliability if the proposed Brunswick to Clifton Hill double circuit was initially installed with only one circuit on double circuit towers; the second circuit to be commissioned at a later date (i.e. when Clifton Hill became operational). The effect of this was to nearly double the number of interruptions compared to the basic option R1 and therefore as the capital cost saving would be fairly small, this variant was not given further consideration.

3.2 West Melbourne Terminal Station Reinforcement (refer Figure 2.2)

The results of the TRIP studies for the various West Melbourne reinforcement options are shown in Table 2. Option W3 (Keilor to West Melbourne) was not specifically studied, as although it would provide improvements in security at West Melbourne comparable with the other options it did not improve the security at neighbouring locations, for example Newport. A single underground cable from Fishermen's Bend to Richmond (Option W5) produced a 20-fold improvement in security whereas the double circuit interconnections proposed in the other options produced 200-fold or greater improvements.

Three variants of option W4 were considered with West Melbourne being connected to Brunswick (a) by a double overhead line (b) by two underground cables and (c) by a single underground cable. Ignoring practical considerations the West Melbourne to Brunswick overhead line option (W4 a) appears the most favourable, however, as an overhead line easement is extremely unlikely this option has to be rejected. If instead the West Melbourne to Brunswick connection is made by underground cable (Options W4 b and c) the frequency of disconnection decreases but the kWh lost increases due to the fact that cable faults tend to take much longer to repair. The results indicate that options W1 and W2 are broadly similar with W2 being slightly better due to the simpler connection arrangement with both options yielding lower kWh lost figures than the cable variants of option W4. Since the capital cost of option W1 is considerably lower than that for option W2 (due to the need for a short underground cable section) the connection from Newport to Fishermen's Bend (option W1) appears to be the most favourable.

4. Discussion of Interruptions of Supply of Long Duration

The majority of supply interruptions caused by faults on an overhead line network are of short duration. This is because multiple and overlapping outages tend to occur during short periods of adverse weather, for example lightning storms, and the circuits are not normally permanently damaged and so may be rapidly returned to service. However, some of the supply interruptions may last much longer due, for example, to transmission tower damage, or major fires at terminal stations.

The advantages of diverse routing and separate supply points are that it is extremely unlikely for independent routes and terminal stations to suffer extended outages simultaneously. To assist, this maintenance is usually carried out when adverse weather is not expected and when the consequences of an interruption would be least. Consideration should be given to circuit and terminal station location when assessing these risks. Terminal stations sited near airports, particularly under the flight path, may have a higher risk of major outages due to the possibility of aircraft crashes. Similarly, transmission towers in exposed locations are more likely to suffer wind damage, transmission towers running alongside a highway are more likely to be damaged by vehicular collision and transmission towers sited by rivers are more likely to experience foundation damage during flooding.

With these factors in mind, the Richmond reinforcement options R1, R2 and R5 have diverse supply points, but both options R1 and R2 have either riverside or roadside routing. However, careful design could ameliorate any problems that this raises and the high cost option R5 need not be considered. The West Melbourne reinforcement options W1 and W2 are both fed from Keilor terminal station, albeit by diverse routes, but the underground cable options W4 and W5 although having the benefit of diverse supply points are too costly.

5. Cost-effectiveness of the Favoured Reinforcement Options

Advice was requested on the cost-effectiveness of the reinforcement proposals and an approximate analysis based on the limited data available was carried out.

Each of the reinforcement options, W1 and R1, have a capital cost of \$7M and the question is whether the benefits gained warrant this expenditure. The obvious benefit is the saving in kWh lost and the resulting reduction in the probability of disrupting the CBD. However in addition, the installation of more transmission capacity can reduce the electrical losses on the system.

The cost of interruptions to services and public administration have been considered in Swedish and Finnish surveys² and, although they may not be wholly applicable to Melbourne, cost figures of \$2/kWh interrupted plus \$10/kWh curtailed may prove reasonable estimates.

Using these figures and capitalising the kWh saved by each option over 40 years at 5% discount rate indicates that the value of the kWh saved is around \$5.1M for option R1 and \$6.2M for option W1, (see Appendix 2). The additional kWh savings at Brunswick may be worth around \$1M for option R1 and the savings at Brooklyn and Fishermen's Bend may be worth around \$7M for option W1.

Using very rough approximations (see Appendix 3) the additional maintenance and fixed losses might cost \$3M over 40 years for each option yet the savings in variable losses might be around \$6M for the R1 option and around \$15M for the W1 option.

In summary the favoured Richmond R1 reinforcement option costs \$7M and the net savings total around \$9M and similarly for the West Melbourne W1 option, the cost is \$7M and the net savings total around \$25M. Table 3 summarises these costs and presents the estimated Internal Rate of Return of each project.

6. Conclusion

The 220 kV reinforcement options proposed by SECV for Melbourne, Victoria have been assessed and on the basis of capital cost, improvements in security of supply and net savings in operating costs and the preferred options have been selected. For Richmond terminal station the connection by overhead line to Brunswick via Clifton Hill is recommended whereas for West Melbourne terminal station the link by overhead line from Newport to Fishermen's Bend is recommended.

7. References

1. CEEB Report - CS-DS/1/82 - TRIP - A programme for the investigation of the reliability of the transmission connections to a power station. - September 1982.
2. Electricity Council Report - CP/D9/81 - The monetary values that consumers place on interruptions of electricity supply - A. Walker - August 1981.

TABLE 1

RESULTS OF RELIABILITY ASSESSMENT FOR RICHMOND T.S. ONLY (Neighbouring Stations excluded)

| Ref. No. | Richmond Reinforcement Option | Frequency of loss of all 220kV Supplies to Richmond T.S. (Once every n years) | Average duration of interruption (hours) | Av. kWh lost at Richmond T.S. per year | |
|----------|---|---|--|--|--------------------------|
| | | | | excluding load transfer | with post-fault transfer |
| - | Prior to reinforcement | 9 | 3.7 | 32200 | 23500 |
| R1 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Brunswick - double overhead circuit | 270 | 2.4 | 280 | 205 |
| R2 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Kew - double overhead circuit | 267 | 2.4 | 285 | 208 |
| R3 | Richmond to Malvern - single overhead circuit | 251 | 2.4 | 315 | 230 |
| R5 | Richmond to Fishermen's Bend - single cable circuit | 215 | 3.0 | 500 | 365 |
| CSD 1 | Richmond to Clifton Hill - double overhead circuit Clifton Hill to Brunswick - double overhead circuit | 2750 | 2.2 | 17 | 12 |
| CSD 2 | Richmond to Clifton Hill - single overhead circuit Clifton Hill to Brunswick - single overhead circuit | 170 | 2.4 | 460 | 340 |

TABLE 2

RESULTS OF RELIABILITY ASSESSMENT FOR WEST MELBOURNE T.S. ONLY (Neighbouring Stations excluded)

| Ref. No. | West Melbourne Reinforcement Option | Frequency of loss of all 220kV Supplies to West Melbourne T.S. (Once every n years) | Average duration of interruption (hours) | Av. kWh lost at West Melbourne T.S. per year | |
|----------|---|---|--|--|--------------------------|
| | | | | excluding load transfer | with post-fault transfer |
| - | Prior to reinforcement | 14 | 4.9 | 40800 | 30200 |
| W1 | Fishermen's Bend to Newport - double overhead circuit | 3500 | 2.1 | 12 | 9 |
| W2 | West Melbourne to Yarraville - double overhead circuit | 4600 | 2.2 | 11 | 8 |
| W4(a) | West Melbourne to Brunswick - double overhead circuit | 6500 | 2.2 | 7 | 5 |
| (b) | West Melbourne to Brunswick - double cable circuit | 7100 | 3.5 | 15 | 11 |
| (c) | West Melbourne to Brunswick - single cable circuit | 510 | 5.7 | 480 | 350 |
| W5 | Fishermen's Bend to Richmond - single cable circuit | 350 | 6.0 | 550 | 410 |

TABLE 3

SUMMARY OF COSTS AND SAVINGS FOR REINFORCEMENT
OPTIONS R1 AND W1

Units - Million Australian Dollars

| | Richmond Option R1 | West Melbourne Option W1 |
|--|-----------------------|-----------------------------|
| Capital cost | 7.0 | 7.0 |
| Less capitalised value of kWh saved - Total | 6.1 | 13.2 |
| Less capitalised value of net savings in variable losses | 6.0 | 15.0 |
| Plus capitalised value of additional fixes losses and operating costs | 3.0 | 3.0 |
| Total net cost of project | -2 | -18 |

| | | |
|-----------------------------------|----|-----|
| Estimated Internal Rate of Return | 7% | 20% |
|-----------------------------------|----|-----|

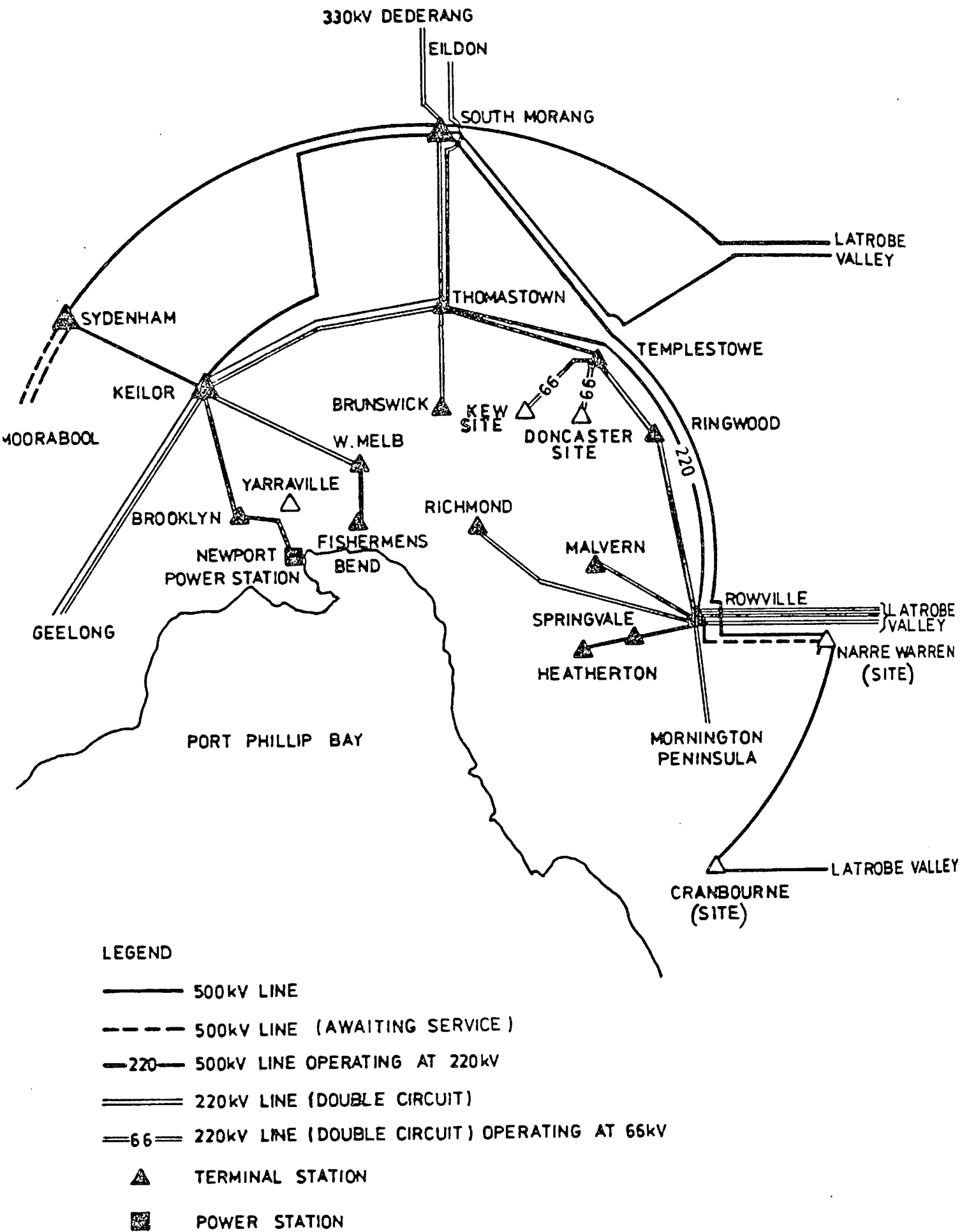


FIG 1
 EXISTING 500,000 VOLT AND 220,000 VOLT
 RING NETWORK SUPPLYING
 THE METROPOLITAN AREA

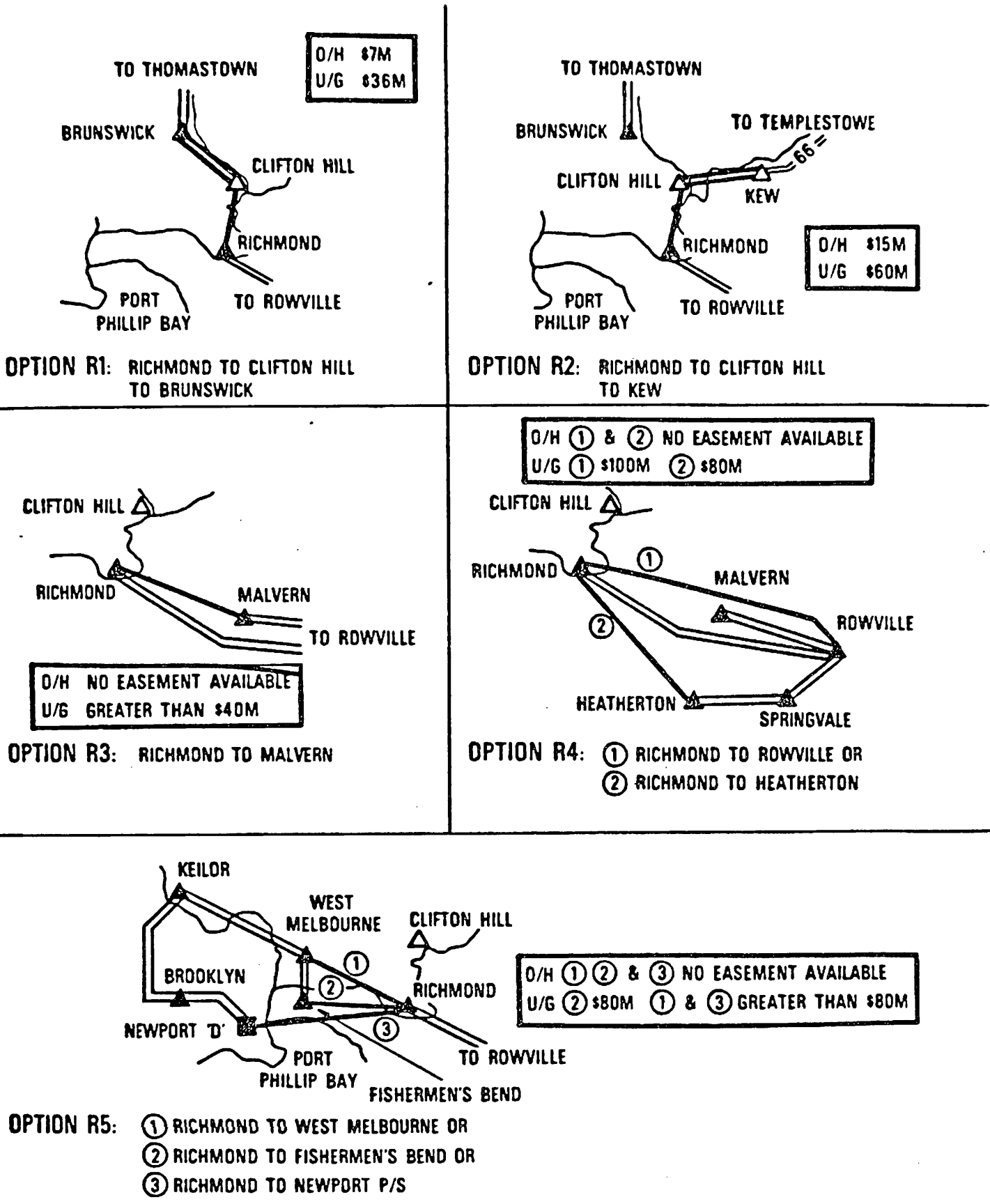
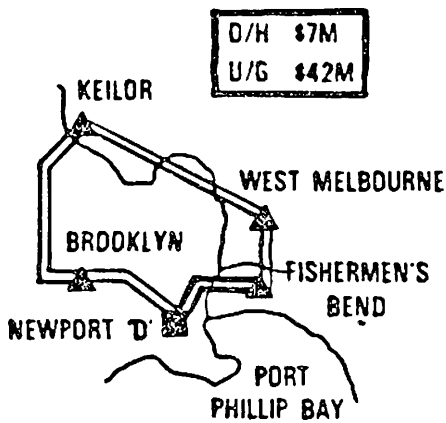
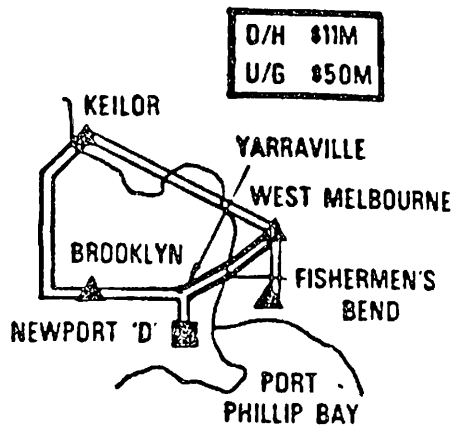


FIGURE 2.1 SECV OPTIONS FOR REINFORCEMENT OF 220,000 VOLT TRANSMISSION TO RICHMOND TERMINAL STATION

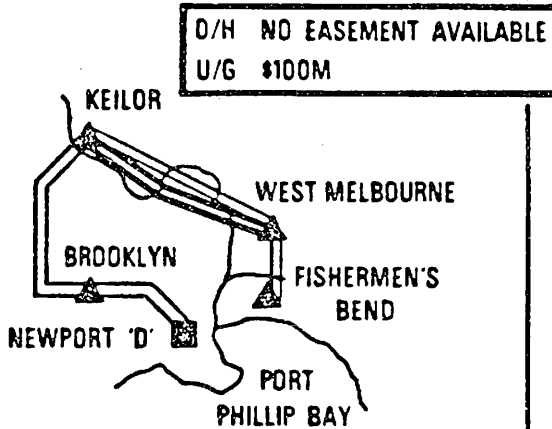
KEY
 O/H COST OF OVERHEAD CONNECTION
 U/G COST OF UNDERGROUND CONNECTION



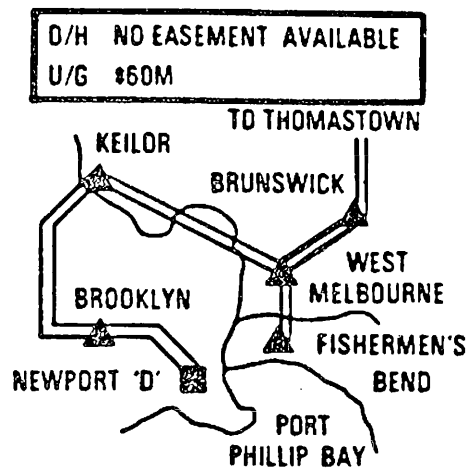
OPTION W1: FISHERMEN'S BEND TO NEWPORT P/S



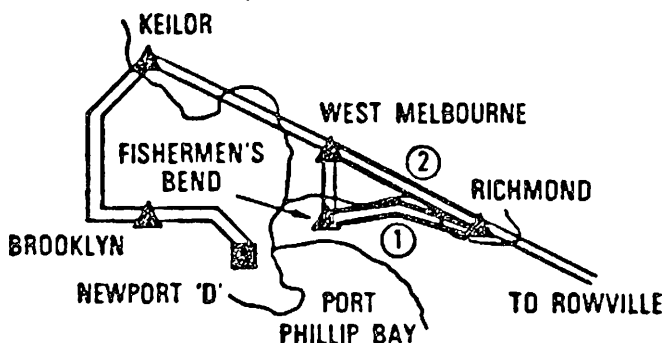
OPTION W2: WEST MELBOURNE TO YARRAVILLE



OPTION W3: WEST MELBOURNE TO KEILOR



OPTION W4: WEST MELBOURNE TO BRUNSWICK



OPTION W5: ① FISHERMEN'S BEND TO RICHMOND OR
② WEST MELBOURNE TO RICHMOND

O/H ① & ② NO EASEMENT AVAILABLE
U/G ① \$80M ② GREATER THAN \$80M

FIGURE 2.2 SECV OPTIONS FOR REINFORCEMENT OF 220,000 VOLT TRANSMISSION TO WEST MELBOURNE TERMINAL STATION

KEY
O/H COST OF OVERHEAD CONNECTION
U/G COST OF UNDERGROUND CONNECTION

Transmission Fault Data

The following transmission fault data, used within the TRIP program, is based on an amalgam of SECV and CEGB data.

SECV Source - "Summary of line outages on the 220 kV Metropolitan System 1972/73 - 1981/82"

CEGB Source - CEGB Report O(05)87 - "CEGB Supergrid Fault Statistics - Annual Report, 1980/81"

(a) Single Circuit Line Fault Data - (SECV data used)

SECV data indicated an unscheduled outage rate (Fault rate) of 2.07 events per 100 km per year with an average outage time of 77.8 minutes.

Note:- The comparable CEGB data (275 kV) indicated a fault rate of 2.6 events per 100 km per year with a mean outage time of 870 minutes - the longer average duration due to a few long outages.

No information was available as to the corresponding SECV fault rates during normal and adverse weather - therefore assuming that 25% of faults occur during normal weather and 75% occur during adverse weather and further assuming that adverse weather periods last a total of 40 hours per year (say 10 periods of 4 hours each).

Normal fault rate = 0.52 faults/100 km/year of normal weather.

Adverse fault rate = $2.07 \times .75 \times \frac{365 \times 24}{40}$

(b) Double Circuit Line Fault Data - (SECV data used)

An analysis of the limited SECV double circuit fault data indicated a fault rate of 0.12 faults/100 km of d.c. line/year.

Again assuming that 75% of the faults occur during adverse weather.

Normal weather d.c. fault rate = 0.03 faults/100 km of d.c. line/year.

Adverse weather d.c. fault rate = 20 faults/100 km of d.c. line/year of adverse weather.

(c) Circuit Breaker Fault Data - (CEGB data used)

275 kv:-

5.5. faults/100 circuit breakers/year.

(d) Protection Equipment Fault Data - (CEGB data used)

275 kV:-

7.0 faults/100 "circuit ends"/year

(e) Underground Cable Fault Data - (CEGB data used)

275 kV:-

3.5 faults/100 km/year

Appendix 2

Cost Savings (kWh)

\$2 per kW interrupted + \$10 per kWh curtailed.

Richmond T.S.

Growth rate = 325 MW to 370 MW in 10 years

= 1.3% per year. = y

Therefore the cost of kW interruptions capitalised at 5% over 40 years

$$= 325 \times 10^3 \times 0.5 \times \frac{1}{9} \times \chi(1.3) \times \$2 = 753 \text{ k\$}.$$

The cost of kWh curtailed similarly capitalised

$$= 325 \times 10^3 \times 0.5 \times (0.174 - 0.0015) \times \chi(1.3) \times \$10$$

$$- 50 \times 10^3 \times (0.174 - 0.0015) \times \chi(0.0) \times \$10$$

$$= 4367 \text{ k\$}.$$

Therefore the total capitalised cost of power interrupted and energy curtailed

$$= 753 + 4367 = 5120 \text{ k\$}.$$

West Melbourne T.S.

Growth rate = 335 MW to 385 MW in 10 years

= 1.4% per year. = y

Therefore the cost of kW interruptions capitalised at 5% over 40 years

$$= 335 \times 10^3 \times 0.5 \times \frac{1}{14} \times \chi(1.4) \times \$2 = 507 \text{ k\$}.$$

The cost of kWh curtailed similarly capitalised

$$= 335 \times 10^3 \times 0.5 \times (.212 - 0) \times \chi(1.4) \times \$10$$

$$- 50 \times 10^3 \times (.212 - 0) \times \chi(0.0) \times \$10$$

$$= 5706 \text{ k\$}.$$

Therefore the total capitalised cost of power interrupted and energy curtailed

$$= 507 + 5706 = 6213 \text{ k\$}.$$

Where $\chi(y)$ is a function combining the increasing load growth with its decreasing value due to discounting at 5%.

$$\chi(y) = \frac{\left(\frac{105}{100-y}\right)^{40} - 1}{\left(\frac{105}{100+y}\right)^{40} \cdot \left(\frac{105}{100+y} - 1\right)}$$

Therefore $\chi(0.0) = 17.16$

$$\chi(1.3) = 20.86$$

$$\chi(1.4) = 21.19$$

Estimation of additional savings due to improvements in reliability of supply at associated terminal stations.

The R1 reinforcement option will also improve the reliability at Brunswick and therefore assuming that the improvement at Brunswick is comparable with that for Richmond, the kWh saving is equivalent to around \$1M.

Similarly the W1 reinforcement option will improve the reliability at Brooklyn and Fishermen's Bend and this additional saving will be worth approximately \$7M.

Other costs of reinforcement

Installing a new line leads to new fixed line losses and maintenance costs whilst the reduction in load or neighbouring circuits leads to reduced overall "copper" losses.

The relevant Australian data to assess these costs was unavailable so the assessment below is based on typical CEGB information:-

(a) Additional maintenance and fixed losses (corona etc)

Fixed losses capitalised over 40 years are equivalent to approximately 8% of the capital cost of the new line. Maintenance (@ 2% of capital cost per year) is equivalent to approximately 35% of the capital cost of the new line.

(b) Savings in overall variable line (copper) losses (WMTS)

| Line (and length) | Flow prior to reinforcement p.u. | Flow after reinforcement p.u. |
|----------------------|-------------------------------------|----------------------------------|
| KTS-WMTS (12) | .33 | .15 |
| WMTS-FBTS (2.8) | .1 | .1 |
| FBTS-NPS (4.5) | - | .18 |
| NPS-BLTS (4.9) | .3 | .11 |
| BLTS-KTS (15) | .1 | .1 |
| | 1.04 | 0.40 |

(Where 1 p.u. is equivalent to normal line rating)

Variable losses after WMTS reinforcement are 35% of pre-reinforcement losses 70% of which were on the KTS-WMTS circuits.

CEGB experience indicates that a line operating at an average of (0.33 x 50% LF =) 17% of Max. loading has variable losses approximately equivalent to the capital cost of the line. Therefore total losses over 40 years may equal \$25M and the reinforcement proposed may reduce this to around \$10M.

(c) Savings in overall losses (RTS)

| Line (and length) | Flow prior to reinforcement p.u. | Flow after reinforcement p.u. |
|----------------------|-------------------------------------|----------------------------------|
| ROTS-RTS (25) | .21 | .15 |
| BTS-CHTS (3.5) | - | .06 |
| CHTS-RTS (5.5) | - | .11 |
| TTS-BTS (10) | .19 | .16 |
| | 1.46 | 0.9 |

Variable losses after RTS reinforcement are 60% of pre-reinforcement losses 75% of which were on the RTS-ROTS circuits.

CEGB experience indicates that a line operating at an average of (0.21 x 50% LF) 11% at Max. loading has variable losses approximately equivalent to 40% of the capital cost of the line. Therefore total losses over 40 years may equal \$15M and the reinforcement proposed may reduce this to around \$9M.

Relevant extracts detailing the SECV proposals.

(Section 2 of the State Electricity Commission of
Victoria - Report - "Development of the Transmission Supply
for Melbourne" - November 1982)

2.2 OPTIONS FOR REINFORCEMENT OF 220 000 VOLT TRANSMISSION TO RICHMOND

The options described below are shown diagrammatically in Figure 2.1:

a Option R1 - Richmond to Clifton Hill to Brunswick Terminal Stations

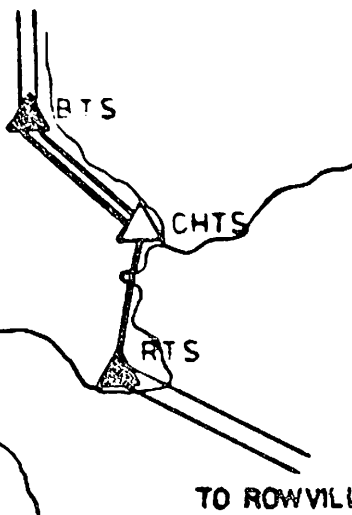
As proposed by the SEC, a single circuit 220 000 volt line from Richmond to Brunswick would provide the required improvement in security of supply to Richmond Terminal Station. In addition, as a loop supply, it would secure Brunswick Terminal Station and, by passing through Clifton Hill Terminal Station site, would provide potential for securing Clifton Hill. The section from Clifton Hill to Brunswick would need to be double circuit to fully secure the supply to the Clifton Hill load.

The proposed connection would use the existing 66 000 volt line route and is estimated to cost \$7M for an overhead construction of some 3.5 kilometres along the Merri Creek between Brunswick and Clifton Hill, with a further 5.5 kilometres through Yarra Bend and Studley Parks and along the Yarra riverside reserve from Clifton Hill to Richmond.

Alternative overhead routes have been evaluated for the proposed single circuit connection between Clifton Hill and Richmond. One alternative is a route of via Yarra Bend and Studley Parks and then via Burnley Street. Another route by-passes Yarra Bend and Studley Parks and runs via Hoddle, Highett and Burnley Streets.

Several routes for underground cable connections have been investigated, including parkland and street routes, the minimum cost for an underground route being \$36M.

TO THOMASTOWN



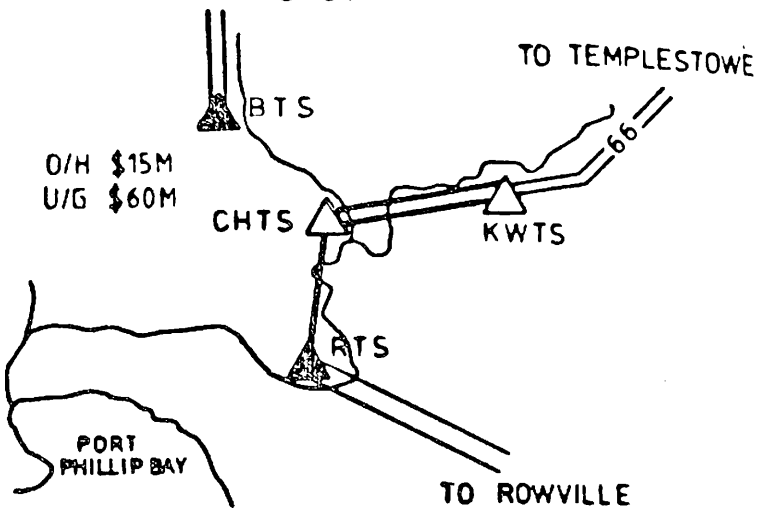
O/H \$7M
U/G \$36M

PORT PHILLIP BAY

TO ROWVILLE

OPTION R1: RICHMOND TO CLIFTON HILL
TO BRUNSWICK

TO THOMASTOWN



O/H \$15M
U/G \$60M

PORT PHILLIP BAY

TO ROWVILLE

OPTION R2: RICHMOND TO CLIFTON HILL
TO KEW



O/H NO EASEMENT AVAILABLE
U/G GREATER THAN \$40M

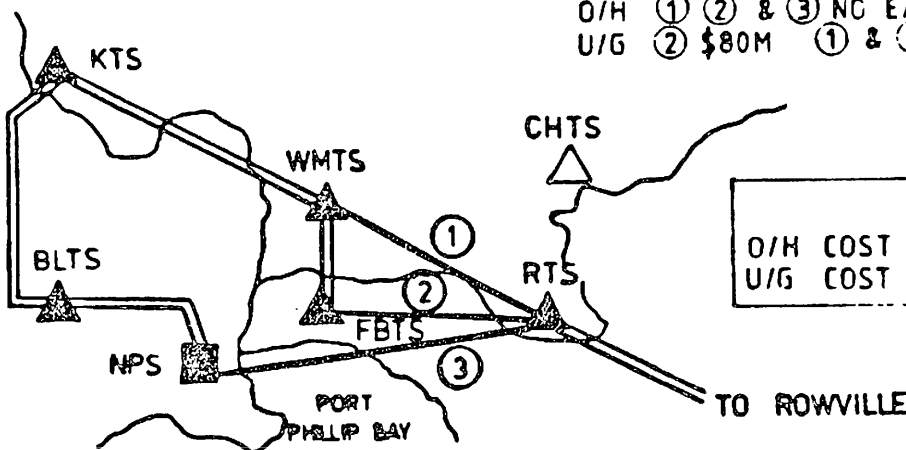
OPTION R3: RICHMOND TO MALVERN



O/H ① & ② NO EASEMENT AVAILABLE
U/G 1 \$100M 2 \$80M

OPTION R4: ① RICHMOND TO ROWVILLE
② RICHMOND TO HEATHERTON

O/H ① ② & ③ NO EASEMENT AVAILABLE
U/G ② \$80M ① & ③ GREATER THAN \$80M



KEY
O/H COST OF OVERHEAD CONNECTION
U/G COST OF UNDERGROUND CONNECTION

OPTION R5: ① RICHMOND TO WEST MELBOURNE OR
② RICHMOND TO FISHERMEN'S BEND OR
③ RICHMOND TO NEWPORT P/S

REFER APPENDIX 1-3 FOR TERMINAL STATION NAMES

FIG 2-1

OPTIONS FOR REINFORCEMENT OF
220,000 VOLT TRANSMISSION TO
RICHMOND TERMINAL STATION

The proposed Clifton Hill Terminal Station is planned as another supply point for the Central Business District and eastern inner metropolitan area. Although the present load growth in the area is low, it is essential that the current planning includes provision for additional supply capacity. The current timing for the Clifton Hill Terminal Station development is the mid-1990s. At this time, the station would supply local and some Central Business District load and off-load the existing stations to make capacity available for them to meet their growing local loads.

The Clifton Hill site was chosen to give a balanced spread of terminal stations for supply of inner metropolitan loads.

b Option R2 - Richmond to Clifton Hill
 to Kew Terminal Stations

The 220 000 volt line from Templestowe to Kew Terminal Station is currently operating at 66 000 volt and has been planned for operation at 220 000 volt with the establishment of Kew Terminal Station, which is not expected before the late 1990s. At that stage, the local Kew 66 000 volt network would then be supplied from Kew Terminal Station instead of being supplied at 66 000 volt from Templestowe Terminal Station.

The supply to Richmond Terminal Station could be secured by advancing the establishment of Kew Terminal Station and erecting a Kew to Richmond Terminal Station line via the Clifton Hill Terminal Station site. As for the Richmond to Clifton Hill to Brunswick option, the line section from Richmond to Clifton Hill would be single circuit with a double circuit section from Clifton Hill to Kew Terminal Station.

The connection would secure the future Clifton Hill Terminal Station but would not secure Brunswick Terminal Station but has the cost penalty of early development at Kew Terminal Station.

The cost of the transmission would be some \$7M for an overhead line of around 6.5 kilometres running adjacent to the Eastern Freeway between Kew and Clifton Hill Terminal Stations and a further 5.5 kilometres through Yarra Bend and Studley Parks and along the Yarra riverside reserve from Clifton Hill to Richmond.

For underground cable following a similar route, the cost is estimated to be around \$52M.

Including the cost of \$8M for establishment of Kew Terminal Station, the overall cost for the overhead and underground options for this connection are estimated at \$15M and \$60M, respectively.

This option would require provision of a new easement for the Kew to Clifton Hill section, but the Clifton Hill to Richmond section could make use of the existing 66 000 volt line route.

c Option R3 - Richmond to Malvern Terminal Stations

Establishment of a single circuit line from Richmond to Malvern Terminal Station would secure both of these stations. However, the existing lines from Rowville supplying Richmond and Malvern are on a common easement and between Rowville and Malvern could, therefore, be totally interrupted for a single event.

As a further easement is not available, establishing a line from Richmond to Malvern Terminal Station would require extensive demolition of existing buildings in this heavily built-up area over a distance in the order of 10 kilometres.

A cable connection could be constructed through major streets in a similar manner to the connections from Richmond to Brunswick or Richmond to Kew Terminal Stations, but the greater length would give a cost greater than \$40M.

These connections would not provide for supply to the future Clifton Hill Terminal Station, additional circuits would need to be constructed to Clifton Hill at a later date.

d Option R4 - Richmond to Rowville
 (or Heatherton) Terminal Stations

These connections could provide security for Richmond Terminal Station (and Heatherton and Springvale Terminal Stations in the case of a Richmond to Heatherton connection), but would not secure the other inner metropolitan area terminal stations at Brunswick and Clifton Hill. Also, they would not provide for supply to Clifton Hill and, therefore, connections to Clifton Hill would be required at a later date.

As easements are not available, an overhead line would require extensive demolition of existing buildings in a heavily built-up area. Cable connections could be established via major roads at a cost of at least \$100M for a Richmond to Rowville connection involving a route length of 25 kilometres.

e Option R5 - Richmond to Fishermen's Bend (or West Melbourne)
 Terminal Stations (or Newport Power Station)

These connections could secure Richmond Terminal Station, but as there are no available or feasible easements for overhead lines, an underground (or submarine) cable of about 9 kilometres at an estimated cost not less than \$40M would be required to obtain a single cable connection between Richmond and Fishermen's Bend with a further \$40M required by the turn of the century for a second cable to secure the increasing West Melbourne load as discussed in Option W5, Section 2.3 following.

The connections to West Melbourne or Newport Power Station would be longer and therefore more expensive.

These connections would have a much higher cost than the cable connection from Richmond to Brunswick or Kew Terminal Stations due to river crossings and interactions with other services.

The connection to Fishermen's Bend or West Melbourne would secure supply to West Melbourne Terminal Station until around the turn of the century when a further circuit would be required to cover the predicted loading. This would defer a cost of \$7M by delaying the requirement for establishing the proposed Newport to Fishermen's Bend connection (refer Clause 2.3(a) following) but would not provide for supply to the future Clifton Hill Terminal Station or secure Brunswick Terminal Station.

2.3 OPTIONS FOR REINFORCEMENT OF 220 000 VOLT TRANSMISSION TO WEST MELBOURNE

The options described below for securing the supply to West Melbourne Terminal Station are shown diagrammatically in Figure 2.2:

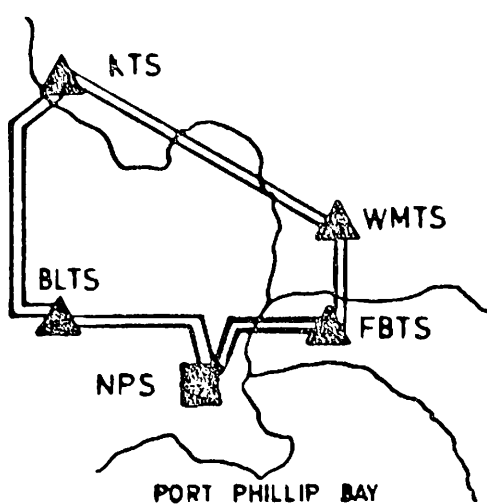
a Option W1 - Fishermen's Bend Terminal Station to Newport Power Station (or Yarraville Terminal Station)

As proposed by the SEC, a double circuit 220 000 volt connection from Fishermen's Bend across the Yarra to Newport would provide the required improvement in supply to West Melbourne Terminal Station. Also, as this connection forms a 220 000 volt loop, it would secure Brooklyn and Fishermen's Bend Terminal Stations.

The overhead connection is estimated at \$7M for a double circuit transmission line of some 4.5 km length on the existing easement. This easement runs north from Newport Power Station for some 400 metres before crossing the Yarra River downstream of the Westgate Bridge. It then runs in an easterly direction along Howe Parade and adjacent to the Westgate Freeway and crosses Salmon Street before turning north to connect with Fishermen's Bend Terminal Station.

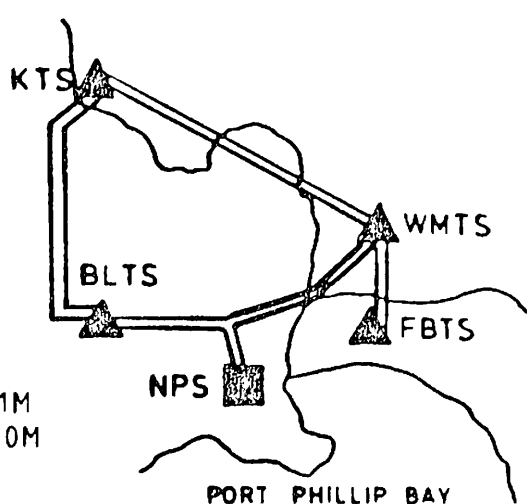
The option of a total underground connection has been estimated at \$22M with a further \$20M for a second cable for loads expected by the turn of the century.

Intermediate cost alternatives involving sections of overhead and underground construction and various routes across the Yarra River have also been investigated.



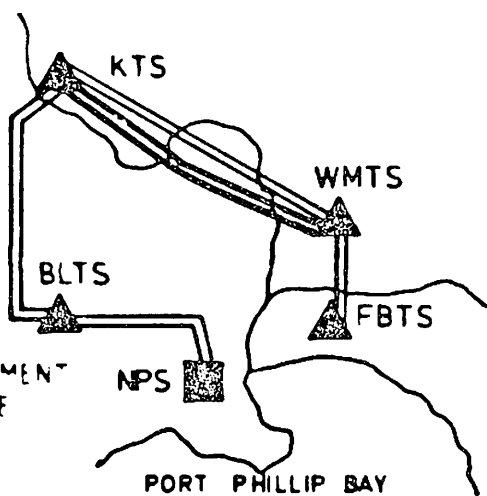
O/H \$7M
U/G \$42M

OPTION W1: FISHERMEN'S BEND TO NEWPORT P/S



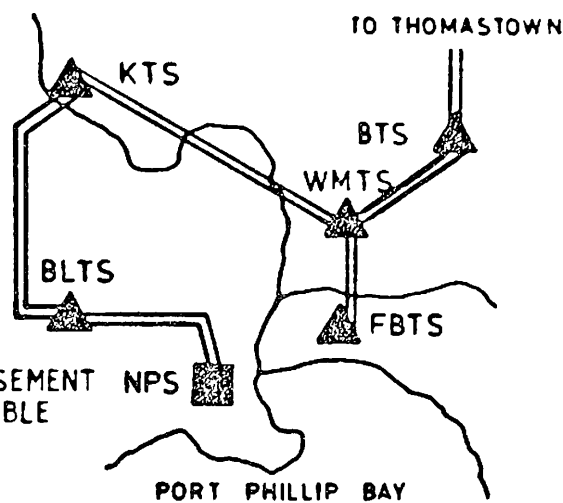
O/H \$11M
U/G \$50M

OPTION W2: WEST MELBOURNE TO YARRAVILLE



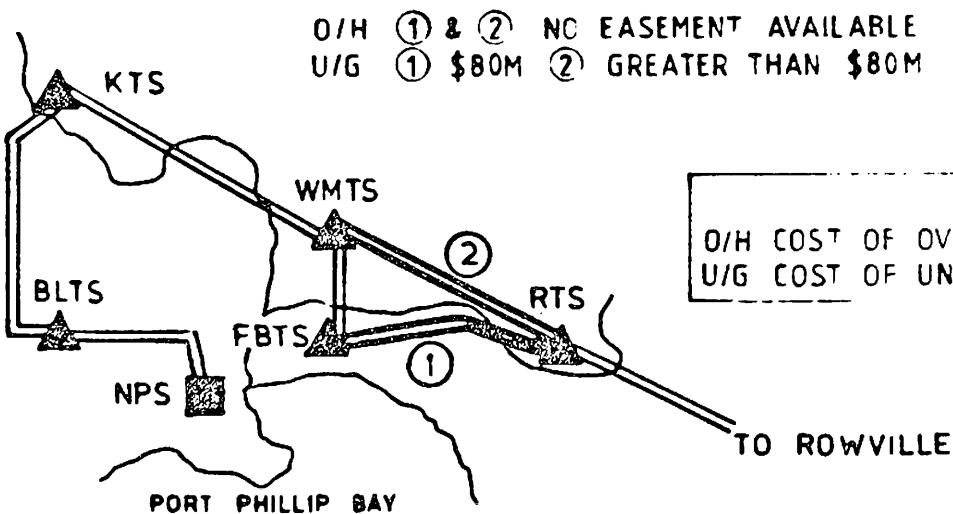
O/H NO EASEMENT AVAILABLE
U/G \$100M

OPTION W3: WEST MELBOURNE TO KEILOR



O/H NO EASEMENT AVAILABLE
U/G \$60M

OPTION W4: WEST MELBOURNE TO BRUNSWICK



O/H ① & ② NO EASEMENT AVAILABLE
U/G ① \$80M ② GREATER THAN \$80M

KEY
O/H COST OF OVERHEAD CONNECTION
U/G COST OF UNDERGROUND CONNECTION

OPTION W5: ① FISHERMEN'S BEND TO RICHMOND or
② WEST MELBOURNE TO RICHMOND

REFER APPENDIX 13 FOR TERMINAL STATION NAMES

FIG. 2-2

OPTIONS FOR REINFORCEMENT OF 220,000 VOLT TRANSMISSION TO W/MELBOURNE TERMINAL STATION

One such alternative is to cross the Yarra River to the north of the Westgate Bridge and connect into the Brooklyn to Newport Power Station 220 000 volt double circuit line adjacent to the Yarraville Terminal Station. This would provide security for West Melbourne and the other inner metropolitan stations of Brooklyn and Fishermen's Bend.

This alternative would cost appreciably more than the proposed all-overhead option, due to the longer overhead transmission length and the need for an underground cable section to cross under the Westgate Freeway to join with the existing easement to Fishermen's Bend.

b Option W2 - West Melbourne to Yarraville Terminal Station

A 220 000 volt connection from West Melbourne Terminal Station to Yarraville to connect with the 220 000 volt Brooklyn to Newport Power Station line would secure West Melbourne and Brooklyn Terminal Stations, but not Fishermen's Bend.

This connection would involve a crossing of the Maribyrnong River and the docks and wholesale market area. The estimated cost for a route length of around 6.5 kilometres is in excess of \$11M for double circuit overhead line construction and at least \$25M for a single cable with a further \$25M required by the turn of the century for a second cable.

An easement would need to be acquired to make this connection.

c Option W3 - Keilor to West Melbourne Terminal Stations

An additional 220 000 volt connection from Keilor Terminal Station to West Melbourne Terminal Station would provide security for the West Melbourne Station but would not secure the other western inner metropolitan area terminal stations at Fishermen's Bend and Brooklyn.

To establish a double circuit overhead line, extensive demolition of existing buildings would be required over a distance in the order of 13.5 kilometres or use of the Maribyrnong River parkland with reduced demolition.

A single cable connection based on a route through major streets is estimated to cost at least \$50M with a further \$50M required by the turn of the century for a second cable.

An easement would need to be acquired to provide this connection.

d Option W4 - West Melbourne to Brunswick Terminal Station

This connection would secure West Melbourne and Brunswick Terminal Stations but would not secure the other western inner metropolitan terminal stations at Brooklyn and Fishermen's Bend.

Establishment of a double circuit overhead connection would require extensive demolition of existing buildings through an area of high residential density with buildings of historical interest over a distance of some 7.5 km.

The cost of a single cable connection, along major roads, is estimated to be at least \$30M with a further \$30M required by the turn of the century for a second cable.

e Option W5 - Fishermen's Bend (or West Melbourne) to
 Richmond Terminal Station

As indicated previously for Option R5, the Fishermen's Bend to Richmond connection would secure West Melbourne and Richmond as well as Fishermen's Bend.

There are no available or feasible easements for an overhead line and around 9 km of underground (or submarine) cable would be necessary for this connection.

Due to the river crossing and congestion of services, this connection is estimated to cost \$40M with a further \$40M required by the turn of the century for a second cable.

This connection would also secure Richmond Terminal Station and defer expenditure of \$7M by avoiding a Richmond to Brunswick line, but would not provide for the future Clifton Hill Terminal Station.

The alternative of connecting from Richmond directly to West Melbourne Terminal Station would secure both Richmond and West Melbourne, but not provide security for the other inner metropolitan stations or provide for supply to Clifton Hill. This would be a more expensive alternative due to the longer route length for the connection.

REPORT BY BRITISH ELECTRICITY INTERNATIONAL LTD.
ENVIRONMENTAL CONSIDERATIONS - PROPOSED BRUNSWICK - RICHMOND LINE
ALONG MERRI YARRA PARK

C O N T E N T S

1. INTRODUCTION
2. ENVIRONMENTAL IMPACT
 - 2.1 Determining the line route and tower positions for minimum impact
 - 2.2 Visual treatment of the overhead line
 - 2.3 Other actions to gain acceptance of the proposed overhead line
 - 2.4 Treatment of existing and proposed terminal stations
 - 2.5 Effect on land use of cabling through Parkland

1. INTRODUCTION

1.1 It is readily acknowledged that the proposed 220 kV overhead line between Richmond and Brunswick terminal stations following the route of the existing 66 kV line along the Merri Creek and Yarra River will be detrimental to the visual amenity of these valleys. This appendix discusses the visual and environmental aspects which should be considered when determining whether the 220 kV connection shall be overhead or by underground cable. Several actions are described which may be taken to minimise the visual impact of the overhead line, which if implemented, would it is considered make it visually acceptable.

2.1 Determining the Line Route and Tower Positions for Minimum Impact

2.1.1 Assessing Visual Impact

The Centre of Environmental Studies at the University of Melbourne has been commissioned by the SECV to undertake a special study to establish a methodology for the assessment of the visual impact of an overhead 220 kV line between Richmond and Brunswick terminal stations. The SECV is to be commended for taking this initiative, and the University for the excellent results it has produced so far. The preliminary results indicated that the VIEWIT and PREVIEW computer programmes will become an essential tool for the detailed routing of the Richmond to Brunswick line. The following actions are suggested:

2.1.1.1 The contact between the SECV and the University should be continued to further refine the methodology, and the results applied to the present line proposal until the matter is finally resolved.

2.1.1.2 Line assessments should be made for both lattice towers and poles, although it will be seen later that poles are suggested as more appropriate.

2.1.1.3 The methodology should be extended to record the screening effect of existing trees.

2.1.1.4 The results will indicate the extent that towers or poles may be seen from certain viewpoints. This information would help the Landscape Architect, (the SECV Landscape Architect is suggested,) to design tree planting for screening. It is suggested that the programme be re-run with the additional data for a projected tree growth of say 10 and 20 years, to assess the effectiveness of the proposed landscaping, and after any necessary modifications to provide assurance for what is proposed.

2.1.1.5 A whole series of programmes should be run to examine a whole range of options, which are discussed in paragraphs 2.1.2, 2.1.3, and 2.1.6. It should be remembered that the minimum visual impact is not the only criterion to be considered in finally determining a route. As the line traverses a Linear Park it is particularly important that the sequence of towers should be seen to progress in a smooth flowing curve following so far as possible the line of the valley. Sharp deviations and crossings of the valley should be reduced to a minimum. This aesthetic consideration will in all probability not meet the minimum visual impact criterion, so a compromise will have to be made. Nevertheless the computer programme would help to quantify the extent of any compromises that may be contemplated, and thus help to explain and justify the tower positions that may be finally determined.

2.1.2 Line Crossings of the Merri Creek and Yarra River

The proposed 220 kV line appears to cross the Merri Creek and Yarra River on at least sixteen occasions. These crossings are in visual conflict with the alignment of the valley and it would be preferable to reduce the number of these crossings. The crossings between towers 2, 3 & 4; 6, 7, 8 & 9; 19, 20 & 21; should be carefully examined to see if they could be reduced or eliminated.

The first five tower positions Nos 43-47, out of Richmond Terminal station are particularly obtrusive, especially as they involve three crossings of the River Yarra. The possibility of using the railway from tower No 42 as far as Coppin Street and then alongside the open space in Coppin Street to the terminal station should be carefully examined.

2.1.3 Ratio of Height of Structures to Span

The overriding consideration when planning an overhead line route, is to ensure the safety clearance between the lowest conductor and the ground or other objects. Subject to this requirement there is quite a wide range of choice between lower structures closely sited, or higher structures more widely spaced. It is a matter of fine judgement when assessing the visual impact of a line to evaluate a fewer number of more intrusive structures, as against a larger number of less intrusive structures. In the present case however, with the small scale and intimacy of the Merri Creek and Yarra River, tall structures would tend to be overpowering, particularly when they are higher than the trees and break the skyline. The balance of advantage would seem to be to keep the structures as low as possible, even though there would be more of them. It is considered that the cumulative visual impact of more low structures would be less harmful than fewer but taller structures.

2.1.4 Removal of Other Overhead Lines

If the 220 kV line is to be routed overhead through the valleys of the Merri Creek and Yarra River, it is important that its presence when perceived should be seen as a plain visual statement uncluttered by the intrusion of other electricity lines of differing constructions and voltages. It is recommended that all other lines that cross the proposed 220 kV line as seen from the Linear Park should be undergrounded. The precise points at which this undergrounding should take place will require to be determined by the circumstances of each case, but the guiding principle is that none of these other lines should appear in the same view as the 220 kV line from any point within the Linear Park.

2.1.5 Effect upon the Proposed Merri Path

The proposed 220 kV line is routed along part of the proposed Merri Creek and this was examined to see to what extent, if any, it would be adversely affected by an overhead line.

It appears from discussions with Kinhill Stearns Pty Ltd, who had proposed the preliminary alignment for the path, and with the Landscape Architect at the Centre for Environmental Studies at the University of Melbourne who had prepared outline landscaping proposals, that any future transmission towers had not been taken into account. This approach was entirely reasonable as the actual tower positions could not have been known with certainty, nor indeed the form of the supporting structures, whether towers, masts, or poles.

The presence of the existing 66 kV line had been taken fully into account, and the path alignment with the proposed tree and shrub planting had been designed to reduce the visual impact of the 66 kV towers.

In the event that the 66 kV line, and other low voltage lines were to be removed, and a 220 kV line built, the path would require to be realigned and the landscaping proposals modified. It is considered that a 220 kV overhead line would have no significant effect upon the practical use of the proposed path, and if the same landscaping skill were to be exercised for an amended route, then the visual impact of the line to users of the path could be reduced to an acceptable level.

It is concluded therefore that a 220 kV overhead line could be accommodated along the route of the proposed Merri Path with no, or very little detriment to the users of the path.

2.1.6 Opportunities for Further Improvement to the

Merri Path Linear Park and the Siting of Structures

The siting of structure No 27 is particularly unfortunate located on a sharp bend of the river and on a promontory, and also because the line makes a sharp change of direction the stronger angle structure would make it particularly conspicuous. This

structure position adjoins the Carba Dry Ice factory which was for sale. Consideration should be given to the purchase of this site and clearance of the buildings for the following two reasons:

2.1.6.1 Structure No 27 could be sited further away from the promontory and the angle of the line reduced, and possibly with the resiting of the adjoining structures this deviation of the line could be eliminated entirely. This realignment would be a significant visual improvement over what is now proposed.

2.1.6.2 The Carba Dry Ice factory site could be made available to the City of Collingwood for incorporation into the Merri Path Linear Park. It could be envisaged being laid out as a small car park, linked to a barbecue, and arranged to provide vantage viewing areas along both stretches of the river.

This instance of the Carba Dry Ice factory site is cited as a practicable example of how the judicious acquisition of land adjoining the Linear Park could improve the alignment and siting of the transmission structures, as well as enhancing the Merri Path. The SECV should be invited to carefully examine this possibility.

2.1.7 Balloon Flying Exercise

It is understood that the Merri Yarra Municipal Protection Committee, as part of a public relations exercise to draw attention to the visual impact that an overhead 220 kV line would have upon Merri Creek and the Yarra River, flew balloons to indicate the position and height of the proposed towers. It is not known whether this experiment was successful or not, but the experiment is one that should be repeated as a serious exercise fully involving public participation. The following procedure is suggested:

2.1.7.1 It should be a joint exercise initiated by SECV and the Centre for Environmental Studies, and involving the appropriate City Councils, and as wide a section of the public wishing to participate.

2.1.7.2 Visual impact analysis of the overhead line route should be undertaken and the selection of the tower positions giving the minimum visual impact determined.

2.1.7.3 Alternative sub-options should also be evaluated on the basis of differing tower heights and spans.

2.1.7.4 Balloons should be flown at the proposed tower positions and to the appropriate height, and photographed from as many locations as possible. Local residents particularly should be encouraged to take photographs from their dwellings. The time of photographs should be recorded, so that alternative sub-options could also be recorded later the same day.

2.1.7.5 The correlation of the results may perhaps be best done at the Centre for Environmental Studies, to enable comparisons to be made with the results from the PREVIEW and VIEWIT programmes.

2.1.7.6 It is anticipated that the results from the combined exercise would have four substantial benefits:-

2.1.7.6.1 It would inform the public of precisely the visual effect that an overhead line would have as a basis for a more considered judgement, rather than opinion based on emotion, apprehension and imagination.

2.1.7.6.2 It may go some way to reassure the public that the SECV is making every effort to preserve the visual amenity of the Merri Creek and Yarra River.

2.1.7.6.3 It would enable the SECV to locate the towers with the confidence of knowing that they would cause the minimum visual impact.

2.1.7.6.4 It would further the research being undertaken at the Centre of Environmental Studies into methods for assessing the visual impact of overhead transmission lines, which could be of benefit for future line routeing.

2.1.8 Visual Presentation of Proposed Line Route

The Merri Yarra Municipal Protection Committee had requested a visual presentation illustrating the impact of the 220 kV overhead line along the valleys of the Merri Creek and Yarra River. It is considered that this request would be fully met by the use of the computer PREVIEW program in use by the Centre for Environmental Studies at the University of Melbourne, and by photographs recording the balloon flying exercise,.

2.2 Visual Treatment of the Overhead Line

2.2.1 Selection of Support Structures

There are two main alternatives, towers and poles. The argument has been advanced that the selection of the most appropriate structure would depend upon the particular characteristics of each proposed site. Although in one respect this proposition seems logical, it is considered that an apparently random mixture of towers and poles along a route would be visually undesirable and should be avoided. It is considered important that there should be a consistency of structure to maintain a sense of visual continuity. This will inevitably result in some compromise from what may be regarded as the single site preferred choice, but it is considered that any compromise is entirely justified for the greater benefit of achieving a visual coherence.

There are several arguments both for and against both types of structure in respect of their degree of perception, aesthetic form, and appropriateness in various locations. The Mitcheltree/Bishop study touches upon this matter, but does not pursue it in depth, but reports that of the perceived relative values the lattice tower is lowest and the pole the highest, which would seem to imply that the tower should be adopted if visual impact were the only criterion to be considered. There are however at least three other factors to be taken into account which are public preference, effect on land use, and appropriateness.

There is some evidence to suggest that the public if given a choice between lattice towers and poles show a preference for a pole structure. A pole structure would cost at least twice as much as a lattice tower, and a recent study indicated that although the public prefer the pole they do not consider it to be worth twice the cost.

A lattice tower causes more disruption to land use than a pole, because of the spread of its four legs, and the severe limitations it imposes upon any use within that area.

The Merri Creek and Yarra River valleys are fairly well furnished with trees, and it is proposed that many more will be planted. A pole is similar in form to the trunk of a tall tree, and although possibly slightly more visible than a lattice tower its structural affinity with trees would probably make it more readily acceptable to the observer.

Although the choice between the towers and poles is not clear cut, it would seem that the balance of advantage rests with poles, and they are therefore recommended for adoption in this instance.

2.2.2 Colour of Tower or Pole

The colour of the structure can make a great difference to its visibility, but it is not easy to determine what the most suitable colour should be to provide the greatest degree of camouflage. It depends upon so many variable factors, such as type of vegetation in foreground and background, direction of the sun, time of day, and season of the year, that any colour or combination of colours will be inappropriate at some time or another. Nevertheless the careful selection of colour will result in some improvement some of the time. The colours should be selected from a limited range of medium greys, brown earth colours, and dark olive greens, when the structure is viewed against a landscape background, and consideration given to painting the upper part of the structure an off white or light sky blue if it is likely to be viewed principally against the sky.

It is recommended that the colour of each structure should be individually determined, but within a very limited range of colours, and consistent with adjoining structures, so far as is possible and appropriate. All colours to be matt finish.

2.2.3 Colour of Insulators

It is understood that the colour of the insulators proposed is light grey, and this colour would be entirely appropriate.

2.2.4 Conductors

The bright shine of new conductors can on occasion be visually very obtrusive which may be substantially reduced by the use of non-reflecting, 'non specular' conductors. It is understood that the SECV have had experience of such conductors and their adoption in this instance is suggested.

2.2.5 Landscaping by Trees and Shrubs

The opportunities for landscaping to achieve screening of the overhead line along the route of the easement in conjunction with the necessity for land reinstatement, as part of the overall plan for the Merri Path Linear Park is discussed elsewhere. As a further way of reducing the visual impact of the line the use of 'off site' tree and shrub planting should be considered. It is suggested that the SECV should offer to plant trees and/or shrubs on any land at the landowners written request, in any location that would provide screening of the transmission line. The offer should be made at the time of any approval that may be given for an overhead line but the implementation deferred until the line has been built and its effect upon any property accurately assessed. Experience has shown that the requests for such 'off site' planting is likely to be quite modest. If all the recommendations for the visual treatment for the proposed line is carried out it is expected that the resultant visual offence would be quite small, with consequently few requests for tree planting. It is possible that those people enjoying a view would prefer to continue to enjoy it with the incidence of a power line, rather than lose the view screened by trees.

Nevertheless it is considered that there will be several instances where the planting of a carefully selected tree skilfully placed to screen a structure could result in a significant improvement to the aspect from the property at relatively modest cost. The expression of willingness by the SECV to undertake such 'off site' planting would be a further expression of their concern to protect the visual environment, and help to create an atmosphere of mutual understanding.

2.3 Other Actions to Gain Acceptance of the Proposed Overhead Line

2.3.1 Implementation of the Merri Creek and Yarra River Linear Park

Attention has been drawn to the proposed Linear Park along the Merri Creek and Yarra River, and the great importance placed upon the amenity benefit that such a scheme would bring. It was understood that the detailed design and implementation of the Linear Park would be carried out by the several City Councils within whose area it was situated. The detailed design prepared by each City Council would be within the overall intent of the conceptual design, but would almost inevitably, if prepared by different designers, lack a sense of being a complete entity, particularly in respect of the detailed planting along its full length. It is therefore suggested that there should be an overall co-ordinating Landscape Architect to ensure that the separate parts are complementary to the whole.

2.3.2 Appointment of a Co-ordinating Landscape Architect

If the principle of the appointment of a co-ordinating Landscape Architect is adopted several considerations arise. As the precise alignment of the path, and detailed planting plans for trees and shrubs will to some extent be determined by the location of the transmission line structures, it is considered that the financial burden of such an appointment should be met by the SECV. As the co-ordinating Landscape Architect will be required to work very closely with the SECV on the matters outlined above it would be expedient if the Landscape Architect on the staff of the SECV could be given this role. Such an arrangement although not guaranteeing success would afford every opportunity of ensuring the best possible landscaping solution, and bring credit and recognition to the SECV for its practical concern for the environment.

2.3.3 Land Reinstatement after Transmission Line Construction

It must be recognised that there will be considerable land disturbance whether an overhead line or underground cable should be decided for the Richmond to Brunswick route. It will be a responsibility of the SECV to ensure that reinstatement is fully and properly carried out. This suggests that the opportunity will arise for such reinstatement to be done in accordance with the detailed proposals for the Linear Park. It is thought appropriate that such land reinstatement as may be necessary should be interpreted liberally so that a substantial part of the Linear Park may be implemented.

2.4 Treatment of Existing and Proposed Terminal Stations

2.4.1 Richmond Terminal Station - existing

This terminal station is very conspicuous from most viewpoints around the site. Whilst recognising that the present fairly high substation structures impose severe limitations upon mitigating its visual impact in the short term, there is still scope for effecting some improvement. It is suggested that the chain link fencing enclosing the site should be replaced by a high brick wall. Such an enclosure would require considerable architectural ingenuity to make it visually interesting, by introducing a series of recessed bays, some patterning of brickwork with snapped headers or similar. There is also considerable scope for further landscaping by trees and shrubs.

In the long term as the equipment is replaced, lower structures or possibly metalclad equipment should be used.

2.4.2 Brunswick Terminal Station - existing

This terminal station is well furnished with planting which generally provides fairly effective screening. No proposals are suggested at this stage, but a detailed examination may indicate where some modest improvements may be made.

2.4.3 Clifton Hill Terminal Station - proposed

As a general statement it may confidently be said that all future terminal stations need cause no visual offence. There are five main ways of making a terminal station visually acceptable:

2.4.3.1 If conventional outdoor equipment is used the site can be screened by well designed enclosing walls with trees and shrubs.

2.4.3.2 If conventional outdoor equipment is used and the site is large enough, the floor of the terminal station may be lowered by excavation, and the material used to construct ground modelling high enough to screen the equipment. The addition of tree and shrub planting would improve screening and the general environment of the locality.

2.4.3.3 If the site available for a terminal station is severely restricted, the smaller site area required by metalclad equipment over conventional equipment would provide the opportunity of selecting a more electrically satisfactory site, whilst still providing the amenity treatment available under 1 and 2 above.

2.4.3.4 The use of metalclad equipment entirely enclosed in a separate building, or as an integral part of a larger building, most appropriately in a high density urban area.

2.4.3.5 The last option is to use metalclad equipment in a completely underground terminal station, for example in a public park when the surface could be reinstated for park use.

The selected site for the proposed Clifton Hill terminal station may therefore be regarded as satisfactory provided it is designed appropriately in accordance with the methods outlined above.

2.5 Effect on land use of cabling through parkland, with special reference to the proposed 220 kV line between Richmond and Brunswick .

If this route were to be cabled the SECV would require three trenches 0.70m wide and 1.00m deep with 2.00m between trenches, a total width of 6.10m. The SECV also require 0.90m clear alongside the two outside trenches to make an overall easement width of 7.90m. An alternative cabling specification proposed elsewhere in this report would require two trenches about 1.20m wide with a 2.00m space between them, clearance along the outside of the trenches would bring the overall easement width to approximately 7.20m.

Either cabling arrangement would result in a considerable land disturbance which would not be solely confined to the area required for the easement. Access for excavating machinery, lorries to remove the spoil, equipment to handle the large cable drums, and further lorry loads of the special back-fill material, would all create land damage. Areas would also have to be set aside and enclosed for the contractors huts, and the storage of plant and equipment.

After the cables are laid and the land reinstated, its use would be restricted mainly to grass, and although paths and hard surface areas are not prohibited it would be desirable that they should be kept to a minimum. Buildings and structures over the cables would not be allowed except in very exceptional circumstances, when special provision would have to be made for ducts or tunnels. There would be no objection to the planting of small shrubs and flowers over cables, but not large shrubs and trees. The cables must not be put at risk of damage by plant roots.

No difficulty would be anticipated in designing a landscaping scheme for the Merri Creek and Yarra River Linear Park to accommodate a cable route, and it may be possible for the cable alignment to run alongside and partly under the proposed path.

In conclusion it may be confidently stated that with good landscape design and careful land reinstatement the presence of an underground cable route would not be apparent.

Environmental consideration for a
Proposed SECV 200 kV Transmission Line between Newport Power Station
and Fishermens Bend Terminal Station.

Visual considerations concerning the crossing of the Yarra River.

The report of Professor George Seddon the Director of the Centre for Environmental Studies at the University of Melbourne dated 23 February 1979 has been studied. A copy is attached.

The whole document is a very reasonable statement of the problem. Of the two options, an overhead crossing of the Yarra River, or cabling under the River, the argument against cabling is supported as it is considered that the cost would not be justified for the amenity gain in this predominately industrial area. The discussion is therefore concerned with an overhead route.

The university report recommendation that the River crossing should be as far away from the Westgate Bridge as possible to avoid detracting from the perception of the Bridge as an independent component of the landscape, is fully supported. The report also recommends that to achieve this objective there should be a direct crossing of the River Yarra from Newport Power Station PARALLEL with the Bridge. It is considered that such a parallel crossing although perhaps theoretically correct, would tend to place the eastern river crossing tower too far south, particularly as the termination of the line is to the north east. For this reason it is suggested that the proposal be modified slightly to permit a right angle crossing of the river. As all views of the tower crossing and the Westgate Bridge will be seen in perspective, and at the separation distance proposed, it is thought extremely unlikely that the different alignment of the Bridge and crossing towers would be apparent, except to the most perceptive observer, and even then unlikely to be visually disturbing when viewed against the industrial landscape.

The problem of routeing the line from the east bank of the river eastwards towards Fishermens Bend Terminal Station is difficult because of the presence of Webb Dock, but is made particularly more so by the proposed Webb Dock extension. There would seem to be two main alternatives:-

1. Direct route eastwards

If the line were to be routed eastwards across the proposed extension to Webb Dock similar high crossing towers would be required to provide the same clearance for shipping as across the river. These towers would be expensive and also intrusive which would to some extent off set the visual advantage gained by the more southerly crossing.

It may be possible to continue the line parallel to Williamstown Road and then north into Fishermens Bend Terminal Station, which would keep the line away from the Westgate Bridge approach.

2. Northern route around Webb Dock extension

Another alternative would be a direct crossing of the River then a route northwards either parallel with the new river alignment and new road, or

further east parallel with the western boundary of the Webb Dock extension to Howe Parade and then to Fishermens Bend.

The two alternatives resolve into a choice between a closer route to the Westgate Bridge of normal height towers, and at least two more high crossing towers further away.

It is not possible to make any recommendation for a route at this stage, except that following a preliminary investigation there would seem to be alternatives to the SECV proposal that would have less visual impact upon the Westgate Bridge. It is possible that the alternatives may not be practicable when the redevelopment proposals of the Port of Melbourne Authority are known, but certainly the visual effect of the 220 kV crossing requires further detailed study. It is considered that the VIEWIT and PREVIEW programmes being currently developed at Melbourne University could make an important contribution to an assessment of the visual impact of the several alternatives as one factor together with engineering and cost as a basis for making a decision.

VISUAL ANALYSIS, PROPOSED SECV TRANSMISSION LINE LOWER YARRA
CROSSING, NEWPORT TO FISHERMANS BEND

1. DESIGN CRITERIA

- a. The lower Yarra is an industrial landscape, and a powerful one. Much of it is neglected in detail, but this neglect will be repaired by attention to detail within an industrial design framework, and not by attempts at suburban beautification. The major elements in the landscape are the great horizontal sweep of river and Yarra delta; the dramatic view of the city towers on the north-east skyline; and the West Gate Bridge, a dramatically beautiful construction on a scale that is worthy of such an essentially open landscape.

The proposed SECV towers will also be major engineering structures, and in themselves an appropriate element in an industrial landscape.

- b. The possible visual problem arises only in their relation with the West Gate Bridge, which will have symbolic identity for Melbourne perhaps equal to that of the Sydney Harbour Bridge. It is at least arguable that the Bridge should be perceived as much as possible as a complete element in itself, without visual intrusion or competition. The current SECV alignment proposal from Newport to the Howe Parade sewer easement (an alignment for which they already hold a permit) will bring the towers and lines within the visual envelope of the Bridge from most points of view. This will in my view detract from the perception of the Bridge as an independent component of the landscape.

- c. Moreover, the two sets of structures are not visually

compatible in close detail. The Bridge is gently convex; it is curvilinear in plan; it is a concrete and steel structure; despite its height, it is essentially horizontal in emphasis; its only visible steel components are the guy cables, and these are under such tension compared to their self-weight that they are essentially linear. The towers and transmission lines will make a concave profile rather than a convex one; they will be rectilinear in plan; they will be all-steel structures, and the towers will be a lattice framework quite unlike anything in the Bridge structure; the primary visual effect of the towers will be a vertical accent, rather than a horizontal tie; the cables will not be taut, and will have a marked catenary droop.

2. CONCLUSION (VISUAL ANALYSIS)

Purely on visual grounds, it is therefore preferable that the towers and lines not be so close to the Bridge. This conclusion takes no account of the relative cost, safety, or planning implications of alternatives, to which we now turn.

3. ALTERNATIVES

- a. Run the lines under the river. According to the SECV, this would require a tunnel, because dredging, anchor dragging and other port-related activities make it unsafe to lay the cables on the river bed, or within the surface silt. The cost is estimated (by the SECV) at \$6.3 million for tunnel construction as against \$1.8 million for an overhead crossing. There would also be quite large river bank structures where the lines go underground, and these could be intrusive, although much would depend on their location and design. Sydney Harbour has such a crossing just

west of the Harbour Bridge, and the exit points have low visibility - but in a very different topography.

- b. Run the lines under the Bridge. The SECV advise that the Bridge is not designed for such an additional stress. In any case, there would be substantial design problems in getting the lines to and from the Bridge.
- c. Relocate the alignment further down stream. The present alignment is the outcome not so much of SECV planning needs as those of the Port of Melbourne Authority. A direct crossing from Newport, parallel with the Bridge would be visually preferable in our view to the current proposal. The two structures (Bridge and transmission lines) would still coalesce when viewed from the north or south - in other words, from the river - but there would be much better east-west visual separation (see accompanying map). Therefore the compatibility of such an alignment with Port of Melbourne Authority planning needs should be investigated further.
- d. An alignment even further down stream would further improve visual separation, but is unlikely to be acceptable to the Port of Melbourne Authority. This should nevertheless be confirmed.

4. CONCLUSION (ALTERNATIVE STRATEGIES)

Alternative 3(c) appears to be the most promising. Public amenity in the lower Yarra environs is at present low, although the Port of Melbourne Authority now has plans to upgrade them. In my view, \$4.5 million dollars, or even a quarter of that sum, could be spent much more effectively and make a greater contribution to public amenity, than by tunnelling under the Yarra. For example, an exercise in

creative ecology at the mouth of Stony Creek could enhance this area greatly as a bird sanctuary, and the contrast of a natural area in such a setting would offer an unusual range of experiences. Equally, a well designed riverside towpath with bollards and good lighting, linking the Strand to the Newport foreshore, would immeasurably improve public enjoyment of the river. The SECV might consider the joint funding of such improvements with the Port of Melbourne Authority, and the planning assistance of the Williamstown Council.

In any case, the detailed design of the towers and lines should be considered in relation to the Bridge. The *towers* would be better related if they were non-lattice, but the size of tapering single column towers would probably make this impracticable. The *lines* should perhaps ideally invert the geometry of the Bridge, such that their concavity equals its convexity. (In practice, the sag of the lines is likely to be about twice the rise of the Bridge. At least the relation of the two curves should be considered if they are to be seen together.) *Tower placement* should if possible relate to the major symmetrical elements of the Bridge. *Tower colour* should also bear some reasonable relation with the Bridge. It is essential to know in advance whether or not aeronautical requirements will be applicable. Candy-striped towers so near the Bridge would be very conspicuous.

GS:LT
23.2.79

George Seddon
Director
Centre for Environmental Studies
University of Melbourne

MERRI YARRA MUNICIPAL PROTECTION COMMITTEE

SUBMISSION
TO THE
NATURAL RESOURCES AND ENVIRONMENT COMMITTEE
ON THE
INQUIRY INTO TRANSMISSION
LINES SERVICING MELBOURNE

C O N T E N T S

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DEVELOPMENT OF THE TRANSMISSION SUPPLY FOR MELBOURNE

INTRODUCTION

Last year the S.E.C.V. outlined a proposal to the eight Municipal Councils listed below to extend a 220 KV transmission line from Brunswick to Richmond along the Merri Creek Valley and the Yarra Valley. At the time of making this proposal the S.E.C.V. undertook to prepare an Environmental Effects Statement in response to a request by the Ministry of Conservation. The eight Municipal Councils decided to unite and form a regional Committee in response to public outcry, to oppose the proposal. A Yarra Bend Park Trust representative was co-opted. This Regional Committee is known as the Merri Yarra Municipal Protection Committee (MYMP Committee) and is comprised of one Councillor (Richmond - Commissioner) from each of the following Municipal Councils:

- Brunswick City Council
- Northcote City Council
- Fitzroy City Council
- Collingwood City Council
- Kew City Council
- Richmond City Council
- Hawthorn City Council
- Prahran City Council

Subsequently, in October last year, His Excellency, the Governor of Victoria, announced that the Natural Resources and Environment Committee was to inquire into and consider and report to the Victorian Parliament on the "transmission lines servicing Melbourne".

The S.E.C.V. prepared a report to submit to this enquiry in November last year. The MYMP Committee, representing the eight Municipal Councils, has prepared a report for submission to the enquiry and in response to the S.E.C.V. report. This report analyses the specific development of a 220 KV transmission line from Brunswick to Richmond proposed by the S.E.C.V., and establishes criteria for assessing the environmental impact of that line on the public parklands and the public river frontages.

In carrying out this analysis it attempts to establish criteria that could be adopted for assessing other similar proposals. The report also discusses processes that should be adopted for carrying out this assessment.

In lodging this submission with the Natural Resources Environment Committee a request is made for a visual presentation illustrating the impact on the environment of the S.E.C.V.'s proposal for the transmission line between Brunswick and Richmond.

Throughout the report "towers" is a general word used to also mean and embrace the terms "poles" and "pylons".

OBJECTIVES OF ENVIRONMENTAL STUDY

- * To study in detail the route of the S.E.C.V. proposal R1, for a 220 KV overhead line along the Yarra and Merri Creek Valleys from Brunswick to Richmond Terminal Stations, via Clifton Hill.
- * To establish a method of assessing the land use and environmental impact arising from this proposal in such a way that comparisons could be made directly with other proposals for alternative routes or undergrounding as required.
- * To present these findings in the form of a submission as well as a coloured slide presentation to the Victorian Government's Parliamentary Committee of Inquiry on or after the 4th February, 1983.

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STUDY METHOD

This Committee was supported by volunteer groups of citizens, Architects and Planners who studied and reported on sections of the proposed route.

The reports were presented on standard survey sheets and required assessment of the following 10 items on a scale rating for each item of 0 (Ideal) to 10 (Maximum envisaged adverse impact).

No attempt was made to grade or weigh each item, though clearly some items are more important than others.

- * Visual impact within Park or Riverside.
- * Visual impact outside Park.
- * Effect of Towers and Lines on vistas within the Park.
- * Effect of Towers and Lines on vistas outside the Park.
- * Effect on urban natural setting of parks and surrounds.
- * Effect on vegetation.
- * Physical restriction.
- * Effect of inhibiting recreation activity (eg. Bike Paths, Sports Ovals, etc.).
- * Effect on attractiveness to tourists.
- * Effect on commercial activity in Park/River area.

In addition to these items, two further questions were suggested -

- * Estimated number of dwellings with direct views to Lines or Towers.
- * Estimated number of people using parks per annum (from local Councils).

The Committee had available to it an aerial survey map with the proposed S.E.C.V. Tower positions 1 to 47 indicated on it. In many cases, these Towers correspond closely with existing 66 KV lines and in other cases their position had to be estimated. The assessment of the items outlined above were related to each Tower position. It was noted that proposed Towers 25, 26 and 27 were a new intrusion along the Yarra River.

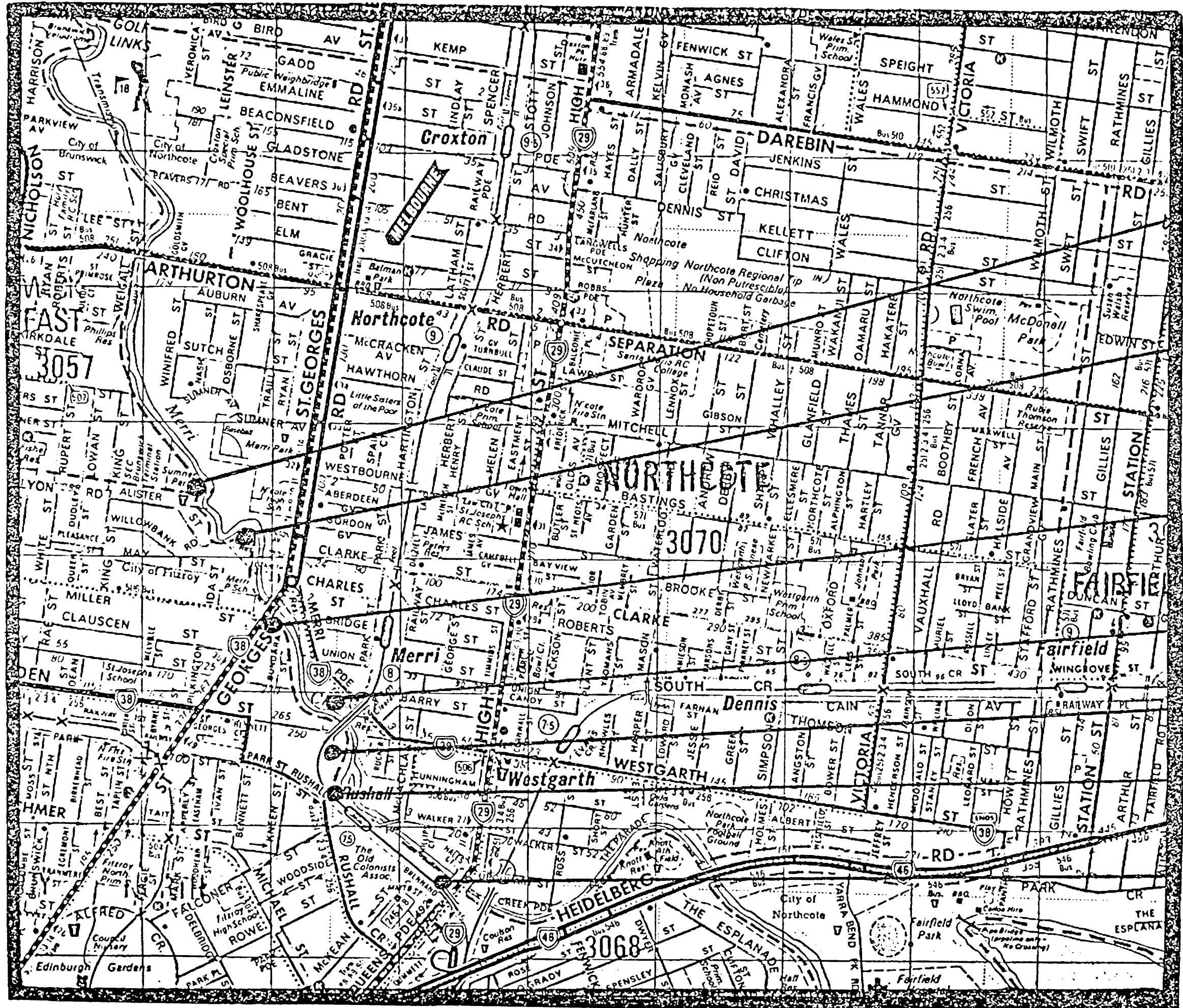
The proposed 220 KV transmission line starts at Brunswick Terminal, and proceeds with 47 Towers to Richmond Terminal Station. Study teams were each responsible for assessing their own section of the proposed line. Repetitional assessment at adjoining Towers was part of the study design in order to correlate the scoring between teams. For details of team assessments see "Impact Survey Score Sheets" (Appendix - Pages 22-27).

Because no definite public statement to the contrary was obtained, the S.E.C.V. assumed that the existing 66 KV Towers will remain, and the proposed 220 KV transmission line will be additional to the present system. This would have a disastrous effect on the proposed development of the Merri Creek Valley for recreational use, either in the form of selected parklands or development as a linear park.

In addition, the section of the creek between the Brunswick Terminal Station and the railway bridge across the creek at Merri Parade is affected by a 'proposed main road reservation'. Councils are actively seeking to have the reservation removed from the Melbourne and Metropolitan Planning Scheme within the near future on the basis that it is no longer required by the Country Roads Board for main road purposes.

With the same consideration in mind, the environmental effects have been assessed on the assumption that the existing electricity supply facilities will remain, and the 'proposed main road reservation' will be removed.

It should be noted also that even if the 66 KV line is removed the following comments would apply equally to the construction of the new higher 220 KV line alone.



Tower 1

Tower 2

Tower 3

Tower 4

Tower 5

Tower 6

Tower 7

TOWER ANALYSIS

Towers 1 - 7

(Sumner Park, May Street, St. Georges Bridge, West Side Merri Bridge Merri Parade, Holden Street, near Rushall Station and Queens Parade Bridge)

Tower 1:

The tower would be situated in Sumner Park adjacent to the Brunswick Terminal Station. There are imposing views from this relatively small park across the Merri Creek on the other side of the creek towards the impressive Convent and Nursing Home on the eastern side of St. Georges Road. Views towards the creek from Northcote Hill (upon which the Convent is located) have the creek and Sumner Park in the background.

The Park currently has three 66 KV towers located within its boundaries which affect the vistas to and from the park; a further 220 KV tower some 37m high would seriously affect the visual enjoyment of this area as well as encumber the use of the park further by the proliferation of towers within it.

Tower 2:

The tower would be located between Sumner Park and the St. Georges Road bridge near the Miller Street Primary School, on the higher ground overlooking a bend in the creek. A 66 KV tower is already located in this area. The land is suitable for development as parkland for public use and for use by the school, and has attractive views back towards Sumner Park and Merri Park along the creek valley. The proposed location of the tower would affect the use of the area for development as parkland, views along the creek from Sumner Park, as well as affect the location of the proposed Merri Creek Pathway. The pathway is proposed to extend along the Merri Creek from its confluence with the Yarra River to Barry Road, Broadmeadows.

Tower 3:

The tower is proposed to be situated within an M.M.B.W. reserve adjacent to the St. Georges Road Bridge. The treed reserve is small, and the proposed position of the tower in the reserve would unduly affect the location of the proposed Merri Creek Pathway. The pathway crosses the creek at St. Georges Road, and views from the path on the Northcote side of the creek towards the reserve and the bridge would be seriously affected by the position of the tower within the reserve.

Tower 4:

The tower is proposed to be situated adjacent to two 66 KV towers near Merri Bridge. The siting of the tower will also affect the proposed route of the Merri Creek Pathway, as well as affect tree planting that would be established as part of the pathway project. Being above the bank of the Merri Valley at this point, the towers would be a dominant influence on the surrounding area.

Tower 5:

The tower is proposed to be situated on the Fitzroy side of the Creek between the railway line and the creek near an existing tower. The site is opposite the Mason Reserve on the Northcote side of the creek. There are picturesque views of the City along the Merri Creek Valley from Mason Reserve, and the location of the proposed tower would be at the eastern extremity of this vista. This tower will interfere with proposed recreation developments.

Tower 6:

The tower is proposed to be situated on the Fitzroy side of the creek midway between the Rushall Station and the railway bridge at Merri Parade. The tower would be set in an existing wooded area of the creek close to an existing tower thereby affecting the intimate setting of this section of the creek valley.



Tower 1

Tower 2

Tower 3

Tower 4

Tower 5

Tower 6

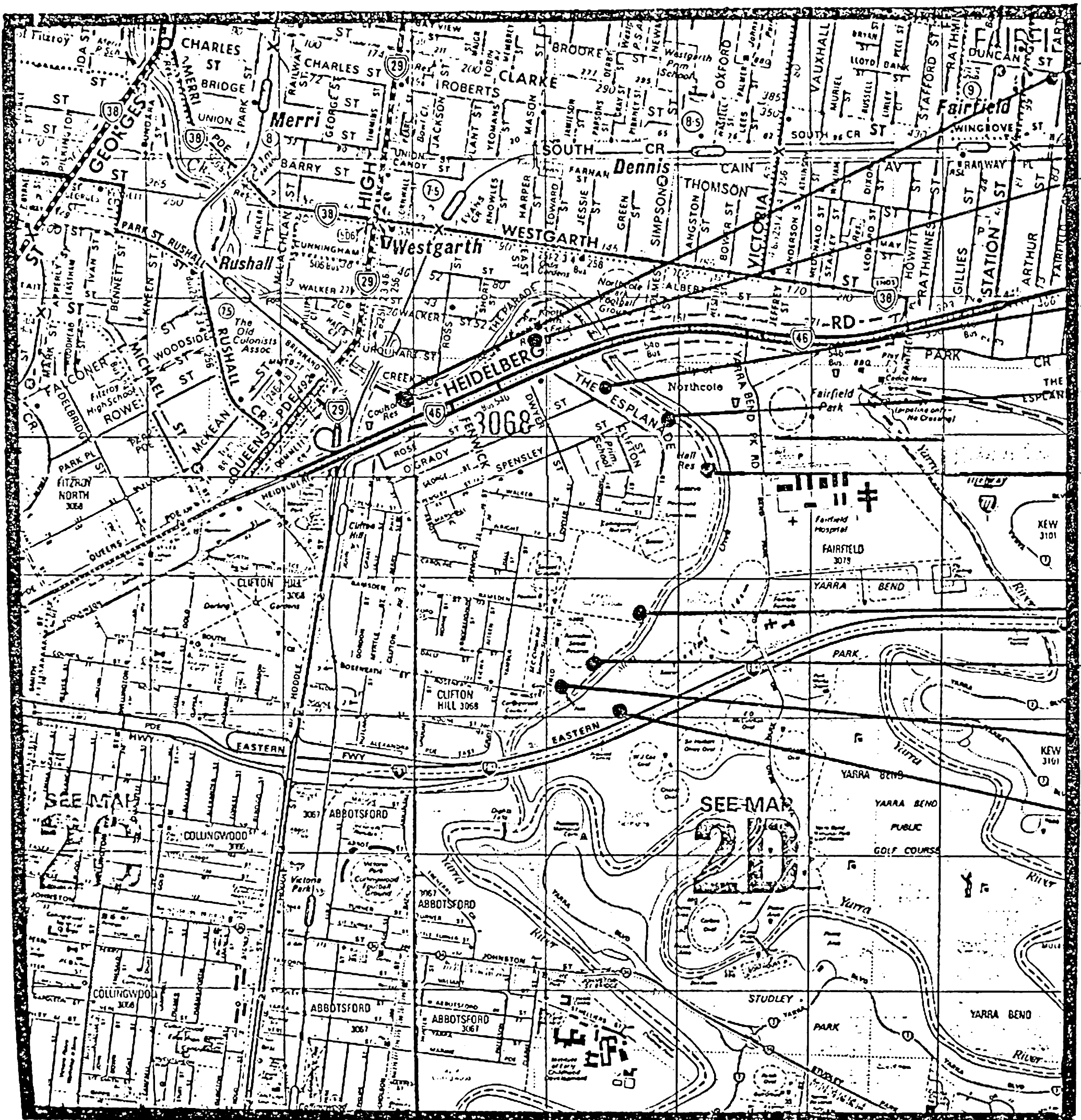
Tower 7

Tower 7:

The tower is proposed to be situated close to an existing tower located on the Fitzroy side of the creek near the Queens Parade bridge. Views along the valley from the Rushall Station will be affected, as well as the proposed route of the Merri Creek Pathway.

TOWERS 1 - 7 IMPACT SUMMARY - 447 (MAXIMUM POSSIBLE 700) 64%

ESTIMATED NUMBER OF DWELLINGS WITH DIRECT VIEW TO TOWER OR LINES - 245.



Tower 8

Tower 9

Tower 10

Tower 11

Tower 12

Tower 13

Tower 14

Tower 15

Tower 16

Towers 8 - 16

(Adjacent Coulson Reserve, Knott Reserve, The Esplanade, Hall Reserve, Ramsden Street Reserve, Merri Creek adjacent to tip, Yarra Bend Park)

Towers 8 - 16:

This area would be severely affected by the power lines and towers in an area which is extremely deprived in terms of parkland for the population.

In general, the impact becomes greater as one moves from south to north. Close to the Terminal Station (proposed) the area is partly industrial, and is already marred by existing towers. Within Yarra Bend Park tower 16 in this section is close to the freeway with its urban intrusion into the parklands.

Where the towers are close to Merri Creek, interference with the Merri Creek bicycle path, both in physical terms and in its recreation use will occur.

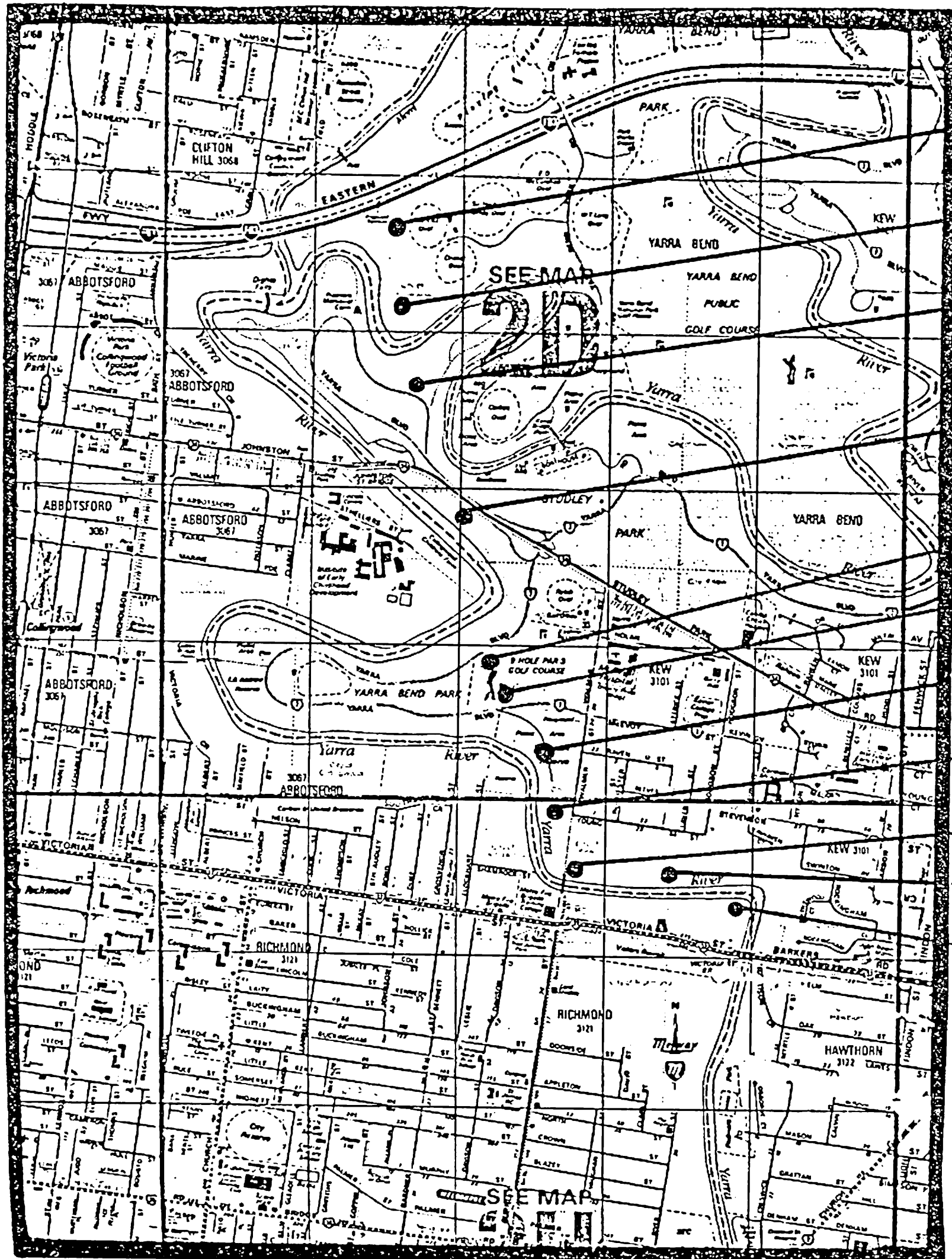
Between Merri Creek and the Esplanade, Clifton Hill, greatest impact will take place. The current towers are along the creek bed and below the tree line. By contrast, the proposed towers are along the ridge line, well above the tree line, close to houses and flats and affecting a narrow area of open parkland.

This parkland is used for a mixture of informal recreation activity including a casual soccer area, a playground, a bicycle moto-cross track, and a general area for walking and jogging. The Northcote Housing Commission high-rise flats will have a clear view of a number of these towers, which will also be clearly visible from the Merri Creek Bridge and High Street indicating that Clifton Hill is "Pylon City".

On the north side of Heidelberg Road, the towers are again proposed on the highest point of the land. They will be clearly visible to users of the athletic track, necessitate removal of the car park and its relocation and a consequent further loss of parkland.

IMPACT SUMMARY - 477 (MAXIMUM POSSIBLE 900) 53%

ESTIMATED NUMBER OF DWELLINGS WITH DIRECT VIEW TO TOWER OR LINES - 721



Tower 17

Tower 18

Tower 19

Tower 20

Tower 21

Tower 22

Tower 23

Tower 24

Tower 25

Tower 26

Tower 27

Towers 17 - 27

(Yarra Bend Park, Yarra Boulevard, South side of Johnston Street, Dickinson Reserve, Cnr. Walmer & Young Streets, Young Street and north side of Victoria Street Bridge)

Towers 17 - 27:

A total of 300,000 people use the Yarra Bend Park per annum. These towers will create unsightly short range views from the Eastern Freeway, and unsightly longer range descending views from the Dight Falls Lookout and Loop Road are likely. The new towers will be located in open areas, and will have a considerable visual effect on the Yarra Bend Park.

Tower 20:

This tower will produce particularly severe visual problems. The existing tower is located in a most prominent location causing serious visual disturbances from a number of locations, the worst being for motorists travelling eastwards over Johnston Street Bridge and up Studley Park Road. Another tower at this location would be very disadvantageous and visible for a long distance. The existing tower is especially intrusive when viewed from the natural parkland setting at Kanes Bridge.

Towers 20 - 21:

The power line here is likely to be very high above the river, and will be viewed from large areas and the parkland.

Towers 21 - 23:

Visual problems will increase with new structures, and the recreational amenity will be affected, particularly on the north side of the Par 3 Golf Course adjacent to tower 21. Tower 21 will create its worst visual impact to the public on the Boulevard, especially from about 100 metres on the western approach and about 60 metres on the northern approach.

Towers 22 - 25:

At these locations the powerline passes through public recreational parkland containing a moderate density of relatively mature native trees. The effect on short range views within the park will be considerable with the intrusion of additional structures and lines. The aerial view along Young Street towards tower 24 in the west will be critical, as ugly silhouettes are presently created in the evening by the existing 66 KV tower in the same location.

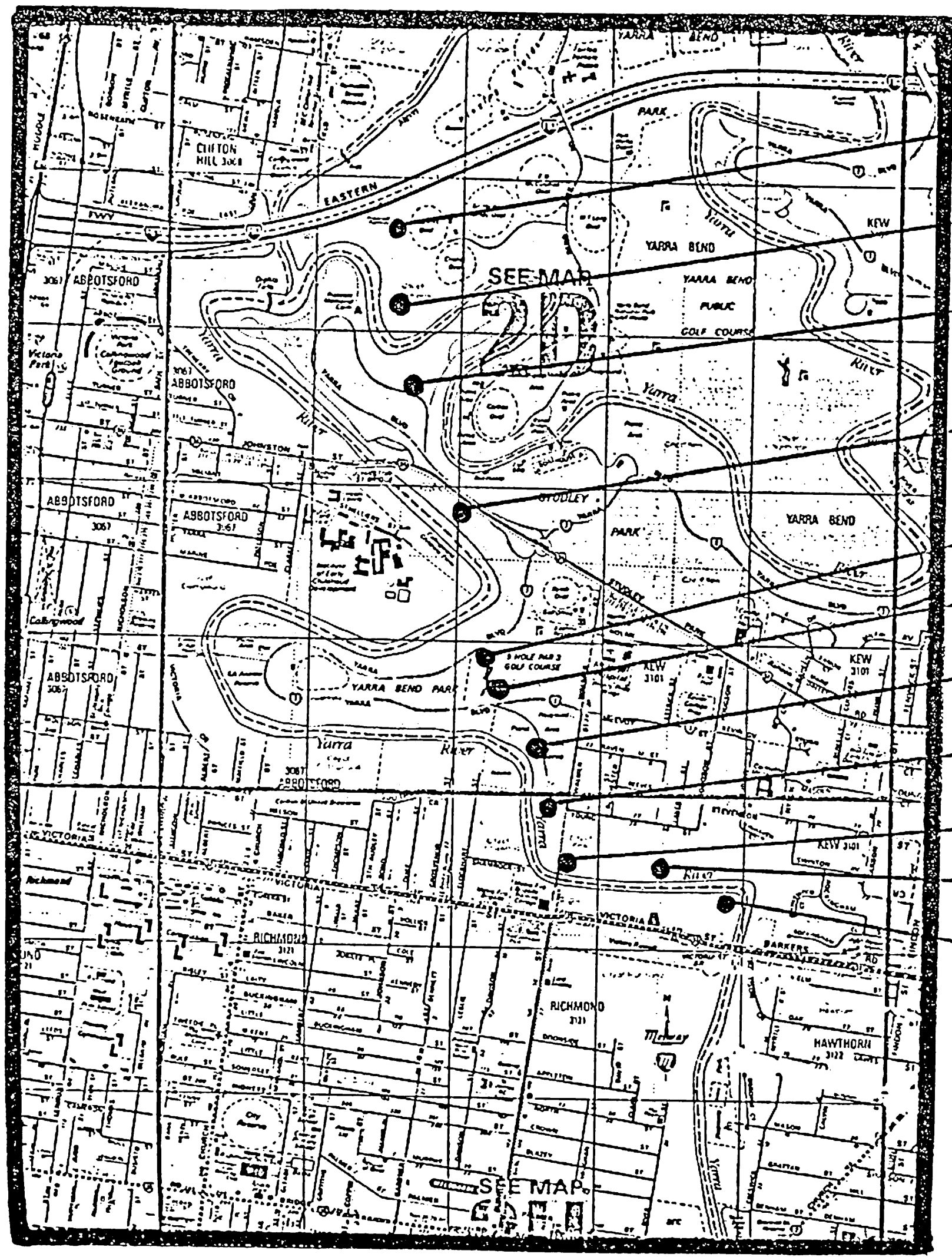
Concern is expressed regarding the degree of tree clearing which will be necessary in the Studley Park area, and the effect this will have on this naturally beautiful public park. This area is under the control of the Yarra Bend Park Trust which has lodged objections to these transmission lines.

Towers 25 - 27:

Beginning at proposed tower 27 through to tower 25 visual impact is particularly serious from a number of vantage points. Unlike positions 24 through to 17, this section of the Yarra Valley presently contains no power lines and the community therefore faces a dramatic new intrusion into this area, rather than simply a worsening of an existing intrusion.

This area can be seen from the residential area to the north, north east and east.

The visual impact in this area is considerably worse in the winter months due to the high proportion of deciduous trees lining the river bank and footbridge approaches.



Tower 17

Tower 18

Tower 19

Tower 20

Tower 21

Tower 22

Tower 23

Tower 24

Tower 25

Tower 26

Tower 27

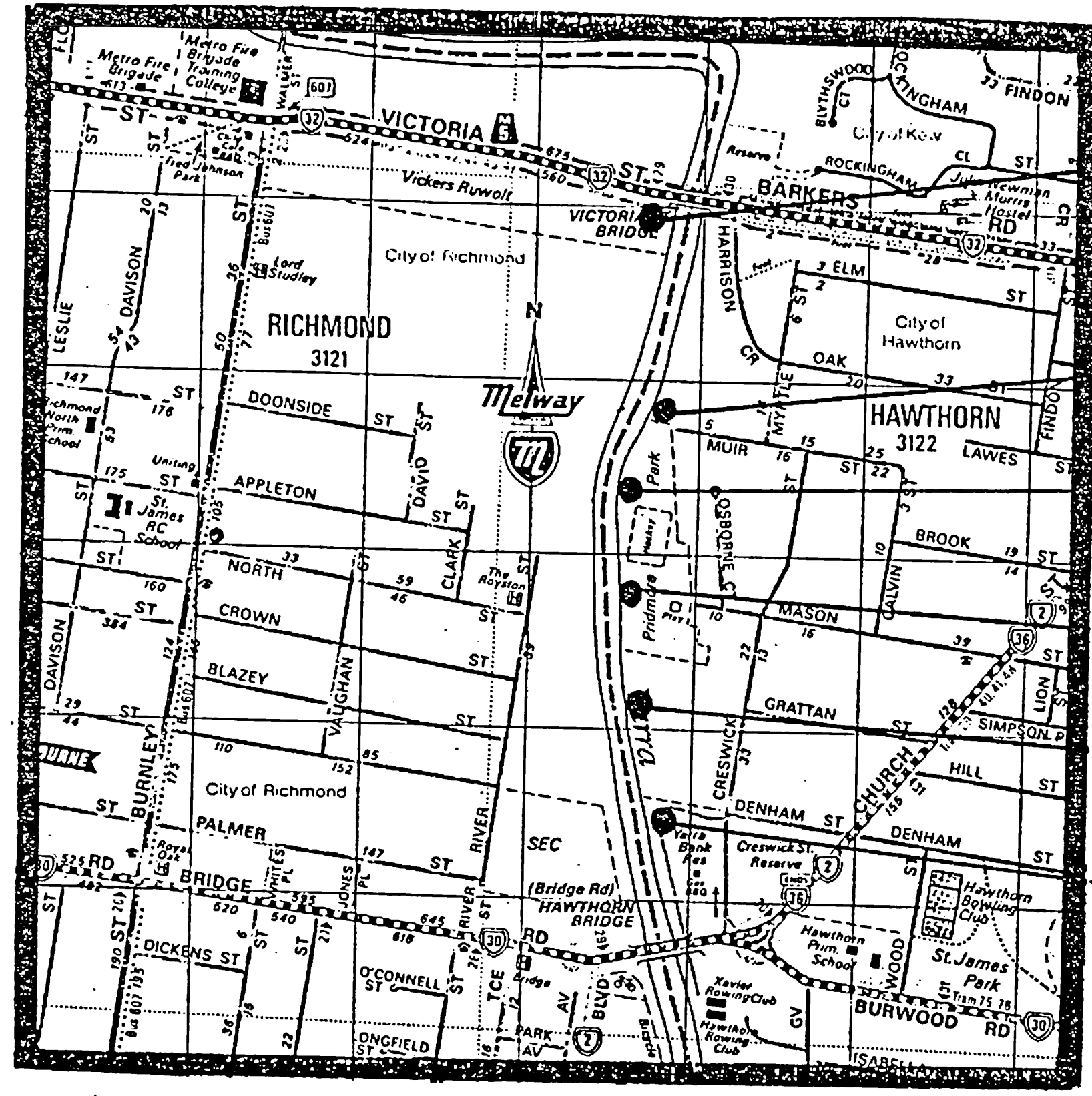
Towers 17 - 27 (cont'd.)Tower 27:

Tower 27 is especially poorly placed - with serious visual impact likely to be created from Victoria Street Bridge in a clear 290⁰ arc around to Walmer Street footbridge in the west.

The unsightly view of the powerline crossing the river between towers 26 and 27 will affect a proposed bicycle track, riverboat cruises, canoeists and also commercial office development on the south side of the river at this point.

IMPACT SUMMARY - 548 (MAXIMUM POSSIBLE 1100) 50%

ESTIMATED NUMBER OF BUILDINGS WITH DIRECT VIEWS TO TOWERS OR LINES - 110.



Tower 28

Tower 29

Tower 30

Tower 31

Tower 32

Tower 33

210

Towers 28 - 33

(South side Victoria
Street Bridge, Pridmore
Park and Yarra Bank
Reserve)

This is a beautiful and quiet section of the river, in which lies particular charm, and it offers an important recreational resort for the public. It is viewed from north and south from Victoria Bridge and Hawthorn Bridge.

Along much of the left bank is public park access, and the picnic area adjacent to Hawthorn Bridge (Yarra Bank Reserve) is very popular.

The extent of through movement and awareness of the wider community will increase dramatically with the extension of the bike track through this section. Detailed design of the track is currently under way. Here the power line will cross and recross the river north and south of the two bridges respectively (Towers 28 to 33). This will have a high impact on the views from the bridges.

Views from the Hawthorn parkland will also be affected, and here the towers will occupy land in the park reserve and affect use, enjoyment and local views within the parks themselves. This effect is already obvious with the existing 66 KV line.

Again residences on the Hawthorn side will be affected as these overlook the river valley from a higher elevation and cannot avoid the prospect of the towers and cables.

Probably the most serious impact will be on views across the river from the west bank. It is estimated that this will have major impact on the potentially very attractive prospect from the bike track.

Again, tower 28 located adjacent to Victoria Street Bridge, like tower 34 located close to Hawthorn Bridge, will have a major impact on views both within and outside the river environs, along Victoria Street and from the many dwellings located on the extensive south facing slopes of the north bank, where the river bends westward towards the Walmer Street Bridge.

Discussion with Hawthorn Council's Municipal Recreation Officer, Mr. Cam Opie, indicates that Harrison Crescent Reserve, Pridmore Park and Yarra Bank Reserve (all located along the left bank of the river between Victoria and Hawthorn Bridges) attract at least 22,000 people a year.

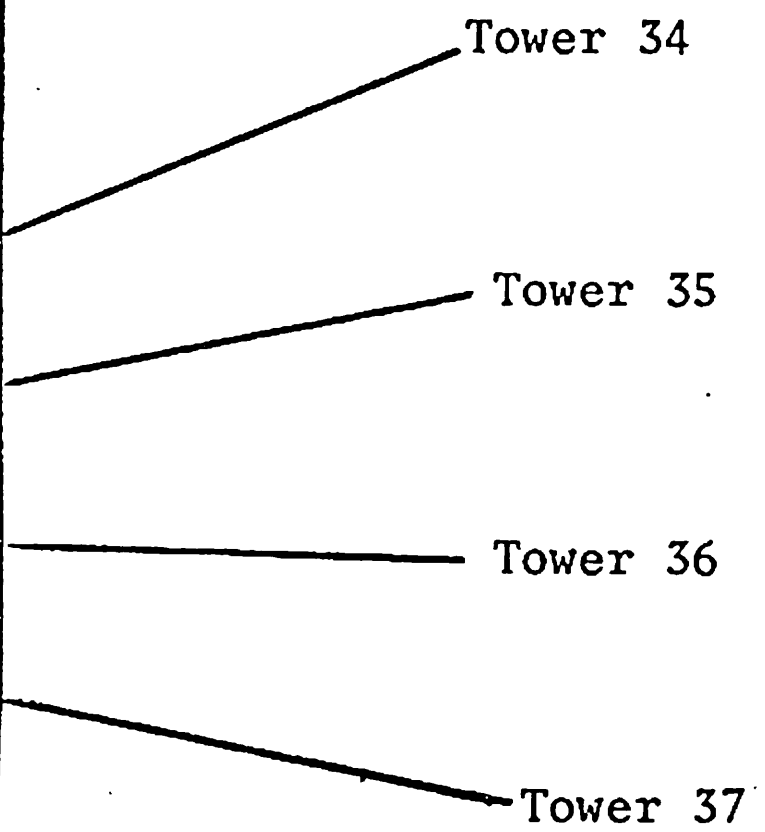


Tower 34

Tower 35

Tower 36

Tower 37



Towers 34 - 37

(South side Hawthorn
Bridge, to Richmond
High School and
Yarra Boulevard
Richmond)

Tower 34, situated beside Hawthorn Bridge directly opposite Hawthorn Rowing Club, will delete views to the east and north. Tower 35 will be located within Richmond High School sports fields which are already relatively small and inadequate.

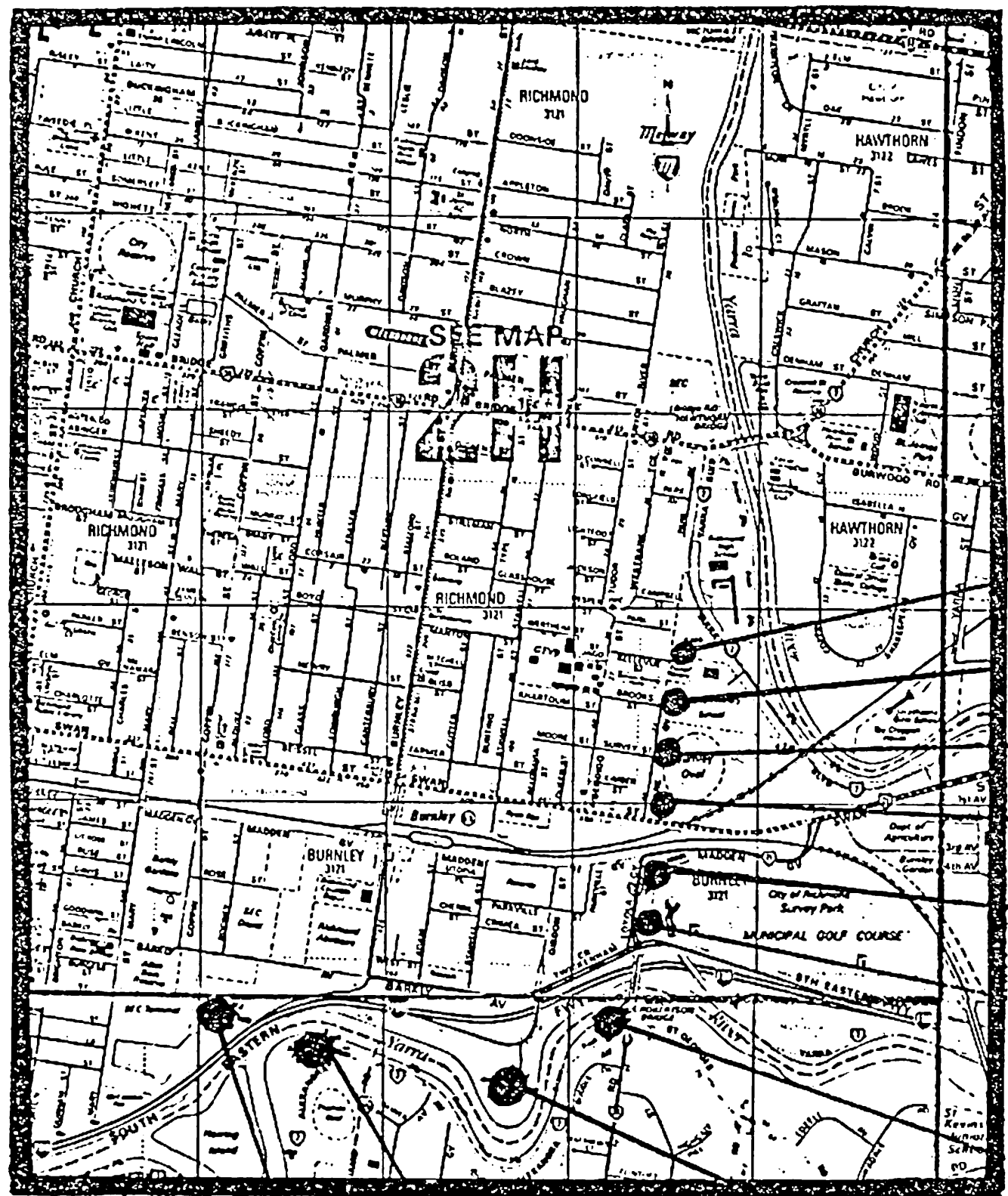
The aspect from the bridge, looking to the east and south of the High School, consists primarily of water and trees crowding the banks and climbing the eastern slopes of the St. James Park residential area. The impression is of an almost totally natural river setting unaffected by either buildings or services.

Detrimental impact on the serenity of this view is likely because of the great increase in scale of the proposal (as compared to the existing line), and the viewer will be much more aware of the line, particularly at two points:

- * Where the line cuts the skyline of the low ridge just north of Burnley Oval;
- * At the Boulevard - Hawthorn Bridge intersection (Tower 34) which will have a high impact on views from Barkers Road, Bridge Road and the bridge.

IMPACT SUMMARY - 582 (MAXIMUM POSSIBLE 1000)

ESTIMATED NUMBER OF BUILDINGS WITH DIRECT VIEWS TO TOWERS OR LINES - 425.



Tower 38

Tower 39

Tower 40

Tower 41

Tower 42

Tower 43

Tower 44

Tower 45

Tower 46

Tower 47

Towers 38 - 47

(Burnley Oval, Loyola Grove, McRobertson Bridge, Gibdon Street, Alexander Avenue to adjacent S.E.C.V. terminal Richmond)

Existing poles and towers numbers 38 to 48 are very obtrusive and follow a line of exotic and native trees. Towers 38, 39 and 40 occur at the ends of Bellevue, Brooks and Survey Streets, presumably for ease of access by S.E.C.V. vehicles, and are therefore seen in views along these streets from Bendigo Street. The impact on these views is considerable. An increase in height of about 50% for the proposed line will spoil longer distance views along these streets. Properties close to the route will suffer visual intrusion since they will look directly at the lines. It is possible to see the lines from Coppin Grove from the east side of the river. A taller series of towers and lines is certain to have a serious visual impact on views from the Hawthorn side.

Tower 41 is prominent at Swan Street and a taller tower for the new line will be more so. Towers 42 and 43 at Loyola Grove continue to follow a line of trees, and are obtrusive to residents and the public using the Richmond Golf Course and travelling through the area. Taller towers and transmission lines will exacerbate the problem.

Towers 44, 45 and 46 would be adjacent to existing 220 KV towers which are very obtrusive at present. Existing towers for the 66 KV line are situated beside these. With the proposed new line there will be three transmission lines in one area. The existing lines are extremely visible from the riverbank area on the Toorak side, and from the residences situated up the hill, particularly Matthews Court off Grange Road. A bicycle track runs on the Toorak side of the river and tower 46 will be adjacent to the Power House Rowing Club and surrounding recreational areas. The proposed tower will be visible from the Como North playing fields and picnic areas. Towers 44 to 47 are visible from homes on the Richmond side, and will interrupt vistas to the parklands on both sides of the river. Tower 45 will have a very adverse effect on the small park in which it is located. The Richmond area already has very little parkland and the proposal will reduce this even further.

IMPACT SUMMARY - 569 (MAXIMUM POSSIBLE 1000)

ESTIMATED NUMBER OF DWELLINGS WITH DIRECT VIEW TO TOWERS OR LINES - 1000.

SUMMARY

Several important findings have emerged from the survey carried out by the Committee. These are summarised as follows:

| <u>PROPOSED TOWER NOS.</u> | <u>% OF MAXIMUM POSSIBLE IMPACT</u> | <u>NO. OF DWELLINGS WITH DIRECT VIEWS OF TOWERS</u> |
|----------------------------|-------------------------------------|---|
| 1 - 7 | 64 | 245 houses (approx.) |
| 8 - 16 | 53 | 721 " " |
| 17 - 27 | 70 | 200 " " |
| 28 - 37 | 58 | 500 " " |
| 38 - 47 | 57 | 1500 " " |

The proposed 220 KV line will have a detrimental impact in the public parklands and riverside adjoining the eight (8) municipalities of Brunswick, Northcote, Fitzroy, Collingwood, Kew, Hawthorn, Richmond and Prahran.

These results which show from 53 - 70% degradation of the Yarra and Merri Valleys, reinforce the wide community opposition to the power lines.

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SUMMARY (cont'd.)

The local and regional value of the public open spaces which go to making this area a valuable metropolitan inner area are becoming increasingly recognised. Recent public campaigns such as the Age's "Give the Yarra a Go" have achieved popular support and acceptance. For the first time a modest but concerted effort is being made to clean up river banks, and to create access to the inner urban Merri Creek and Yarra Valley with re-forming of banks, planting, creation of cycle tracks and the like. For the first time in over a century there is seen to be the promise of giving back industrialised and despoiled stretches of the Merri Creek and Yarra to the people. At this juncture it is most unfortunate that a major service authority sees the Merri Creek and Yarra valleys as a line of least resistance which provide an opportunity for it to easily route new power transmission lines.

The proposed 220 KV overhead system will be disastrous not only for the Yarra Valley but also for the proposed development of the Merri Creek Valley for recreational use.

It is submitted by the Committee that the assessment technique used by it provides a satisfactory criteria against which the impact of transmission lines can be evaluated.

The Committee contends also that in view of the above findings the present R1 proposal should not proceed. Later in this submission consideration of the development of other options is provided.

If it is in fact necessary, the Committee urges consideration of the development of other options, including an independent assessment of possible other routes.

OPEN SPACE CONSIDERATION

The Committee draws the Inquiry's attention to the following Table (Page 21) which gives 1978 figures on open spaces available to the public.

The 1954 M.M.B.W. (Metropolitan Open Space Inventory) recommends 3.5 acres (passive open space) per 1000 population.

This Committee sees the proposed new transmission lines as destroying public parklands and riverside.

If the areas already specifically threatened by the proposed lines are examined, the following will be found:

| | | | | | |
|-------------|-----|-------|-----|------|------------|
| HAWTHORN | 2.0 | acres | per | 1000 | population |
| PRAIRAN | 1.2 | " | " | " | " |
| FITZROY | 2.7 | " | " | " | " |
| COLLINGWOOD | 3.4 | " | " | " | " |
| BRUNSWICK | 0.7 | " | " | " | " |
| NORTHCOTE | 2.5 | " | " | " | " |
| RICHMOND | 2.9 | " | " | " | " |

This is well under 1954 recommended open space. Kew has 10.2 acres per 1000 population only because it includes a large proportion of the Yarra Bend Park.

SUMMARY (cont'd.)

The proposed new power lines and associated towers will, in the view of this Committee, invade the park in a very real and physical way. It is not just a visual threat, but a very real loss of parkland. This land, designated by the Government for the use and enjoyment of the City of Melbourne, its workers and its residents, is vital to the city dweller as open space, unfettered by steel and concrete intrusion. People who would most use these parks are from the above inner city suburbs, and in main live cheek by jowl industry and high rise. They are people who can least afford to lose the valuable asset of open land for recreation.

The 1954 recommendations are out of date - 3.5 acres per 1000 people is probably too little in view of the increased pressure and density of city living. This is reflected in the increased habit of the city dweller to flee the city in holiday and weekend periods.

Further alienating people from their home environment will be the result of new power lines through parklands which are already dwindling per head of population.

OPEN SPACE IN ACRES PER 1000 OF POPULATION BY LGA (based on 1978 population figures)

| LGA | Total Passive (Unrestricted) Open Space (1954 Standard = 3.5 acres/1000) | Total Public Developed (Active and Passive) Open Space, excluding Golf Courses, Race Courses, Greyhound and Trotting Tracks (Standard = 7.5 acres/1000) | Total Public Open Space (Developed and Undeveloped) |
|-------------------|---|--|--|
| Altona | 5.8 | 10.6 | 21.4 |
| Berwick | 38.0 | 45.7 | 54.9 |
| Box Hill | 4.5 | 8.0 | 10.3 |
| Brighton | 2.7 | 7.1 | 10.5 |
| Broadmeadows | 2.0 | 4.6 | 7.7 |
| Brunswick | 0.7 | 2.0 | 3.0 |
| Bulla | 17.6 | 24.6 | 33.8 |
| Camberwell | 3.4 | 6.8 | 8.0 |
| Caulfield | 0.9 | 3.3 | 3.4 |
| Chelsea | 5.1 | 8.8 | 12.3 |
| Coburg | 1.8 | 3.9 | 5.1 |
| Collingwood | 3.4 | 6.5 | 7.7 |
| Cranbourne (part) | 1.8 | 6.4 | 15.8 |
| Croydon | 5.9 | 11.3 | 18.3 |
| Dandenong | 3.5 | 7.0 | 8.9 |
| Diamond Valley | 2.6 | 8.7 | 12.3 |
| Doncaster & Temp. | 5.1 | 8.3 | 27.8 |
| Eltham | 320.1 | 324.1 | 355.3 |
| Essendon | 2.3 | 6.5 | 7.2 |
| Fitzroy | 2.7 | 3.4 | 3.5 |
| Footscray | 1.5 | 4.7 | 5.7 |
| Frankston | 6.2 | 10.3 | 17.7 |
| Hawthorn | 2.0 | 4.8 | 5.3 |
| Heidelberg | 4.0 | 7.2 | 15.3 |
| Keilor | 7.0 | 9.9 | 30.2 |
| Kew | 10.2 | 12.9 | 15.4 |
| Knox | 10.9 | 15.3 | 27.9 |
| Malvern | 1.6 | 4.9 | 7.4 |
| Melbourne | 11.7 | 20.0 | 24.5 |
| Melton | 14.8 | 18.1 | 121.2 |
| Moorabbin | 0.5 | 1.6 | 3.9 |
| Mordialloc | 5.2 | 9.5 | 10.2 |
| Northcote | 2.5 | 6.8 | 12.6 |
| Nunawading | 5.0 | 7.3 | 10.9 |
| Oakleigh | 1.1 | 5.4 | 7.1 |
| Pakenham (Part) | 38.1 | 62.7 | 106.8 |
| Port Melbourne | 4.5 | 9.6 | 12.5 |
| Prahran | 1.2 | 1.8 | 1.8 |
| Preston | 3.1 | 6.3 | 11.0 |
| Richmond | 2.9 | 4.6 | 6.0 |
| Ringwood | 4.4 | 8.8 | 14.2 |
| St. Kilda | 3.4 | 5.6 | 5.7 |
| Sandringham | 7.3 | 10.8 | 15.6 |
| South Melbourne | 3.6 | 16.2 | 21.8 |
| Springvale | 2.0 | 4.2 | 4.6 |
| Sunshine | 0.7 | 3.1 | 6.1 |
| Waverley | 5.3 | 8.1 | 10.4 |
| Werribee | 4.2 | 10.0 | 23.0 |
| Whittlesea | 120.0 | 123.2 | 147.6 |
| Williamstown | 3.1 | 16.8 | 18.9 |
| TOTAL | 11.0 | 14.6 | 20.9 |

APPENDIX.

M...i YARRA MUNICIPAL PROTECTION COMMITTEE

.. IMPACT SURVEY ..

| Vicinity of Pylon or Tower No. ↓ | INSTRUCTION - Fill in square on a scale rating for each item from IDEAL (0) to MAX. Envisaged Adverse Impact (10) | | | | | | | | | | Estimated No. of Dwellings with view to Pylon or Lines | Estimated No. of People using Park per annum (From local Council) | COMMENTS |
|-------------------------------------|---|--|--|---|--|----------------------|--|--|--------------------------------------|--|--|---|---|
| | Visual Impact within Park or Riverside | Visual Impact from outside Park or Riverside | Effect of Pylons & Lines on Vistas within Park | Effect of Pylons & Lines on Vistas outside Park | Effect on Urban Natural setting of Parks and surrounds | Effect on Vegetation | Physical Restriction of Pylons/ Lines curtailing use of Park | Effect of Inhibiting Recreation Activity (eg Bike Paths) | Effect on Attractiveness to Tourists | Effect on Commercial activity in Park/River area | | | |
| 1 | 8 | 9 | 9 | 9 | 7 | 5 | 7 | 7 | 9 | 7 | 60 | Not Available | (See Report) |
| 2 | 8 | 8 | 9 | 7 | 6 | 5 | 7 | 7 | 8 | 5 | 40 | " | " |
| 3 | 9 | 9 | 9 | 7 | 7 | 8 | 7 | 8 | 8 | 4 | 10 | " | " |
| 4 | 7 | 7 | 8 | 7 | 5 | 7 | 5 | 5 | 5 | 5 | 30 | " | " |
| 5 | 6 | 7 | 5 | 6 | 4 | 6 | 2 | 2 | 5 | 2 | 20 | " | " |
| 6 | 6 | 7 | 7 | 8 | 7 | 8 | 2 | 3 | 7 | 2 | 25 | " | " |
| 7 | 8 | 7 | 7 | 7 | 6 | 7 | 3 | 7 | 6 | 3 | 60 | " | " |
| | | | | | | | | | | | | | Maximum Adverse Impact ... 70 Actual Impact ... 44 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

220

MELBOURNE YARRA MUNICIPAL PROTECTION COMMITTEE
 .. IMPACT SURVEY ..

| Vicinity of Pylon or Tower No. | INSTRUCTION - Fill in square on a scale rating for each item from IDEAL (0) to MAX. Envisaged Adverse Impact (10) | | | | | | | | | | Estimated No. of Dwellings with view to Pylon or Lines | Estimated No. of People using Park per annum (From local Council) | COMMENTS |
|--------------------------------|---|--|--|---|--|----------------------|---|--|--------------------------------------|--|--|---|--|
| | Visual Impact within Park or Riverside | Visual Impact from outside Park or Riverside | Effect of Pylons & Lines on Vistas within Park | Effect of Pylons & Lines on Vistas outside Park | Effect on Urban Natural setting of Parks and surrounds | Effect on Vegetation | Physical Restriction of Pylons/Lines curtailing use of Park | Effect of Inhibiting Recreation Activity (eg Bike Paths) | Effect on Attractiveness to Tourists | Effect on Commercial activity in Park/River area | | | |
| 8 | 8 | 9 | 8 | 9 | 8 | 0 | 8 | 8 | 8 | 0 | 50 | | |
| 9 | 8 | 9 | 8 | 9 | 7 | 0 | 10 | 10 | 9 | 8 | 200 | Thousands | Car park for athletics area to be utilized. Will cause further alienation of parkland. |
| 10 | 9 | 9 | 8 | 9 | 9 | 9 | 9 | 8 | 9 | 0 | 150 | " | Narrow open space area used for recreation and close to houses. |
| 11 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 9 | 7 | 0 | 150 | " | Narrow open space area used for recreation and close to houses. |
| 12 | 9 | 8 | 8 | 8 | 7 | 5 | 8 | 8 | 6 | 0 | 50 | " | |
| 13 | 8 | 5 | 4 | 5 | 3 | 2 | 5 | 8 | 3 | 0 | 70 | " | This is in the vicinity of the Collingwood tip and proposed for future parkland as tip to be closed and filled in. |
| 14 | 8 | 8 | 8 | 4 | 2 | 3 | 5 | 9 | 10 | 0 | 1 | " | Tower to be located very close to the current bike path, possibly on it. |
| 14A & 15 | 0 | 9 | 6 | 4 | 7 | 0 | 0 | 0 | 3 | 0 | 50 | " | Terminal station towers. |
| 16 | 6 | 8 | 7 | 8 | 5 | 2 | 0 | 0 | 7 | 0 | 100 | " | Yarra Bend Park. Clear view down Roseneath Street. |
| | | | | | | | | | | | 721 | | Maximum Adverse Impact ... 900 Actual Impact ... 477 |

221

MELBOURNE YARRA MUNICIPAL PROTECTION COMMITTEE

.. IMPACT SURVEY ..

| Vicinity of Pylon or Tower No. ↓ | INSTRUCTION - Fill in square on a scale rating for each item from IDEAL (0) to MAX. Envisaged Adverse Impact (10) | | | | | | | | | | Estimated No. of Dwellings with view to Pylon or Lines | Estimated No. of People using Park per annum (From local Council) | COMMENTS | |
|-------------------------------------|---|--|--|---|--|----------------------|--|--|--------------------------------------|--|--|---|--|---|
| | Visual Impact within Park or Riverside | Visual Impact from outside Park or Riverside | Effect of Pylons & Lines on Vistas within Park | Effect of Pylons & Lines on Vistas outside Park | Effect on Urban Natural setting of Parks and surrounds | Effect on Vegetation | Physical Restriction of Pylons/ Lines curtailing use of Park | Effect of Inhibiting Recreation Activity (eg Bike Paths) | Effect on Attractiveness to Tourists | Effect on Commercial activity in Park/River area | | | | |
| 17 | 7 | 7 | 6 | 7 | 7 | 4 | 7 | 2 | 7 | 4 | | | 17-19. Poles located in open parkland areas. Highly visible from all vistas | |
| 18 | 7 | 7 | 6 | 7 | 7 | 4 | 7 | 2 | 7 | 4 | | | | |
| 19 | 8 | 8 | 8 | 8 | 8 | 5 | 5 | 5 | 8 | 6 | | | | |
| 20 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 8 | 5 | | | 20. Existing tower sited near ridge line. Clearly visible for miles. | |
| 21 | 8 | 8 | 8 | 8 | 8 | 5 | 8 | 8 | 8 | 8 | | | 21-27. Poles within Public Par 3 Golf Course. Interrupt vistas over Melbourne City line. | |
| 22 | 8 | 8 | 8 | 8 | 8 | 5 | 8 | 8 | 8 | 8 | | | | |
| 23 | 8 | 8 | 8 | 8 | 8 | 5 | 8 | 8 | 8 | 5 | } 200 | | 23-24. Situated within Dickinson Reserve. Popular area for picnic gatherings. | |
| 24 | 8 | 8 | 8 | 8 | 8 | 5 | 8 | 8 | 8 | 5 | | | | |
| 25 | 5 | 6 | 7 | 7 | 8 | 6 | 5 | 5 | 7 | 5 | | | | 25. Existing pylon shadows nearby houses in western sun. New pylon will be worse. |
| 26 | 5 | 6 | 7 | 7 | 8 | 6 | 5 | 5 | 7 | 5 | | | 26. To be located within market garden. Will interrupt beautiful views from Walmer Street Bridge down the Yarra. | |
| 27 | 6 | 5 | 5 | 5 | 8 | 5 | 6 | 5 | 7 | 7 | | | Maximum Adverse Impact ... 1100 Actual Impact ... 736 | |

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M. I. YARRA MUNICIPAL PROTECTION COMMITTEE

.. IMPACT SURVEY ..

| Vicinity of Pylon or Tower No. ↓ | INSTRUCTION - Fill in square on a scale rating for each item from IDEAL (0) to MAX. Envisaged Adverse Impact (10) | | | | | | | | | | Estimated No. of Dwellings with view to Pylon or Lines | Estimated No. of People using Park per annum (From local Council) | COMMENTS |
|-------------------------------------|---|--|--|---|--|----------------------|--|--|--------------------------------------|--|--|---|--|
| | Visual Impact within Park or Riverside | Visual Impact from outside Park or Riverside | Effect of Pylons & Lines on Vistas within Park | Effect of Pylons & Lines on Vistas outside Park | Effect on Urban Natural setting of Parks and surrounds | Effect on Vegetation | Physical Restriction of Pylons/ Lines curtailing use of Park | Effect of Inhibiting Recreation Activity (eg Bike Paths) | Effect on Attractiveness to Tourists | Effect on Commercial activity in Park/River area | | | |
| 28 | 7 | 9 | 4 | 8 | 8 | 5 | 6 | 0 | 2 | 5 | | | High impact on view from houses and riverbank area in Kew, also Barkers Road Bridge. |
| 29 | 10 | 7 | 8 | 7 | 8 | 5 | 6 | 7 | 7 | 5 | | | 28-33. High impact on views within and outside Pridmore Park and Yarra Bank Reserve. Will |
| 30 | 10 | 7 | 8 | 7 | 8 | 5 | 6 | 7 | 7 | 5 | | | affect use of parks for recreational activities and future bike path location. Will be visually intrusive within a very natural parkland environment |
| 31 | 10 | 7 | 8 | 7 | 8 | 5 | 6 | 7 | 7 | 5 | | | |
| 32 | 10 | 7 | 8 | 7 | 8 | 5 | 3 | 7 | 7 | 5 | | | |
| 33 | 10 | 7 | 7 | 8 | 7 | 7 | 9 | 7 | 7 | 6 | | Very Popular Reserve | |
| 34 | 6 | 8 | 6 | 7 | 8 | 2 | 0 | 0 | 4 | 5 | | | 34. Situated beside Hawthorn Bridge directly opposite Hawthorn Rowing Club. Cuts views to east and north. |
| 35 | 6 | 8 | 5 | 7 | 8 | 0 | 0 | 3 | 4 | 5 | | | 35. Located within Richmond High School sports fields (which are relatively small and inadequate). |
| 36 | 5 | 6 | 5 | 7 | 5 | 0 | 0 | 4 | 0 | 5 | | | 36. Setback from River but clearly visible from Richmond (park area). |
| 37 | 5 | 7 | 5 | 5 | 4 | 5 | 0 | 4 | 2 | 5 | | | 37. Cuts skyline on view from bridge. Possible removal of well-established trees. |
| | | | | | | | | | | | Approx. 500 | | Maximum Adverse Impact ... 1000 Actual Impact ... 582 |

M. I. YARRA MUNICIPAL PROTECTION COMMITTEE

.. IMPACT SURVEY ..

224

| Vicinity of Pylon or Tower No. ↓ | INSTRUCTION - Fill in square on a scale rating for each item from IDEAL (0) to MAX. Envisaged Adverse Impact (10) | | | | | | | | | | Estimated No. of Dwellings with view to Pylon or Lines | Estimated No. of People using Park per annum (From local Council) | COMMENTS |
|-------------------------------------|---|--|--|---|--|----------------------|--|--|--------------------------------------|--|--|---|--|
| | Visual Impact within Park or Riverside | Visual Impact from outside Park or Riverside | Effect of Pylons & Lines on Vistas within Park | Effect of Pylons & Lines on Vistas outside Park | Effect on Urban Natural setting of Parks and surrounds | Effect on Vegetation | Physical Restriction of Pylons/ Lines curtailing use of Park | Effect of Inhibiting Recreation Activity (eg Bike Paths) | Effect on Attractiveness to Tourists | Effect on Commercial activity in Park/River area | | | |
| 38 | 6 | 7 | 7 | 7 | 8 | 9 | 3 | 3 | 7 | 5 | | | All proposed poles/pylon position correspond with existing 66 KV Lines. 38-41. New power line will be clearly visible from Hawthorn side or river and Richmond as far as west side of Bendigo Street. It will severely mar views from within parkland. Some mature deciduous trees exist here and probably will have to be lopped to provide space for poles. Line will be very obtrusive looking west from Burnley oval area - one of the few parks available in Richmond. |
| 39 | 5 | 7 | 8 | 7 | 8 | 9 | 3 | 3 | 7 | 5 | | | |
| 40 | 8 | 7 | 6 | 6 | 8 | 8 | 4 | 4 | 7 | 5 | | | |
| 41 | 8 | 7 | 6 | 7 | 8 | 7 | 7 | 8 | 7 | 5 | | | |
| 42 | 5 | 8 | 5 | 7 | 6 | 6 | 5 | 5 | 7 | 5 | | | 42-43. Very obtrusive from Richmond Golf Course. 43 will utilise some of car parking area for club. |
| 43 | 5 | 8 | 5 | 7 | 6 | 6 | 5 | 5 | 7 | 5 | | | |
| 44 | 7 | 8 | 7 | 5 | 5 | 5 | 2 | 4 | 7 | 5 | | | 44-45. Existing 220 KV very obtrusive along riverside and adjoining surrounds. Visual impact of line will add severely to the maze of lines and towers in this area. Very ugly from river. |
| 45 | 10 | 5 | 6 | 5 | 4 | 5 | 4 | 3 | 5 | 6 | | | |
| 46 | 8 | 5 | 7 | 5 | 7 | 4 | 3 | 3 | 7 | 7 | | | 46-47. Visual prominence for cyclists on bike path, motorists using Alexandra Avenue, and recreational areas around Como. |
| 47 | 3 | 4 | 5 | 4 | 4 | 0 | 0 | 0 | 6 | 5 | | | 46 will utilise Tower House Rowing Club car parking area. 47 No foliage or screening. Will exist in very obtrusive position. |
| | | | | | | | | | | | APPROX. 1500 | | Maximum Adverse Impact ... 1000 Actual Impact 569 |

THE PROCESS FOR ASSESSMENT AND APPROVAL OF POWER LINES TO MINIMISE DUPLICATION OF PERMITS
AND MAXIMISE PUBLIC INPUT

INTRODUCTION

To date, the political administrative structures, through which decisions are taken, handicap, and often preclude, co-ordination and reconciliation of environmental and developmental policies.

It is often difficult to clearly identify where the existing bureaucratic decision-making process has led to undesired results, as public involvement and scrutiny is seldom invited. This Term of Reference recognises the need by the State Government to deal with environmental management by improving the decision-making process.

The broad spectrum of decision-makers must also be aware of its availability, and correctly appraise its significance for their work.

The purpose of decision-making is to arrive at an informal judgement regarding proposed actions and, whether, how, or when to act. A decision against action may be as significant as one for action, and the way in which a decision is arrived at may be as important as the substance of what is decided.

A structure for environmental and planning decision-making must, therefore, provide a coherent system that links all political levels - local, state and regional - and that provides for continuous communication among experts, planners and decision-makers as well as between official and non-governmental agencies.

THE PROCESS

The essential aim of the process for assessment and approval of power lines is:

- Firstly, maintain and improve existing planning procedures that would normally apply for permit determination, and additionally, establish an independent panel to investigate the proposal in its totality.
- Secondly, to ensure that all those affected by such a proposal be given the opportunity to participate in the decision-making process, and furthermore, to call on persons that will assist in making the best decision. Such participation should include the necessary ingredients of public input, accessibility and accountability.

In line with the above it would be necessary that an Independent Panel be established with inquisitorial powers and charged with the responsibility of obtaining sufficient technical information to equal the technical resources of the proponent (S.E.C.V.). Accordingly, the Panel should be given power to call a person, or persons, to give evidence and request such papers, files and documentation as it deems necessary.

It is imperative that this Panel function as a public inquiry by allowing public input, accessibility and accountability.

A time period should be imposed on the Panel for its determination although it may be necessary to allow the Panel to request an extension of time, but only on the unanimous request of the Panel. The Panel should sit in a central location, preferably in the City, and advertise extensively in local and daily media for submissions in addition to notifying interested parties.

All persons should have the right to be heard, whether legal persons or unincorporated associations, and whether aggrieved or not aggrieved. Submissions should be allowed to be made either orally or in writing, or both.

THE PROCESS (cont'd.)

As the proposal concerns the S.E.C.V. the right of questioning the Commission through the Panel should be granted.

After hearing all submissions the Panel should provide a preliminary recommendation, with detailed and comprehensive reasons for its recommendation. Such preliminary recommendation should be made public and subject to further submissions to the Panel before a final recommendation is made.

The final recommendation should once again set out in detail all reasons and information relied upon, and it should be made public. The final recommendation should then be presented to the Government.

This process is obviously intended to act in addition to the normal planning process which the S.E.C.V. must undertake before proceeding with its proposal.

As an Independent Panel the credentials of the individuals who comprise it are important. It is the Committee's recommendation that the Panel should consist of three persons comprising a Chairman and two other members. Each of them should be significantly distanced from the S.E.C.V. and not only be, but seen to be, independent from both the Commission and the State Government. Furthermore, they should have the necessary qualifications and ability to comprehend the problem, provide a proper determination and when necessary call on expert witnesses for further clarification. It is important that a lay person representing the community should sit on this Panel.

This process does not obviate the need for an Environmental Effects Statement, but is a process where all information gathered in relation to the proposed development is called in to one Panel for determination.

THE S.E.C.V. PROPOSAL

The S.E.C.V. has identified three main phases for the approval process for major transmission work, being:

- (a) Planning phase
- (b) Investigation phase
- (c) Route determination phase.

The S.E.C.V. acknowledges that it is responsible to the Minister for Minerals and Energy for justifying particular transmission work, however, such works will also involve the responsibilities of the Ministry for Planning and the Ministry for Conservation. It is therefore agreed that in decisions as to major transmission works, the community would be best served by the establishment of an Independent Panel.

Two procedures presently exist for obtaining planning approval for routes for transmission works, being:

- (a) Where an easement exists
- (b) Where a new easement is required
- (c) A combination of both.

Table 6.1. in the S.E.C.V. report to the Committee of Inquiry refers to "Procedures which have existed to the present for the establishment of a new easement".

It is evident from this procedure that public input occurs at the end rather than at the beginning. It is essential that there be public input in the planning and investigation phase as past experience shows that the decision is already made and public comments will do little to influence or change a proposal at this late stage of the planning procedure. In addition, public access to information and documentation should be freely available for perusal and use by the public. It is questionable whether the interaction as noted in this Table occurs between the S.E.C.V. and the various government and public bodies as well as local governments.

The S.E.C.V. should give full accountability of its decisions and alternatives that may have been examined to all involved and interested parties. As already noted earlier in this submission, the availability of information in a usable form is a necessary step towards better environmental and planning decisions. However, any decision-making procedure must provide a coherent system that links all political and administrative levels and provides regular channels for continuous communication among experts, planners and decision-makers as well as between official and non-governmental agencies.

Table 6.2 in the S.E.C.V. report to the Committee of Inquiry refers to "Options for assessment and approval of planning".

An Environmental Effects Statement is but one of the many contributions that need to be made to achieve the best possible decision. It should still be required in addition to public participation. It may be that the Independent Panel, being inquisitorial in nature, will be able to call persons responsible for the Environmental Effects Statement and the public to make submissions before it, or give the public the right to make submissions in addition to the Environmental Effects Statement.

There are three proposals put forward for greater public participation during the planning phase.

The first proposal requires the Minister for Minerals and Energy to issue a report to the public in which the S.E.C.V. planning proposals are set out. This is unsatisfactory as the public participation comes after the S.E.C.V. has formulated its own planning proposal. Rather, it should have public input at the very beginning to ensure that serious, not token, consideration has been given to public comments.

The second proposal requires the Minister for Minerals and Energy to request a Parliamentary Committee to hold a public inquiry. (This will have certain political problems and because of the technical nature of transmission works, an Independent Panel with the appropriate credentials would best serve the community and provide the best solution.)

The third proposal requires the Minister for Minerals and Energy to grant approval in principle to the plan, subject to an environmental inquiry. Once again, this is giving the public token participation after the decision has already been made. Indeed if the Minister has granted approval in principle to the plan, the likelihood is there will be little variation or amendment to those plans.

Table 6.3 in the S.E.C.V. report to the Committee of Inquiry refers to "Options for assessment and approval of possible alternative corridors and sites".

Three means are proposed for improving public participation in the investigation phase which do provide greater public input and accessibility to information.

Table 6.4 in the S.E.C.V. report to the Committee of Inquiry refers to "Options for environmental assessment and determination of a route/sites".

In making a final determination in relation to transmission works it is essential throughout the whole process and all three phases that there occur public input, accessibility and accountability. The earlier in the process that this occurs, the greater and more effective is the public participation in the decision-making process.

A number of options are shown in this Table, however, the proposals as set out in the Committee's submission recommends the establishment of an Independent Panel to conduct an inquiry. An inquiry of this nature is but part of a whole process that requires a constant stream of public input. The Independent Panel should have complete power, to investigate all matters, to call any person(s) and document(s) and to hear all person(s), particularly those with equivalent technical ability to the S.E.C.V.

CONSIDERATION OF OTHER OPTIONS FOR THE PROPOSED TRANSMISSION SUPPLY FOR MELBOURNE

The S.E.C.V. proposals for new power lines are based on two propositions:

. . . Load Increase

That the load in the Central Business District and the Inner Eastern Suburbs will increase markedly.

. . . Security of Supply

That improved security of supply to the Eastern Central Business District is necessary.

Load Increase

In Section 1.2 of its report, the S.E.C.V. states that accurate long term forecasts are not realistic. Indeed it has been shown that the Commission's overall forecasts for power requirements in the State have been over-exaggerated. It would seem therefore, that an independent survey of likely load growth within the metropolitan area in general, and the Central Business District and Inner Eastern Suburbs in particular, should be undertaken to provide an alternative assessment to that already given by the S.E.C.V. The Committee does not believe that historical methods alone of assessing likely load increases are appropriate in today's rapidly changing socio-economic and technical environment. Careful and prudent Government planning action and energy management could have a considerable bearing on ultimate load growth.

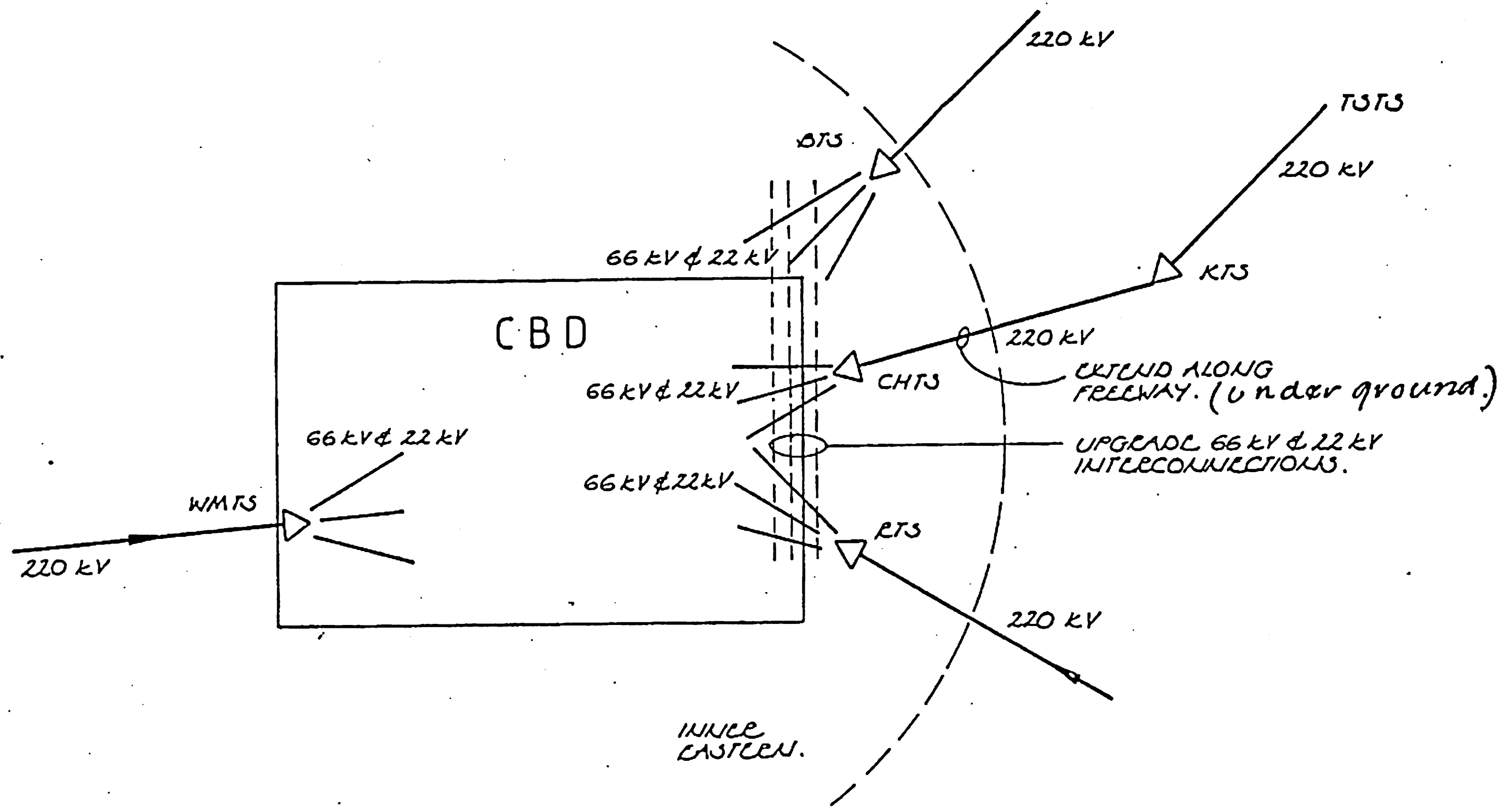
Supply to the Inner Eastern Suburbs and the eastern portion of the Central Business District could be upgraded with small disruption to the visual environment by employing Option R2. This calls for the extension of the 200 KV line from the Templestowe Terminal Station via the future Kew Terminal Station to the new Clifton Hill Terminal Station with a security connection to Richmond.

AN ALTERNATIVE OPTION

The Committee proposes that the R2 option be extended to the Clifton Hill Terminal Station only, deleting the Richmond security connection. This will allow upgrading of the supply to the inner eastern suburbs and the eastern central business district. Upgrading of the existing 66 KV and 220 KV reticulation in these areas could be made a viable alternative to the Richmond/Clifton Hill circuit.

Parkland is already alienated for the R2 option over the route from Templestowe Terminal Station to the proposed Kew Terminal Station site adjacent to the Eastern Freeway/Burke Road interchange.

The S.E.C.V. already recognises the clear possibility of extending the 220 KV line from Kew to the proposed Clifton Hill Terminal Station. The transmission line would be underground.



MODIFIED R2 OPTION.

Security of Supply

Within the Committee's limited capability it has great difficulty in understanding fully the proposals. This underlines the Committee's previous argument.

Much is made of the need to improve the security of supply to Richmond and Brunswick by the means of a transmission line from Richmond to Brunswick via Clifton Hill. If this need is proved, rather than destroy the parklands visually along the Merri Creek and Yarra Valleys, or create further disruption or visual degradation in major streets of the affected suburbs, the Committee believes that security to the supply could be improved by upgrading and modernising the existing circuitry and switchgear within the Inner Eastern Suburbs and the Central Business District.

In particular, the Central Business District should yield a number of options for upgrading any present easement.

An independent study should be undertaken of the existing Central Business District and Inner Eastern Suburbs distribution networks to determine the costs associated with upgrading those networks.

Consideration should also be given to the routing of overhead lines along railway easements, where overhead wires are already a feature of the landscape.

Whilst we do not wish to see visual environment of parklands destroyed, we equally do not wish to see the visual environment of Inner Suburban streets destroyed any more than they are to date. The value of the visual environment compared with the cost of finding alternative routes, or underground cables, needs to be weighed carefully.

The proposals put forward by the Committee suggest a number of new options which should be considered. A very important point is that the Committee believes an independent assessment of the load requirements and the means of satisfying them should be met. This independent assessment should not address Supply Authority requirements only, but should embrace all of the community requirements. The Supply Authority studies are essentially engineering based, and serve to provide only the most narrow economic solution. The implications are, however, much wider.

CONCLUSION

1. CRITERIA

The criteria which have been developed in assessing the transmission line proposed by the S.E.C.V. from Brunswick to Richmond would be applicable for assessing other transmission line proposals.

2. PROCESS

The processes recommended for assessing proposals made by bodies such as the S.E.C.V. for development of transmission lines should always be assessed by independent bodies of equal technological means. As well as this the processes must allow for public participation at the initial stages and not after the proposal has been formulated.

CONCLUSION (cont'd.)3. PREFERRED OPTION

There are options which can achieve the S.E.C.V.'s objective of securing the services which do not pass through public parklands and which have a less detrimental effect on the environment.

4. 220 KV BRUNSWICK, RICHMOND

The proposed 220 KV transmission line between Brunswick and Richmond is extremely detrimental to public parklands and riversides. It would have the effect of reducing their area and their usage. This is particularly pertinent when the passive open space in 7 of the municipalities concerned is already under the old (1954) recommended Melbourne Metropolitan Board of Works minimum ratio.

ACKNOWLEDGEMENT

The Merri Yarra Municipal Protection Committee appreciates having been given the opportunity to respond to the Natural Resources and Environment Committee on the State Electricity Commission of Victoria's proposals, and looks forward to supporting this submission before the Inquiry.


 MERRI YARRA MUNICIPAL PROTECTION COMMITTEE

10th August, 1983

Paul Jones,
Mayor,
Municipal Offices,
Burwood Road,
Hawthorn, 3122.

Hon. I.R. Knowles,
Chairman,
Parliamentary Natural Resources and
Environment Committee,
7th Floor,
100 Exhibition Street,
MELBOURNE, 3000.

Dear Sir,

Reference : Proposed SECV Transmission Line,
Yarra River Valley and Merri Creek Valley.

Further to my letter of 28th July, I enclose a map showing the alternate route which was presented to the SECV Commissioners Messrs. Trethowen and Gibson, and General Manager, Mr. Smith at a meeting today with them.

The Commissioners received our presentation on the understanding that we present it to you, with the view that, provided you were in agreement, they would report to you on its costing and feasibility.

This preferred optional route was arrived at our last meeting of the Merri Yarra Municipal Protection Committee and it was the unanimous opinion of the Committee members, having discussed this with their Councils that the environmental impact by this route would be more acceptable than the new 220KV route down the Valley and they would support it publicly should the need arise.

We wish to point out that this option is for an overhead line throughout and goes in direct line along streets and the railway, (similar to the SECV option 4) and is as suggested by the individual Council representatives.

It achieves the basic objectives of the Committee of not only protecting the Valley from the intrusion of the new line but, because the 66KV line will be redundant, of having it also removed from the Valley landscapes. We hope this important proposal will be accepted as part of our submission to you.

Would you please indicate to the SEC Chairman at your earliest convenience that you are agreeable to them making their appraisal and report on it to you.

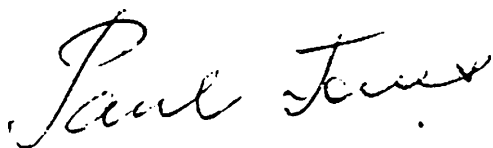
A REGIONAL COMMITTEE

Comprising Representatives of Brunswick, Collingwood, Fitzroy, Hawthorn,
Kew, Northcote, Prahran and Richmond Councils

We would be pleased to receive copies for our Committee of such a Report.

We thank you for your continued co-operation and practical handling of this important Inquiry.

Yours faithfully,

A handwritten signature in cursive script that reads "Paul Jones".

Paul Jones,
Mayor of Hawthorn,
Chairman - Merri Yarra Municipal Protection Committee.

c.c. - S.E.C.V.



INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

COMMENTS ON ALTERNATIVE ROUTES SUGGESTED BY
MERRI YARRA MUNICIPAL PROTECTION COMMITTEE

TRANSMISSION DEVELOPMENT DEPARTMENT
STATE ELECTRICITY COMMISSION OF VICTORIA
17 AUGUST 1983

17 August 1983

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE
COMMENTS ON ALTERNATIVE ROUTE SUGGESTED BY
MERRI YARRA MUNICIPAL PROTECTION COMMITTEE (MYMPC)

In their July 1983 submission to the Natural Resources Committee, the Merri Yarra Municipal Protection Committee raised concerns regarding the effects of the proposed Richmond to Brunswick 220 000 volt line on land use and visual amenity of the open lands along the proposed SEC route. In a letter to the Committee on 10 August 1983, they suggested two alternatives for consideration by the Natural Resources and Environment Committee -

- a an overhead line street route for the total length of the line between Brunswick and Richmond (Figure 1);
- b a variation of the alignment of the SEC proposed line along the Merri Creek and Yarra River (Figure 2).

The following provides comments on the MYMPC proposal in relation to practicability, environmental considerations and costs.

MYMPC PROPOSED STREET ROUTE

The SEC have investigated a number of alternative complete street routes and as indicated in the July 1983 submission none of these have been considered viable options.

In particular, a route along Hoddle Street was investigated as proposed by MYMPC and was not considered to be viable as a total route for the following reasons:

BRUNSWICK TO CLIFTON HILL

1 Construction of a line in St Georges Road is not feasible. The median strip is an MMBW Water Reserve containing large water pipes which would make construction of a transmission line impractical. An easement could only be provided by limitation on the street used by intrusion of the poles into the carriageway.

2 For the section from Hoddle Street to the Clifton Hill Terminal Station site along the Eastern Freeway, there is insufficient room to construct the proposed double circuit line from Brunswick and the proposed single circuit line to Richmond. Sufficient easement could only be provided by demolition of buildings.

CLIFTON HILL TO RICHMOND

3 Construction of a line along Hoddle Street, from the Eastern Freeway to Bridge Road, as proposed, has severe practical difficulties requiring -

- construction of poles of 1.2 m diameter down the median strip with crash barriers with extreme environmental impact because of the narrow corridor where no shielding is possible as in more open areas - viewed from a distance, the poles would appear as a huge picket fence;

- relocation of other services, including relocation of street lighting from the median strip onto either side of the road;

- disruption of traffic on a main arterial road and outlet for the Eastern Freeway for a period of about 9 months during construction and at regular intervals for maintenance.

4 Along Punt Road between Bridge Road and Swan Street an easement could only be provided by -

- demolition of buildings and intrusion into the grounds of the Yarra Park Primary School and Richmond Football Ground or if the line was located on the eastern side of Punt Road large scale demolition of buildings would be required;

- erection of tall structures to cross Richmond Railway Station with disruption to rail traffic during construction and maintenance - to avoid this, the alternative would be to take an easement through Yarra Park between the Richmond Football Ground and the MCG.

5 Along Swan Street, an easement could only be provided by large scale demolition of retail and commercial premises.

6 Overall, the visual impact of a line along the proposed streets would be severe for the local communities particularly in the high density living area around Johnston Street, Collingwood, where there are high-rise flats and retail developments and the retail/residential areas in Swan Street.

The Merri Yarra Municipal Protection Committee offer the opinion that the street route would be more acceptable than down the Merri Creek and Yarra Valley. The wider community and many more people and their livelihoods would be far more directly affected by the proposed street route and they must also be considered.

The section of the route with less severe impact is that in Hoddle Street north of the eastern freeway to Queens Parade where an easement could be provided through the boundary of Mayors Park and Darling Gardens.

Large visually intrusive structures would be required in Mayors Park to provide for crossing the high level Heidelberg Road crossing of Queens Parade. This section of a street route was tested as an option to the route along the Merri Creek around the Esplanade by the Melbourne University Landscape Assessment and was considered to have a higher visual impact than the proposed route in the Merri Creek Valley.

7 In addition to the above constraints, the overall cost of the proposed total street route would be approximately \$10M compared with \$7M for the SEC proposal. The increase is due to higher line design costs, the high costs of purchasing and demolishing buildings, and the cost of disruption and relocation of other community services.

The additional cost is not considered to provide any improvement in the environmental impact over the proposed SEC route and is arguably significantly inferior to the proposed route.

MYMPC ALTERNATIVE

MERRI CREEK-YARRA VALLEY OVERHEAD LINE ROUTE

The proposed route shown on Figure 2 is similar to the SEC route with minor re-alignments to take into account features perceived as being sensitive.

The feasibility, environmental effects and costs of these re-alignments could be considered together with other suggested variations to the proposed SEC route during the preparation of an Environmental Effect Statement (EES) and evaluated following public examination of all alternatives presented in the EES.

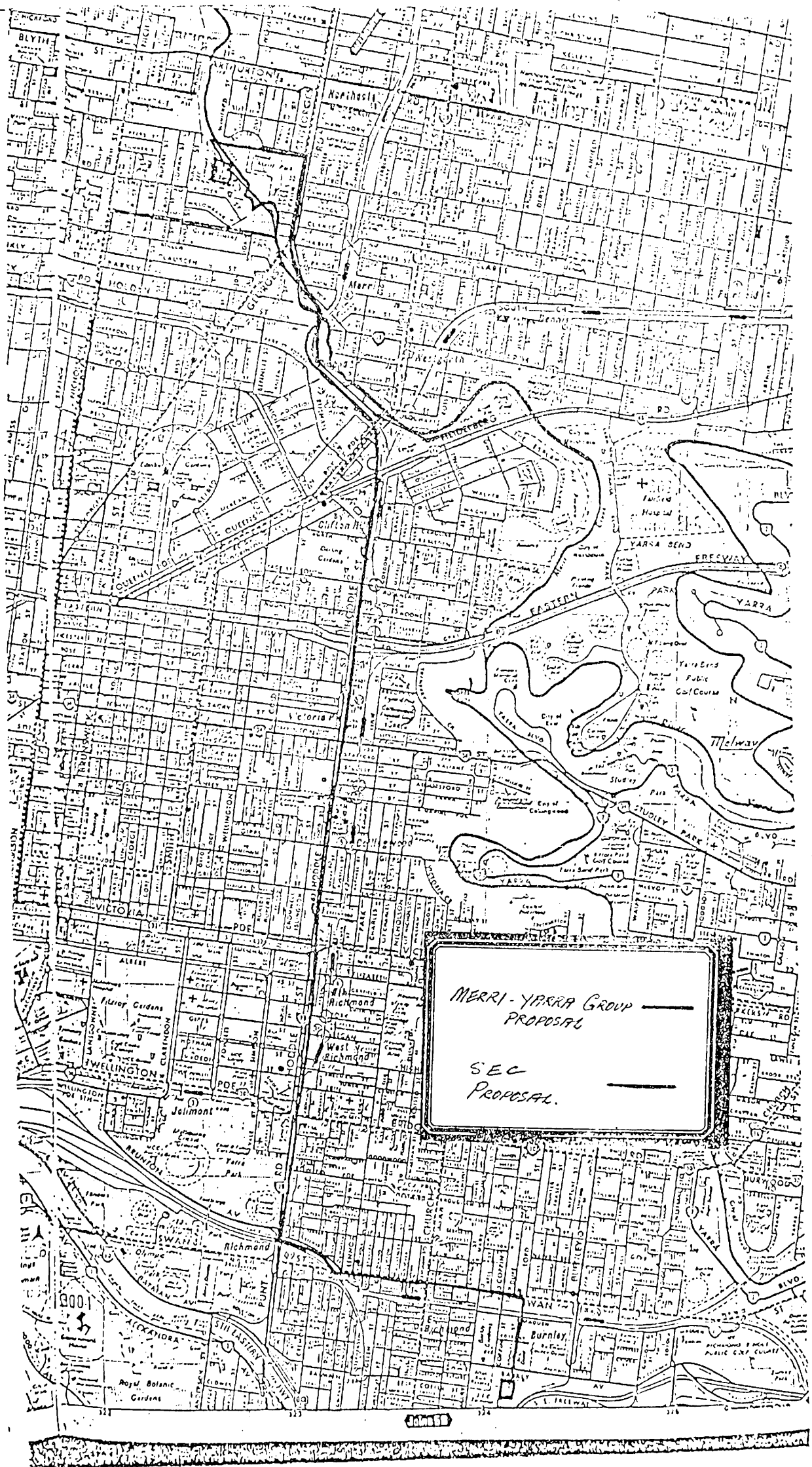
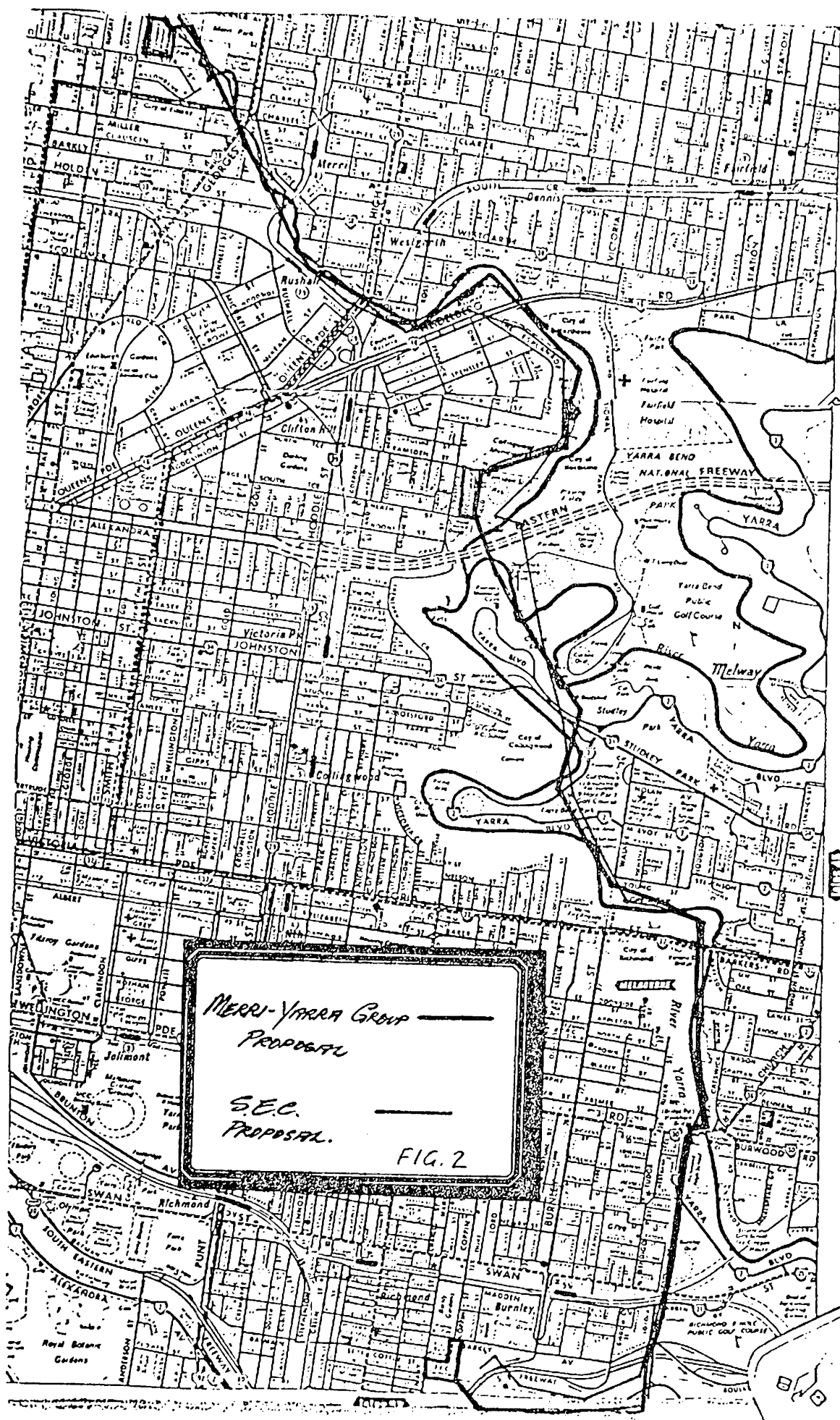


FIG 1





MELBOURNE AND METROPOLITAN BOARD OF WORKS

625 Little Collins Street Melbourne
Box 4342 Melbourne Vic 3001

Telex: AA 34220 Cable and Telegraphic Address: 'Metropolis'

Correspondence To: Director of Administration

Telephone Enquiries: 615 5301 - the Chairman

Board's Reference: 725/101/0081

26th July 1983.

Mr. Malcolm R. Knight,
Director of Research,
Natural Resources and Environment
Committee,
100 Exhibition Street,
MELBOURNE. Vic., 3000.

Dear Mr. Knight,

SEC 220 kv TRANSMISSION LINE PROPOSAL -
BRUNSWICK TO HERRING ISLAND

I understand that the Parliamentary Committee will next meet on Wednesday 27th July 1983, when they will consider two basic issues :

- . the need for additional power supplies in the central and inner areas of Melbourne; and
- . if such a need is established, the best way of providing the required link.

You have already received advice from the Board's officers on :

- . the criteria for assessing alternative routes and types of structures;
- . the future development possibilities for the inner area; and
- . the statutory processes involved in approval.

I now enclose a copy of a report prepared by the Board's Planning Branch dealing with the proposed 220 kv SEC transmission line along the Merri Creek-Yarra River route.

The report indicates both in written and photographic form, the generally high landscape quality of the immediate river and creek valleys and it demonstrates the significant impact that the proposed line would have on this sensitive area.

Whilst the area is already traversed by a 66 kv power line, this is not seen as sufficient justification for creating further detriment to the visual quality of these relatively narrow river and creek valleys.

26th July 1983.

In this respect, the proposal would constitute a major departure from the principles which have been enunciated on a number of occasions which aim to conserve and enhance the landscape quality of the Lower Yarra River. In particular, your attention is drawn to Statement of Planning Policy No. 4 - Yarra River of 1971, and to the Yarra Development Act 1981.

A copy of the draft report 'Planning Opportunities along the Lower Yarra River' which was recently prepared for the Board's Lower Yarra Advisory Committee is also enclosed.

In all the circumstances, it is recommended to the Committee that more appropriate alternatives for power distribution should be sought.

Yours faithfully,



R.D. MARGINSON
C h a i r m a n

Encls

RICHMOND TO BRUNSWICK MAJOR TRANSMISSION LINE PROPOSAL -
 COMMENTS OF EFFECT ON THE LANDSCAPE

I SEC PROPOSAL - EFFECT ON THE YARRA RIVER/MERRI CREEK
 CORRIDOR

The area which would be affected by the proposal covers the Merri Creek Valley from the Brunswick terminal station at Sumner Park/Merri Park to the creek's confluence with the Yarra and continues down the Yarra to the Richmond terminal station on Mary Street, generally following the existing easement. Adjacent land use is diverse, but there are significant linear linkages of land which has been reserved or developed for public open space or for other public purposes, or zoned for Special Use 1. (mainly used for golf courses in the study area.)

Historically, the river valley was generally developed with little thought to its value as an aesthetic and recreational amenity. Hence, when the SEC easement was introduced, it is not surprising that the river valley was accepted as a low-cost existing 'right-of-way'. However, in 1971, Statement of Planning Policy No. 4 directed that the "River Yarra and its immediate environs shall be planned primarily as an open space system for nature conservation and recreation" It further identified the River Yarra and its environs "as one of the most significant physical features in the Melbourne metropolis". The Statement also gave consideration to the creeks which feed the Yarra, including the Merri. In 1981, the Yarra Development Act gave further effect to the SOPP No. 4. Planning for the development of the Merri Creek for public open space is well advanced as is the preliminary planning for a Concept Plan for enhancement of the Yarra for public enjoyment.

There is now a clear change in direction in thinking and planning for the river and its immediate environs. The existing transmission line no longer provides a sufficient basis to justify further degradation of that route through the building of significantly larger power infrastructure.

II EFFECT ON THE LANDSCAPE OF THE PROPOSAL

The Merri Yarra Municipal Protection Committee carried out a landscape assessment to determine the impact of the proposal on the landscape at each proposed pylon or pole site. Although the assessment technique used is not uncommon, interpreting the results is quite confusing. This is due to lack of definitions of parameters, overlapping of parameters, probable double counting of parameters and the use of simple arithmetic algorithms to analyse the results of subjective ratings of quality.

Furthermore, as different groups of evaluators examined different sections of the transmission route, there is some doubt as to the consistency of the scoring results.

Consequently, Board Officers carried out an independent landscape assessment for each of the pylon/pole sites and for possible alternatives. Due to severe time constraints, the approach taken had to be simple without the refinement in the field which is usual in such assessments. The objectives were to identify the more sensitive locations in the proposal and to identify any alternatives which might minimise any negative visual impact.

ASSESSMENT METHOD FOR THE PROPOSED TRANSMISSION LINE

Five qualities were chosen which were specifically related to the proposal and which are generally agreed (in the professional literature) to have a strong bearing on landscape quality. These qualities are listed and defined below. At each site, one of 5 ratings was assigned by two viewers who mentally superimposed the proposed pylon/pole on the scene. The ratings are rather akin to a student report with E representing the worst case and A, the best. No attempt was made to combine these independent variables, but a site with numerous "D" and "E" ratings was considered sensitive in some degree. Brief comments on each of the sites were also made. (Ref. to Appendix for ratings of the 47 sites).

PARAMETERS AFFECTING LANDSCAPE QUALITY

(i) Landform

This was looked at in relation to the ability of the topography of the site and surroundings to visually absorb the impact of the pylon/pole. An open, panoramic view area was regarded as having poor visual absorption capability (rating E) while a site which could visually absorb the pylon/pole was given an A rating. The sheer height of the proposed towers precluded any A ratings, though higher ratings were possible where the proposal specified a shorter pole.

(ii) Edge Definition of Tower

It was assumed that the pylon/pole finish would be galvanized which is initially quite harsh, but weathers in time to a sort of "cloudy sky" colour. In locations with many man-made elements and particularly industrial areas, the edge of the tower would tend to blend with other angular edges in the landscape. In areas where the components of the landscape are mainly natural, the tower edges have greater impact. Such a 'sharp contrast' was given an E rating while a tower superimposed on an industrial landscape was given a lower rating.

(iii) Existing Visual Integrity

A landscape consisting of a wide diversity of line, colour, texture and form with no apparent or defineable pattern (interrupted) is generally regarded as poor in quality and therefore the addition of one more intrusion (eg. a tower) would have a lesser impact (A rating) than if the existing scene were cohesive (E rating).

(iv) Visual Access to Tower

A location which is viewable by many persons was regarded as more sensitive (E rating) than one affecting only a few viewers (A rating). No attempt was made to weight the importance of different types of viewers - i.e., motorists, residents, recreationists.

(v) Impact on River Amenity

Where a tower is likely to strongly affect the visual or physical amenity of the river and its immediate environs, an E rating was given. The justification for using this parameter stems in large part from the provisions of Statement of Planning Policy No. 4 and the Yarra Development Act. (Ref. to Part 1 of this report.) Towers set well back from the river generally were given lower impact ratings.

The individual ratings for each of the pylon sites is given in the Appendix. The following general comments can be concluded from the assessments.

- The 220KV towers would have a significantly greater visual impact than the existing 66KV towers and poles. In general the impact of the 220KV poles would be only slightly greater than that of the 66KV towers, because although the former would be much taller, their form is more aesthetically acceptable than the latter.
- Where existing towers and poles are surrounded by mature trees of similar height their visual impact is greatly softened by screening and background effects. However, existing vegetation and even possible landscape planting would be of more limited ameliorative value in many situations with respect to the proposed, taller towers and poles.
- The impact of the proposed towers and poles would be especially severe where the sites are either in areas of high existing or potential landscape amenity or in close proximity to dwellings.

(vi) Most Sensitive Areas

The most sensitive sites identified in the survey are as follows :

- Tower 3 is proposed to be sited near the St. Georges Road Bridge, in an attractive parkland area of strategic importance to the development of open space along Merri Creek.
- Tower 7 would be sited near the Queens Parade Bridge in area with major potential for open space development along Merri Creek.
- Towers 10 and 11 would be located in an area of attractive informal open space bordering Merri Creek, in close proximity to a residential area.
- Towers 19 and 20 would be located on very prominent sites overlooking the Yarra Bend Park and other parkland (Tower 21 would have only slightly less impact).

- Tower 27 would be located on the banks of the Yarra in a site of strategic importance for open space development.
- Towers 44 and 45 would be located on strategically located sites in an area which has been recognised as of regional significance for open space (and which has already been degraded by power infrastructure).

A number of other proposed tower/pole sites must also be regarded as having a high degree of environmental sensitivity; these include numbers 2, 4, 6, 9, 12, 18, 21, 25, 28, 33, 34, 35, 36, 37, 39, 40 and 46 (refer to the attached descriptions of individual sites).

III ASSESSMENT OF ALTERNATIVES

Some alternatives to the original SEC proposal have recently been presented to the Natural Resources and Environment Committee; these alternatives relate to specific sections of the transmission route.

Three alternatives have been proposed in the Clifton Hill area. One would involve connecting Tower 7 with the terminal station via a pole line along Hoddle Street (and then along either Ramsden or Roseneath Streets). This route would pass through an attractive area of open space bordering Hoddle Street and then along a largely residential street; clearly these intrusions constitute major disadvantages. A second option would connect Towers 9 and 13 via a series of poles generally sited below the edge of the valley slopes. This option has the advantages of greater separation from dwellings and the substitution of poles for towers, but it would involve greater intrusion within the Merri Creek environs. A third, quite expensive option would involve an underground cable along Berry and Ramsden Streets; this approach would avoid major environmental intrusion.

At the Richmond end of the route, it has been proposed that a pole line could connect Pole 41 with the terminal station via Madden Grove and Rooney Street. This alternative has the advantage of avoiding further intrusion along the Yarra in the vicinity of Alexandra Parade. However, the alternative pole line would be in close proximity to a number of houses (note that some concern has been expressed in the literature that exposure to high voltage power infrastructure may have adverse health effects). Clearly, undergrounding would be another option in this area.

While certain of the proposed alternatives for sections of the transmission route might reduce the potential environmental degradation associated with the transmission line, no specific alternatives have been advanced with respect to other sections of the route. In particular major problems remain in the sections through the Studley Park area, near Young Street, in the vicinity of Burnley Oval, and the 'upstream' end along Merri Creek. Although landscape planting would have some ameliorative value in several situations, greater benefit could be gained by the substitution of poles for towers where possible, as well as through some changes in siting.

One alternative not mentioned is the Carba Dry Ice Site (Pylon No. 27). This site, which is for sale, is partially floodprone. Because of the site's availability, the opportunity exists for the SEC to purchase all or part of the land and to relocate the proposed tower to a less obtrusive location to the north of the site leaving the floodprone area for public open space. A cycle path is planned to pass through the proposed tower location.

Perhaps the greatest impact of implementing the proposal will be the sheer height and width of the towers. Possible poles might be a feasible alternative to some of the towers, even though spans between poles would need to be shorter than between towers. The impact of the existing (much lower) transmission line is substantially softened by mature tree plantings - a feat not possible with the higher towers. However, care would need to be taken to ensure that for visual cohesion, a line has 'visual sections' of only poles or only pylons, rather than a mix.

An opinion expressed by those officers carrying out the assessment was that serious consideration should be given to replacing at least the most sensitive pylons with poles.

IV SUMMARY

The fact that an existing transmission line traverses the proposed route is an insufficient justification for making an undesirable situation (albeit, necessary utility) worse. The Yarra River and the Merri Creek have been given new directions for enhancement and development which require careful planning if an intrusion such as the proposal is to be accommodated. The existing line is generally tolerable because its height is limited and therefore native vegetation and low-rise buildings soften its impact. The proposed towers are well beyond the scale of existing landscape components.

In assessing costs and benefits of the proposal and its alternatives, good landscape, as a public asset, eludes evaluation. In this specific instance, however, the numbers of people concerned would certainly escalate landscape value. For this reason, the cost to find alternatives to the more sensitive site proposals seems merited.

ANNE WHITTENBURY
TREVOR BLAKE
HEATHER LLOYD

20 July 1983

SITE SENSITIVITY RATINGS - SUMMARY TABLE

PARAMETERS

SITE NUMBER

1* 2* 3* 4* 5* 6* 7* 8* 9* 10* 11* 12* 13* 14* 15* 16* 17 18 19* 20* 21* 22 23 24

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landform (Visual Absorption Capability) | D | D | D | D | D | C | E | D | D | E | E | E | D | D | D | D | D | D | E | E | E | D | D | C |
| Edge Definition of Tower | C | E | C | D | C | C | D | C | D | E | E | E | D | D | D | D | D | D | E | E | D | D | D | C |
| Existing Visual Integrity | C | D | D | B | B | C | D | C | C | E | E | D | B | B | B | B | C | D | E | D | E | E | D | D |
| Visual Access to Tower | C | D | E | C | C | D | E | D | D | E | D | C | B | C | B | D | D | C | D | E | D | C | C | L |
| Impact on River Amenity | C | C | E | B | C | C | E | C | C | D | D | C | C | C | B | B | C | D | E | E | D | B | C | C |

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25* 26 27* 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44* 45* 46* 47*

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|------|------|------|------|------|------|------|---|---|---|---|
| Landform (Visual Absorption Capability) | D | D | E | C | C | C | C | C | C | D | D | D | C | B | D | D | D | D | D | E | E | D | D |
| Edge Definition of Tower | D | D | E | C | C | D | D | D | C | D | D | D | C | C | D | D | D | D | D | D | E | D | D |
| Existing Visual Integrity | D | C | C | D | D | D | D | D | D | C | C | C | D | B | D | D | C | B | C | D | E | C | B |
| Visual Access to Tower | D | C | D | D | C | C | C | C | D | E | E | E | D | B | D | D | D | D | D | E | E | D | D |
| Impact on River Amenity | D | C | E | C | C | C | C | C | D | D | A | A | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | E | E | D | C |

* Towers ; others are poles

n.a. = not applicable



Sensitive sites



Most sensitive sites

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

SECV COMMENTS ON MMBW REPORT OF EFFECT ON THE
LANDSCAPE PROPOSED RICHMOND TO BRUNSWICK TRANSMISSION LINE

1 BASIS OF MMBW STUDY

The independent assessment by the MMBW of the proposed SEC line uses a simple technique of two observers mentally superimposing the proposed structures into the landscape and subjectively giving a rating against environmental criteria covering -

- i ability of topography to absorb the structure;
- ii the impact of the structure edges against the landscape;
- iii the effect of the structure on the cohesion of the landscape;
- iv the number of persons who may have a view of the structure;
- v the effect of the structure on the visual or physical amenity of the immediate river environs.

The assessment was made based on the SEC proposal for towers (15 in total) in the Brunswick to Clifton Hill Section and poles (22 in total) and towers (9 in total) in the Clifton Hill to Richmond Section.

2 MAIN CONCLUSIONS OF STUDY

2.1 The 220 kV towers would have a greater visual impact than the existing 220 kV towers. The 220 kV poles would have an impact only slightly greater than the 66 kV towers.

SEC COMMENT

The independent landscape study carried out for the SEC by Melbourne University concluded that the towers have an impact only slightly greater than the 66 kV towers and gave less impact than the poles because the poles were shown to have a larger radius of impact - in spite of the towers being taller. The Commission accepts that the larger towers tend to be out of scale with residential urban environment and from a given observation point may be considered inferior to the poles. However, following further consideration, it is proposed that lattice-braced "pole type" structures could be used of similar height and spacing to the poles, and which may remove the negative elements of both the Melbourne University and MMBW assessments.

2.2 Landscape planting would have some ameliorative value in several situations but greater benefit is gained by substitution of poles for towers where possible, as well as some changes in siting. The impact of the existing transmission line is substantially softened by mature tree plantings - a feat not possible with the higher towers. The mix of poles and towers is not preferred.

SEC COMMENT

From the perspective used by the MMBW in carrying out the study, the SEC agrees with the conclusion and considers that this supports the use of the shorter "pole type" lattice-braced structures with a lower radius of impact.

2.3 Sensitive Areas in the Brunswick-Clifton Hill Section - Four towers (T3, T7, T10 and T11) were identified as being the most sensitive sites with five other towers (T2, T4, T6, T9 and T12) having a high degree of sensitivity. (Refer Figure 1.)

SEC COMMENT

The SEC has indicated to the Committee that all towers in this section could be replaced by poles. This was not taken into account by the MMBW study. On the basis of the MMBW criteria, this should substantially lower their assessment of the sensitivity of these sites.

For example, the most sensitive sites of T7 and of T9 and T10 (in the Esplanade area) would be substantially removed and the high degree of sensitivity of T10 and T11 would be eliminated.

In the case of T3-T6, the effect of overall rationalisation by replacing the 12 existing lattice-braced structures would not have been taken into account by the MMBW and would modify the MMBW assessment of this section, with the larger number of poles perhaps not being considered better than the lesser number of towers.

2.4 Sensitive Areas in the Clifton Hill-Richmond Section - Six towers (T19, T20, T21, T27, T44 and T45) were identified as being the most sensitive sites with two towers (T25 and T46) and nine poles (18, 28, 33, 24, 35, 36, 37, 39 and 40) having a high degree of sensitivity. (Refer Figure 2.)

SEC COMMENT

Again, the SEC has indicated to the Committee that all the towers in this section could be replaced by poles. As above, this was not taken into account by the MMBW study and would substantially remove the most sensitive assessment for T19, T20, T21, T27, T44 and T45. In particular, in the case of towers T19, T20 and T21 in the Yarra Boulevard area, the MMBW study would not have taken into account that the new proposed structures which replace the existing structures are similar in height and slimmer than the existing structures with the result that, as shown in the Melbourne University Study, there would be no change from the present situation.

In the case of the nine poles, 18-40, from the perspective used by the MMBW, the use of the shorter "pole type" lattice-braced structures would substantially eliminate the high degree of sensitivity assessed by the MMBW.

2.5 The Use of Street Routes -

A pole line along Hoddle Street north of the Freeway would have intrusions that constitute major disadvantages. A pole line via Madden Grove offers advantages.

SEC COMMENT

This supports the Commission's own conclusions.

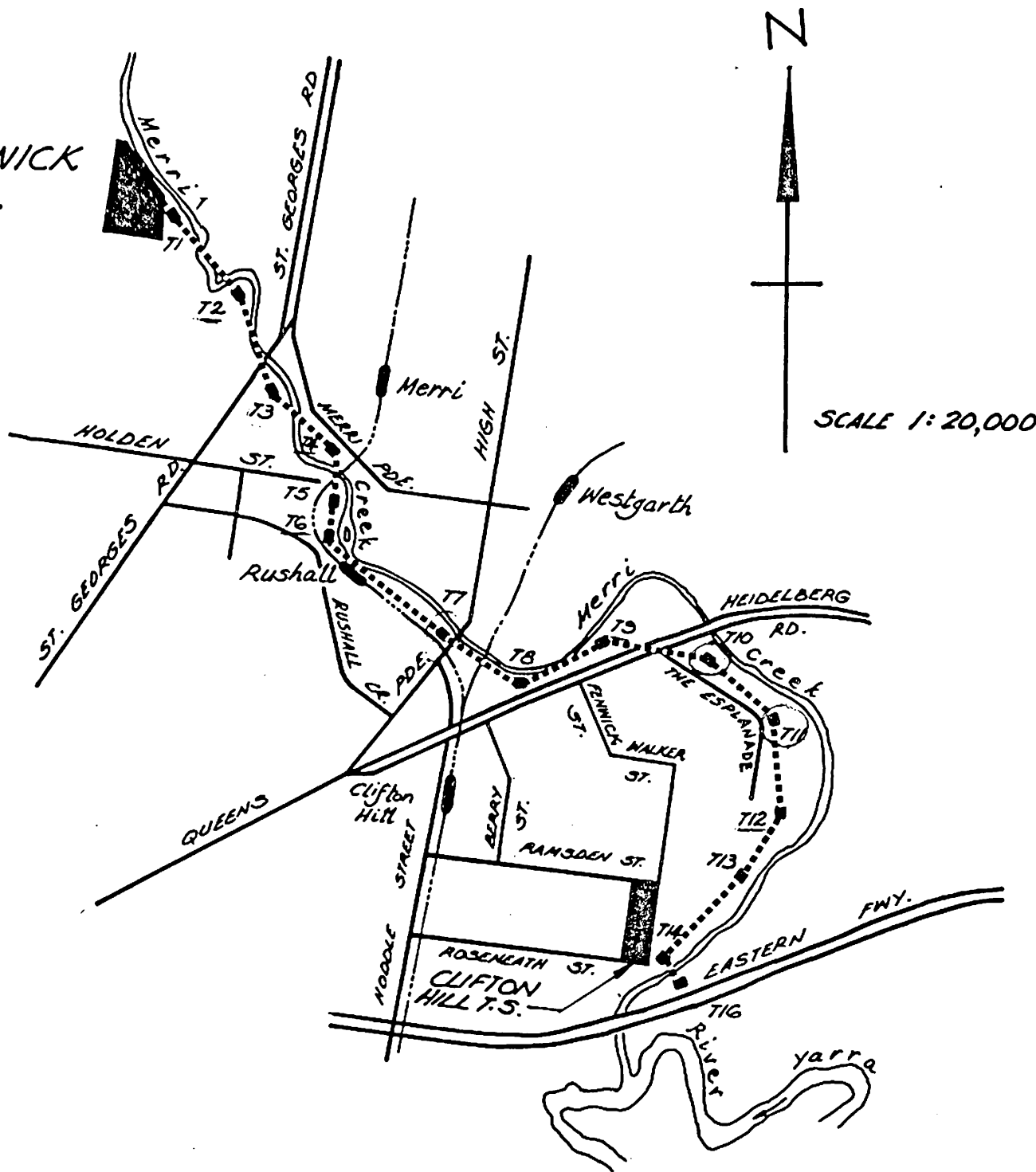
3 GENERAL COMMENT

The MMBW Study in general has identified similar areas to the SEC and the Melbourne University Study as being sensitive.

The MMBW Study concludes that "the existing 66 kV line is generally tolerable because its height is limited and therefore native vegetation and low rise buildings softens its impact". The opinion is expressed "that serious consideration should be given to replacing at least the most sensitive pylons with poles". Based on these conclusions, it is considered that with all or some of the treatments of the line proposed for consideration by the SEC, the effect in areas identified by the MMBW as sensitive can be substantially reduce to give an environmentally acceptable line construction of at worst, similar impact to the existing 66 kV line.

Having regard for the strong preference expressed by the MMBW for use of poles and the assessment by the Melbourne University that these have an undesirable high radius of impact, it is considered that both assessments can be satisfactorily taken into account by the use of light "pole type" latticed-braced structures.

BRUNSWICK T.S.



SCALE 1:20,000

LEGEND

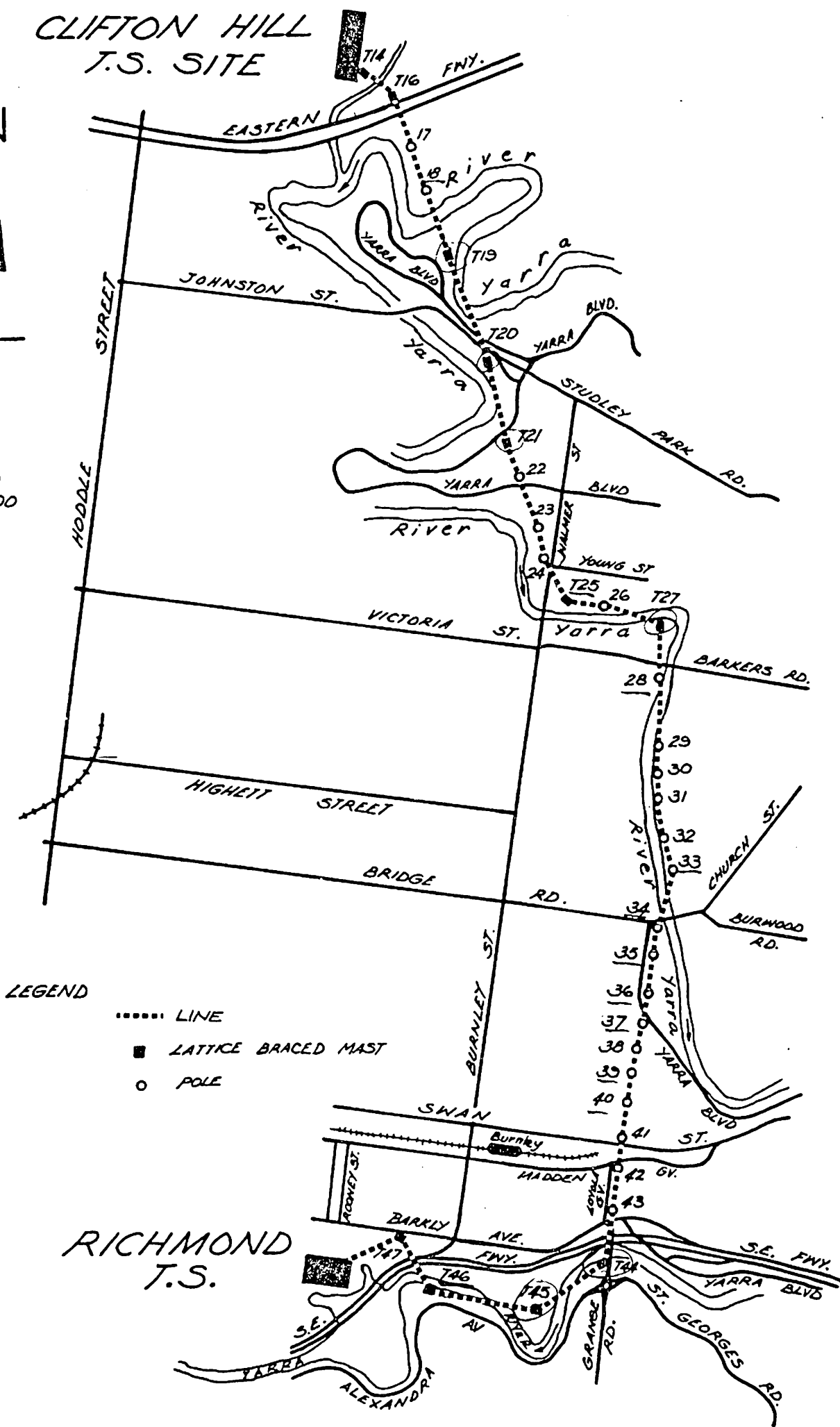
- LINE
- TOWER
- POLE
- (Symbol) ...
- High voltage conductivity

PROPOSED 220 kV TRANSMISSION LINE
 BRUNSWICK T.S. - CLIFTON HILL T.S.
 FIGURE NO. 1

CLIFTON HILL
T.S. SITE



SCALE 1: 20,000



PROPOSED 220 kV TRANSMISSION LINE
CLIFTON HILL T.S. - RICHMOND T.S.
FIGURE N° 2

INQUIRY INTO TRANSMISSION LINES
SERVING MELBOURNE

SURVEY ON THE EFFECT OF TOTAL LOSS OF
ELECTRICITY SUPPLY TO INNER MELBOURNE

VOLUME 1

ANALYSIS OF SURVEY RESULTS

TRANSMISSION DEVELOPMENT DEPARTMENT
STATE ELECTRICITY COMMISSION OF VICTORIA
JUNE 1983

PREFACE

The Natural Resources and Environment Committee of the Victorian Parliament is conducting an Inquiry into Transmission Lines Serving Melbourne.

Within its terms of reference, the Committee is required to report to Parliament on the needs for the development of the transmission system servicing the central business district and inner metropolitan areas.

In December 1982, the SEC presented to the Inquiry a submission entitled "Development of the Transmission Supply for Melbourne" which explained SEC plans for securing supply by the interconnection of terminal stations adjacent to the inner metropolitan areas.

To assist in its assessment of the need for supply reinforcement, the Natural Resources and Environment Committee requested that the SEC conduct a survey of inner metropolitan municipal councils and nominated government departments and statutory authorities to obtain detailed information on the effects of the total loss of electricity supply.

This report on the results of the survey has been prepared by the SEC for the Committee.

SUMMARY

A survey of Municipal Councils, Government Departments and Statutory Authorities was carried out in May 1983 in order to determine the potential effects of the accidental loss of power supplies to all or part of the central business district and inner metropolitan area.

The Natural Resources and Environment Committee nominated the following bodies for the survey:

Thirteen government departments and statutory authorities, to provide information on the effect on essential services.

Seventeen municipal councils, to provide information on the effect on local communities, including welfare, industrial and commercial activities.

The survey covered a highly developed urban area containing high-rise flats and single dwellings, light and heavy industries, concentrated commercial centres and local shopping centres, and the Victorian headquarters of most essential services and government functions. The residential population is 600 000, up to one third of whom could be simultaneously affected by loss of supply to one terminal station. Within the area surveyed is the Melbourne Central Business District which has a daily workforce of 205 000.

The respondents to the survey identified the effects of loss of electricity supply as follows:

. Community Hardship

The effects increase with duration of loss - five minutes causes little or no inconvenience while two hours would cause some disruption (lighting, heating, lifts, public transport). Beyond two hours, refrigerated foods are at risk and it would become impossible for most people to prepare or purchase foods, to travel by public transport and to obtain fuel for private transport. Loss of supply to one of the main SEC terminal stations could strand up to 66 000 rail passengers and 7000 tram passengers, while elderly and incapacitated people would be severely inconvenienced by the absence of lifts and heating in multi-storey accommodation.

. Public Health

In general, interruptions of the order of five minutes do not threaten public health, but health risks increase as the length of interruption increases. After two hours there are risks from cessation of water supply in high-rise buildings, lack of ventilation in large buildings and overflowing of sewers. For outages of one to three days, hospital activities become restricted and refrigerated drug and blood stocks may be lost and sewerage overflows become critical.

. Safety

The main risk from a five minute interruption is the panic which would arise as a result of large numbers of people being simultaneously trapped in lifts in buildings throughout the affected area. If the interruption continues for two hours, rescue services would be unable to meet requests for release of trapped passengers. The absence of lighting constitutes a major hazard in -

- . stairwells;
- . hazardous locations in laboratories and factories;
- . commercial premises occupied by large crowds; and
- . after dark, in all streets and public places.

All traffic lights would cease to function. An interruption of up to three days would place tremendous strain on police and fire services with an increase possibility of fire and crime. Fire-fighting facilities and alarms would be impeded, and security systems would be affected. The possibility of explosion and fire in chemical plants increases.

. Equipment and Operations

Short interruptions have a severe effect on computer installations and on continuous industrial processes.

Longer interruptions have a critical effect on -

- . communications;
- . public transport;
- . food supply and preparation;
- . freight handling;
- . fuel supplies;
- . refrigerated storage; and
- . most industrial and commercial activities.

. Economic Loss

Large industries expect losses amounting to many thousands of dollars for any interruption to continuous processes. Most other industrial and commercial respondents expect to suffer losses if interruption extends to two hours. For interruptions lasting up to three days, the losses for large industries amount to millions of dollars, while essential services face large payments for overtime. In most cases, the losses continue for some time after electricity is reconnected. Industries require on average one day and, in some cases, up to two weeks to recover from an interruption and commercial activities require from four hours to two days to recover.

. Emergency Generation

The survey also reviewed the extent of emergency generation installed in individual premises, and found that such plant is restricted to large industrial and commercial establishments, hospitals and the controlling centres of essential services.

No emergency generation was reported to exist in private homes, high-rise buildings used for residential accommodation, nursing homes, health centres, or general community services.

Without the benefit of the emergency generation which is installed at the present time, the effects of loss of SEC supply would be more critical and far-reaching than those outlined above.

An augmentation in the number and size of emergency generators in individual premises may reduce the severity of some of the effects, but such an expansion is unlikely because the high costs associated with generator installations are unacceptable to individual organisations.

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

SURVEY ON THE EFFECT OF TOTAL LOSS OF ELECTRICITY SUPPLY TO INNER MELBOURNE

VOLUME 1 : ANALYSIS OF SURVEY RESULTS

CONTENTS

INTRODUCTION

- 1 APPROACH TO THE SURVEY
- 2 CHARACTERISTICS OF AREA SURVEYED
- 3 ANALYSIS OF EFFECTS OF LOSS OF SUPPLY
- 4 EXPERIENCE OF PAST INTERRUPTIONS
- 5 EMERGENCY GENERATION

INTRODUCTION

This volume provides an analysis of the results of a survey of Municipal Councils, Government Departments and Statutory Authorities which was carried out in May 1983 in order to determine the potential effects of the accidental loss of power supplies to all or part of the Central Business District and inner metropolitan area of Melbourne.

The report outlines the approach used in obtaining the information and describes the characteristics of the areas surveyed in relation to their dependence on electricity supply.

The information obtained on the effects of loss of supply is analysed under the following headings:

- . Community Hardship
- . Public Health
- . Safety
- . Equipment and Operations Critically Affected
- . Economic Loss

Information on emergency generation installations in the organisations surveyed is also included.

The questionnaires used for the survey and a compilation of the responses received are contained in Volume 2.

SECTION 1
APPROACH TO THE SURVEY

1 APPROACH TO THE SURVEY

An interruption of electricity supply to inner Melbourne would affect most domestic, industrial and commercial activities. In order to determine the extent and severity of the effect, interviews were conducted in conjunction with questionnaires to examine the activities and services within the inner metropolitan area and the degree to which each is dependent on electricity for its safe, effective and economic operation.

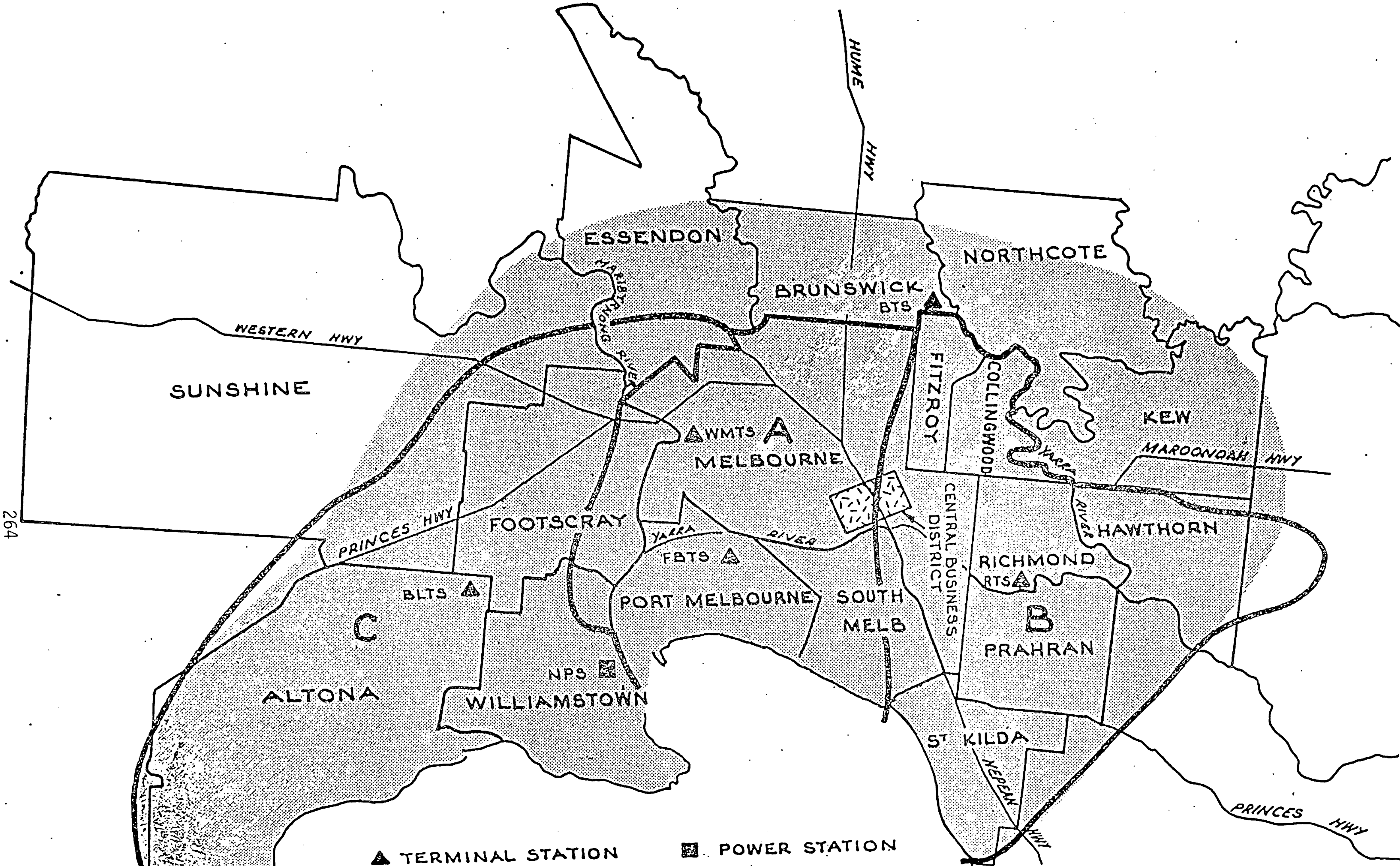
1.1 ORGANISATIONS SURVEYED

The survey was conducted by approaching the community at three levels as follows:

- a The 13 government departments and statutory authorities responsible for essential community services which operate over the entire area, independently of municipal boundaries.
- b The 17 municipal councils comprising the inner metropolitan area, in their role as responsible bodies having knowledge of local communities and reflecting needs of those communities.
- c Individual industrial and commercial establishments, representing users with specific needs. The establishments surveyed were those which were nominated by the municipal councils as being representative of local activities and the responses were obtained via the councils.

1.2 AREA SURVEYED

The inner metropolitan area, for the purpose of this survey, is defined by the shaded area on Figure 1. The map shows the boundaries of each of the municipal council areas which formed the basis for the collection of data. To assist in the analysis of essential services where council boundaries are not relevant, two areas to the east and west of the Central Business District were defined as A and B on the map and the authorities responsible for essential services were asked to provide separate assessments of the effects of loss of supply to each area where these effects were not the same as for loss of supply to the whole inner metropolitan area.



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▲ TERMINAL STATION ■ POWER STATION

FIG.1. MAP OF THE AREA SURVEYED, SHOWING MUNICIPAL BOUNDARIES

Area A represents the area dependent on the tower line supplying West Melbourne and Fishermen's Bend Terminal Stations and Area B represents the area dependent on the tower line supplying Richmond Terminal Station.

The area shown as C on Figure 1 is dependent on the tower line supplying Brooklyn Terminal Station and the remainder of the shaded area, i.e. the small area to be north of A, B and C, is supplied mainly from Brunswick Terminal Station. Supply to all of the terminal stations mentioned would be secured by the proposed Richmond to Brunswick and Newport to Fishermen's Bend transmission connections.

1.3 DATA REQUESTED

In order to determine the nature of the urban community which is served by the electricity supply, councils were asked to define the composition of their municipality with regard to population, residential accommodation, commerce and industry.

Government departments and statutory authorities were asked to provide details of their operations with particular attention to those dependent on electricity.

To enable an assessment of the degree of dependence on the community on a secure electricity supply, all participants in the survey were asked for their perception of the effects of short, medium and long-term interruptions on residential, industrial and commercial activities and on community and essential services.

The interruption durations proposed as a basis for comment were -

- . five minutes;
- . two hours;
- . three days;

corresponding with the possible types of failure.

In each case, the criteria to be used for assessing the effects were -

- . general community hardship;
- . risk to health;
- . safety;
- . damage or disruption to equipment and operations;
- . economic loss.

Respondents were asked to quantify their assessments by selecting representative examples of each affected activity and providing data specific to those examples.

To provide further quantification of their assessments of the possible effects of blackout, the participants were invited to describe their experiences during past failures of local supply.

In order to gauge the extent to which the effects of loss of transmitted electricity supply could be alleviated by the use of individual stand-by generator units, the data requested from individuals included details of any such units which exist at the present time.

SEC officers visited each of the public bodies to discuss the survey and to present three types of questionnaires to cover the different class of participants, i.e. -

- . government departments and statutory authorities;
- . municipal councils;
- . specific premises.

These questionnaires are reproduced in Volume 2, Section 1, together with a list of the responding public bodies.

1.4 COMPILATION

To facilitate analysis, the material received from respondents was classified into the following categories:

- a Profile of Area
- b Effects
 - . Community Hardship
 - . Public Health
 - . Safety
 - . Equipment and Operations Affected
 - . Economic Losses
- c Past Experience of Local Supply Failures
- d Emergency Generation

The results for each of these categories are compiled in Volume 2, Sections 2, 3, 4 and 5 respectively.

SECTION 2
CHARACTERISTICS OF AREA SURVEYED

2 CHARACTERISTICS OF THE AREA SURVEYED

The survey covers a highly developed urban area containing high-rise flats and single dwellings, light and heavy industries, concentrated commercial centres and local shopping centres and the Victorian headquarters of most essential services and government functions.

2.1 POPULATION AND HOUSING

For the inner metropolitan area as defined in Section 1, the total residential population is 600 000. Of this number, approximately 100 000 reside within Area A, 220 000 within Area B, 130 000 within Area C and the remaining 150 000 on the northern side of these three areas.

Apart from the residential population, there is a daily workforce population in the Central Business District of 205 000.

In Areas A and B, there are concentrations of high-rise flats near the city centre (in Richmond and South Melbourne, high-rise flats represent 25% of all dwellings).

In general, most people live in flats in Area B and individual dwellings predominate in Area C. There is no predominant type of housing in Area A or the remainder of the inner metropolitan area.

About one quarter of the dwellings were indicated to have special needs, based on occupation by elderly persons or infants.

Approximately 150 of the dwellings within the area have a special need for secure electrical supply because of patients dependent on home renal dialysis machines.

2.2 ESSENTIAL SERVICES

The centre of the surveyed area contains the headquarters and control centres of the Metropolitan Fire Brigade, Victoria Police, Ambulance Service, Blood Bank, Board of Works, Telecom, Victorian Railways, Tramways Board, State Emergency Service, Gas and Fuel Corporation and the State Electricity Commission.

In addition, there are 21 major public hospitals and one prison.

Other important installations are -

- a the railway signalling network for the suburban system which is entirely dependent on supply from Richmond Terminal Station, in Area B; and
- b the MMBW pumping station at Brooklyn which pumps 2/3 of the sewage from the whole of the metropolitan sewage system, servicing 1 500 000 people. This station is entirely dependent on supply from Brooklyn Terminal Station, in Area C.

. Dependence on Individual SEC Supply Sources

In relating their installations to local SEC supplies, MMBW, Victorian Railways, MMTB, Telecom and some large hospitals indicated how they had improved their security by taking power from different SEC high voltage sources. Terminal stations are the main supply points for relatively large areas. Supplies within these areas are derived from substations and the "independent" SEC substation sources used to provide security for specific installations are inevitably fed from a common terminal station. The installations concerned are therefore secured against localised supply interruptions but are dependent on the supply to the terminal station.

2.3 INDUSTRIAL AND COMMERCIAL

Most types of industry are represented in Area A, small service industries predominate in Area B, while there is a heavy concentration of chemical-related industries in Area C.

Victoria's main cargo handling and loading facilities for shipping, rail and road transport are concentrated within Area A.

The dominant commercial area is the Melbourne CBD which has a concentration of some 3900 offices, 1900 retail shops and 1700 service establishments in high-rise buildings.

All of the 17 municipalities have their own business and shopping centres which include most types of commercial activities.

Volume 2, Section 2, contains the data collected from the respondents in relation to the characteristics of the area and lists the individual industrial and commercial respondents who were selected by the municipal councils to participate in the survey.

SECTION 3

ANALYSIS OF EFFECTS OF LOSS OF SUPPLY

3 ANALYSIS OF THE EFFECTS OF LOSS OF SUPPLY

3.1 COMMUNITY HARDSHIP RESULTING FROM LOSS OF SUPPLY

The responses to the survey indicated that the loss of electricity supply is considered most likely to be felt by the general community through the absence of lighting, heating, medical services, transport and food supplies.

The degree of hardship would increase with duration of loss - five minutes causes little or no inconvenience while two hours would cause some disruption (lighting, heating, lifts, public transport). Beyond two hours, refrigerated foods are at risk and it would become impossible for most people to prepare or purchase foods, to travel by public transport and to obtain fuel for private transport. Loss of supply to either Area A or Area B, if it occurred at peak period, could strand up to 66 000 rail passengers and 7000 tram passengers.

Elderly and incapacitated people are severely inconvenienced by the absence of lifts in multi-storey accommodation and the absence of electric heating, which is commonly used by these people.

If the blackout extended into hours of darkness, any movement out of doors would become unsafe.

A three-day loss would inflict severe hardship on the whole community and may have disastrous consequences in terms of public health and welfare, as outlined in the following sections.

The State Emergency Service has indicated that it would probably implement its Disaster Welfare Plan if the duration of a power blackout approached three days.

3.2 PUBLIC HEALTH EFFECTS OF LOSS OF SUPPLY

3.2.1 Short Interruptions

Interruptions of the order of five minutes do not threaten public health.

3.2.2 Medium-term Interruptions

Most respondents indicated that interruptions of less than two hours would not be a significant risk to health.

The following health risks would arise after two hours:

- . Cessation of water supply in high-rise buildings, including water for sanitation.
- . Stoppage of medical equipment in homes and some hospitals.
- . Lack of ventilation in large buildings.
- . Overflowing of sewers into storm water drains and local water courses and in some cases from toilet bowls.
- . Possible flooding of low lying properties, due to cessation of MMBW drainage pumps.

3.2.3 Long Interruptions

The health risks would increase as the length of the interruption increases and for outages of one to three days, the following problems are added to those listed above:

- . Restriction of hospital services, with exhaustion of emergency battery power, in those hospitals not equipped with full standby generating plant.

- . Loss of drug and blood stocks due to lack of refrigeration at medical centres, blood bank and laboratories.
- . Pollution of Yarra and Maribyrnong Rivers and Port Phillip Bay with raw sewage. (For loss of supply to the main MMBW pumps, 400 megalitres of sewage per day would accumulate in the Bay.)
- . Flooding of South Melbourne, Port Melbourne and Albert Park areas which rely heavily on pumps for drainage.
- . Discharge of vapours from chemical plants.
- . Lack of heating in premises housing the sick, the aged and the very young.
- . Blockage of sewerage system in high-rise flats.

3.3 SAFETY EFFECTS OF LOSS OF SUPPLY

3.3.1 Short Interruptions

The main risk from a five minute interruption is the panic which would arise as a result of large numbers of people being simultaneously trapped in lifts in buildings throughout the affected area, particularly when this area includes part of the CBD and the suburbs of Richmond or South Melbourne, where 25% of residential accommodation comprises high-rise units.

3.3.2 Medium-term Interruptions

Safety hazards arising during a two-hour interruption are as follows:

- . Inability of rescue services to meet requests for release of trapped lift passengers.
- . Absence of lighting in stairwells and in hazardous locations in laboratories and factories.
- . Complete absence of traffic lights.
- . Obstruction of road traffic by automatically lowered railway boom gates and disabled trams.
- . Build-up of heat and pressure in continuous-process furnaces and chemical reactors.
- . Absence of lighting in large commercial premises leading to panic, pilfering and assault among uncontrolled crowds, e.g. 20 000 people in Myer City Store, 1500 in Footscray Market.
- . After dark, the absence of street lighting and the presence of unlit trams in the roadway.

3.3.3 Long Interruptions

After two hours, the safety risks increase as battery-powered emergency systems become exhausted and the demands on essential services increase. The following hazards were identified for an interruption which extends through hours of darkness and lasts for up to three days:

- . Failure of fire-fighting facilities in large buildings.
- . Failure of building fire alarms to fire stations and emergency alarm systems to police stations.
- . Failure of emergency lighting systems, where installed, and absence of lighting in railway stations and public places.
- . Increase in crimes of violence under cover of darkness.
- . Absence of security monitoring of prisoners, e.g. at Fairlea Prison, the City Watch-house and in local police station cells.
- . Tremendous strain on police personnel due to the diversion from all normal tasks to concentrate on maintaining law and order, the need for most police to work 12 hour shifts and the difficulties of working in complete darkness to control crowds and traffic.
- . Probability of fires and explosions at chemical plants.
- . Shutdown of the Police Information Bureau, hindering the identification and apprehension of criminals.
- . Cessation of fire alarms and radio communications at fire stations, other than the four innermost stations.

3.4 EQUIPMENT AND OPERATIONS CRITICALLY AFFECTED BY LOSS OF SUPPLY

This section deals with items which are critically affected by loss of electricity supply but do not constitute a direct risk to public health and safety.

3.4.1 Short Interruptions

The majority of activities reported as critical for a five minute interruption fall into two categories -

- a computers in commercial, industrial and laboratory applications;
- b continuous processes in the chemical, petrochemical, metal and food processing industries.

3.4.2 Medium-term Interruptions

Many activities are critically affected when the supply interruption is of two hours' duration:

- . Refrigerated specimens in hospitals and laboratories, including police forensic evidence.
- . PABX communications in business houses.
- . Teleprinter services.
- . All data circuits using modems.
- . All railway signalling (for loss of Area B), resulting in major dislocation of rail system.
- . All railway traction west of Flinders Street (for loss of Area A).

- . Lighting, public address and information displays at railway stations.
- . Seat reservation and catering for country/interstate trains.
- . Railway freight handling and wagon sorting.
- . All tramway services in the affected area (A or B).
- . Ship loading and cargo handling.
- . Cargo storage and security.
- . River navigation lights.
- . Refrigerated food storage.
- . Liquefied gas storage.
- . Industrial production lines, processes, cooling water supplies, etc.
- . Air conditioning.
- . Sterilisers in hospitals and medical premises.
- . Security devices in banks.

3.4.3 Long Interruptions

For outages of one to three days, the following additional items would be affected:

- . Suburban rail service (complete shutdown for loss of Area B).

- . Food supply and preparation.
- . MMBW pumping plant (due to flooding of pumping stations).
- . Railway fuelling, turntables and bogie exchange.
- . Perishables in refrigerated containers.
- . Shipping schedules.
- . Metal melting furnaces.
- . Hazardous materials in chemical plants.
- . Fuel supplies for essential services.
- . Telephone network (severe congestion).
- . Public telephones (except that calls for emergency services would still be possible).
- . Police stations and other properties (vandalism).

3.5 ECONOMIC LOSS FROM SUPPLY INTERRUPTIONS

The losses considered are those which can be evaluated in monetary terms, i.e. lost or damaged materials and lost revenue. The survey did not seek to place a monetary value on human life and welfare.

3.5.1 Short interruptions

Among the industries surveyed, large industries operating continuous processes, indicated that significant losses could arise for a five minute outage.

The losses were assessed as follows:

- . \$25 000 by GMH, Fishermen's Bend.
- . \$100 000 to \$500 000 by UCAL, Altona.
- . \$150 000 by ACI, Spotswood.

3.5.2 Medium-term Interruptions

Economic loss from a two-hour interruption would be widespread, with almost all of the representative industrial and commercial establishments expecting to suffer losses. For those establishments which do not have continuous industrial processes, the individual estimates of loss are in the range \$1000-\$10 000. Where continuous processes are involved, costs are similar to those for short interruptions.

Among the public authorities, the Port of Melbourne Authority estimates the cost of a two hour loss at \$250 000 and Victorian Railways estimate the cost of a one hour delay to morning peak trains at \$133 000.

3.5.3 Long-term Interruptions

For interruptions lasting between one and three days, the economic losses become very high, with the largest industries estimating their losses in millions of dollars and essential services anticipating large payments for overtime.

In Area A, the Port of Melbourne Authority estimates losses on port operations at \$4 700 000 for a three day interruption, while the cost to the World Trade Centre would exceed \$250 000. GMH, Fishermen's Bend, anticipates losses up to \$2 500 000 for a three day interruption, while ACI Spotswood estimates losses ranging from \$170 000 to \$12 000 000, depending on whether the interruption occurs at a critical time.

In Area B, Victorian Railways estimates a loss of \$600 000 for a three day interruption to the suburban network plus \$30 000 for spoiled perishables. Prince Henry's Hospital estimates a loss of \$60 000 and ADAPS, St Kilda, estimates their loss at \$30 000 for a three day outage.

In Area C, seven of the representative Altona petrochemical industries expect to lose, between them, up to \$3 000 000 if the interruption occurs at a critical time.

3.5.4 Recovery

In most cases, normal activity will not resume as soon as the electricity is reconnected.

Additional time and money is required to restore the conditions existing prior to the blackout.

The Ministry of Housing expects that repairs costing \$10 000 and extending over one week would be required on each high-rise housing block, mainly for sewerage and water systems. In the meantime, rent amounting to \$10 000 per block per week would be lost. On this basis, loss of supply to the whole inner area could cost the Ministry \$1 000 000 and loss of Area A or Area B about half this amount.

Prince Henry's Hospital estimates that six months and \$500 000 would be needed to return to normal.

Police forensic analysis would be hampered until new analytical standards were obtained from overseas.

Industries would require on average one day and, in some cases, up to two weeks to recover.

Estimated recovery time for commercial activities ranges from four hours to two days, involving costs of several thousand dollars in most cases.

Volume 2, Section 3, sets out in detail the effects which are discussed in this section.

SECTION 4
EXPERIENCE OF PAST INTERRUPTIONS

4 EXPERIENCE OF PAST INTERRUPTIONS TO SUPPLY

Much of the foregoing data was based on an extension of experiences during localised interruptions to the distribution system.

Most of the experiences reported were the result of localised supply interruptions. A much more serious outcome would be expected if similar effects occurred simultaneously over an area of the size that could be affected by a transmission line failure.

The majority of respondents indicated that they had not experienced any significant interruptions in recent times. One user among those surveyed (ADAPS), reported that there had been no interruptions for at least five years but stated that, because of recent changes in equipment and services operated, an interruption five years ago would have been much less damaging than is the case today.

4.1 MINISTRY OF HOUSING

The longest interruption was that reported by the Ministry of Housing, when their Park Towers flats in South Melbourne were blacked out for five hours in the afternoon following a fire in a local SEC substation. All cooking facilities, lighting and lifts were immediately lost and the main water supply and sewerage systems ceased to function one hour after the interruption occurred. Panic set in at 4.00 pm when children arriving home from school were unable to gain access to their homes and normal family relationships broke down.

Emergency power resources were sought but it took four hours to move a generator on to the site. A further two hours would have been needed to modify the system connections to allow the generator to be used. SEC power was restored prior to the temporary connections being made.

4.2 TRAMWAYS BOARD

The Tramways Board reported one experience when overloading of their network resulted from a supply interruption following a failure at the SEC Deepdene Substation. A Tramways feeder cable melted and fell to the road at Kew Junction and a considerable section of the trolleywire network was annealed and required replacement. Low voltage in the network slowed all tram movements. The failure occurred in the morning and, although temporary repairs were affected by the evening peak, some days were needed to repair all damage.

4.3 PETROCHEMICAL COMPLEX

A 40 minute interruption in the early hours of the morning in June 1982, due to failure of the double circuit transmission line supplying Brooklyn Terminal Station, was reported by several industries in the Altona petrochemical complex as having severe economic consequences for continuous processes.

4.4 CENTRAL BUSINESS DISTRICT

Melbourne City Council reported an experience in May 1980 when a failure at a city substation resulted in two early morning interruptions. The first, from 6 am to 7.30 am, affected city accommodation establishments, confining people in darkened bedrooms and delaying meal preparation. The second, from 8 am to 10 am, caused traffic chaos and some commercial buildings remained closed for business until power was restored.

SECTION 5
EMERGENCY GENERATION

5 EMERGENCY GENERATION

The installation of emergency generation plant is restricted to relatively large industrial and commercial establishments, hospitals and the controlling centres of essential services.

No emergency generation was reported to exist in private homes, high-rise buildings used for residential accommodation, nursing homes, health centres or general community services.

The Ministry of Housing has considered emergency generation for high-rise housing blocks and estimates that a capital expenditure of \$4 800 000 would be required to equip 48 existing blocks with the required 100 kilowatt per block.

5.1 COSTS AND LIMITATIONS

The installation costs for existing emergency generators in industrial and commercial premises, as reported by the owners, range between \$200 and \$1000 per kilowatt. The variation is attributable to the size and age of the generators and the extent of reticulation provided. In addition, costs of several thousands of dollars annually are incurred in maintaining the plant in operable condition. Some users expressed concern that their emergency generators may fail when called upon to operate in a blackout. In many cases, the time for which generation can be sustained is limited by the capacity of the stored fuel supply.

5.2 EXTENT OF INSTALLATIONS

All of the essential services and public utilities have emergency generation to maintain communications and essential functions in their control centres. Telecom has full stand-by generation in most exchanges. In these cases, the cost of emergency generation is justifiable because the electrical demand of the equipment is inherently small in relation to the importance of its function. A similar pattern is apparent among the commercial respondents, where the only establishments with anywhere near full stand-by were computer installations.

In hospitals, stand-by arrangements vary widely, with installed generation ranging from nil to "sufficient for normal operation". In general, those public hospitals having over 500 beds are adequately equipped with stand-by power for essential activities.

Victorian Railways estimate that they could provide stand-by generation for their industrial and commercial activities for an outlay of \$4 000 000 but there is no feasible method of providing stand-by for their traction load. MMBW have not considered it practical to install emergency generation capable of driving pumps of the size installed at their main sewage pumping station.

Similarly, industrial users indicate that full stand-by generation is impractical for the size and nature of the loads involved. The majority of respondents have less than 10% stand-by, which is intended only for safe shutdown of continuous processes or safe evacuation of premises.

5.3 EMERGENCY GENERATION AS SUPPLY BACKUP

Without the benefit of the emergency generation which is installed at the present time, the effects of loss of SEC supply would be more critical and far-reaching than those outlined in the preceding sections of this report. An augmentation in the number and size of emergency generators in individual premises may reduce the severity of some of the effects previously described but such expansion is unlikely because the high costs associated with generator installations are unacceptable to individual users.

INQUIRY INTO TRANSMISSION LINES
SERVING MELBOURNE

SURVEY ON THE EFFECT OF TOTAL LOSS OF
ELECTRICITY SUPPLY TO INNER MELBOURNE

VOLUME 2

REPORT OF SURVEY RESULTS

TRANSMISSION DEVELOPMENT DEPARTMENT
STATE ELECTRICITY COMMISSION OF VICTORIA
JUNE 1983

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

SURVEY ON THE EFFECT OF TOTAL LOSS OF ELECTRICITY SUPPLY TO INNER MELBOURNE

VOLUME 2 : REPORT OF SURVEY RESULTS

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- 2 CHARACTERISTICS OF AREA SURVEYED
- 3 RESULTS OF SURVEY ON LOSS OF SUPPLY
- 4 COMMENTS RECEIVED ON SUPPLY SECURITY
- 5 RESULTS OF SURVEY OF EMERGENCY GENERATION

INTRODUCTION

This volume provides a compilation of the results of a survey of Municipal Councils, Government Departments and Statutory Authorities which was carried out in May 1983 in order to determine the potential effects of the accidental loss of power supplies to all or part of the Central Business District and inner metropolitan area of Melbourne.

The questionnaires employed for the survey are reproduced, together with a list of respondents. Data relating to the characteristics of the area surveyed is presented under headings of:

- . Residential
- . Community Services
- . Industrial
- . Commercial

The information obtained on the effects of loss of supply is set out under the following headings:

- . Community Hardship
- . Public Health
- . Safety
- . Equipment and Operations Critically Affected
- . Economic Loss

Details of the emergency generation installations in the organisations surveyed are also included.

The results contained herein are analysed in Volume 1 of the survey report.

SECTION 1

QUESTIONNAIRES AND RESPONDENTS

SECTION 1

QUESTIONNAIRES AND RESPONDENTS

CONTENTS

LIST OF RESPONDENTS

QUESTIONNAIRES FOR GOVERNMENT DEPARTMENTS AND AUTHORITIES

Ministry of Housing
Metropolitan Fire Brigade
Victoria Police
Health Commission
Melbourne and Metropolitan Board of Works
Telecom
Community Welfare Services Department
Victorian Railways
Melbourne and Metropolitan Tramways Board
State Emergency Service
Road Safety and Traffic Authority
Port of Melbourne Authority
Building Division, Public Works Department

QUESTIONNAIRES FOR MUNICIPAL COUNCILS

Part A for Councils
Part B for Specific Individual Premises

LIST OF RESPONDENTS

GOVERNMENT DEPARTMENTS AND AUTHORITIES

- . Ministry of Housing
- . Metropolitan Fire Brigades Board
- . Victoria Police
- . Health Commission
- . Melbourne and Metropolitan Board of Works
- . Telecom Australia
- . Department of Community Welfare Services
- . Victorian Railways
- . Melbourne and Metropolitan Tramways Board
- . Victoria State Emergency Service
- . Road Safety and Traffic Authority
- . Port of Melbourne Authority
- . Public Works Department

MUNICIPAL COUNCILS

- . Altona
- . Brunswick
- . Essendon
- . Footscray
- . Hawthorn
- . Melbourne
- . Port Melbourne
- . Prahran
- . Richmond
- . South Melbourne
- . St Kilda
- . Sunshine
- . Williamstown

NOTES

1 The following councils notified their intention not to supply information pending further considerations by the Merri-Yarra Municipal Protection Committee:

Collingwood, Fitzroy and Kew.

2 The following council advised that it considered that a response was unwarranted "in view of the effects being no different to what would generally be the case":

Northcote.

3 Respondents for individual premises are listed by category in Appendix 3.

REQUEST FOR INFORMATION FROM MINISTRY OF HOUSING

1 What Housing Commission services are dependent for their normal operation on the SEC supply?

2 Do any of these services have emergency sources of electrical supply independent of the SEC? If so, describe the nature, e.g. diesel generator, battery, and the specific services supplied.

3 What would be the effects on Housing Commission services of a total loss of electricity supply to all or part of the area shaded on the attached map, and in particular the areas marked A and B? Describe the effects for total supply losses of -

a 5 minutes;

b 2 hours; and

c 3 days

Include comments on aspects such as -

- . number of people affected
- . nature of the effects, e.g. trapped in lift, risk of assault, etc.
- . numbers of high rise occupants

To demonstrate the effect on occupants of high rise housing, typical buildings should be selected as examples, and one of the attached questionnaires completed for each building.

Ministry of Housing (Contd)

EFFECT OF TOTAL LOSS OF ELECTRICITY SUPPLY
QUESTIONNAIRE

Building Address

Principal Occupant

How many storeys are there in building?

In the building, what is the number of lifts?

Escalators?

Stairwells?

What is the average number of people occupying the building on a typical -

Weekday?

Weekend?

Should a blackout occur, specify from the list opposite those hazards to which people would be exposed.

| | |
|---|--|
| Trapped in lift | |
| Life support system | |
| Robbery and assault | |
| Fire | |
| Unlit stairwell | |
| Lack of ventilation | |
| Other - please specify (attach details) | |

How many people would be exposed to hazards during the period of blackout?

On the list opposite, indicate those activities critically dependent on continuity of supply and the length of interruption that would be critical.

| Duration of Interruption | Up to 5 Min | Up to 2 Hrs | Up to 3 Days |
|--------------------------|-------------|-------------|--------------|
| Food storage | | | |
| Food preparation | | | |
| Water pumps | | | |
| Lighting | | | |
| Traction | | | |
| Drug/blood storage | | | |
| Specimen storage | | | |
| Communications | | | |
| Air conditioning | | | |
| Sewerage | | | |
| Computers | | | |
| Continuous processes | | | |
| Other (please specify) | | | |

At what times would people and plant be exposed to hazards by interruption of supply?

| | |
|------------------------|--|
| Weekdays | |
| Weekends | |
| Normal Business Hours | |
| Morning & Evening Peak | |
| Daylight Hours | |
| Hours of Darkness | |

If a standby generator is installed, what is its capacity?

_____ kilowatts

What proportion of services could be supplied by the standby generators as a percentage of normal total activity?

| Less Than 10% | Between 10-30% | Between 30-50% | Greater Than 50% |
|---------------|----------------|----------------|------------------|
| | | | |

For those activities which are critically affected, what time and cost would be required to recover from a critical supply outage?

| | |
|----------------|--|
| Time | |
| Estimated Cost | |

What is the estimated loss of revenue likely to be incurred as a result of interruption to supply?

| Duration of Interruption | Up to 5 Mins | Up to 2 Hours | Up to 3 Days |
|--------------------------|--------------|---------------|--------------|
| Wages/Salary | | | |
| Sales | | | |
| Damage | | | |

If standby supplies are selected to feed specific services, what are these services?

| | |
|----------------------|--|
| Computers | |
| Lighting | |
| Orderly evacuations | |
| Lifts | |
| Escalators | |
| Stairwell lighting | |
| Ventilation | |
| Other (please state) | |

What is the normal power demand of the activity?

_____ kilowatts

What is the cost of standby generation -
 Cost of generator, including installation _____ dollars
 Operating cost per annum _____ dollars
 Operation of standby generation per annum _____ hours

For how long could the standby generators provide continuous supply during a blackout?

| Less Than 1 hr | 1-5 hr | 5-10 hr | >10 hr |
|----------------|--------|---------|--------|
| | | | |

What other emergency procedures are implemented to minimise the effects of a prolonged blackout?

| | |
|------------------------------------|--|
| Send workers home | |
| Orderly evacuation procedure | |
| Lock up premises | |
| Roll call | |
| Eliminate non-essential activities | |
| Other - please specify | |

What is actual experience of power blackouts for this activity?

Please discuss under the following headings:

- . When blackout occurred.
- . Duration of blackout.
- . Effect on occupants.

REQUEST FOR INFORMATION FROM MFB

1 What MFB systems rely for their normal operation on the SEC supply? For example, communications, alarms.

2 How are these supplies derived from the SEC system?

3 Do any of these systems have alternate emergency sources of electricity supply independent of the SEC? If so, describe the nature, e.g. battery, diesel generator, and specific services supplied.

4 What would be the effects on these systems and the normal operation of the MFB of a total loss of electricity supply to all or part of the area shaded on the attached map, and in particular the areas marked A and B? Describe the effects for total supply losses of -

- i 5 minutes;
- ii 2 hours; and
- iii 3 days.

Include comment on aspects such as -

- areas of increased public health and safety risks;
- effect of loss of other services on MFB operations, e.g. traffic controls, hospitals, lifts in high rise buildings.

REQUEST FOR INFORMATION FROM VICTORIA POLICE

1 What police systems rely for their normal operation on the SEC supply? For example, communications, alarms, computers.

2 How are these supplies derived from the SEC system?

3 Do any of these systems have alternate emergency sources of electricity supply independent of the SEC? If so, described the nature, (e.g. diesel generator, battery) and specific services supplied.

4 What would be the effects on these systems and the normal operation of the Victoria Police of a total loss of electrical supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B? Described the effects for total supply losses of -

a 5 minutes;

b 2 hours; and

c 3 days.

Include comments on aspects such as -

- . areas of increased public health and safety risk;
- . effect of possible loss of other services on police operations, e.g. traffic controls, lighting.

REQUEST FOR INFORMATION FROM HEALTH COMMISSION

1 What are the requirements for hospitals and other services under the jurisdiction of the Health Commission to have emergency electricity supplies independent of the SEC?

2 Do these requirements vary with the size and age of the hospital?

3 Where emergency supplies are installed, indicate the nature, e.g. diesel generator, battery, and the percentage of load or specific services which must be supplied.

4 What would be the effects on hospitals and other health services for the total loss of electrical supply to all or part of the area shaded on the attached map, and in particular the areas marked A and B? Describe the effects for total supply losses of -

a 5 minutes;

b 2 hours; and

c 3 days

Include comments on aspects such as -

- . number of hospitals and patients affected
- . the nature and degree of effects
- . specific procedures laid down for covering blackouts
- . requirements to transfer patients
- . rescheduling of operations
- . drug, blood and specimen storage
- . food storage and preparation
- . heating, air conditioning, lighting
- . ambulance services - for example the effect of possible traffic congestion, communications problems

5 Typical examples of the various services should be selected, and for each example one of the attached detailed questionnaires completed.

REQUEST FOR INFORMATION FROM THE MELBOURNE
AND METROPOLITAN BOARD OF WORKS

- 1 For the Central Business District and inner metropolitan areas, what MMBW systems are normally dependent on SEC Supply?
- 2 How are these supplies normally derived?
- 3 Do any of these systems have alternative backup or emergency supplies independent of the SEC? If so, describe nature of supply (e.g. diesel generator, battery) and the specific services supplied.
- 4 What would be the effects on the MMBW systems and the consequent effects on the community of a total loss of electricity supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B? Describe the effects for total losses of -
 - a 5 minutes;
 - b 2 hours; and
 - c 3 days.

Include comments on aspects such as -

- . numbers of people affected;
- . the nature of the effects;
- . the effects on other services, e.g. MMFB, high rise buildings.

REQUEST FOR INFORMATION FROM TELECOM

1 For the Central Business District and inner metropolitan areas, what Telecom systems are normally dependent on SEC Supply?

2 How are these supplies normally derived?

3 Do any of these systems have alternative backup or emergency supplies independent of the SEC? If so, describe nature of supply (e.g. diesel generator, battery) and the specific services supplied.

4 What would be the effects on the Telecom systems and the consequent effects on the community of a total loss of electricity supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B? Describe the effects for total losses of -

a 5 minutes;

b 2 hours; and

c 3 days.

Include comments on aspects such as -

- . numbers of people affected;
- . the nature of the effects;
- . the effects on emergency services, e.g. MMFB, police, ambulance;
- . the effects on commercial and business activities.

REQUEST FOR INFORMATION FROM
THE DEPARTMENT OF COMMUNITY WELFARE SERVICES

1 What Department services are highly dependent on SEC supply for normal operation?

2 Do any of these services have emergency supplies independent of the SEC? If so, indicate nature (e.g. diesel generator, batteries) and the specific services supplied.

3 What would be the effect on the provision of these services and the consequent effect on the community of a total loss of supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B? Describe the effects for total supply losses of -

a 5 minutes;

b 2 hours; and

c 3 days.

Include comments on such aspects as -

. number of people affected;

. nature of the effects.

4 Apart from the direct effects caused by the loss of the Department's services as requested above, is there any evidence that a total loss of supply would affect the social well-being of individuals or particular sections of the community? If so, describe, indicating factors such as -

. the particular sections of the community at risk;

. the nature of the risks.

REQUEST FOR INFORMATION FROM VIC RAIL

1 For the inner metropolitan and central business district (CBD) rail network, what are the normal voltage and power requirements for -

- . traction?
- . signalling, points, boom gates?
- . train controls?
- . lighting, ventilation?
- . other?

2 What are the normal principal supply points for each of these supplies and how do they relate to the SEC network?

3 Are there any emergency supplies independent of the SEC available? Indicate nature, e.g. diesel generator, batteries, and the specific services supplied.

4 For the total loss of supply to all or part of the area shaded on the attached map, and in particular for the areas marked A and B, describe the effect of losses of -

- i 5 minutes,
- ii 2 hours; and
- iii 3 days -

on -

- . the suburban train network;
- . the underground loop;
- . interstate and country train services.

Include comment on aspects such as -

- . number of people affected;
- . the effect, e.g. stranded, delayed;
- . variation between non-peak and peak hours.
- . effect at large stations, e.g. Flinders St, Spencer St;
- . effect on road traffic flow due to boom gates;
- . effect on freight services.

Vic Rail (Contd)

5 Are there any changes proposed for the VR electricity supply network which will affect the above? If so, describe proposed changes and the effect.

6 What works would be necessary to make the CBD and inner metropolitan rail network secure against total loss of supply from any one of the SEC's major terminal stations? What would be the order of cost of these works?

REQUEST FOR INFORMATION FROM MELBOURNE
AND METROPOLITAN TRAMWAYS BOARD

1 For the Central Business District and inner metropolitan tram network, what are the normal voltage and power requirements for -

- . traction
- . signalling
- . controls
- . other?

2 How is the tram network supplied with electrical power and how does this relate to the SEC system?

3 Are there any emergency supplies independent of the SEC? Indicate nature e.g. diesel generator, batteries, and the specific services supplied.

4 For the total loss of supply to all or part of the area shaded on the attached map, and in particular for the areas marked A and B, describe the effect of losses of -

- i 5 minutes;
- ii 2 hours; and
- iii 3 days.

Include comment on such aspects as -

- . number of people affected;
- . the effect, e.g. stranded, delayed;
- . effect on motor vehicle traffic e.g. obstruction;
- . risk to stalled trams;
- . effect on bus operation.

REQUEST FOR INFORMATION FROM
VICTORIA STATE EMERGENCY SERVICE

1 For the total loss of electricity supply to all or part of the area shaded on the attached map, and in particular the areas marked A and B, what would the State Emergency Service see as the major risks to human health and safety? Describe in relation to total loss of -

- i 5 minutes;
- ii 2 hours; and
- iii 3 days.

2 What role would the State Emergency Service play in the event of such a power blackout?

3 Would the total loss of electricity affect the operations of the State Emergency Service? For example, communications, lighting.

REQUEST FOR INFORMATION FROM ROSTA

1 For the Central Business District and inner metropolitan areas, what road traffic controls are normally dependent on SEC supply?

2 How are these supplies normally derived?

3 Do any signals have alternative back-up or emergency supplies independent of the SEC? If so, describe nature of supply, e.g. battery, generator, and specific controls supplied.

4 What would be the effect on the traffic control system and consequently the traffic flow for the total loss of electricity supply to all or part of the area shaded on the attached map, and in particular the areas marked A and B? Describe the effects for total losses of -

i 5 minutes;

ii 2 hours; and

iii 3 days.

Include comment on aspects such as -

- . numbers of motor vehicles and people affected;
- . effect on movement of emergency vehicles;
- . effect on trams, trains.

5 From past experience, what is the effect of traffic signal failure on the incidence of accidents at intersections?

REQUEST FOR INFORMATION FROM PORT OF MELBOURNE AUTHORITY

- 1 What Port of Melbourne Authority services are dependent on the SEC supply for their normal operation?
- 2 Do any of these services have emergency supplies independent of the SEC? If so, describe nature of supply (e.g. diesel generator, battery) and the specific services supplied.
- 3 What would be the effects on the operation of the Port of Melbourne and the World Trade Centre for a total loss of electricity supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B?

Describe the effects for total losses of -

- a 5 minutes;
- b 2 hours, and
- c 3 days

Include comments on aspects such as -

- . number of people at risk
- . nature of risk, e.g. lack of lighting, security
- . effect on ship movements
- . effect on freight handling
- . estimated economic loss.

- 4 To indicate the effect on occupants and services in the World Trade Centre, the attached detailed questionnaire should be completed.

REQUEST FOR INFORMATION FROM
BUILDING DIVISION, PUBLIC WORKS DEPARTMENT

1 What classes of Government buildings or services are highly dependent on the SEC supply for their normal operation?

2 For these buildings or services, indicate the possible effects of a total loss of electricity supply to all or part of the area shaded on the attached map and, in particular, the areas marked A and B. Describe the effects for total supply losses of -

- a 5 minutes;
- b 2 hours; and
- c 3 days.

Include comments on aspects such as -

- . number of people affected;
- . nature of the effects, e.g. lack of lighting, ventilation.

3 What are the standards or recommended practices adopted by your Department for -

- a the provision of emergency electricity supplies to buildings;
- b the minimisation of risks to health and safety in the event of loss of normal electricity supply.

4 To demonstrate the effect on occupants and services in Government buildings, typical buildings should be selected as examples and one of the attached questionnaires completed for each building.

QUESTIONNAIRE FOR MUNICIPAL COUNCILS

PART A : GENERAL

..... CITY COUNCIL

DOMESTIC

What is the current residential population within the municipality?

Distribution of residential accommodation -

| | | |
|----------------------|-------|---|
| High Rise | | % |
| Flats | | % |
| Individual Dwellings | | % |

Of all dwellings, what proportion have special needs, e.g. -

| | | |
|--|-------|---|
| Aged over 65 years | | % |
| Young Families | | % |
| Home medical equipment dialysis, respiratory support | | % |

What is the effect of loss of electricity supply on each of the categories for five minutes, two hours, three days, e.g. lifts in high rise buildings, household cooking and heating?

.....
.....
.....
.....

COMMUNITY SERVICES

Indicate the number and type of community services which operate in your area, e.g. - hospitals, nursing homes, medical centres, infant welfare, schools, waste disposal.

.....

For the services listed, indicate in the following table the degree of disruption caused by loss of electricity supply for the times indicated:

| DURATION OF LOSS OF SUPPLY | DISRUPTION TO SERVICE | | |
|----------------------------|-----------------------|---------|-----|
| | SEVERE | PARTIAL | NIL |
| 5 Minutes | | | |
| 2 Hours | | | |
| 3 Days | | | |

Comment on the nature of the disruption to the services listed.

.....

Municipal Councils (Contd)
INDUSTRIAL

Indicate the number and type of industry which operates in your area, e.g. heavy industry, petro chemical, machining, plastic moulding, continuous process, food manufacture.

.....

For those industries listed, indicate in the following table the degree of disruption caused by loss of electricity supply for the times indicated:

| DURATION OF LOSS OF SUPPLY | DISRUPTION TO SERVICE | | |
|-------------------------------|-----------------------|---------|-----|
| | SEVERE | PARTIAL | NIL |
| 5 Minutes | | | |
| 2 Hours | | | |
| 3 Days | | | |

Comment on the nature of the disruption to the services listed.

.....

COMMERCIAL

A NON-RETAIL

Indicate the number and type of commercial non-retail premises which operate in your area, e.g. office accommodation, banks, etc.

.....

For those premises listed, indicate in the following table the degree of disruption caused by loss of electricity supply from the times indicated:

| DURATION OF LOSS OF SUPPLY | DISRUPTION TO NON-RETAIL PREMISES | | |
|-------------------------------|-----------------------------------|---------|-----|
| | SEVERE | PARTIAL | NIL |
| 5 Minutes | | | |
| 2 Hours | | | |
| 3 Days | | | |

Comment on the nature of the disruption to the services listed.

.....

Municipal Councils (Contd)

B RETAIL

Indicate the number and type of retail premises which operate in your area, e.g. - equipment sales, food sales, etc.

.....

For those premises listed, indicate in the following table the degree of disruption caused by loss of electricity supply for the times indicated:

| DURATION OF LOSS OF SUPPLY | DISRUPTION TO RETAIL ACTIVITY | | |
|-------------------------------|-------------------------------|---------|-----|
| | SEVERE | PARTIAL | NIL |
| 5 Minutes | | | |
| 2 Hours | | | |
| 3 Days | | | |

Comment on the nature of the disruption to the services listed.

.....

QUESTIONNAIRE FOR MUNICIPAL COUNCILS (Contd)

PART B : SPECIFIC

Building Address

Principal Occupant

How many storeys are there in building?

In the building, what is the number of lifts?

Escalators?

Stairwells?

What is the average number of people occupying the building on a typical -

Weekday?

Weekend?

Should a blackout occur, specify from the list opposite those hazards to which people would be exposed.

| | |
|---|--|
| Trapped in lift | |
| Life support system | |
| Robbery and assault | |
| Fire | |
| Unlit stairwell | |
| Lack of ventilation | |
| Other - please specify (attach details) | |

How many people would be exposed to hazards during the period of blackout?

On the list opposite, indicate those activities critically dependent on continuity of supply and the length of interruption that would be critical.

| Duration of Interruption | Up to 5 Min | Up to 2 Hrs | Up to 3 Days |
|--------------------------|-------------|-------------|--------------|
| Food storage | | | |
| Food preparation | | | |
| Water pumps | | | |
| Lighting | | | |
| Traction | | | |
| Drug/blood storage | | | |
| Specimen storage | | | |
| Communications | | | |
| Air conditioning | | | |
| Sewerage | | | |
| Computers | | | |
| Continuous processes | | | |
| Other (please specify) | | | |

At what times would people and plant be exposed to hazards by interruption of supply?

| | |
|------------------------|--|
| Weekdays | |
| Weekends | |
| Normal Business Hours | |
| Morning & Evening Peak | |
| Daylight Hours | |
| Hours of Darkness | |

If a standby generator is installed, what is its capacity?

_____ kilowatts

What proportion of services could be supplied by the standby generators as a percentage of normal total activity?

| Less Than 10% | Between 10-30% | Between 30-50% | Greater Than 50% |
|---------------|----------------|----------------|------------------|
| | | | |

If standby supplies are selected to feed specific services, what are these services?

| | |
|----------------------|--|
| Computers | |
| Lighting | |
| Orderly evacuations | |
| Lifts | |
| Escalators | |
| Stairwell lighting | |
| Ventilation | |
| Other (please state) | |

What is the normal power demand of the activity?

_____ kilowatts

What is the cost of standby generation -
 Cost of generator, including installation _____ dollars
 Operating cost per annum _____ dollars
 Operation of standby generation per annum _____ hours

For how long could the standby generators provide continuous supply during a blackout?

| Less Than 1 hr | 1-5 hr | 5-10 hr | >10 hr |
|----------------|--------|---------|--------|
| | | | |

What other emergency procedures are implemented to minimise the effects of a prolonged blackout?

| | |
|------------------------------------|--|
| Send workers home | |
| Orderly evacuation procedure | |
| Lock up premises | |
| Roll call | |
| Eliminate non-essential activities | |
| Other - please specify | |

For those activities which are critically affected, what time and cost would be required to recover from a critical supply outage?

| | |
|----------------|--|
| Time | |
| Estimated Cost | |

What is the estimated loss of revenue likely to be incurred as a result of interruption to supply?

| Duration of Interruption | Up to 5 Mins | Up to 2 Hours | Up to 3 Days |
|--------------------------|--------------|---------------|--------------|
| Wages/Salary | | | |
| Sales | | | |
| Damage | | | |

What is actual experience of power blackouts for this activity?

Please discuss under the following headings:

- . When blackout occurred.
- . Duration of blackout.
- . Effect on occupants.

SECTION 2

CHARACTERISTICS OF AREA SURVEYED

SECTION 2

CHARACTERISTICS OF AREA SURVEYED

1 RESIDENTIAL DISTRIBUTION IN SURVEYED AREA

1.1 Ministry of Housing Development and Property Division

There are two basic types of high-rise accommodation units provided by the Ministry of Housing and all of these lie within the survey area -

- . 48 x 20 Storey Family Blocks (Exception is Park Towers, South Melbourne which is 30 Storeys)

On average, there are two lifts (serving alternate floors) and two stairwells per 20 storey block.

Each block comprises approximately 200 flats (Park Towers 299 flats) with an average of three to four persons per flat giving a total occupancy of over 600 people per block and in excess of 25 000 for the blocks in the survey area.

- . 9 x 12 Storey Elderly Person Blocks

On average, there are two lifts (serving alternate floors) and two stairwells per 12 storey block.

There are around 200 persons accommodated in each block and some 1800 persons in total occupying this form of accommodation in the survey area. Some of these residents are incapacitated but are placed in these high-rise residences because of the availability of lifts.

In addition to the above high-rise blocks, the Ministry of Housing provides "walk-up" units which comprise blocks of flats up to four storeys.

These units do not have any lifts and therefore are used to accommodate only persons capable of walking and climbing stairs.

The design of the high-rise blocks (20 and 12 storey) is similar throughout the survey area and the Ministry of Housing has provided details for typical 20 storey and 12 storey blocks.

1.2 Municipal Councils

Population and housing statistics supplied by municipal councils are shown in Table 1.

TABLE 1 : POPULATION AND HOUSING

| Municipal Council | Current Residential Population | Distribution of Residential Accommodation (% of Total) | | | Dwellings with Special Needs (% of Total) | | Number of Home Medical Units (Dialysis, Respirators) |
|-------------------|--------------------------------|--|-------|----------------------|---|----------------|--|
| | | High-Rise | Flats | Individual Dwellings | Occupants Over 65 Years of Age | Young Families | |
| Altona | 32 000 | - | 10 | 90 | 10 | 25 | (1) |
| Brunswick | 47 000 | 1 off (2) | 11.1 | 88.9 | 14 | 27 | Estimate 1% |
| Collingwood (7) | 15 500 | - | - | - | 12 (3) | - | |
| Essendon | 56 380 | 0.2 | 27.5 | 69.7 | 23.5 | 12.0 | (1) |
| Fitzroy (7) | 19 200 | - | - | - | 14 (3) | - | |
| Footscray | 50 000 | 1 | 21 | 68 | 17 | 17 | Approx 50 |
| Hawthorn | 30 700 | - | 53 | 47 | 20 (3) | - | (1) |
| Kew (7) | 29 700 | - | - | - | 23 (3) | - | |
| Melbourne | 59 300 (4) | 22 | 29 | 49 | 11 | 16 | 10 |
| Northcote (8) | - | - | - | - | - | - | - |
| Port Melbourne | 8 700 | - | 18 | 82 | 12 | 15 | 3 |
| Prahran | 46 800 | 11.1 (9) | 45.9 | 40.1 | 15.2 | - | (1) |
| Richmond | 24 900 | 25 | 36 | 39 | 14 | 19 | (1) |
| South Melbourne | 20 200 | 25 | 5 | 70 | 14 | Approx 5 | (1) |
| St Kilda | 49 366 | 2 | 75 | 23 | 19 (5) | - | (1) |
| Sunshine | 94 418 | 0 | 11.8 | 88.2 | 25.2 (6) | - | (1) |
| Williamstown | 27 000 | 3 | 12 | 85 | 25 | - | 1 |

EXPLANATORY NOTES

- (1) Council unable to supply details of home medical equipment. However, SEC Metropolitan Electricity Supply Region has 97 recorded homes with dialysis machines within its supply area.
- (2) Actual number - not percentage.
- (3) Per cent of population aged over 60 years.
- (4) Includes 4216 in CBD. Workforce population is 205 000.
- (5) Per cent of population - not dwellings.
- (6) Aged over 60 years.
- (7) Council has advised that they are awaiting consideration by the Merri-Yarra Municipal Protection Group before responding. Population figures are from ABS Census 1981.
- (8) Council chose not to provide details.
- (9) Excludes 6% of households in Housing Commission stock.

1.3 Residential Premises Selected by Respondents as a Representative Example for Analysis

- . Housing Commission - family units (20 storeys, two lifts, two stairwells).
- . Housing Commission - elderly person units (12 storeys, two lifts, two stairwells).
- . Barkly Street, Brunswick (12 storeys, two lifts, two stairwells).
- . (Address not stated), Footscray (multi-storey, low rise, no lifts).
- . 12 Marine Parade, St Kilda (12 storeys, two lifts, two stairwells).

2 PROFILE OF COMMUNITY AND ESSENTIAL SERVICES

2.1 Metropolitan Fire Brigade

Nineteen MFB stations are located within the area concerned, as follows:

| | | |
|------------|--------------------------|-----------------|
| Altona | Malvern | St Kilda |
| Ascot Vale | Melbourne (Eastern Hill) | South Melbourne |
| Brunswick | Newport | Spotswood |
| Carlton | North Melbourne | West Melbourne |
| Footscray | Northcote | Windsor |
| Hawthorn | Port Melbourne | |
| Kew | Richmond | |

These stations provide all fire services to the area and are the termination points for 4250 building alarms.

2.2 Victoria Police

The police establishments within the area are as follows:

- . Police Headquarters
- . CIB Administration
- . Forensic Science Laboratory
- . Information Bureau, Records Section
- . Traffic Operations Group
- . Local Police Districts (Stations)

2.3 Health Commission

Twenty-one major public hospitals are located in the area, as listed below. The number of beds are shown in brackets:

| | |
|---------------------------------|----------------------------------|
| After Care, Collingwood (114) | Royal Childrens, Parkville (658) |
| Alfred, Prahran (615) | Royal Dental, Melbourne (17) |
| Altona (25) | Royal Melbourne, Parkville (658) |
| Caritas Christi, Kew (97) | Royal Womens, Carlton (596) |
| Essendon (77) | St Georges, Kew (150) |
| Eye & Ear, East Melbourne (135) | St Vincents, Fitzroy (538) |
| Fairfield, Kew (648) | Western General, Footscray (305) |
| Mercy, East Melbourne (299) | Williamstown (121) |
| Mount Royal, Parkville (695) | Cancer Institute (-) |
| Prince Henry's, Melbourne (409) | Royal Talbot (102) |
| Queen Victoria, Melbourne (436) | |

Specific hospitals selected for detailed analysis are as follows:

- . Prince Henry's Hospital, St Kilda Road, South Melbourne
- . Royal Melbourne Hospital, Grattan Street, Parkville
- . Williamstown Hospital, Railway Crescent, Williamstown

Ambulance service headquarters are also included in the survey.

2.4 Board of Works

The following MMBW installations in the inner metropolitan area are TOTALLY dependent on SEC supply:

- a Brooklyn Sewerage Pumping Station, which pumps 2/3 of the sewerage from Metropolitan Melbourne (400 000 kL daily in dry weather and double this in wet weather). This is by far the most vital element in the MMBW system and is essential to the health and welfare of more than 1 500 000 people.
- b Fourteen local sewerage pumping stations, located as follows. The dry weather daily average sewerage flow is shown in brackets for each station as an indication of relative importance:
 - Altona - Pinnacle Road (1200 kL), Western No 2 Purification Plant (4000 kL)
 - Braybrook - Braybrook (770 kL)
 - Fishermen's Bend - Fishermen's Bend 'K' (1000 kL)
 - Footscray - Smith Crescent (130 kL)
 - Kew - Coombs Avenue (60 kL), Kew Treatment Works (580 kL)
 - Maribyrnong - Riverview Court (260 kL)
 - Melbourne - Flinders Street (1300 kL normal, 5000 kL on day of MCG fixture)

Toorak - Verdant Avenue (16 kL)

West Melbourne - Schintler (9 kL), Brambles (9 kL),
Ansett (32 kL), Mayne Nickless (69 kL)

- c Storm-water pumping stations located in South Melbourne and Port Melbourne prevent the flooding of local areas.

2.5 Telecom

Numerous telephone exchanges and radio telephone stations are located within the area surveyed.

2.6 Community Welfare Services Department

The main establishment affected is Fairlea Womens Prison.

2.7 Victorian Railways

The VicRail activities affected are -

- . communications;
- . control centres;
- . suburban electrified system (390 000 passengers daily);
- . country and interstate passenger trains;
- . freight handling;
- . catering;
- . workshops.

2.8 Melbourne and Metropolitan Tramways Board

The whole of the tramway system is totally dependent on SEC supply. The system serves 185 000 passengers daily and has a loading of 39 000 kilowatts. Security of electricity supply is provided by feeding all trolley-wire sections from two independent tramway substations, with each tramway substation in turn being fed from two different SEC distribution sources where practicable.

2.9 Road Safety and Traffic Authority

There are approximately 1100 intersection signals and 500 pedestrian operated signals in the Melbourne metropolitan area with a greater density near the CBD.

All traffic signals derive their power from the nearest convenient point of 240 volt supply.

2.10 State Emergency Service

The State Emergency Service is responsible for the co-ordination of the Disaster Welfare Plan, which would need to be implemented if the duration of a power blackout approached three days.

2.11 Municipal Councils - General Profile

Details of community services as supplied by councils are set out in Table 2.

Specific services selected by councils for detailed analysis are as follows:

- . Nursing Homes

44 Stephen Street, Yarraville (60 beds)
K15 Raleigh Street, Windsor

- . Schools (Tertiary)

Footscray Institute of Technology, Ballarat Road, Footscray
University of Melbourne, Swanston Street, Carlton
(15 multi-storey buildings)

3 PROFILE OF INDUSTRY

3.1 Port of Melbourne Authority

The following industrial activities in the Port of Melbourne and dependent on SEC supply for their normal operation as follows:

- a Equipment directly associated with loading and unloading cargo from ships at wharves, including wharf and container cranes, pumping equipment, ventilating fans, cargo lighting, shore based ramps for stern loading.
- b Services for stacking, maintaining and handling cargo in areas immediately adjacent to the wharves. These include shed and office lighting and power, refrigerated container power outlets, lighting of stacking areas and roadways.
- c PMA workshops at West Melbourne and Williamstown.
- d Navigation lighting - shore based.

3.2 Municipal Councils - Industrial Profile

Details of industries, as supplied by councils, are set out in Table 3.

TABLE 2 : COMMUNITY SERVICES

| Council | Hospitals | Nursing Homes | Medical Centres, Clinics | Child Welfare (Including Kindergarten) | Schools (Including Tertiary) | Social Welfare Centres | Waste Disposal |
|-----------------|--------------|---------------|--------------------------|--|------------------------------|------------------------|----------------|
| Altona | 1 | 4 | 20 | 6 | 22 | - | |
| Brunswick | | | 20 | | 15 | - | |
| Collingwood* | | | | | | - | |
| Essendon | 1 | 7 | - | 6 | 30 | - | |
| Fitzroy* | | | | | | - | |
| Footscray | 4 | 5 | 2 | 21 | 18 | - | |
| Hawthorn | 6 | 7 | 60 | 3 | 16 | - | |
| Kew* | | | | | | - | |
| Melbourne | 7 | 3 | 3 | 28 | 20 | 14 | - |
| Northcote* | | | | | | - | |
| Port Melbourne | 0 | - | 5 | 6 | 3 | 4 | 1 |
| Prahran | 11 (Private) | 19 | 21 | - | 27 | - | 1 (baler) |
| Richmond | 2 | - | 2 | 3 | 8 | - | - |
| South Melbourne | 2 | 1 | - | 3 | 8 | - | 1 |
| St Kilda | 0 | 31 | 35 | - | - | - | - |
| Sunshine | 2 | 4 | 9 | 39 | 57 | 2 | - |
| Williamstown | 1 | 5 | 10 | 4 | 12 | - | - |

*These councils did not provide details.

TABLE 3 : GENERAL INDUSTRIAL PROFILE

| Municipal Council | Metal Products and Fabrication | Chemical, Petroleum | Paper, Paper Products and Printing | Textiles, Clothing, Footwear | Food, Beverages, Tobacco | Wood Products, Furniture | Motor and Other Machinery | Other Light Industry | Unspecified | Total |
|-------------------|---|---------------------|------------------------------------|------------------------------|--------------------------|--------------------------|---------------------------|----------------------|-------------|-------|
| Altona | | X | | | X | X | X | X | | X |
| Brunswick | 41 | 1 | 15 | 130 | 21 | 26 | 33 | 19 | | 286 |
| Collingwood* | Mainly small service industries - number not specified. | | | | | | | | | |
| Essendon | Mainly light industrial - no heavy industry. | | | | | | | | | |
| Fitzroy* | 63 | 24 | 14 | 19 | 14 | 14 | 5 | 214 | 8 | 375 |
| Footscray | Mainly light industrial - no heavy industry. | | | | | | | | | |
| Hawthorn | 41 | 13 | 119 | 154 | 34 | 16 | 35 | 61 | | 473 |
| Kew* | 11 | 1 | | | | | 2 | 1 | 30 | 45 |
| Melbourne | 80 | 28 | | 193 | 32 | 76 | | 34 | | 600** |
| Northcote* | | | | | X | X | X | X | | 542 |
| Port Melbourne | | | | 46 | 20 | | | 100 | | 166 |
| Prahran | 57 | 23 | 16 | 12 | 23 | | 60 | 28 | | 219 |
| Richmond* | | X | | X | | | | X | | - |
| South Melbourne | | | | | | | | | | |
| St Kilda | | | | | | | | | | |
| Sunshine | | | | | | | | | | |
| Williamstown | | | | | | | | | | |

* Councils elected not to provide details

X Activity indicated but number not specified.

** Total from 1983 valuations, breakdown from 1974 research report.

3.3 Industries Selected by Councils as a Representative Sample for Analysis

Port of Melbourne Authority -

cargo handling;
navigation.

Metal products and fabrication -

General Motors, Holden, Port Melbourne;
West Footscray Engineering Works Pty Ltd, 50-54 Cross Street,
West Footscray;
Naval Dockyard, Nelson Place, Williamstown.

Petrochemical -

Mobil Oil Australia, 33 Francis Street, Yarraville;
Shell Company of Australia, Burleigh Street, Newport;
ICI Australia, Ballarat Road, Deer Park;
Monsanto Australia Ltd, Somerville Road, West Footscray;
Altona Petrochemical Company, Maidstone Street, Altona
Dow Chemical, Kororoit Creek Road, Altona;
Union Carbide, Maidstone Street, Altona;
Australian Carbon Black, Millers Road, Altona.

Chemical -

ACI Operations Pty Ltd, Booker Street, Spotswood
Commonwealth Serum Laboratories, 45 Poplar Road, Parkville;
CSIRO, Division of Applied Organic Chemistry, 506 Lorimer Street,
Fishermen's Bend;
Allbright and Wilson, Whitehall Street, Yarraville.

Textiles, Clothing, Footwear -

Port Phillip Mills, 31 Nelson Place, Williamstown.

Food, Beverages -

Carlton and United Breweries, 16 Bouverie Street, Carlton;
Kraft Foods Limited, Salmon Street, Port Melbourne.

Light Industry -

Australian Hostess Industries, 286 Burwood Highway, Hawthorn
Wrightcell, 8 Cato Street, Hawthorn.

4 PROFILE OF COMMERCIAL PREMISES

4.1 Public Works Department

There are nine buildings on the Treasury Reserve, housing a number of Government Departments and Services. The buildings range from two to twelve storeys.

4.2 Port of Melbourne Authority

The World Trade Centre is a five-building complex with 46 office floor levels and seven car park levels, with a potential occupancy of 3500 people plus 2000 visitors.

4.3 Municipal Councils

The commercial profile provided by councils is set out in Table 4.

TABLE 4 : GENERAL COMMERCIAL PROFILE

| Council | Non-Retail | | | | | Retail | | |
|-----------------|------------|-------|--------------------------|----------------|---------|------------|-------------|-------|
| | Offices | Banks | Hotels and Food Services | Other Services | Total | Food Sales | Other Sales | Total |
| Altona | - | - | - | - | 47 | X | X | 212 |
| Brunswick | 200 | 20 | X | X | 400 | X | X | 200 |
| Collingwood* | | | | | | | | |
| Essendon | X | X | X | X | - | X | X | - |
| Fitzroy* | | | | | | | | |
| Footscray | 109 | 27 | 51 | 65 | - | X | X | 1221 |
| Hawthorn | X | X | X | X | 484 | X | X | 907 |
| Kew* | | | | | | | | |
| Melbourne CBD | - | 3910 | - | 508 | 1173 | - | 453 | 1466 |
| Northcote* | | | | | | | | |
| Port Melbourne | 125 | 5 | 21 | - | - | 32(1) | 89 | - |
| Prahran | 123 | 55(3) | 120 | 1661 | | 219 | X | 1700 |
| Richmond* | | | | | | | | |
| South Melbourne | X | X | 118 | X | 2150(2) | 300+ | 500 | |
| St Kilda | 339 | 28 | 33 | 161 | - | X | X | 881 |
| Sunshine | 78 | 28 | 65 | 77 | 248 | 197 | 443 | 640 |
| Williamstown | X | 13 | - | - | - | 163 | X | - |

* Councils elected not to provide details.

X Activity indicated but number not specified.

(1) Milkbars.

(2) Occupancies.

(3) Includes finance houses.

4.4 Commercial Premises Selected by Councils as a Representative Sample for Analysis

Offices -

State Government Offices, 1 McArther Street, Melbourne;
World Trade Centre, Flinders Street Extn, Melbourne;
Australia Post, 214 Nicholson Street, Footscray;
ANZ Twin Towers, Collins Street, Melbourne;
Cadbury-Schweppes, 636 St Kilda Road, St Kilda;
Computer Technology, 1 St Kilda Rd, St Kilda;
ADAPS Ltd, 135 Inkerman Street, St Kilda.

Banks -

Commonwealth Bank, 122 Nicholson Street, Footscray;
State Bank, Bay Street, Port Melbourne.

Hotels -

Cnr Mt Alexander Road and Dean Street, Moonee Ponds;
Regent Hotel, Collins Street, Melbourne;
Queens Lodge Motor Inn, 81 Queens Road, St Kilda.

Other services -

South Pacific Health Centre, Lower Esplanade, St Kilda;
Coles Warehouse, Plummer Street, Port Melbourne.

Food sales -

Footscray Market, Leeds Street, Footscray;
Sandwich/Milk Bay, Bay Street, Port Melbourne;
Woolworths, 29 Fitzroy Street, St Kilda;
Safeway, 117 Ackland Street, St Kilda;
S E Dickens, Camden Street, Balaclava;
Safeway, Devonshire Road, Sunshine.

General retail sales -

Forges, Nicholson Mall, Footscray;
G J Coles, 138 Nicholson Street, Footscray;
Myer, Bourke Street Mall, Melbourne;
Williamstown Shopping Area.

SECTION 3
RESULTS OF SURVEY ON LOSS OF ELECTRICITY SUPPLY

SECTION 3

RESULTS OF SURVEY ON LOSS OF ELECTRICITY SUPPLY

1 COMMUNITY HARDSHIP

1.1 HARDSHIP IN DOMESTIC ACTIVITIES

1.1.1 Ministry of Housing

Advice from the Development and Services Division, Ministry of Housing, indicates that the total loss of electricity supply to the Housing Commission blocks would result in an immediate loss of cooking facilities, lights and lifts. After one or two hours, the water supply to the high-rise blocks would also fail.

The loss of lifts would severely inconvenience the elderly, especially those who would not be able to make use of the stairs.

1.1.2 Municipal Councils

The councils have indicated that the degree of community hardship caused by the loss of electricity supply will increase with the duration of the loss. In general, a five minute loss is seen to cause little or no inconvenience; a two hour loss to cause partial disruption, particularly with respect to heating, cooking and lighting and a three day loss to have a severe effect. Heating, cooking, lighting and refrigeration are identified as the main areas of inconvenience and hardship.

Specific comments made by councils on the nature of the effect of the disruption to domestic activities are as follows:

. Essendon City Council

Five minutes - stairway access.

Two hours - stairway access, lifts, cooking, heating, TV and wireless.

Three days - stairway access, lifts, cooking, heating, TV and wireless.

. Footscray City Council

General lighting affected for all periods. Heating, cooking and food storage affected if disruption more than a day.

. Port Melbourne City Council

Depending on the time of day and length of loss of power, inconvenience could be caused with inability of household cooking facilities. The majority of hot water facilities are electric powered.

. Prahran City Council

Two hour loss could just be tolerated, except for lifts in high rise flats, but there would be significant disruption if it occurred at mealtimes. Three day loss would leave the community with no cooking facilities, lighting, heating in some instances, loss of refrigerated and frozen food and would be a catastrophic situation.

. Richmond City Council

This Council believes the total loss of electricity supply would cause disruption and even potential disaster in certain areas.

. St Kilda City Council

St Kilda has a high proportion of elderly people. Many rely on electrical heating (as they cannot afford other types) and many who live in high-rise would be physically incapable of climbing up or down stairs.

Five minutes - lifts, safety lighting.

Two hours - frozen food.

Three days - this would be particularly damaging, especially in Winter, relief supplies for elderly persons (especially in high-rise) who would need cooked food delivered and would have to be physically carried down from buildings. Complete lack of open fire facilities in flats would mean problems for elderly and young children who usually have radiators.

. Williamstown City Council

Loss of cooking, heating and refrigeration.

1.2 HARSHIP IN COMMUNITY AND ESSENTIAL SERVICES

1.2.1 Victorian Railways

Approximately 390 000 passengers travel in the rail system each working day (February 1983 count) with around 66 300 people travelling between the peak hours of 8.00 am and 9.00 am.

Table 1 summarises the disruption which the total loss of electricity supply to all or part of the inner metropolitan area would cause to the suburban passenger rail services during daylight hours.

No suburban rail service could be operated in the blacked-out areas during hours of darkness.

TABLE 1 : VICTORIAN RAILWAYS

| Area Affected by Total Supply Loss | Duration of Loss | | |
|------------------------------------|-----------------------|--|-------------------|
| | Up to Five Minutes | Up to Two Hours | Up to Three Days |
| A | Delays of 15 minutes. | No trains west of Flinders Street. Cancellations and delays on lines east of Flinders Street. No public address or passenger information at Flinders Street. No trains at night. | As for two hours. |

| Area Affected by Total Supply Loss | Duration of Loss | | |
|------------------------------------|---|---|-------------------|
| | Up to Five Minutes | Up to Two Hours | Up to Three Days |
| B | Delays of 15 minutes. Disruption to road traffic at approximately 28 boom barriers. (Signalling supply, which also operates barriers in all areas, is from Area B.) | Train service reduced "slow crawl". Road traffic stopped at 28 boom barriers. No public address or passenger information at Richmond. No trains at night. | No train service. |
| Whole of shaded area. | Delays to 30 minutes. Disruption to road traffic at boom barriers. | No train service. Disruption to road traffic at boom barriers. | No train service. |

Country and interstate passenger services could continue to operate but slow moving or stationary suburban electric trains could cause serious delays. No catering service could be provided for these trains.

1.2.2 Melbourne and Metropolitan Tramways Board (MMTB)

Table 2 indicates the number of tram passengers likely to be inconvenienced by a total loss of electrical supply in the inner metropolitan areas.

TABLE 2 : NUMBER OF TRAM PASSENGERS AFFECTED BY TOTAL SUPPLY LOSS

| Area Affected by Total Supply Loss | Duration of Loss | | |
|------------------------------------|--|--------------------------|---------------------------------|
| | Up to Five Minutes | Up to Two Hours(1) | Up to Three Days(1) |
| A | Peak = 3200, Off-peak = 1000. | Off-peak = 7000 to 8000. | Total for one day = 38 000. |
| B | Peak = 7000, Off-peak = 2200 to 3400. | Off-peak = 16 000. | Total for one day = 85 000. |
| Whole | Peak = 16 000, Off-peak = 5000 to 7500. | Peak = 90 000. | Total for one day = 170 000(2). |

- (1) In addition to the inconvenience to tram passengers, stalled trams would cause congestion and inconvenience to occupants of motor vehicles.
- (2) Total tram system caters for an estimated 185 000 people per day.

1.2.3 Municipal Councils

Hospitals, medical centres, infant welfare centres and schools are seen as the services which, if disrupted through an extended loss of electricity supply, would cause severe community inconvenience and hardship.

Specific comment:

- . Port Melbourne City Council

To most of the community services, it would just be an inconvenience, except for medical centres. A few of the welfare buildings would lose all communication with loss of power due to the switchboards being used.

1.3 COMMERCIAL HARDSHIP

The disruption to retail shops, especially food suppliers, and petrol stations are seen to be the main causes of community hardship in the commercial area.

Specific comment:

- . Footscray City Council

A disruption of a few hours should not greatly affect those in this category (commercial) except for food sales. A disruption of a few days may be inconvenient but not costly to a majority.

- . Prahran City Council

All premises where food is prepared or stored would be severely affected.

2 EFFECTS ON PUBLIC HEALTH

2.1 RESIDENTIAL HEALTH EFFECTS

2.1.1 Ministry of Housing

High-rise flats are entirely dependent on electric pumps for their main water supply. After two hours without electricity, the water supply may cease and sewage could not be flushed, with a consequent risk to health.

2.1.2 Municipal Councils

For an interruption to supply for two hours or more, the area of concern identified by councils were -

- home medical equipment;
- heating for the aged;
- water supply and sewerage in blocks of flats.

Specific comments are as follows:

. Footscray

Home medical equipment not affected by a five minute outage. An outage of two hours or more may require emergency procedures.

. Port Melbourne

The major problem is with the aged persons; loss of power could cause medical equipment stoppage - severe temperature decrease during winter periods.

2.2 COMMUNITY AND ESSENTIAL SERVICES HEALTH EFFECTS

2.2.1 Health Commission

In hospitals, emergency battery consoles giving three hours of standby are installed in critical areas. Apart from these, standby arrangements vary widely, with installed generation ranging from nil to "sufficient for normal operation". Figures supplied by the Health Commission indicate that major public hospitals having over 500 beds are adequately equipped with standby power for essential activities.

2.2.2 Board of Works

Interruption of supply for two hours will cause sewage overflows at numerous pumping stations.

All sewage overflows go directly or via storm water drains into a watercourse and then into the Port Phillip Bay. Some pumping stations have no overflow outlets, in which case sewage can overflow from toilet bowls and gatic covers.

Overflow of raw sewage and pollution of Port Phillip Bay can be a serious health risk to those using the Bay, the Yarra and other watercourses in the Board's area of responsibility.

2.2.3 Municipal Councils

All responding councils indicate that severe disruption to hospital functions would occur for a two-hour loss of supply.

Some councils expect that a two hour loss would also cause severe disruption to nursing homes and the blood bank and partial disruption to medical centres and infant welfare centres (Footscray, Melbourne, Richmond, South Melbourne, St Kilda and Sunshine).

Most of the councils indicated that a three day outage would affect all community health services.

Specific comments are as follows:

- . Altona

Would require transfer of (hospital) patients.

- . Footscray

A disruption of any period may be costly in human comfort or human life terms. These costs, of course, cannot be recovered by time.

- . Melbourne

Hospitals and nursing homes could be severely affected as they have many critical life support systems dependent on electric power and most are not covered by adequate stand-by generation. Research units at Melbourne University, the Veterinary College, the CSIRO and the Commonwealth Serum Laboratory can lose years of research and batches of drug production should electric supply fail.

- . Prahran

Interruption of supply to Council Baler would result in the accumulation of putrescible garbage.

- . South Melbourne

Prince Henry's Hospital, after two hours, would lose valuable experiments, bone marrow and tissue in cold storage; similarly, Red Cross would lose blood bank stocks.

. Williamstown

The hospital is installing a stand-by generator which will alleviate the problem but the disruption would cause loss of heating and cooking facilities.

2.3 INDUSTRIAL HEALTH EFFECTS

2.3.1 Port of Melbourne Authority

Interruption of electricity supply would result in a health risk in the Port area due to several sewerage pumping systems holding tanks overflowing.

2.4 COMMERCIAL HEALTH EFFECTS

Specific comment:

. Melbourne City Council

A health problem could result from loss of supply to ventilation fans, sewerage and water pumps in large buildings.

3 EFFECTS ON SAFETY

3.1 DOMESTIC SAFETY

Stalled lifts and unlit stairwells were seen by the Ministry of Housing and most municipal councils to be the main safety risk in residential premises. The risk is considered to be present at all times. The hazards reported for the selected representative buildings are given in Table 3.

Specific comments are as follows:

. Melbourne

Elderly people in high-rise flats in North Melbourne rely on electric lifts, lights and cooking. Many other flats with lifts have single parents with young children. Most flats rely on electric sewerage pumps and fire-fighting pumps.

. South Melbourne

In many high-rise buildings, loss of power means loss of fire-fighting capability and loss of reticulated water.

. Williamstown

In high-rise buildings, pensioners and children might panic.

. Ministry of Housing

Staff would be needed to carry emergency supplies up stairs.

TABLE 3 : SAFETY HAZARDS IN TYPICAL RESIDENTIAL PREMISES

| Location of Flats | Number of Occupants | Number Exposed To Hazard | Nature of Hazard | | | | |
|------------------------------------|---------------------|--------------------------|------------------|------------------|------|-----------------|-------------|
| | | | Trapped in Lift | Robbery, Assault | Fire | Unlit Stairwell | Ventilation |
| Barkly St, Bwick | 250 | 250 | X | X | X | X | X |
| Footscray | 10-40 | 10-40 | | X | X | X | |
| Marine Pde, St K | 150 | 100 | X | X | X | X | X |
| Housing Comm - Family Unit | 600 | 600 | X | X | X | X | |
| Housing Comm - Elderly Person Unit | 200 | 200 | X | X | X | X | |

3.2 COMMUNITY AND ESSENTIAL SERVICES SAFETY CONSIDERATIONS

3.2.1 Metropolitan Fire Brigade

Total power failure for a three day period would most certainly create a situation which could be detrimental to the safety of persons and property in the case of fire or other emergency.

3.2.2 Victoria Police

Safety risks resulting from an extended blackout, i.e. two hours or more, are described for each area of police operations affected.

. CIB

The work of the branch would be extremely inconvenienced by the need for total commitment to security duty by all staff.

. Forensic Science Laboratory

With a power loss, all fume cupboards become potentially hazardous immediately extraction ceases. Absence of lighting in other areas would immediately cause hazards involving chemicals.

. Information Bureau

The cessation of information emanating from the Information Bureau leads to increased risk factors to both public and police members by virtue of the fact that, with the facilities available, police can obtain information about the type of person they may be about to confront or with whom they are in contact. This enables them to take precautions if that person has a propensity for violence, or carries weapons, or possesses some other feature which makes them liable to be dangerous. Proper preparedness enables police to take appropriate measures to protect themselves and the public.

If a person at large from a penal establishment, or wanted by police on warrant, or for interview regarding offences was encountered and the facilities of the Information Bureau were not available, then this person may well remain at large due to police not being able to be informed and thus the potential risk to the community would continue.

. Traffic Operations Group

An increase of criminal activities is expected in the blacked-out areas.

Intersectional traffic control during night hours, especially without street lighting, would be most hazardous for members.

There would be a terrific strain on Traffic Operations Group members to maintain traffic control owing to lack of traffic control signals, lighting and the expected greater volume of vehicles and pedestrians on the road.

Local Police Districts

A tremendous number of members would be required to maintain law and order within the inner city area and existing shifts would need to be increased by 200%, involving overtime of some magnitude.

In general, it would require double the number of members available for morning and afternoon shift and triple the number of members for night shift.

A total power blackout in the city area would create a disaster situation when it is considered there would be no street lighting, no traffic signals and no security lighting. In addition to the welfare of the public, there would be enormous traffic and security problems for which the entire personnel and resources of the Police Department would have to be utilised.

Due to the cover of darkness, there is the possibility of increase in crimes of violence, i.e. assaults, burglaries, rapes, etc.

Emergency alarm systems fitted to homes of elderly citizens would be unable to function.

There would be no lighting or TV security monitoring facilities in cells areas at local police stations and prisoner security would become a major problem.

3.2.3 Community Welfare Services Department

Personal injury to staff, prisoners and to the public would be a possibility if riots or escapes occurred due to a prolonged loss of power to Fairlea Prison.

3.2.4 Victorian Railways

The travelling public are tolerant of short-term disruptions but, in the event of a prolonged power failure, passengers would commence walking along the tracks to stations, creating a hazard.

The automatic lowering of all boom barriers when supply is interrupted would obstruct road traffic.

Provided that the blackout affected Area A OR Area B, some traction power could be obtained from an alternative SEC source; however, it would be unsafe to operate any train service at night because of the lack of lighting in stations and freight yards, etc.

3.2.5 Melbourne and Metropolitan Tramways Board

For failure of supply during hours of darkness, stationary trams present a hazard to traffic. The older type (W class) trams would be left without any lighting.

3.2.6 Specific Buildings

Safety hazards which would result from the interruption of supply to particular buildings are set out in Table 4. The data on hospitals is from the Health Commission; the remainder is from municipal councils.

Emergency procedures adopted in the event of blackout are shown in Table 5.

TABLE 4 : SAFETY HAZARDS IN SELECTED BUILDINGS

| Type of Service and Location | Number of Occupants | | Number Exposed to Hazard | | Nature of Hazard | | | | | | |
|--|---------------------|----------|--------------------------|-----------|------------------|---------------------|------------------|------|-----------------|--------------|--|
| | Week-day | Week-end | Day-light | Dark-ness | Trapped in Lift | Life Support System | Robbery, Assault | Fire | Unlit Stairwell | Venti-lation | Other |
| | | | | | | | | | | | |
| Prince Henry's Hospital, South Melbourne | 2000 | 800 | 400 | 800 | X | X | | | X | X | |
| Williamstown Hospital, Williamstown | 380 | 240 | Minima | | X | X | | | | | |
| Royal Melbourne Hospital, Parkville | 2200 | 1650 | 0 | 0 | | | | | | | Emergency gen-erator covers all essential areas. |
| Nursing Home, Yarraville | 80 | 76 | 0 | 60 | | | | | | | Panic could result in patient falls. |
| Nursing Home, Windsor | 260 | 240 | 260 | 260 | x | | x | x | | x | Evacuation of patients taken ill during blackout. |
| Footscray Institute of Technology, Footscray | 3500 | 400 | 200 | 1800 | X | | X | X | X | | |
| University of Melbourne, Carlton | 18 000 | 2000 | - | - | X | | X | X | X | X | Particular hazards exist in medical research areas and electrically vent-ilated fume cup-boards. |

TABLE 5 : EMERGENCY PROCEDURES ADOPTED

| Location | Send Workers Home | Orderly Evacuation | Lock Up Premises | Roll Call | Eliminate Non-Ess Activity | Other |
|--------------------------|-------------------|--------------------|------------------|-----------|----------------------------|------------------------------------|
| Prince Henry's Hospital | No | No | No | No | Yes | No scheduled response to blackout. |
| Williamstown Hospital | No | No | No | No | Yes | |
| Royal Melbourne Hospital | No | No | No | No | Yes | |
| Nursing Home, Yarraville | No | No | No | No | Yes | Use torches. |
| Nursing Home, Windsor | No | No | No | Yes | Yes | Ensure safety of frail patients. |
| Footscray Institute | Yes | Yes | Yes | No | - | |
| University of Melbourne | Yes | Yes | Yes | No | Yes | |

3.3 INDUSTRIAL SAFETY

Safety hazards reported for the representative industrial premises are shown in Table 6.

TABLE 6 : SAFETY HAZARDS IN INDUSTRIAL PREMISES

| Industry | Number of Occupants | | Number Exposed to Hazard | Times When Hazard May Exist | | | | Nature of Hazard | | | Other | |
|----------------------------|---------------------|----------|--------------------------|-----------------------------|-----------|-----------|-----------|------------------|------|------------|-------|--|
| | Week Day | Week End | | Week Day | Week End | Day-light | Dark-ness | Trapped in Lift | Fire | Absence of | | |
| | | | | | | | | | | Lights | | Venti-lation |
| METAL PRODUCTS/FABRICATION | | | | | | | | | | | | |
| West Footscray Eng Works | 250 | 20 | - | X | | X | | | X | X | | No fire alarm. |
| Naval Dockyard | 2000 | 6-500 | up to 80 | X | X | | | | | | X | |
| General Motors Holden's | 3000 | 100-1000 | 200 | X | X | X | X | X | X | X | X | Explosions and run-through in furnaces. |
| PETROCHEMICAL | | | | | | | | | | | | |
| Mobil Oil Aust | 250 | 50 | 100 | | 0600-2000 | | | | | X | | No security lighting. Effluent to Yarra requires monitoring. |
| Shell Co of Australia | - | - | - | | | | | X | | X | | Absence of lighting could lead to serious injury and misoperation of facilities. |
| ICI Australia | 700 | 200 | 300 | X | X | X | X | | X | X | X | Explosives and hazardous materials.* |

TABLE 6 : SAFETY HAZARDS IN INDUSTRIAL PREMISES (CONTD)

| Industry | Number of Occupants | | Number Exposed to Hazard | Times When Hazard May Exist | | | | Nature of Hazard | | | | |
|-----------------------|---------------------|----------|--------------------------|-----------------------------|----------|-----------|-----------|------------------|------|------------|--------------|---|
| | Week Day | Week End | | Week Day | Week End | Day-light | Dark-ness | Trapped in Lift | Fire | Absence of | | Other |
| | | | | | | | | | | Lights | Venti-lation | |
| PETROCHEMICAL (CONTD) | | | | | | | | | | | | |
| Monsanto | 500 | 100 | up to 100 | X | X | | | | | X | X | Flammable vapours. Build-up of pressure in plant. Overheating of reactors. Unstable chemicals. |
| Altona Petrochemical | - | - | - | X | X | X | X | | X | | | |
| Dow Chemical | - | - | - | X | X | X | X | | X | | | |
| Union Carbide | 300 | 30 | up to 300 | X | X | X | X | | X | | | |
| Aust Carbon Black | 150 | 8 | 8 | | | | | | X | X | X | |
| CHEMICAL | | | | | | | | | | | | |
| ACI Spotswood | 400 | 100 | 50 | X | X | X | X | | X | X | | Handling of chemicals. |
| Allbright and Wilson | - | - | 120 | X | X | X | X | | | | | |

TABLE 6 : SAFETY HAZARDS IN INDUSTRIAL PREMISES (CONTD)

| Industry | Number of Occupants | | Number Exposed to Hazard | Times When Hazard May Exist | | | | Nature of Hazard | | | | |
|-------------------------------------|---------------------|----------|--------------------------|-----------------------------|----------|-----------|-----------|------------------|------|------------|--------------|-------|
| | Week Day | Week End | | Week Day | Week End | Day-light | Dark-ness | Trapped in Lift | Fire | Absence of | | Other |
| | | | | | | | | | | Lights | Venti-lation | |
| CHEMICAL (CONTD) | | | | | | | | | | | | |
| Commonwealth Serum Lab | 900 | 100 | - | X | X | X | X | X | X | X | X | |
| CSIRO Division of Organic Chemistry | | | | | | | | | | | | |
| TEXTILES | | | | | | | | | | | | |
| Port Phillip Mills | 200 | 15 | 50 | X | | | X | | X | | | |
| FOOD | | | | | | | | | | | | |
| Carlton & United Breweries | 300 | 30 | - | X | X | X | X | X | X | X | | |
| Kraft Foods | 1000 | 5-100 | Several Hundred | X | X | X | X | X | | X | X | |

* At certain times of the year, heat is required to keep explosives safe. Our steam boilers require electric power to operate.

- Indicates "not stated".

3.4 COMMERCIAL SAFETY

Almost all of the commercial premises indicated that the absence of lighting was a major hazard and in many cases robbery and assault was also anticipated in the absence of lighting.

Specific comments are as follows:

. Public Works Department

Loss of supply for periods of more than two hours would cause difficulties with people trapped in lifts and for occupying sealed air conditioned buildings.

. Melbourne

Most major CBD buildings could not be occupied for any length of time without electricity supply as they would be deprived of lifts, lighting, ventilation, sewerage and fire-fighting pumps.

. Port Melbourne

For banks, loss of power will cause a shutdown in computer networks as well as the elaborate security systems. Others (commercial premises) could have problems with illumination of offices as well as adequate ventilation.

. South Melbourne

Buildings erected before emergency lighting requirements were introduced would lose lighting in fire isolated stairs, passages, exit signs, etc. Fire services would be disrupted. No more emergency lighting after two hours in most buildings.

Table 7 lists the hazards for the selected representative buildings. Data for State Government Offices was supplied by Public Works Department, for the World Trade Centre by Port of Melbourne Authority, and for the remaining buildings by municipal councils.

TABLE 7 : SAFETY HAZARDS IN COMMERCIAL PREMISES

| Type and Location of Premises | Number of Occupants | | Number Exposed to Hazard | Time When Hazard May Exist | | Nature of Hazard | | | | | |
|--|---------------------|-------------------|--------------------------|----------------------------|-------------------|------------------|------|------------|-------------|------------------|---|
| | Bus Hours | Outside Bus Hours | | Bus Hours | Outside Bus Hours | Trapped in Lift | Fire | Absence of | | Robbery, Assault | Other |
| | | | | | | | | Light | Ventilation | | |
| OFFICES | | | | | | | | | | | |
| State Government, 1 McArthur St, Melbourne | 650 | 2 | 650 | X | | X | X | X | X | | Evacuation of disabled staff via darkened stairs. |
| World Trade Centre, Melb | 5500 | 5500 | 5000 | X | X | | | Partial | X | X | |
| Australia Post, Ftscy | 33 | 0 | 33 | X | | | X | X | | X | |
| ANZ, Twin Towers, Melb | 10 000 | 2000 | - | X | X | X | X | X | X | X | |
| Cadbury Schweppes, St K | 180 | 0 | Lift Occ Only | | | X | | | | | |
| Computer Technology, St K | 400 | 40 | Lift Occ | X | | X | | X | X | | |
| ADAPS, St K | 100 | 25 | None | | | | | | | | |
| BANKS | | | | | | | | | | | |
| Commonwealth Bank, Ftscy | 80 | 0 | 80 | X | | | | X | | X | |
| State Bank, Pt Melb | - | - | - | - | - | | | | - | - | |
| HOTELS | | | | | | | | | | | |
| Mt Alexander Rd, Moonee Ponds | 150 | 100 | 150 | X | X | X | | X | X | | |

350

TABLE 7 : SAFETY HAZARDS IN COMMERCIAL PREMISES (CONTD)

| Type and Location of Premises | Number of Occupants | | Number Exposed to Hazard | Time When Hazard May Exist | | Nature of Hazard | | | | | |
|-------------------------------|-----------------------|-------------------|--------------------------|----------------------------|-------------------|------------------|------|------------|-------------|------------------|---|
| | Bus Hours | Outside Bus Hours | | Bus Hours | Outside Bus Hours | Trapped in Lift | Fire | Absence of | | Robbery, Assault | Other |
| | | | | | | | | Light | Ventilation | | |
| HOTELS (CONTD) | | | | | | | | | | | |
| Regent Hotel, Melb | See "ANZ Twin Towers" | | | X | X | X | | Partial | | | Hotel services have priority on emergency generation. |
| Queens Lodge, St K | 45 | 40 | 50 | X | X | X | | X | | | |
| MISC SERVICES | | | | | | | | | | | |
| S Pacific Health Centre, St K | 5-30 | 5-30 | All | X | X | | X | | | X | Boiler Shutdown |
| Coles Warehouse, Pt M | 150 | 0 | Proportion | X | | | | X | | | |
| FOOD SALES | | | | | | | | | | | |
| Footscray Market, Ftscy | 1500 | Sunday 1000 | All | X | X | X | X | | X | X | |
| Sandwich/Milk Bar, Pt M | 4 | 2 | | | Darkness | | | | X | | |
| Woolworths, St K | 30 | 15 | Up to 100 | X | X | X | | X | X | X | |
| Safeway, St K | 265 | 10 | | | | | X | X | | X | |
| Dickins, Balaclava | 120 | 70 | 120 | X | | | X | | | X | |

TABLE 7 : SAFETY HAZARDS IN COMMERCIAL PREMISES (CONTD)

| Type and Location of Premises | Number of Occupants | | Number Exposed to Hazard | Time When Hazard May Exist | | Nature of Hazard | | | | | |
|-------------------------------|---------------------|-------------------|--------------------------|----------------------------|-------------------|------------------|------|------------|-------------|------------------|-----------------------------|
| | Bus Hours | Outside Bus Hours | | Bus Hours | Outside Bus Hours | Trapped in Lift | Fire | Absence of | | Robbery, Assault | Other |
| | | | | | | | | Light | Ventilation | | |
| FOOD SALES (CONTD) | | | | | | | | | | | |
| Safeway, Sunshine | 50-150 | - | - | X | | | | X | X | | Injury from possible panic. |
| GENERAL RETAIL | | | | | | | | | | | |
| Forges, Footscray | 500 | 0 | 500 | X | | X | X | X | X | | |
| Coles, Footscray | 300 | - | - | X | X | X | | X | | X | |
| Myer, Melbourne | 20 000 | 50 | - | X | | X | X | X | X | X | |

- Signifies "not stated".

4 EQUIPMENT AND OPERATIONS CRITICALLY AFFECTED BY LOSS OF ELECTRICAL SUPPLY

This section gives details of the stock and equipment critically affected for each of the particular activities selected by respondents as a representative example for analysis.

The nature of the consequent effect on health, safety and economics is dealt with in parts 2, 3 and 5 of this section.

4.1 RESIDENTIAL EQUIPMENT

4.1.1 Ministry of Housing

A loss of supply for up to five minutes would be critical to the operation of lifts. If the outage continued for up to two hours, the loss of lighting and boiler plant would become critical. A three-day loss would be critical for all electricity dependent activities. Loss of refrigeration and cooking facilities could result in spoilage of food. The loss of water pumps would mean no water for drinking, washing or fire fighting. It also would result in blockage of the sewerage system through continued use without water. Also, flooding could occur upon re-instatement of the water supply due to taps being left open.

5.1.2 Municipal Councils

The loss of electricity for up to five minutes is generally considered not to critically affect any domestic stock or equipment.

For outages of two hours or more, the loss of equipment required for food storage and food preparation may be critical.

4.2 COMMUNITY AND ESSENTIAL SERVICES
EQUIPMENT AND OPERATIONS

4.2.1 Metropolitan Fire Brigade

Table 8 indicates the effect of a total loss of supply on MFB equipment.

TABLE 8 : METROPOLITAN FIRE BRIGADE

| MFB Equipment | Duration of Supply Loss | | |
|--|---|--------------------------------------|---|
| | Up to Five Minutes | Up to Two Hours | Up to Three Days |
| Fire station with stand-by generators (four stations in survey area). | No problems - generators in service. | No problems - generators in service. | No problems - generators in service. |
| Fire station without stand-by generators (15 stations in survey area). | No problems - back-up by batteries. | No problems - back-up by batteries. | After 12 hours, no station fire alarm receiving equipment or radio communications - batteries depleted. |
| Building alarms (some 4250 in survey area). | No problems - back-up by batteries. | No problems - back-up by batteries. | After 48 hours, batteries depleted. "Battery failure" alarms register at functioning stations. |
| Firemen's lifts. | Not available unless building has emergency generation. | | |
| Sprinkler and hydrant booster pumps. | Not available unless building has emergency generation. | | |

4.2.2 Victoria Police

Table 9 indicates the effects of a total loss of electrical supply on the facilities of the Victoria Police.

TABLE 9 : VICTORIA POLICE

| Activity | Critical Loss for Stock and Equipment | | |
|-------------------------------------|--|--|---|
| | Loss up to Five Minutes | Loss up to Two Hours | Loss up to Three Days |
| Forensic Science Laboratory | <p>Security Door (no memory loss due to battery back up).</p> <p>Computer - no terminals; no gas chromatographs.</p> <p>Analytical Equipment - possible loss of exhibit materials in instrument.</p> <p>Photographic Processing - possible loss of some negatives.</p> | <p>Computer - memory loss around two hours.</p> <p>Analytical Equipment - total loss of exhibits in instruments.</p> <p>Refrigeration - could cause exhibit loss in hot weather.</p> <p>Telephone PABX - reduced capacity.</p> | <p>For safety reasons, the laboratory could be expected to cease operations totally for any power loss of one day or more.</p> |
| Criminal Records Information Bureau | Cessation of operation. | Cessation of operation. | Cessation of operation. |
| Local Police Districts | No problems. | No problems. | <p>For losses in excess of two hours -</p> <p>reduced communications; lack of local petrol supplies; lack of lifts; reduced security in cells due to loss of lighting and monitoring equipment.</p> |

4.2.3 Health Commission

Table 10 details the effects of power losses on hospital stock and equipment. In some cases, hospitals have emergency generators which will support some of these activities (refer Section 5 of this volume).

TABLE 10 : EFFECT ON HOSPITALS

| Stock and Equipment Critically Affected for Losses | | |
|--|---|---|
| Up to Five Minutes | Up to Two Hours | Up to Three Days |
| <p>Intensive care - no intensive care monitoring.</p> <p>Analysers stop - analysis would have to be repeated.</p> <p>Diathermy equipment not available to control bleeding.</p> <p>Heart lung machine would require manual operation.</p> <p>Respirators would need to revert to manual ventilation.</p> | <p>Lifts - no lifts would delay emergency movement of patients with risk to life if trapped in lift.</p> <p>Refrigeration and incubation - risk of loss of specimens, especially in ultra-cold freezers.</p> <p>Sterilisation - need to revert to less satisfactory methods.</p> <p>Lighting - particularly at night.</p> | <p>Air conditioning - no air conditioning during extremes of temperature could be detrimental to patients.</p> <p>Food storage - no refrigeration would result in spoilage of food.</p> <p>Refrigeration - risk of loss of drugs and blood.</p> <p>Haemodialysis with artificial kidney machine would cease.</p> <p>Boiler house - loss of steam for heating, sterilising and some cooking.</p> |

4.2.4 Board of Works

The critically affected installations are the sewerage pumping stations. Table 11 shows the effect of loss of electricity supply for each station.

TABLE 11 : MMBW SEWERAGE PUMPING STATIONS

| Pumping Station | Effect of Loss of Supply for | | |
|--|--|---|--|
| | Five Minutes | Two Hours | Up to Three Days |
| Brooklyn | Little or no effect - storage available in major sewers. | Overflow of sewage into rivers and Port Phillip Bay. Possible flooding of low lying properties. | Flooding of South Melbourne, Port Melbourne and Albert Park, causing extensive damage. 1200 megalitres of sewage accumulated in the Bay. |
| Altona (Pinnacle Road and Western No 2) | | Overflow of sewage into local water-courses. | Overflow of sewage into Bay. Pumping station plant damaged by flooding. |
| Braybrook | | Overflow of sewage into local water-courses. | |
| Fishermen's Bend | | Overflow of sewage, if during factory hours. | |
| Footscray Maribyrnong | | Sewage overflow into Maribyrnong River. | |
| Kew (Coombs Ave and Treatment Works) | | Possible sewage overflow. | Overflow of sewage into Yarra River at Studley Park. |
| Melbourne | | Sewage can head up and syphon. Flooding will occur during wet weather or MCG functions. | Overflow into Yarra River and Railway Yards, local flooding, damage to pumping plant. |
| Toorak | | Overflow in wet weather. | Overflow into Yarra River at Como Park. |
| West Melbourne (Schintler, Brambles) | | Possible sewage overflow. | Overflow into local area. |
| West Melbourne (Ansett, Mayne Nickless) | | Sewage overflow out of toilet bowls and gatic covers. | Sewage overflow into premises causing evacuation and damage to plant. |

4.2.5 Telecom

The total loss of supply for up to two hours would have minimal effect on Telecom's telephone network. Although private subscribers lines would be unaffected, business houses served from their own PABX would lose all interhouse communication unless the PABX had battery reserve. Calls would only be possible via incoming exchange lines. All data circuits would be inoperable because modems rely on a.c. power.

For a loss of supply extending to three days, Telecom would suffer severe congestion on trunk and local networks and there would probably be a need to call for restraint in the use of the telephone service so that essential services could be maintained.

Although all public telephone cabinets would not be able to handle normal traffic, emergency calls could still be made to police, ambulance and fire services.

4.2.6 Victorian Railways

Railway communications and control centres are equipped with emergency generation and would not be affected, subject to the limits of fuel storage for the generator units. Table 12 lists the affected operations.

TABLE 12 : EFFECT ON VICTORIAN RAILWAYS OPERATIONS

| Service | Effect on Operation for Loss of Supply of | | |
|-------------------------------------|---|---|--|
| | Five Minutes | Two Hours | Up to Three Days |
| Suburban Trains | | | |
| Supply Loss to Area A | Tolerable delays to services. | Trains west of Flinders St stopped. 45 minute delay to other trains. No lighting, public address or passenger information displays at Flinders and Spencer St Stations. | Limited service east of Flinders St. No trains west of Flinders St. No lighting or public address at Flinders and Spencer St Stations. |
| Supply Loss to Area B | Tolerable delays to services. | No signalling. Trains could travel at a crawl. Road blocked at 28 boom barrier locations. No lighting or p.a. at Richmond Station. | Service shutdown. Road traffic blocked at boom barrier locations. |
| Supply Loss to Areas A and B | Tolerable delays. | Service shutdown. | Service shutdown. |
| Non Electrified Country/Inter-state | Little effect. | Seat reservation computer shutdown. No p.a. or lighting at major stations. Tracks blocked by stranded electric trains. | No refuelling of locos. No reservation service, p.a. or lighting at major stations. |
| Catering | No effect. | Restaurants closed Spencer and Flinders Streets. Service to country/interstate trains curtailed. | Perishables, e.g. meat, lost. |

TABLE 12 : EFFECT ON VICTORIAN RAILWAYS OPERATIONS (CONTD)

| Service | Effect on Operation for Loss of Supply of | | |
|---------|---|--|---|
| | Five Minutes | Two Hours | Up to Three Days |
| Freight | Little effect. | Operation would cease during hours of darkness. No gantry cranes for freight handling. No wagon sorting. | Perishables in refrigerated containers would be lost. Fuelling, turntables and bogie exchange restricted. |

NOTE: The underground rail loop is the only area within VicRail which is fully protected against loss of power, fire, flood, etc. by virtue of emergency generation.

4.2.7 Tramways

A five minute loss of supply would leave trams stranded but would be tolerable as tram supply is automatically restored on restoration of SEC supply.

A two hour or three day failure would have more serious consequences as communication to passengers would be some time in taking effect, trams would be stranded until such time as towing facilities to depots could be actioned. Safety procedures relating to broken d.c. overhead lines would be made inoperative and after-dark failures would be made more difficult because of the loss of local lighting.

In these extremely abnormal conditions, the system protection and supervisory control system would be fully taxed in load shedding operations to prevent overloading of the remaining substations and feeder network. Under these conditions, overloading of plant could possibly result in permanent damage to feeders and trolley wires.

4.3 INDUSTRIAL EQUIPMENT AND OPERATIONS

The effects of loss of supply on the selected representative industries are set out in Table 13.

4.4 COMMERCIAL EQUIPMENT AND OPERATIONS

The effects of loss of supply on commercial activities are set out in Table 14.

TABLE 13 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE INDUSTRIES

| Industry | Activities Reported as Critically Affected for Loss of Supply for | | |
|-----------------------------|---|---|---|
| | Five Minutes | Two Hours | Up to Three Days |
| PORT OF MELBOURNE AUTHORITY | | | |
| Cargo Handling | - | Ship loading/unloading and security. | Refrigerated containers, sewerage, shipping schedules. |
| Navigation | - | River navigation lights. | |
| METAL PRODUCTS/FABRICATION | | | |
| West Footscray Eng Works | Continuous process, computers, lighting. | | |
| Naval Dockyard | - | - | - |
| General Motors Holden | Water pumping, lighting, computers. | Transport, heat treatment, air conditioning, loctite process, sewerage, induction furnaces. | Food storage, metal melting (after eight hours), drug/specimen storage. |
| PETROCHEMICAL | | | |
| Mobil Oil Australia | Lighting, computers, continuous process. | Food storage. | Fuel supply for essential services. |
| Shell Co of Australia | Security lighting. | | |
| ICI Australia | Water pumping, lighting, continuous processes. | Heating to keep explosives safe. | |
| Monsanto | Lighting, continuous processes. | Water pumps, sewerage, air conditioning, food storage. | |

TABLE 13 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE INDUSTRIES (CONTD)

| Industry | Activities Reported as Critically Affected for Loss of Supply for | | |
|--------------------------------|---|---|--|
| | Five Minutes | Two Hours | Up to Three Days |
| PETROCHEMICAL (CONTD) | | | |
| Altona Petrochemical | Continuous processes, steam supply. | Liquified gas storage. | Total plant (after 12 hours). |
| Dow Chemical | Continuous process, water pumping. | Process control computers (after 20 minutes). | Total plant. |
| Union Carbide | Continuous process. | Hazardous material storage. | Unstable chemicals - increased fire, explosion risk. |
| Aust Carbon Black | Continuous process, lighting. | Food storage, air conditioning, communication, sewerage, computers. | |
| CHEMICAL | | | |
| ACI Spotswood | Continuous process, water pumping, lighting, computers. | Air conditioning, transport. | |
| Allbright and Wilson | Continuous process, chemical handling. | Lighting, sewerage. | |
| Commonwealth Serum Laboratory | All activities. | | |
| CSIRO Div of Organic Chemistry | Continuous processes, lighting, ventilation. | Refrigeration. | Specimen storage. |

TABLE 13 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE INDUSTRIES (CONTD)

| Industry | Activities Reported as Critically Affected for Loss of Supply for | | |
|------------------------------|---|---|--------------------------------|
| | Five Minutes | Two Hours | Up to Three Days |
| TEXTILES | | | |
| Port Phillip Mills | - | Lighting, water pumps, production processes. | |
| FOOD | | | |
| Carlton and United Breweries | Continuous process, computers, water pumps, lighting. | Food preparation. | Food storage (after 48 hours). |
| Kraft Foods | Continuous process, computers, water pumps, lighting. | Food preparation/storage, sewerage, communications. | Air conditioning. |
| LIGHT INDUSTRY | | | |
| Aust Hostess Industries | | | Air conditioning, computers. |
| Wrightcell | Boilers, computers, continuous process. | | |

TABLE 14 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE COMMERCIAL BUILDINGS

| Type and Location of Premises | Activities Reported as Critically Effected for Loss of Supply for | | |
|---|--|---|------------------|
| | Five Minutes | Two Hours | Up to Three Days |
| OFFICES | | | |
| State Government, 1 McArthur Street, Melbourne | Lighting, water pumps. | Food storage, air conditioning, communications, computers, sewerage. | |
| World Trade Centre, Melbourne | Computers, communication. | Food storage, air conditioning, water pumps, lighting, lifts/ escalators. | |
| Australia Post, Footscray | Lighting, communication. | Teleprinter. | Food storage. |
| ANZ Twin Towers, Melbourne | Lighting, lifts/ escalators, water pumps, air conditioning, sewerage, computers. | Food storage. | |
| Cadbury Schweppes, St Kilda | - | Lighting, air conditioning, computers. | Food storage. |
| Computer Technology, St Kilda | Lighting, computers. | Nil - emergency power supply available after five minute outage. | |
| ADAPS, St Kilda | Computers, communication. | Lighting, air conditioning, water pumps. | |
| BANKS | | | |
| Commonwealth Bank, Footscray | Lighting, communi- cations, computers. | Water pumps, air conditioning. | |

TABLE 14 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE COMMERCIAL BUILDINGS (CONTD)

| Type and Location of Premises | Activities Reported as Critically Effected for Loss of Supply for | | |
|-----------------------------------|---|---|---|
| | Five Minutes | Two Hours | Up to Three Days |
| BANKS (CONTD) | | | |
| State Bank, Port Melbourne | Security devices. | Lighting, air conditioning, communication, computers. | |
| HOTELS | | | |
| Mt Alexander Road, Moonee Ponds | Food preparation. | Lighting, air conditioning. | |
| Regent Hotel, Melbourne | As for ANZ "Twin Towers" above. | | |
| Queens Lodge, St Kilda | Lighting. | Food storage, air conditioning, water pumps. | |
| MISC SERVICES | | | |
| S Pacific Health Centre, St Kilda | Lighting. | Boilers, computers, specimen storage. | Water pumping. |
| Coles Warehouse, Port Melbourne | Computers. | | Lighting, communication, transport, air conditioning. |
| FOOD SALES | | | |
| Footscray Market, Footscray | Lighting, air conditioning, communication, sewerage. | Food storage, water pumps. | |
| Sandwich/Milk Bar, Pt Melb | - | Food preparation/storage, lighting. | |

TABLE 14 : EFFECT OF LOSS OF SUPPLY ON REPRESENTATIVE COMMERCIAL BUILDINGS (CONTD)

| Type and Location of Premises | Activities Reported as Critically Effected for Loss of Supply for | | |
|-------------------------------|---|---|-------------------|
| | Five Minutes | Two Hours | Up to Three Days |
| FOOD SALES (CONTD) | | | |
| Woolworths, St Kilda | Lighting. | Food storage, air conditioning. | Air conditioning. |
| Safeway, St Kilda | - | Food storage, lighting. | |
| Dickins, Balaclava | Lighting, communication, water pumps, computers. | Food storage. | |
| Safeway, Sunshine | - | Food preparation/storage, lighting, air conditioning. | |
| GENERAL RETAIL | | | |
| Forges, Footscray | Lighting, security, air conditioning, sewerage. | | |
| Coles, Footscray | Communications. | Food storage, water pump, lighting, air conditioning. | |
| Myer, Melbourne | Lighting, communication, air conditioning, computers, lifts/escalators, sewerage. | Food storage/preparation. | |

5 ECONOMIC LOSSES

5.1 ECONOMIC LOSSES TO RESIDENTIAL PREMISES

An extended loss of electrical supply (up to three days) to a high-rise housing block would result in damages requiring around one week and \$10 000 to repair.

The major portion of this time and money would be for cleaning the sewerage system which would become blocked through continued use without water.

In addition to the repair costs, there would be a loss of revenue of around \$10 000 per block per week due to tenants not paying rent while the services were not available.

For a loss of supply over the whole shaded area, the total repair bill and loss of revenue for the 48-20 storey and 9-12 storey blocks would exceed \$1M for a three-day outage.

Some blocks would have to be vacated due to health hazards, involving further costs in providing temporary accommodation.

5.2 ECONOMIC LOSSES TO COMMUNITY AND ESSENTIAL SERVICES

The following table indicates the economic loss reported by various government organisations in the field of community and essential services for activities under their jurisdiction.

| Organisation and Activity | Estimated Loss in Revenue or Damage |
|---|---|
| HEALTH COMMISSION: Prince Henry's Hospital | \$60 000 for three days. Six months and \$500 000 to recover. |
| POLICE: Forensic Laboratory | One day - total loss of value of many exhibits. Three days - loss of significant number of exhibits and loss of standards used in various analysis. Analysis would be affected for a considerable time until new standards were obtained from overseas. |
| Local Districts | Large amount of overtime required to ensure adequate policing. Police stations and vehicles at risk of damage. |
| TELECOM: | Loss is difficult to assess but it is expected that there would be a significant reduction in the \$1.5M per day normally earned from the network. |

| Organisation and Activity | Estimated Loss in Revenue or Damage |
|---------------------------|--|
| VICTORIAN RAILWAYS | |
| Suburban Trains | <p>One hour delay in morning peak is estimated to cost the community \$133 000.</p> <p>A one to three day shutdown of the suburban network would cost VicRail approximately \$200 000 per day.</p> |
| Catering | <p>A three day failure would result in the loss of goods stored in deep freezers; estimated at \$30 000.</p> |

5.3 ECONOMIC LOSSES TO INDUSTRY

5.3.1 Port of Melbourne Authority

The cost of a two-hour loss of power is assessed at \$250 000.

This economic loss would result from a suspension of work on loading and unloading ships and a disruption to terminal and office operations. There would also be some risk of cargo pilfering during hours of darkness.

For a three-day power blackout, the estimated economic loss, excluding any allowance for loss of trade to other ports, is \$4.7M.

This estimate is based on a complete stoppage of all cargo handling within the port and delays to shipping schedules. It also includes for spoilage of cargo in refrigerated containers and the high risk of cargo pilfering.

5.3.2 Municipal Councils

The extent of economic loss caused by a disruption to electricity supply will, in general, increase with the duration of the supply interruption except for continuous processes where an interruption of a few seconds can be enough to stop the process and therefore is as severe as an interruption of several hours. Such activities as plastic moulding and machining (Footscray), food preparation (South Melbourne), food, beverage and petrochemical manufacture (Sunshine) and glass manufacture (Williamstown) are seen to be severe for outages up to five minutes. An interruption to electricity supply of up to five minutes is seen to have only minor or no economic effect on other industries.

A two-hour loss of electricity supply is seen as having severe economic effects for activities such as petrochemical, food and beverage manufacture (Footscray), metal industries and textiles (Sunshine) and light industry (South Melbourne). Other industries were generally indicated to be only partially affected.

Most councils indicate that a three-day outage will result in severe economic loss across the full range of industry.

Specific comments are as follows:

. St Kilda City Council

The degree of disruption will depend on the type of premises - obviously all will affect productivity and in the three-day case will cause financial hardship.

. CSL - Reported by Melbourne City Council

CSL (Commonwealth Serum Laboratories) would be badly affected by a complete loss of supply as years of research would be lost in some cases. Batches of serum would be wasted but no danger to human life would occur.

. ICI - Reported by Sunshine City Council

Continuous processes, once stopped, usually take several hours to restart. This is particularly the case with plastic film processes.

. University of Melbourne - Reported by Melbourne City Council

The University has many continuous processes involving research and many years of work can be lost because of failure of electric supply even for short periods.

. Monsanto - Reported by Sunshine City Council

Most areas of production are shutdown - only critical equipment running off emergency power.

. Port Phillip Mills - Reported by Williamstown City Council

Any loss of power beyond two hours means total shutdown of operations with all labour force stood down.

Table 15 shows the estimated costs of losses incurred by particular industries.

TABLE 15 : ECONOMIC LOSS TO REPRESENTATIVE INDUSTRIES

| Industry | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | |
|---|------------------------------|---------------------|--------------------------------|--------|------------------------|--------------------------|--|---------|-----------------------|--------------|-----------|
| | Time | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | |
| | | | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage |
| Port of Melbourne Authority Cargo Handling | | | - | - | 0 | - | - | 250 000 | - | - | 4 700 000 |
| METAL PRODUCTS/FABRICATION | | | | | | | | | | | |
| West Footscray Eng Works | | | - | - | - | 6000 | 25 000 | - | - | (3) | |
| Naval Dockyard | | | | | 3000 | | | (2) | | | (2) |
| General Motors Holden | 24-36 hrs | 67 000 | 0 | 0 | 25 000 | 30 000 | 0 | 30 000 | 225 000 | Great Effect | 2 200 000 |
| PETROCHEMICAL | | | | | | | | | | | |
| Mobil Oil Aust | 2 weeks | 10 000 | 0 | 0 | 0 | 1000 | 15 000 | 0 | 10 000 | 300 000 | 100 000 |
| Shell Co of Aust | | | 0 | 0 | 0 | 16 000 8 000 8 000 | (6 am-6 pm) (4 am-6 am) (6 pm-10 pm) | (1) | | 360 000 | (1) |
| ICI Australia | 2-3 hours | 0 | 0 | 50 000 | 5000 | 0 | 60 000 | 6000 | 40 000 | 65 000 | 6 000 |
| Monsanto | 5-24 hrs | 1000 to 10 000 | 0 | 1000 | 0 | 0 | 10 000 | 0 | 0 | 50 000 | 0 |
| Altona Petrochemical | Significant | | 0 | 0 | 20 000 to 60 000 | - | - | (3) | - | - | (3) |

TABLE 15 : ECONOMIC LOSS TO REPRESENTATIVE INDUSTRIES (CONTD)

| Industry | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | | |
|-------------------------------------|------------------------------|---------------------|--------------------------------|-----------------|--------|----------------------|---------|--------|-----------------------|---------------|-------------------|--|
| | Time . | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | | |
| | | | Wages/ Salary | Sales | Damage | Wages/ Salary | Sales | Damage | Wages/ Salary | Sales | Damage | |
| PETROCHEMICAL (CONTD) | | | | | | | | | | | | |
| Dow Chemical | - | 56 000 to 100 000 | - | - | 18 000 | - | - | 33 000 | - | - | 50 000 | |
| Union Carbide | 1 week | 100 000 to 500 000 | - | 100 000-500 000 | - | 500 000 | 150 000 | - | up to 2 000 000(4) | | | |
| Aust Carbon Black | 6 hours | 9 800 | | | 0 | | | | 287 000 | | | |
| CHEMICAL | | | | | | | | | | | | |
| ACI Spotswood | 3 days | 150 000 | 0 | 150 000 | 5 000 | 0 | 200 000 | 20 000 | 150 000 to 1.2M | 1.5M to 10.5M | 200 000 to 12M(4) | |
| Allbright and Wilson | 2 to 3 shifts | (3) | | | | | | | | | | |
| Commonwealth Serum Lab | No estimates made | | | | | | | | | | | |
| CSIRO Division of Organic Chemistry | 1 week | 2000 | | | | | | | | | | |

TABLE 15 : ECONOMIC LOSS TO REPRESENTATIVE INDUSTRIES (CONTD)

| Industry | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | | |
|------------------------------|------------------------------|---------------------|--------------------------------|---------|--------|----------------------|---------|--------|-----------------------|----------------------------|---------------|--|
| | Time | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | | |
| | | | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | |
| TEXTILES | | | | | | | | | | | | |
| Port Phillip Mills | 2 hours | 1000 | | 1000(1) | | | 1000(1) | | | | 36 000 (1) | |
| FOOD | | | | | | | | | | | | |
| Carlton and United Breweries | No estimate made | | | | | | | | | | | |
| Kraft Foods | 24 hours | 200 000 | 0 | 0 | 0 | 4000 | 0 | 0 | 100 000 | Depends on Cool Store Loss | | |
| LIGHT INDUSTRY | | | | | | | | | | | | |
| Wrightcell | 2 hours | 500 | 70 | 0 | 0 | 3000 | 0 | 0 | 20 000 | 180 000 | 0 | |

(1) Nature unspecified.

(2) Stand-by generation covers longer periods.

(3) Unable to estimate.

(4) Depends on time that interruption occurs.

5.4 ECONOMIC LOSS TO COMMERCIAL PREMISES

5.4.1 State Government Offices

The State Government Office building in McArthur Street, Melbourne is quoted as a typical example of a Public Works Department building in the surveyed area.

It is expected that there would be a large reduction in the useful work performed in this building under blackout conditions and the assessed economic loss of \$96 000 is based on paying full salaries for this condition (refer Table 16).

5.4.2 World Trade Centre

The assessed economic losses for a blackout of the World Trade Centre are shown in Table 4.2 and are based on the anticipated activities at a fully-occupied stage.

5.4.3 Municipal Councils

One council indicated that the interruption of electricity supply for five minutes would result in substantial economic loss for offices using computers (South Melbourne). No other responses indicated a significant economic loss to commercial activities for a five minute outage.

Many councils see a two hour loss as being a severe economic penalty to banks and large offices (Footscray, Port Melbourne, South Melbourne, Sunshine).

Most of the councils indicated severe or partial economic loss to a wide range of retail and non-retail activities from a three day loss of supply.

Specific comments are as follows:

. Footscray

A short duration outage should have little effect on the majority of those in this category (non-retail). However, as time without supply increases, the inconvenience and loss of revenue will become greater.

. South Melbourne

Short disruptions of power to computers can cause loss of programs and data and cost thousands of dollars to retrieve. Offices with computers would need to close after say four hours off power.

. Footscray Market

During trading hours, no trade can continue and much pilferage results. Food preparation stops and partly prepared food is lost. A prolonged outage creates major problems with refrigerated products.

Table 16 shows the estimated costs of losses incurred by representative commercial premises.

TABLE 16 : ECONOMIC LOSS TO REPRESENTATIVE COMMERCIAL PREMISES

| Commercial Premises | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | |
|---------------------------------|------------------------------|---------------------|--------------------------------|-------|---------|----------------------|--------|--------|-----------------------|--------|---------|
| | Time | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | |
| | | | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage |
| OFFICES | | | | | | | | | | | |
| State Government Offices (Melb) | - | - | - | - | - | - | - | - | 96 000 | - | - |
| World Trade Centre | 2 days | 100 000 | 0 | 0 | <10 000 | 10 000 | 10 000 | 10 000 | 100 000 | 50 000 | 100 000 |
| Australia Post (Ftscy) | No estimates made | | | | | | | | | | |
| ANZ Twin Towers (Melb) | No estimates made | | | | | | | | | | |
| Cadbury Schweppes (St Kilda) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Computer Technology (St Kilda) | 4 hours | 1000 | 1000 | 0 | 160 | 1000 | 0 | 160 | 1000 | 0 | 160 |
| ADAPS Ltd (St Kilda) | 50% of outage time | 10 000/day | 0 | 0 | 1000 | - | - | 5000 | - | - | 30 000 |
| HOTELS | | | | | | | | | | | |
| "Unnamed" (Ess) | No estimates made | | | | | | | | | | |
| Regent (Collins St, Melbourne) | No estimates made | | | | | | | | | | |

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TABLE 16 : ECONOMIC LOSS TO REPRESENTATIVE COMMERCIAL PREMISES (CONTD)

| Commercial Premises | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | |
|--|------------------------------|---------------------|--------------------------------|-------|--------|----------------------|-------|--------|-----------------------|-----------|-----------|
| | Time | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | |
| | | | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage |
| HOTELS (CONTD) | | | | | | | | | | | |
| Queenslodge (St Kilda) | - | Food replacement | - | - | - | - | - | - | - | - | Food only |
| OTHER SERVICES | | | | | | | | | | | |
| South Pacific Health Centre (St Kilda) | - | - | - | - | - | - | - | - | 700 | 2100 | 2000 |
| Coles Warehouse (Pt M) | No estimates made | | | | | | | | | | |
| FOOD SALES | | | | | | | | | | | |
| Footscray Market | 2 days | - | - | - | - | - | - | - | - | - | - |
| Milk Bar (Pt M) | 1 day | 1500 | - | 50 | - | 100 | 300 | 200 | - | 2000 | 1500 |
| Woolworths (St Kilda) | - | thousands | 0 | 100 | 0 | 300 | 1000 | - | hundreds | thousands | - |
| Safeway (St Kilda) | No estimates made | | | | | | | | | | |
| S E Dickens (Balaclava) | No estimates made | | | | | | | | | | |
| Safeway (Sunshine) | 12 hours | 3600 | 0 | 0 | 0 | 500 | 6500 | 0 | 5500 | 85 000 | 3600 |

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TABLE 16 : ECONOMIC LOSS TO REPRESENTATIVE COMMERCIAL PREMISES (CONTD)

| Commercial Premises | Recovery from Supply Outages | | Estimated Loss of Revenue (\$) | | | | | | | | | |
|----------------------------|------------------------------|-------------------------|--------------------------------|-------|--------|----------------------|---------|---------|-----------------------|---------------------------|--------|--|
| | Time | Estimated Cost (\$) | Loss up to Five Minutes | | | Loss up to Two Hours | | | Loss up to Three Days | | | |
| | | | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | Wages/Salary | Sales | Damage | |
| GENERAL RETAIL SALES | | | | | | | | | | | | |
| Forges (Footscray) | No estimates made | | | | | | | | | | | |
| G J Coles (Footscray) | - | - | 0 | 0 | 0 | 0 | Minimal | Minimal | 0 | 1000 | 10 000 | |
| Myer (Bourke St, Melb) | No estimates made | | | | | | | | | | | |
| Williamstown Shopping Area | - | Food losses after 1 day | 0 | 0 | 0 | 0 | 0 | 0 | | "Small for some premises" | | |

6 PAST EXPERIENCE OF LOCAL SUPPLY FAILURES

6.1 RESIDENTIAL EXPERIENCES OF SUPPLY LOSS

. Ministry of Housing

In 1978, a five-hour blackout occurred mid-afternoon at Park Towers, South Melbourne due to a fire in an SEC main substation. Cooking, lighting and lifts were immediately lost and the main water supply and sewerage systems ceased to function one hour after the interruption occurred. Panic set in at 4.00 pm when children arriving home from school were unable to gain access to their homes and normal family relationships broke down.

Emergency power resources were sought by the MOH but it was at least four hours before a generator could be placed on site. A further two hours would have been needed to modify the system connections to allow the generator to be used. SEC power was restored prior to the temporary connections being made.

. Barkly Street Flats, Brunswick

No more than two blackouts, maximum outage two hours, in the past eight years.

6.2 COMMUNITY AND ESSENTIAL SERVICES EXPERIENCES OF SUPPLY LOSS

. Health Commission

Prince Henry's Hospital had a 1-1/2 hour blackout in 1975, with minor effect. No major interruptions in 20 years. A stand-by supply from an alternative SEC substation minimises the possibility of blackout.

. Tramways Board

In the past 25 years, there has been only one serious failure but its effect caused widespread damage and interference to services. The failure occurred at the SEC Deepdene Substation, interrupting supplies to our Deepdene and East Kew substations and some supply to our Camberwell Substation with the effect that our substations at Kew and Hawthorn attempted to supply the eastern area of the tram network.

A feeder cable at Kew Junction was melted and fell to the roadway and a considerable section of the overhead trolley wire network was annealed and had to be replaced. Because of the very low voltage, trams could barely move and the whole system was disrupted. This failure occurred in the morning and it was possible to effect temporary repairs to operate the evening peak service but there were problems for some days before the whole system was restored to normal.

. Footscray Institute of Technology

When blackouts occurred, the main problems were -

- a evacuation of staff and students in areas where there is no natural light;

- b release of passengers from lifts;
- c computer going off line.
- . Nursing Home, Yarraville

Several minutes of interrupted supply approximately six months ago during the day - the exit signs only stayed on.

No drastic effect for such a short period.

- . University of Melbourne

Blackouts have occurred due to equipment failure in the council (Melbourne City) system. Supply is usually restored by system switching in one hour or less.

6.3 INDUSTRIAL EXPERIENCES OF SUPPLY LOSS

- . General Motors Holdens

To date, we have not experienced a complete blackout at the Fishermen's Bend plant.

Several times in recent years, we have lost power to one of our eight supply points and either power was restored after a short period or we were able to restore supply to the buildings from an alternative substation where power was maintained.

- . ICI Australia, Deer Park

Several power "dips" have occurred recently, caused by damage to power poles. These "dips" are sufficient to trip the plastic film lines and interrupt production. It normally takes one hour to re-establish production.

We have been free from complete SEC initiated blackouts for quite some time (about two years).

- . Altona Petrochemical Co

Major plant shutdowns caused by electrical supply interruption.

| DATE | DURATION | CAUSE |
|---------|--|------------------------------|
| 25/2/77 | { Not recorded, but probably less than | Storm |
| 24/5/77 | | Not known. |
| 9/12/79 | (one minute. | SEC human error. |
| 31/3/80 | 25 minutes | SEC supervisory cable. |
| 10/6/82 | 33 minutes | SEC transmission line. |
| 24/3/83 | 6 minutes | SEC automatic load shedding. |

- . Union Carbide

Two blackouts experienced - 11 June 1982 (main transmission) outage cost UCAL approximately half a million dollars; 10 March 1980 (local supply) outage cost about half that amount.

. Australian Carbon Black

Over recent years, the power outages have generally been of short duration with the exception of one outage during March 1983.

Fortunately, other than the cost of recovering from a power outage, the potentially unsafe condition for the operatives and the general inconvenience associated with such an outage, we have on each occasion managed to bring the plant to a safe shutdown.

. ACI Spotswood

Early in 1982, a local power failure lasting 45 minutes occurred in the middle of the night. Workers in dangerous areas moved out with aid of partly ineffective emergency lighting. Generators were run up but not put on line before power restored. Damage to equipment approximately \$20 000. Damage is expected to have occurred to furnaces but is not estimable at this stage. Emergency procedures for stand-by generators were found inadequate.

. Allbright and Wilson

On occasions of previous blackouts, we have had to send people home and delay starting for incoming shifts until power had been restored. Additional work was then required to prepare equipment caught in a crash shutdown before production could be recommenced. The duration of this work often ran into two to three shifts.

. Commonwealth Serum Laboratories

Loss of some supply due to high voltage feeder and equipment failure have occurred but supply has been restored within one hour by switching on the council system.

6.4 COMMERCIAL EXPERIENCES OF SUPPLY LOSS

. State Government Offices

No experience of power blackouts as there has only been a supply loss of two hours in 20 years.

. Central Business District

On 9 May 1980, water entering switchgear at Melbourne City Council Substation LQ, which supplies part of the CBD, put five of the six sections of busbars out of service. Supply was carried by the remaining section until 0600 hours when equipment overload shut off all supplies from this substation.

Most supplies were restored by 0730; however, with the rapid increase in load, a complete shutdown occurred at 0800. Complete restoration of all supplies was achieved by 1000 hours.

The outage at 0600 affected accommodation buildings with people being trapped in darkened bedrooms and late meals. Street and public lighting was also seriously interrupted.

The outage at 0800 hours caused traffic chaos and some commercial and retail buildings remained closed until power was restored.

. ANZ Twin Towers

Supply to sections has been lost due to feeder faults but restored within one hour. No experience of total loss.

. Cadbury Schweppes

Blackouts experienced of up to two hours' duration have affected only secretarial services (typing) and accounting. Natural light is adequate on bright daylight times and staff remain on site.

. ADAPS

Fortunately, we have not had an outage for at least five years. When the last one occurred, the interruption was significant but much less damaging than would be the case today due to changes in the equipment we operate and the services we provide.

. South Pacific Health Centre

Blackout occurred approximately six months ago and lasted for a few hours. Caused two-four horsepower, three-phase motors to burn out and all facilities to shutdown plus damage to two filtration plants.

. Footscray Market

A previous power failure of two hours' duration at night resulted in a claim of collectively \$6000 from three butchers and one delicatessen.

. Williamstown Shopping Area

Two or three blackouts of two-three hours' duration in the last year through traffic accidents. No consequences except at night when several burglar alarms triggered, with no serious consequences.

SECTION 4

COMMENTS RECEIVED ON THE NEED FOR SUPPLY SECURITY

SECTION 4

COMMENTS RECEIVED ON THE NEED FOR SUPPLY SECURITY

. Metropolitan Fire Brigades Board

This Brigade is aware of the consequences associated with such a serious occurrence as total power loss over an extended period and would fully support the concept of any action to alleviate this possibility.

. Melbourne and Metropolitan Board of Works

It is the Board's objective to prevent untreated sewage discharging to streams or the Bay and to prevent flooding. The Board expends considerable capital funds and commits a high operation and maintenance effort to prevent overflows and flooding which could result from equipment failure. It is important that this be reflected in the system supplying power to the Board's installation.

. Richmond City Council

This council believes the total loss of electricity supply would cause disruption and potential disaster in certain areas. The council does not deny that the need for a back-up supply exists but is totally opposed to that back-up being established on pylons up the Yarra/Merri Creek valleys.

. St Kilda City Council

This council expresses its support for the concept of linking the Richmond and Brunswick Terminal Stations.

. Melbourne Chamber of Commerce

No interruption greater than two hours, if any, should ever be considered for the Capital City.

SECTION 5
RESULTS OF SURVEY OF EMERGENCY GENERATION

RESULTS OF SURVEY OF EMERGENCY GENERATION

1 RESIDENTIAL USE OF EMERGENCY GENERATION

The responses from councils and government authorities indicated that there are no emergency supplies installed in private homes or in high rise flats used for domestic accommodation.

2 EMERGENCY GENERATION IN COMMUNITY AND ESSENTIAL SERVICES

2.1 Metropolitan Fire Brigade

Emergency generation is provided to maintain services at the four stations nearest the city centre, namely Eastern Hill, West Melbourne, Carlton and Richmond Stations. The remaining fifteen stations in the inner metropolitan area are entirely dependent on SEC supply.

2.2 Victoria Police

Police Headquarters and the Russell Street complex have emergency generation capable of maintaining power for the essential requirements of those buildings for more than three days.

The Traffic Operations Group has a petrol-driven generator to maintain the fuelling of police vehicles at Dawson Street, Brunswick.

All other police establishments are without emergency generators.

2.3 Health Commission

Table 1, which was supplied by the Health Commission, provides details of emergency generation in public hospitals.

The Ambulance Service Headquarters has emergency generation capable of maintaining communications and all necessary functions.

2.4 Board of Works

No emergency generation is available to operate the Board's pumping installations.

2.5 Telecom

All major telephone exchanges, radio telephone stations and practically all suburban exchanges within the shaded area on the map have emergency power plant in the form of automatic start diesel alternator sets which can provide sufficient power to keep all telephone systems handled by that exchange "on the air". These emergency power plants have locally stored fuel supplies of sufficient capacity to enable them to run for longer than three days.

2.6 Community Welfare Services Department

An emergency generator can provide essential lighting at Fairlea Prison.

2.7 Victorian Railways

Fixed stand-by generators are installed at the following locations:

Metropolitan Train Control Centre (Metrol), Batman Avenue,
(800 kVA Gas Turbine)

Train Control for Country and Interstate Trains, Spencer Street
Head Office (50 kVA Diesel)

Electrical Systems Control Centre, Batman Avenue (10 kVA Diesel)

Flagstaff Station (105 kVA Gas Turbine)

Museum Station (1050 kVA Gas Turbine)

Parliament Station (1050 kVA Gas Turbine)

The only stations in the system which have emergency lighting are Flagstaff, Museum and Parliament.

It is estimated that \$4M+ would be required to purchase sufficient stand-by generators to support the VicRail industrial load.

It would not be practical to install generators to support the traction substations and signal loads.

2.8 Melbourne and Metropolitan Tramways Board

There are no emergency generators to support the tramway system. However, a battery supply can maintain the substation supervisory systems for ten hours.

2.9 State Emergency Service

Emergency generation is provided and can support all necessary power, lighting and communications requirements.

2.10 Municipal Councils

The responses from councils indicated an absence of emergency generation for community services other than the services mentioned above.

3 EMERGENCY GENERATION INSTALLED IN INDUSTRIAL AND COMMERCIAL PREMISES

Table 2 provides details of the emergency generation installed in the industrial premises covered by the survey and Table 3 provides details of emergency generation installed in commercial buildings.

TABLE 1 : EMERGENCY GENERATION IN PUBLIC HOSPITALS

| Hospital | Total Beds | Generator Size Kilowatts | Starting | Capacity to Function Through Blackout |
|----------------------------|------------|--------------------------|----------------|---------------------------------------|
| After Care, Collingwood | 114 | No Gen | - | M |
| Alfred, Prahran | 615 | 2 x 875 | Auto | K |
| Altona | 25 | No Gen | - | M |
| Caritas Christi, Kew | 97 | No Gen | - | M |
| Essendon | 17 | No Gen | - | M |
| Eye & Ear, East Melbourne | 135 | No Gen | - | M |
| Fairfield, Kew | 468 | 1 x 40 2 x 162 | Manual Auto | K |
| Mercy, East Melbourne | 299 | 500 kVA | Auto | K |
| Mount Royal, Parkville | 695 | No Gen | - | M |
| Prince Henry's, Melbourne | 409 | 60 | Auto | M |
| Queen Victoria, Melbourne | 436 | No Gen | - | M |
| Royal Childrens, Parkville | 517 | 750 | Auto | K |
| Royal Dental, Melbourne | 17 | No Gen | - | M |
| Royal Melbourne, Parkville | 658 | 1425 (1) | Auto | K |
| Royal Womens, Carlton | 596 | 2 x 238 | Auto | L |
| St Georges, Kew | 150 | 90 | Auto | L |
| St Vincents, Fitzroy | 538 | 275 | Auto | L |
| Western General, Footscray | 305 | 12.5 | Auto | M |
| Williamstown | 121 | 140 (2) | Auto | L |
| Cancer Institute | - | 330 | Auto | L |
| Royal Talbot | 102 | No Gen | - | M |

M = No, or minor, emergency power.

L = Emergency power available for limited services.

K = Continue normal operation - minor limit on usage.

(1) Installation cost \$251 000.

(2) Installation cost \$36 000.

It is standard procedure that emergency battery consoles be provided for emergency lighting in all operating theatres and delivery suites and associated areas. Duration of operation three hours and higher.

Generally speaking, nursing homes and geriatric centres, day care centres and community health centres are not considered to be providing services that would require, for patient safety, emergency a.c. power in the case of a blackout.

Casualty, operating theatres, intensive care, outpatients, lifts (passenger) and various specialised areas are generally areas in need of emergency power.

Hot water circulation, food storage, refrigeration, medical gases, lighting, PABX and communication systems and, to a lesser extent X-ray, sterilisation and cooking are services that emergency power is considered necessary for, when provided.

TABLE 2 : EMERGENCY GENERATION IN REPRESENTATIVE INDUSTRIAL PREMISES

| Industry | Normal Power Demand | Emergency Generator Size Kilowatts | Proportion of Services % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr | Comments |
|----------------------------|---------------------|------------------------------------|--------------------------|-----------------------------------|---|----------------------|----------------------|---------------------------|------------------------------------|
| PORT OF MELB AUTHORITY | | | | | | | | | |
| Cargo Handling | - | 0 | 0 | Nil | | | | | Some lights have battery standby. |
| Navigation | - | 0 | 0 | Nil | | | | | |
| METAL PRODUCTS/FABRICATION | | | | | | | | | |
| West Footscray Eng Works | 3000 | 600 | 10-30 | As required | 10 | 75 000 | 70(1) | - | (1)Per hour. |
| Naval Dockyard | 2000 | 3000 | More than 50 | - | 10 | - | - | - | |
| General Motors Holden | 62 000 | 490 | Less than 10 | Cooling water, lighting | 10 | 140 000 | 3500 | 300 | |
| PETROCHEMICAL | | | | | | | | | |
| Mobil Oil Australia | 1000 | 250 | Less than 10 | Computer, lighting, effluent pump | 10 | 100 000 | 1000 | 24 | |
| Shell Co of Australia | - | - | Less than 10 | Fire pumps and essential safety | - | - | - | - | |
| ICI Australia | 6000 | 400 | Less than 10 | Selected processes(2) | | | | | (2)Not for explosives manufacture. |

TABLE 2 : EMERGENCY GENERATION IN REPRESENTATIVE INDUSTRIAL PREMISES (CONTD)

| Industry | Normal Power Demand | Emergency Generator Size Kilowatts | Proportion of Services % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr | Comments |
|-----------------------|---------------------|------------------------------------|--------------------------|---|---|----------------------|----------------------|---------------------------|--|
| PETROCHEMICAL (CONTD) | | | | | | | | | |
| Monsanto | | 700(3) | | Chemical processes | | | | | (3)Total of four small units. |
| Altona Petrochemical | - | Not stated (4) | Less than 10 | Critical processes | 8 | - | - | - | (3)Steam driven. |
| Dow Chemical | | "Limited" (5) | Less than 10 | Critical processes | - | - | - | - | (5)May fail to operate. |
| Union Carbide | 18 000 | 50 | 0.25 | Lighting, instruments, critical activities | - | - | - | - | |
| Aust Carbon Black | 1000 | 405 | 40 | Safe shutdown | 75 | - | 450 | 12 | |
| CHEMICAL | | | | | | | | | |
| ACI Spotswood | 10 000 | 3000(6) | 10 | Computer, lighting, ventilation, critical furnace | = | Unknown | - | 10 | (6)Capability uncertain - 3 years since last loaded. |
| Allbright and Wilson | 1340 | 100 | Less than 10 | Small parts of continuous process plant | 10 | - | - | - | |

TABLE 2 : EMERGENCY GENERATION IN REPRESENTATIVE INDUSTRIAL PREMISES (CONTD)

| Industry | Normal Power Demand | Emergency Generator Size Kilowatts | Proportion of Services % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr | Comments |
|----------------------------|---------------------|------------------------------------|--------------------------|--|---|----------------------|----------------------|---------------------------|---------------------------------------|
| CHEMICAL (CONTD) | | | | | | | | | |
| Commonwealth Serum Lab | 8000 | 800(7) | Less than 10 | Not stated | | | | | (7)Unreliable, also several at 70 kW. |
| CSIRO Div of Organic Chem | - | 0 | 0 | Nil | | | | | |
| TEXTILES | | | | | | | | | |
| Port Phillip Mills | - | 0 | 0 | Nil | | | | | |
| FOOD | | | | | | | | | |
| Carlton & United Breweries | 5000 | 1700 | 10-30 | Computer, lighting, lifts, continuous processes, safe shutdown | 48 | | | | |
| Kraft Foods | 1500 | 600 | 10-30 | Computer, lighting, continuous process | 30 | 20 000 | 3000 | 80 | |
| LIGHT INDUSTRY | | | | | | | | | |
| Aust Hostess Industries | 950 | 0 | 0 | Nil | | | | | |
| Wrightcell | 620 | 430 | 50 | All | 72 | 170 000 | - | 50 | |

TABLE 3 : EMERGENCY GENERATION IN REPRESENTATIVE COMMERCIAL BUILDINGS

| Type and Location of Premises | Normal Power Demand Kilowatts | Emergency Generator Size Kilowatts | Proportion of Services Supplied % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr |
|---|-------------------------------|------------------------------------|-----------------------------------|---|---|----------------------|----------------------|---------------------------|
| OFFICES | | | | | | | | |
| State Government, 1 McArthur St, Melbourne | 250 | 0 | 0 | Nil | | | | |
| World Trade Centre, Melb | - | 900 (+ UPS 300) | 10-30 | Computers, lighting, lifts, venti- lation, fire service | >10 | 990 000 | 30 000 | 80 |
| Australia Post, Footscray | - | 0 | 0 | Nil | | | | |
| ANZ, Twin Towers, Melb | 10 000 | 3000 | - | Essential services* | - | - | - | - |
| Cadbury Schweppes, St Kilda | - | 0 | 0 | Nil | | | | |
| Computer Technology, St K | 312 | 350 | 99 | Computers, lighting | >10 | 100 000 | 4000 | 140 |
| ADAPS | 180-228 | 315 | 50 | Computers, lighting, ventilation | >10 | 70 000 | 1500 | 48 |
| BANKS | | | | | | | | |
| Commonwealth Bank, Ftscy | - | 0 | 0 | Nil | | | | |
| State Bank, Port Melbourne | - | 0 | 0 | Nil | | | | |

TABLE 3 : EMERGENCY GENERATION IN REPRESENTATIVE COMMERCIAL BUILDINGS (CONTD)

| Type and Location of Premises | Normal Power Demand Kilowatts | Emergency Generator Size Kilowatts | Proportion of Services Supplied % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr |
|-----------------------------------|-------------------------------|------------------------------------|-----------------------------------|---------------------------|---|----------------------|----------------------|---------------------------|
| HOTELS | | | | | | | | |
| Mt Alexander Road, Moonee Ponds | - | 0 | 0 | Nil | | | | |
| Regent Hotel, Melbourne | See "ANZ Twin Towers" | | | All* | - | - | - | - |
| Queens Lodge, St Kilda | - | 0 | 0 | Nil | | | | |
| MISC SERVICES | | | | | | | | |
| S Pacific Health Centre, St Kilda | - | 0 | 0 | Nil | | | | |
| Coles Warehouse, Pt Melb | 1200 | 100 | 10-30 | Computer, Lighting | 10 | 70 000 | - | - |
| FOOD SALES | | | | | | | | |
| Footscray Market, Ftscy | - | 0 | 0 | Nil | | | | |
| Sandwich/Milk Bar, Pt Melb | - | 0 | 0 | Nil | | | | |
| Woolworths, St Kilda | - | 0 | 0 | Nil | | | | |
| Safeway, St Kilda | - | 0 | 0 | Nil | | | | |
| Dickens, Balaclava | - | 0 | 0 | Nil | | | | |
| Safeway, Sunshine | - | 0 | 0 | Nil | | | | |

TABLE 3 : EMERGENCY GENERATION IN REPRESENTATIVE COMMERCIAL BUILDINGS (CONTD)

| Type and Location of Premises | Normal Power Demand Kilowatts | Emergency Generator Size Kilowatts | Proportion of Services Supplied % | Type of Services Supplied | Time for which Emergency Supply Sustained Hours | Installation Cost \$ | Operating Cost \$/Yr | Normal Running Time Hr/Yr |
|-------------------------------|-------------------------------|------------------------------------|-----------------------------------|---------------------------|---|----------------------|----------------------|---------------------------|
| GENERAL RETAIL | | | | | | | | |
| Forges, Footscray | 200 | 40 | Up to 10 | Lighting | 5-10 | - | 1000 | - |
| Coles, Footscray | - | 0 | 0 | Nil | | | | |
| Myer, Melbourne | - | 0 | 0 | Nil | | | | |

*Hotel has first call on the emergency generation in the Twin Towers.

APPENDIX 10

SUBMISSIONS RECEIVED

State Electricity Commission
Ministry for Conservation
Conservation Council of Victoria
Merri Yarra Municipal Protection Committee
Collingwood Residents Association
City of Melbourne
City of Port Melbourne
City of Camberwell
City of Fitzroy
City of Hawthorn
City of Prahran
Education Department

* * *

APPENDIX 11

LIST OF WITNESSES

| | | |
|--------------------|---|---|
| Mr. J. Whines | - | Representing British Electricity International Ltd. |
| Cr. P. A. Jones |) | |
| Cr. G. V. Little |) | |
| Cr. H. S. V. Jurie |) | |
| Cr. M. Miller |) | |
| Cr. M. Jermyn |) | Representing the Merri Yarra Municipal Protection Committee |
| Mr. P. McIntyre |) | |
| Mr. D. Williams |) | |
| Mrs. M. Hall |) | |
| Mr. T. Latham |) | |
| Mrs. S. P. Larkin |) | |
| Cr. R. M. J. Long |) | Representing the City of Williamstown |
| Mr. M. B. Hodges |) | |
| Mr. I. P. Bates |) | |
| Mr. A. C. Spicer |) | Representing the State Electricity Commission |
| Mr. P. J. Wallace |) | |

* * *

EXTRACTS FROM THE PROCEEDINGS

The Minutes of the Proceedings of the Committee show the following Divisions which took place during consideration of the draft report:

Wednesday, 19 October 1983.

The Committee divided on the question, That Paragraph 4.59 stand part of the Report:

The result of the Division was:

Ayes, 6

The Hon. W. R. Baxter
Mr. C. W. Burgin
The Hon. R. I. Knowles
Mr. W. D. McGrath
Mr. D. K. McKellar
Mr. E. M. P. Tanner

Noes, 5

The Hon. D. E. Henshaw
Mr. G. R. Ihlein
Mr. M. J. McDonald
The Hon. B. A. Murphy
The Hon. B. T. Pullen

And so it was resolved in the affirmative.

* * * * *

Paragraph 5.22

The Committee recommends that -

- (1) The Newport Power Station should be connected to the Fishermen's Bend Terminal Station by a 220 000 volt double circuit overhead transmission line following the route proposed by the State Electricity Commission and included in this report as Figure 18.

(The Hon. B. T. Pullen)

Mr. Tanner moved, as an amendment, That the words "proposed by the State Electricity Commission and included in this report as Figure 18" be omitted with the view of inserting in place thereof "north of the West Gate Bridge".

Question - That the words proposed to be omitted stand part of the paragraph - put.

The Committee divided.

Ayes, 10

The Hon. W. R. Baxter
Mr. C. W. Burgin
The Hon. D. E. Henshaw
Mr. G. R. Ihlein
The Hon. R. I. Knowles
Mr. M. J. McDonald
Mr. W. D. McGrath
Mr. D. K. McKellar
The Hon. B. A. Murphy
The Hon. B. T. Pullen

Noes, 1

Mr. E. M. P. Tanner

And so it was resolved in the affirmative - Amendment negatived.

* * * * *

Paragraph 5.22 - Additional sub-paragraph proposed.

The Hon. B. T. Pullen moved, That the following new sub-paragraph be added:

"(4) In conjunction with this project additional resources be allocated to enhance the public amenity of the Lower Yarra environs."

Question - That the sub-paragraph proposed to be added be so added - put.

The Committee divided.

Ayes, 5

The Hon. D. E. Henshaw
Mr. G. R. Ihlein
Mr. M. J. McDonald
The Hon. B. A. Murphy
The Hon. B. T. Pullen

Noes, 6

The Hon. W. R. Baxter
Mr. C. W. Burgin
The Hon. R. I. Knowles
Mr. W. D. McGrath
Mr. D. K. McKellar
Mr. E. M. P. Tanner

And so it passed in the negative.

* * * * *

MINORITY REPORT

by

The Honourable B. T. Pullen, M.L.C.

Dr. G. M. Vaughan, M.P.

Mr. G. R. Ihlein, M.P.

Mr. M. J. McDonald, M.P.

The Honourable B. A. Murphy, M.L.C.

The Honourable D. E. Henshaw, M.B.E., M.L.C.

Pursuant to S4N(4)

of the

Parliamentary Committees Act 1968

DISCUSSION

- 1.1 The Committee Report does not address fully the environmental impacts of the power line proposals and it fails to make explicit recommendations to compensate the affected communities. Notwithstanding the changes recommended by the Committee to reduce environmental impact, it must be acknowledged that the construction of 220 000 volt overhead lines along the proposed routes will have environmental and visual impacts of both a temporary and permanent nature.
- 1.2 It is incontestable that these impacts will intrude on the Merri Creek and Yarra River Valleys, which constitute existing and potential community resources in municipalities which are densely populated but whose access to open space and waterway areas for recreation and enjoyment is extremely limited.
- 1.3 The Lower Yarra environs in the vicinity of the West Gate Bridge will also be significantly affected by overhead power line construction. This river environ constitutes an important community resource, neglected in the past but capable of being up-graded.
- 1.4 The situation therefore exists where particular areas and communities are being affected in order to facilitate the achievement of a wider community objective, in this case the obtaining of greater security of electrical supply to the inner area and, particularly, the Central Business District of Melbourne. It is contended that special action should be considered to achieve some compensating or offsetting addition of amenity to the areas most affected.

- 1.5 Actions which might be taken to improve amenity in relation to the proposed routes have been canvassed in an independent assessment carried out by the consultants, British Electricity International Ltd.

In respect to the Richmond to Brunswick route, the most pertinent sections occur in Annex 7 Environment Considerations in which the idea is raised of expediting and co-ordinating the construction of a substantial portion of the Merri Yarra linear park in conjunction with the power line project. This section states in part:

2.3.1 Implementation of the Merri Creek and Yarra River Linear Park

Attention has been drawn to the proposed Linear Park along the Merri Creek and Yarra River, and the great importance placed upon the amenity benefit that such a scheme would bring. It was understood that the detailed design and implementation of the Linear Park would be carried out by the several City Councils within whose area it was situated. The detailed design and implementation prepared by each City Council would be within the overall intent of the conceptual design, but would almost inevitably, if prepared by different designers, lack a sense of being a complete entity, particularly in respect of the detailed planting along its full length. It is therefore suggested that there should be an overall co-ordinating Landscape Architect to ensure that the separate parts are complementary to the whole.

2.3.2 Appointment of a Co-ordinating Landscape Architect

If the principle of the appointment of a co-ordinating Landscape Architect is adopted several considerations arise. As the precise alignment of the path, and detailed planting plans for trees and shrubs will to some extent be determined by the location of the transmission line structures, it is considered that the financial burden of such an appointment should be met by the SECV. As the co-ordinating Landscape Architect will be required to work very closely with the SECV on the matters outlined above, it would be expedient if the Landscape Architect on the staff of the SECV could be given this role. Such an arrangement, although not guaranteeing success, would afford every opportunity of ensuring the best possible landscaping solution, and bring credit and recognition to the SECV for its practical concern for the environment.

2.3.3 Land Reinstatement after Transmission Line Constructions

It must be recognised that there will be considerable land disturbance, whether an overhead line or underground cable should be decided for the Richmond to Brunswick route. It will be a responsibility of the SECV to ensure that reinstatement is fully and properly carried out. This suggests that the opportunity will arise for such reinstatement to be done in accordance with the detailed proposals for the Linear Park. It is thought appropriate that such land reinstatement as may be necessary should be interpreted liberally so that a substantial part of the Linear Park may be implemented.

Thus it is envisaged that the SEC should contribute additional resources for co-ordinating of the landscaping and by a liberal interpretation of land reinstatement.

- 1.6 In the section dealing with the Lower Yarra crossing (Annex 8), the report by Professor George Seddon reinforces the point by directly supporting the increase of public amenity in lieu of being able to eliminate environmental impact by tunnelling under the Yarra. He states:

..... Public amenity in the lower Yarra environs is at present low, although the Port of Melbourne Authority now has plans to up-grade them. In my view \$4.5 Million, or even a quarter of that sum, could be spent much more effectively and make a greater contribution to public amenity, than by tunnelling under the Yarra. For example, an exercise in creative ecology at the mouth of Stony Creek could enhance this area greatly as a bird sanctuary, and the contrast of a natural area in such a setting would offer an unusual range of experiences. Equally, a well-designed riverside towpath with bollards and good lighting, linking the Strand to the Newport foreshore, would immeasurably improve public enjoyment of the river. The SECV might consider the joint funding of such improvements with the Port of Melbourne Authority and the planning assistance of the Williamstown Council.*

*George Seddon, Director, Centre for Environmental Studies
University of Melbourne, 23/2/79*

(\$4.5 Million was the estimate for tunnelling at that time.
The current SEC estimate is \$11.6 Million.)*

- 1.7 It is concluded that having regard to the previous points and, in particular, the principle of wider equity enunciated in Clause 1.4, that practical actions can and should be taken to provide offsetting amenity to the those areas most environmentally affected by the proposed routes.

RECOMMENDATIONS

The following recommendations are in addition to the recommendations in the Majority Report:

- 2.1 In respect of the Richmond-Brunswick section, it is recommended that -

A co-ordinating landscape architect be appointed to supervise and co-ordinate all land reinstatement after the transmission line construction and to liaise with the relevant local City councils and Government bodies to ensure that the maximum opportunity is taken for reinstatement work and landscaping to be done in accordance with detailed proposals for a linear park along the Merri Creek and Yarra River.

As the co-ordinating landscape architect will be required to work very closely with the SEC on matters outlined above, it may be expedient for the landscape architect on the staff of the SEC to be given this role.

- 2.2 A fund of at least \$1 Million be allocated as a contribution towards the development of the linear park in addition to the allowance made by the SEC for reinstatement and landscaping related to the transmission lines.

- 2.3 The detailed allocation of the fund be made on the basis of the degree of impact of the route and its application should reflect the particular priorities of each area as determined in consultation with the City councils concerned.

2.4 To achieve the necessary co-ordination, a co-ordinating body should be set up for the duration of the project consisting of the Landscape Architect, representatives of each of the relevant councils and the SEC.

2.5 In respect of the Lower Yarra Crossing and the Newport to Fishermen's Bend route, that -

Consistent with the conclusion of Clause 1.6 that, in conjunction with this project, it is recommended that additional resources be allocated to enhance the public amenity of the Lower Yarra environs.

* * * * *

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO THE DEVELOPMENT OF THE
LATROBE VALLEY WESTERN COALFIELDS

REPORT

upon the

PROPOSED DIVERSION OF THE MORWELL RIVER

Ordered to be Printed

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

MEMBERSHIP

The Honourable R. I. Knowles, M.L.C. (Chairman)
Dr. G. M. Vaughan, M.P. (Deputy Chairman)
The Honourable W. R. Baxter, M.L.C.
Mr. C. W. Burgin, M.P.
The Honourable D. E. Henshaw, M.L.C.
Mr. G. R. Ihlein, M.P.
Mr. M. J. McDonald, M.P.
Mr. W. D. McGrath, M.P.
Mr. D. K. McKellar, M.P.
The Honourable B. A. Murphy, M.L.C.
The Honourable B. T. Pullen, M.L.C.
Mr. E. M. P. Tanner, M.P.

COMMITTEE STAFF

Mr. M. R. Knight - Director of Research
Mr. G. H. Westcott - Secretary

* * * * *

LATROBE VALLEY WESTERN COALFIELDS INQUIRY SUB-COMMITTEE

The Honourable R. I. Knowles, M.L.C. (Chairman)
Mr. C. W. Burgin, M.P.
Mr. M. J. McDonald, M.P.
Mr. W. D. McGrath, M.P.
The Honourable B. A. Murphy, M.L.C.
Dr. G. M. Vaughan, M.P.

* * * * *

TERMS OF REFERENCE
PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

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SUMMARY

- 7.1 *The need for, and the possible timing of, a major diversion of the Morwell River cannot be established at the present time.*
- 7.2 *A route for the diversion of the Morwell River and the locations of the associated spoil disposal areas and flood regulating storages were proposed during the Driffield inquiry. These proposals were publicised again during this inquiry. The value of property affected by these proposals has probably changed as a result of the proposals being publicised. This condition is often referred to as "planning blight". The "planning blight" caused by these proposals will be reinforced on each occasion on which the available alternatives for major new power station projects are publicly reviewed.*
- 7.3 *If the most probable route of any future diversion and the most probable locations of the associated spoil disposal areas and flood regulating storages are defined and proclaimed as Public Purpose Reservations now, then the amount of land affected by "planning blight" will be minimised and affected landholders selling their property will be able to claim compensation from the SEC for any loss in value arising from the declaration of the reservation.*
- 7.4 *The most probable route for any future diversion of the Morwell River and the most probable locations of the associated spoil disposal areas and flood regulating storages are shown in figures 11 to 20.*
- 7.5 *Many of the issues raised during the inquiry regarding the detailed design of the diversion and associated works, and the use and tenure of land associated with the diversion will best be resolved if and when it is decided to proceed with the diversion.*

RECOMMENDATIONS

8.1 The Committee recommends that:

- (a) *The option of diverting the Morwell River to the east of Morwell to provide full access to the Western Coalfields should be retained. The need for and timing of the diversion should be reviewed as part of future inquiries into major power station projects;*
- (b) *In order to minimise future "planning blight", protect existing landholders and reduce general uncertainty, the route of the diversion and the location of associated works should be defined now and not subjected to further detailed evaluation until a decision is made that the diversion is actually required;*
- (c) *Any future diversion of the river should be designed and constructed to achieve as close an approximation to a naturally formed watercourse, as technically feasible;*
- (d) *The most probable route for any future diversion and the most probable location of spoil dumps and flood regulating storages is defined in figures 11 to 20. The land which is directly affected, as defined in the above drawings, should be declared a Proposed Public Purpose Reservation (River Diversion);*
- (e) *Land which would be affected by additional infrequent flooding if the flood regulating storages are constructed and land abutting the possible future diversion channel and spoil areas which would be indirectly affected by construction works, as defined in figures 11 to 20, should be zoned in the appropriate planning schemes as a Special Policy Area (Land Subject to Inundation) and as a Special Policy Area (Construction Buffer);*
- (f) *The Special Policy Areas should be overlying zones complementing the existing planning controls. Development proposals by landholders within the Special Policy Area should be referred to the State Electricity Commission for comment before any decision is made on these development proposals by the responsible authority; and*

- (g) *If a decision is eventually made that a diversion is required as part of a major power station project, then the detailed technical and environmental aspects of the diversion should be thoroughly reviewed before the construction of the diversion is approved. This review should include consideration of the long-term ownership and use of land affected by the diversion and the appropriate planning controls following completion of the diversion works.*

* * *

The Natural Resources and Environment Committee appointed pursuant to the provisions of the *Parliamentary Committees Act 1968* (No. 7727) has the honour to report as follows:

INQUIRY INTO THE DEVELOPMENT OF THE
LATROBE VALLEY WESTERN COALFIELDS

REPORT UPON THE PROPOSED DIVERSION
OF THE MORWELL RIVER

CHAPTER ONE

TERMS OF REFERENCE

1.1 On 27 April 1983, the Committee was directed by His Excellency the Governor in Council:

In relation to the development of the Latrobe Valley western coalfields, to inquire into and report by 1 December 1983 on:

- (a) *the need for planning controls in relation to a possible requirement for diversion and regulation of the Morwell River;*
- (b) *the scheme in principle for diversion and regulation of the Morwell River which should be adopted as a basis for the application of any planning controls.*

Particular reference shall be given to:

- (i) *long term protection and utilisation of coal resources;*
- (ii) *possible alternative schemes;*

- (iii) economic, social and environmental consequences of alternative schemes, including:
 - (a) flooding effects in the Latrobe River;
 - (b) effect on houses and farms
- (iv) design objectives to minimise social and environmental effects;
- (v) management of construction operations and maintenance;
- (vi) possible river diversion timing;
- (vii) planning blight.*

And any other matters pertinent to the need for and determination of a scheme in principle as a basis for any planning controls.

BACKGROUND

1.2 A two-stage Public Works Committee Inquiry into SEC proposals for a power station to follow Loy Yang was instigated on 23 December 1980. The terms of reference of the inquiry were modified on 29 September 1981 to read:

To inquire into and report upon the proposals by the State Electricity Commission of Victoria for the development of a base load brown coal power generating project on the coal field at Driffield south-west of the township of Morwell as described broadly in the Commission's Report entitled "Proposed Driffield Project: Interim Report to Government" dated November 1980. The Inquiry and Report should have regard to the short lead time available for the authorization and construction of the project and to this end it is desired that the Parliamentary Public Works Committee should report on the principal matters of concern as follows:

* A definition of planning blight is land said to be affected if:

- (a) the saleability or value of land is affected by the possible future acquisition of the land for a proposed public project; and
- (b) the landowner has no existing right to claim compensation.

- (1) *By 30 November 1981, the selection of brown coal in preference to alternative forms of generation.*

- (2) *By 30 June 1982 -*
 - (a) *the timing of the development;*
 - (b) *the selection of Driffield as the preferred and most economic brown coal development, having regard to long range planning for the Latrobe Valley;*
 - (c) *arrangements for regulation and diversion of the Morwell River as a concomitant part of the Driffield development;*
 - (d) *environmental effects of the development;*
 - (e) *any other matters which may be pertinent to the evaluation of the project and which may have a bearing on its approval.*

- 1.3 During Stage One, the Public Works Committee (PWC) heard evidence commencing in April 1981 from some 15 separate parties, in addition to the SEC, over six days of hearings held in Melbourne and the Latrobe Valley.

- 1.4 In November 1981, the PWC presented a progress report recommending that brown coal be adopted as the fuel for Victoria's next major power generation project.

- 1.5 Hearings for the second stage of the inquiry were held in Melbourne on 7 December 1981, 17 and 23 February 1982, and in Morwell on 10 and 11 February 1982. In all, some 30 submissions were received over these five days of public hearings.

- 1.6 As required by the *Environment Effects Act 1978*, the SEC prepared and published, in August 1981, an Environment Effects Statement (EES) on the proposed Driffield project with the assistance of consultants, Kinhill Pty. Ltd.

- 1.7 Following publication of the EES, agency and public comments were sought by the Ministry for Conservation in the period up to 2 November 1981.
- 1.8 The Ministry for Conservation presented a summary of the comments received in a submission to the PWC hearing on 7 December 1981. At the hearing on 10 February 1982, the SEC submitted detailed replies to this summary and on 23 February the Interim Assessment by the Minister for Conservation on the environmental effects of the proposed project was presented.
- 1.9 In this Interim Assessment, the then Minister for Conservation, the Honourable W. V. Houghton, M.L.C., made the following comments and recommendations which are relevant to the current inquiry:
- (1) *It was expected that the SEC would submit further evidence on the question of timing.*
 - (2) *If SEC load forecasts indicate that a final decision on the project is not required immediately, there is a basis for delaying that decision until the strategy planning has reached a more advanced stage. In this case care must be taken to protect affected landholders from planning blight, particularly along the route for the proposed diversion of the Morwell River.*
 - (5) *Irrespective of whether the Driffield project is approved, steps should be taken to minimise the effects upon people along the route of the proposed Morwell River diversion.*
 - (i) *The eastern route for the diversion of the Morwell River should be approved in principle by the Government.*
 - (ii) *The detailed route of the diversion should be re-examined to see if it is possible to reduce the number of people directly affected by the diversion and in particular to avoid the unnecessary demolition of homes.*

(iii) *The route of the Morwell River diversion should be proclaimed under an Order in Council so that the SEC is able to compulsorily acquire affected properties and compensate landholders accordingly.*

(iv) *The terms on which compensation will be paid should be finally resolved by the Government as quickly as possible.*

1.10 In July 1982, an amendment to the *Parliamentary Committees Act 1968* was passed which, amongst other things, disbanded the PWC and established this Committee. The amendment also provided that evidence taken by the PWC was to be considered as if that evidence had been given to this Committee.

1.11 In December 1982, a report entitled "Victorian Brown Coal Resource Development Study" prepared by Kinhill Pty. Ltd. on behalf of the Victorian Brown Coal Council was completed. This report was released for public discussion and comment and, in November 1983, the Brown Coal Council made recommendations to the Government which, in particular, included the following:

The VBCC supports the concept of the Morwell River diversion to provide full access to the Western Coalfields, and favours the Eastern route. However, final approval and details of the route should be settled by discussion between all affected parties before the Natural Resources and Environment Committee.

1.12 In January 1983, a report entitled "Land Acquisition and Compensation - Proposals for new land acquisition and compensation legislation" was prepared for the Minister for Planning by Stuart Morris, Barrister.

This report was released for public comment and two task forces were established to examine and assist in the preparation of legislation in relation to "land acquisition" and "planning blight". These task forces have reported and it is understood that new legislation will be presented to Parliament in the Autumn Session of 1984.

1.13 In April 1983, the Development of the Latrobe Valley Western Coalfields Inquiry was referred to this Committee by the Governor in Council as indicated in paragraph 1.1.

1.14 Of further relevance, in June 1983, the Latrobe Regional Commission Bill was introduced into Parliament and was subsequently passed in November 1983. This Act, which establishes a regional commission, has the following objectives and functions:

S.6 (1) *The objects of the Commission shall be -*

- (a) *to co-ordinate the planning of the economic, physical, environmental and social development of the Latrobe region;*
- (b) *to improve the co-ordination of and to facilitate the development of major projects in the region;*
- (c) *to assist the implementation of State policies in relation to the region;*
- (d) *to assist in the economic development of region; and*
- (e) *to involve the regional community in decision-making in relation to the region.*

(2) *In carrying out its objects under this Act the Commission shall give effect to statements of Government policy.*

S.7 (1) *Subject to the direction and control of the Minister, the Commission shall in accordance with this Act -*

- (a) *carry out investigations and prepare and implement regional strategy plans for the region;*
- (b) *carry out investigations and prepare infrastructure co-ordination plans in relation to prescribed developments;*
- (c) *prepare and report on co-ordinated plans of works for the region;*

- (d) *promote, co-ordinate and assist in the economic development of the region and the development of the physical and social resources of the region, to improve the region generally and to conserve, restore and enhance sites, areas, structures, works and objects in the region of special significance to the region;*
- (e) *promote public involvement in the planning and development of the region; and*
- (f) *carry out such other functions as are conferred on it by or under this Act.*

1.15 It is expected that the Commission will come into operation during 1984.

PROCEDURE ADOPTED BY THE COMMITTEE

1.16 Following the Order in Council of 27 April 1983, the first public notification of the inquiry was made in press releases issued at the end of April by the then Minister for Conservation, the Honourable Evan Walker, M.L.C. This press release also referred to the Kinhill and Stuart Morris reports.

1.17 The Committee then appointed a Sub-committee consisting of the following Members to carry out the inquiry:

The Honourable R. I. Knowles, M.L.C (Chairman)

Mr. C. W. Burgin, M.P.

Mr. M. J. McDonald, M.P.

Mr. W. D. McGrath, M.P.

The Honourable B. A. Murphy, M.L.C.

Dr. G. M. Vaughan, M.P.

This Sub-committee prepared a draft report which was subsequently adopted by the Full Committee. (Mr. G. R. Ihlein, M.P. withdrew from all deliberations and voting on the grounds of a possible conflict of interests.)

- 1.18 In May 1983, at the request of the Minister for Conservation, the SEC produced and exhibited for public comment a document entitled "Supplementary Information on the Proposed Morwell River Diversion".
- 1.19 Comments were called for by 30 June 1983 and were to be sent to the Ministry for Conservation. These comments have been forwarded to this Committee and have been treated as written submissions to the inquiry. A summary of these comments by the Assessments Section of the Ministry for Conservation is attached as Appendix 1.
- 1.20 On 28 and 29 June 1983, members of the Sub-committee visited the Latrobe Valley to inspect the site of the proposed diversion of the Morwell River and to gain an overall perspective of the development of the coalfields.
- 1.21 On 15 August 1983, the Committee placed advertisements in the local and daily press indicating that public hearings would be held on 28 and 29 September 1983 at the Council Chambers, Civic Centre, Morwell.
- 1.22 Early in September, landholders who might be directly affected by the proposed diversion of the Morwell River were individually informed of the public hearings to be held on 28 and 29 September, and asked to contact the Committee if they wished to give evidence either verbally or in writing.
- 1.23 On 27 September, members of the Sub-committee inspected the proposed route in some detail and, in particular, examined the alternative localised routing of the diversion as set out in the SEC's Supplementary Information. Informal discussions were held with some of the affected landholders.
- 1.24 On 28 and 29 September, the Sub-committee took formal evidence in the Council Chambers, Morwell. A list of those who gave evidence is included in Appendix 4.

- 1.25 During the course of the hearings on 28 and 29 September, new proposals were put forward by landowners for alternative routing of sections of the diversion and the Sub-committee referred these to the SEC for detailed comment.
- 1.26 On 29 September, when giving evidence to the Sub-committee, the SEC produced a document which provided detailed comment on matters raised in submissions to the Ministry for Conservation in response to the exhibition of the Supplementary Information under the *Environment Effects Act 1978*. The Sub-committee decided that this new document from the SEC should be sent to all those who had made submissions or given evidence, and that an opportunity should be given to these people to comment, either verbally or in writing, to the Sub-committee on the information contained in the SEC's document.
- 1.27 In order to ensure that adequate opportunity was made available for all parties to give evidence and refute evidence by others, a further public hearing was held in Morwell on 28 November 1983. A list of those who gave evidence at this hearing is also included in Appendix 4.

DISCUSSION OF THE PURPOSES OF THE INQUIRY

- 1.28 The Committee believes that it is necessary to identify the framework within which it will address its terms of reference, as many complex and indeterminate issues are involved.
- 1.29 In the Committee's opinion, the inquiry had resulted from the earlier Driffield Inquiry and recommendations by the previous Minister for Conservation (as outlined in paragraph 1.9 of this report) and consequently the primary purpose of this inquiry is to determine how the "planning blight" inflicted on landholders along the route of the proposed Morwell River diversion (MRD) might best be dealt with so that these landholders are not further unnecessarily disadvantaged.

- 1.30 Landholders along the proposed route for the MRD have experienced a series of problems which include:
- (a) A threat that some or all of their property may be acquired and that as a consequence their present life style may be changed;
 - (b) The time at which their property may be acquired is uncertain; and
 - (c) If existing landholders wish to sell their property now, potential buyers may be discouraged because of the threat of acquisition. Alternatively, the offers made for their property may be reduced.

1.31 In the case of the MRD, the compensation provisions contained in the *Lands Compensation Act 1958* and the *State Electricity Commission Act 1958* cannot be applied as the land has not been reserved in a planning scheme, or by an Order in Council, for future public use. This was not done, partly because alternative routes were subject to review by the PWC and partly because of some difficulty encountered in the framing of a suitable Order in Council, as the river diversion would mostly require the acquisition of parts of properties.

1.32 The former Minister for Minerals and Energy did direct, as an extension of the policy applying to the Brown Coal Resource Area, that the SEC should purchase properties along the proposed diversion route on a "hardship basis" at fair market prices - "hardship" being defined as the inability to sell the property on the open market at a price equivalent to that which would have been achieved if the MRD had not been proposed.

- 1.33 The provisions for purchase on a "hardship basis" are understood by the Committee to still be in force whilst the land compensation issue is currently being reviewed by the Government.
- 1.34 In order to find a solution to the "planning blight" problem, it would be necessary for the Committee first to review the current situation with respect to the following:
- (a) The need for a diversion of the Morwell River;
 - (b) The possible timing of the diversion;
 - (c) The proposed flood regulating storages associated with the diversion;
 - (d) The most probable general route for the diversion; and
 - (e) The detailed alignment of the most probable route.
- 1.35 However, the Committee emphasizes that it has taken the view that the prime purpose of the inquiry is to determine how landholders along the route of the proposed MRD might best be protected from the effects of "planning blight".
- 1.36 In the Committee's opinion, further inquiries into major power station projects will occur before the need for the diversion is established. When a need has been firmly established, then detailed technical and environmental matters should be thoroughly reviewed before approval to construct the diversion is granted.

1.37 Appended to this report are:

- (a) A summary of submissions sent to the Ministry for Conservation (Appendix 1);
- (b) A review by the State Electricity Commission of concepts for the diversion of the Morwell River through the western edge of the coalfield (Appendix 2);
- (c) Ministry for Planning and Environment submission on planning controls (Appendix 3);
- (d) A list of witnesses (Appendix 4);
- (e) A list of submissions received by the Committee (Appendix 5); and
- (f) Minutes of Evidence. *

* Minutes of Evidence not printed.

CHAPTER TWO

THE NEED FOR AND TIMING OF A DIVERSION OF THE MORWELL RIVER

- 2.1 A large number of people giving evidence to the Committee and making submissions to the Minister for Conservation questioned the SEC's claim that there would be a need to divert the Morwell River in the foreseeable future.
- 2.2 The case put forward by the SEC is contained in the document entitled "Supplementary Information on the Morwell River Diversion". The case for the diversion was summarised by the SEC when giving evidence to the Committee and is as follows (at pages 5 and 6 of the Minutes of Evidence):

The most recent assessment by the SEC of the quantity of coal underlying the Morwell River has shown that if the river remains on its present course up to 4000 Mt of coal could not be recovered. The revised quantity is greater than the 2000 Mt estimate mentioned in the Driffield Environment Effects Statement as it includes deeper M2 and Latrobe seam coal beneath the river which could not be recovered by open cut developments if the river remained on its present course.

In round terms, 4000 Mt of coal would be sufficient to fuel some 16 000 MW of generating plant over a 30-year life, that is the equivalent of about four 4000 MW Loy Yang projects.

The coal in the Western Coalfield is some of the more valuable coal suitable for future power generating purposes. The coal has favourable characteristics as a boiler fuel and attractive coal to overburden ratios.

Further major development of the Western Coalfield beyond possible limited extension of Morwell Open Cut or smaller-scale development in the Driffield area would necessitate diversion of the Morwell River.

In the Maryvale area, to the north of the Morwell township, expansion of the existing Yallourn Open Cut and East Field extension beyond that already planned could not take place until the Morwell River is diverted from the coalfield. Although a separate

development through the very thick overburden on the eastern side of the Maryvale area would delay the need to divert the river, as was identified in the Driffield EES, complete development in the Maryvale area would require the river to be diverted at some time in the future.

The rate of development of the Latrobe Valley brown coal resource for electricity generation, or for other energy requirements, will be largely determined by the rate of growth of economic activity in Victoria and other parts of Australia.

Some upper and lower electricity load growth forecasts are given in Figure 2.4 of the Supplementary Information (figure 1 of this report) for the planning period pertinent to consideration of the longer-term coalfield development. If the upper load growth eventuated, the project to follow Loy Yang would need to be approved within the next two or three years.

If a major development on the Western Coalfield were determined as the project to follow Loy Yang, concomitant approval of the Morwell River diversion could therefore be needed within the next two or three years. The timing would be correspondingly delayed for lower load growth or if the next development were not on the Western Coalfield.

2.3 In giving its evidence to the Committee and as a result of questioning by the Committee, the SEC indicated that it was currently undertaking a series of investigations into the most appropriate size and location of possible future power stations in relation to a range of future load growths. Copies of reports of the investigations already completed were submitted to the Committee.

2.4 Mr. John Larson and Mr. Paul Strickland, on behalf of the Latrobe Valley Community Forum, gave evidence to the Committee. The following points are extracted from their evidence (at pages 221 and 222 of the Minutes of Evidence):

The need for the diversion cannot be seen outside a broad strategy for the Valley. It should not be seen as an inevitable step, required no matter what decisions are made on future development and use of the brown coal.

In particular, the Morwell River Diversion cannot be seen in isolation from other projects in the Western Coalfields.

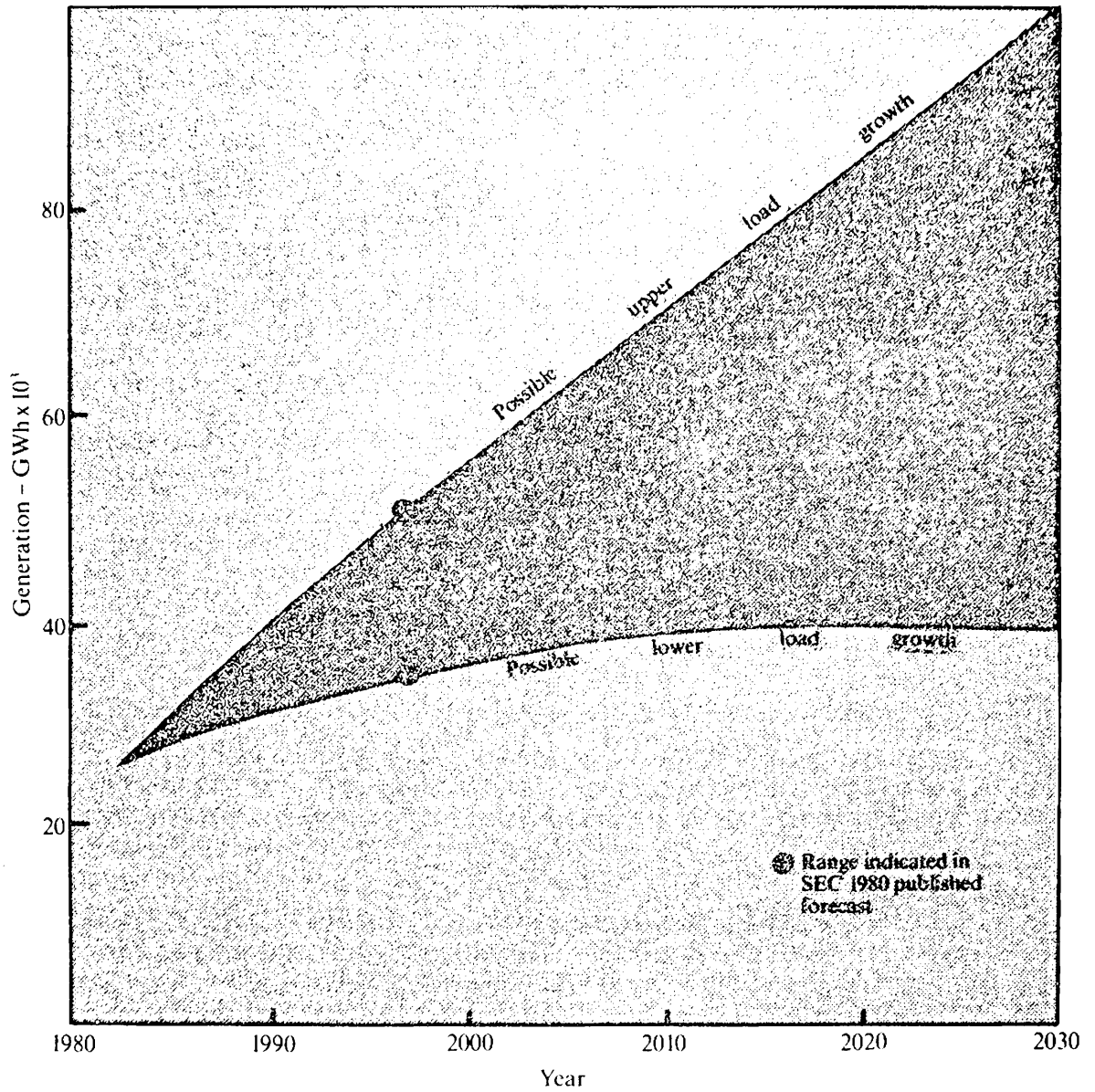


FIGURE 1

Range of long-term electricity forecasts

The uncertainty of development in the Latrobe Valley will not be overcome before there is a total Strategy Plan for the region.

The Forum argued that there was no benefit from an immediate declaration of planning controls in an isolated context.

In particular, the Forum recommended:

- (a) that the Natural Resources and Environment Committee recognise the dangers, in principle, of the proposed diversion, the need for further investigation, and the full value of the 'status quo' and;*
- (b) that the effects of planning blight be compensated, whether or not the diversion proceeds.*

2.5 Morwell Shire Council was represented by the Shire President, Cr. K. G. Hamilton and the Chief Executive Officer, Mr. R. H. Waters. In giving evidence, they indicated that their Council was opposed to any diversion of the Morwell River or the development of the Western Coalfield on the following grounds (at pages 71 to 73 of the Minutes of Evidence):

Growth of demand

There should be a re-examination of the current growth scenarios for energy demand. The impact of the present economic recession and the world-wide re-examination of technological priorities indicate the extreme uncertainty of any scenario in 1983. Before any decision is made to divert the river, the Government should insist on a longer, more detailed examination of the economic strategies. The Government has yet to adopt, even in part, the recommendations of the "Kinhill Report" and this surely precludes any decision to divert the river - a relatively minor part of the proposed strategy.

State Energy Plan

The development of an energy plan by the State Government, together with potential national strategies in this area will ensure that alternatives to the current brown coal developments are examined, debated, and eventually accepted. Until this important issue is decided, it would be premature to decide to divert the Morwell River.

Electricity generating options

A number of options exist before the "Driffield Proposal" is acted upon. The possibility of building smaller power stations with their smaller open cuts is certainly worthy of examination. Once this matter is decided, the need to divert the river is then subject to a further inquiry.

However, there is now sufficient "lead time" to study the possibilities of co-generation with, say New South Wales, renewable resource systems on a smaller scale and others. Technological developments in the next few years may present us with more attractive options as yet unannounced. The SEC should be examining the opportunities to diversify its operations, rather than planning to continue to consolidate its operations on the brown coal resource in the Latrobe Valley.

Adequacy of alternative coal resources

The Kinhill Report presented a vast range of alternative coalfields. On current reports, it would appear that the Loy Yang project, if continued to completion, could supply our electricity needs for a long time in the future. Morwell Shire Council believes that the case to develop the Western Coalfield or to divert the river is yet to be proven.

- 2.6 The Latrobe Valley Consultative Committee submitted evidence and was represented by Cr. K. G. Hamilton, Chairman of the Environmental Sub-committee.

The Environmental Sub-committee and the Rural Land Use Sub-committee presented opposing views on the need for planning controls in the light of uncertainty as to whether the diversion would eventually be needed.

- 2.7 The Morwell Shire Land Owners Protection Association was represented by Mr. R. Quigley and Mr. J. Larson and summarised their submission as follows:

1. *We assert that a valid case supporting the need to divert the Morwell River in the foreseeable future has not been put.*
2. *We do not believe that there is sufficient certainty that a diversion of the nature proposed by the SECV will ever take place to warrant a planning reservation being placed on the proposed route.*

3. *That consideration be given to recommending special compensation clauses to cover projects, such as those being considered in the Latrobe Valley, covering relocation costs and not just market value.*
4. *A planning reservation would not take uncertainty away. Any associated planning restrictions would impose unnecessary and unwarranted hardships on landowners.*

CONCLUSIONS

2.8 The Committee concludes that:

- (a) It is not possible to ascertain at this time whether or not the diversion of the Morwell River will be necessary within the foreseeable future;
- (b) The Morwell River overlies some of the better quality, more economic and most easily won coal;
- (c) The financial cost of diverting the Morwell River would form a relatively small proportion of the total cost of a large power station project located on this coalfield;
- (d) The competitive position of electricity generated from brown coal compared with electricity generated from black coal in New South Wales or black coal imported to a coastal site in Victoria will become progressively worse as the better deposits of brown coal are used up. The pressure to use up any remaining deposits of good quality brown coal in preference to the use of some of the poorer quality coal or coal covered by a great depth of overburden will increase;
- (e) The review and approval of future power station projects is likely to include the review of a range of alternative projects, some of which would include diversion of the Morwell River as part of the project;
- (f) Landholders along the route of a possible diversion will be subjected to planning blight at intervals when new power station projects are reviewed; and
- (g) The minimum number of landholders will be affected by future power station project reviews if the most probable route of any diversion is defined at this time.

CHAPTER THREE

THE MOST PROBABLE GENERAL ROUTE FOR DIVERSION OF THE MORWELL RIVER

- 3.1 Three alternative concepts were brought forward in evidence to the Committee and these were :
- (a) Maintaining the flow along the general route as at present but diverting it over fill material in the worked-out coal areas; or
 - (b) A route to the west of the coalfields; or
 - (c) A route to the east of the coalfields.

WESTERN DIVERSION

- 3.2 During the course of the inquiry, the SEC produced further evidence reviewing concepts for diversion of the Morwell River through the western edge of the coalfield, including diversion of the river over consolidated fill in the proposed Driffield Open Cut and the Yallourn Open Cut as illustrated in Figure 2. This evidence is attached as Appendix 2.
- 3.3 The SEC drew the following conclusions -

A fully regulated scheme was described in the Driffield EES as the most likely western option for diversion of the Morwell River. Reservations were expressed in the EES regarding the risks such a scheme would pose for open cut security, given the likely future open cut earth movements.

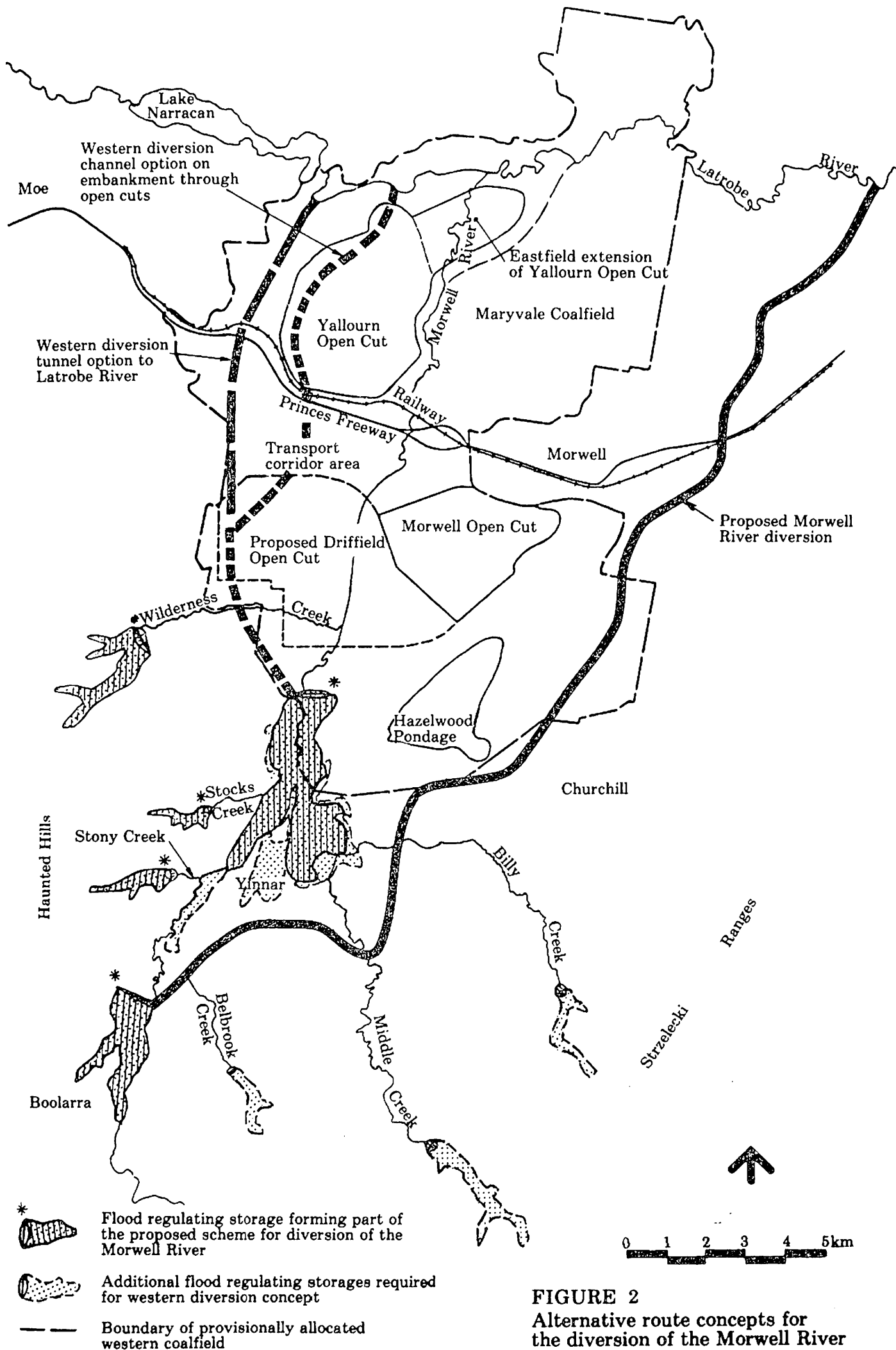


FIGURE 2
Alternative route concepts for the diversion of the Morwell River

Revision of meteorological data and, consequently, of the basic hydrological requirements and the loss of some potential regulating storages as a result of recent geotechnical investigations has meant that a fully regulated diversion of the Morwell River through the western edge of the coalfield is no longer possible.

With a partially regulated western scheme a channel or tunnel to transport flood flows to the Latrobe River would need to be of much greater size than indicated in the EES and, due to the identified future earth movements of up to 5 metres vertically and up to 3 metres horizontally, the feasibility of such structures within, and adjacent to, open cut workings is subject to considerable doubt.

The establishment of a major channel with an 80 metre wide floodway base on a 50 metre high embankment within the proposed Driffield Open Cut or Yallourn Open Cut would present a high risk to life and equipment and resulting loss to the State's power generation system if a failure was to occur which led to flood waters inundating the open cut.

The feasibility of constructing a 75 metre high embankment to contain flood flows on loosely dumped overburden within the Yallourn Open Cut is questionable. This, coupled with the resultant loss of overburden dump capacity in the Yallourn Open Cut, and the need to stage open channel construction through the transport corridor area with possible future open cut development, and congestion in the Yallourn Power Station area, led to the earlier proposal for a tunnel to drain flood flows to the Latrobe River.

With the partially regulated western diversion concept, two tunnels of about 12.5 metres diameter, some 8 kilometres long, would be required.

The cost implications of the channel or tunnel, western diversion concepts, without consideration of the increased risks and questionable feasibility of the works, would be considerable.


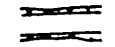
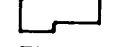





- 3.4 The SEC estimated that a diversion through the western edge of the coalfield would cost some \$700 M.; alternatively, a dual tunnel to the west of the Yallourn Open Cut would cost between \$600 M. and \$1100 M. These costs are considerably more than the estimated \$330 M. for the proposed eastern diversion.

EASTERN DIVERSION

- 3.5 The proposed eastern diversion of the Morwell River, shown in Figure 3, would re-route the river from a diversion weir at Boolarra. The diverted river would join the Latrobe River at a point north-east of Morwell adjacent to the Traralgon to Tyers Road bridge, some 18 kilometres along the river downstream from the existing junction.
- 3.6 The SEC believes that an important design criterion for the proposed diversion channel is to contain the flood flows generally below the natural ground surface, except in some areas of low-lying ground.
- 3.7 This generally constrains the channel location to the sides of the shallow Morwell River valley from the Boolarra diversion weir to Eel Hole Creek where the proposed channel would start to pass through the Morwell Ridge.
- 3.8 As originally conceived, the SEC envisaged that the capacity of the diversion channel could be varied by the addition of up to seven optional flood regulating storages on the southern and eastern tributaries to the Morwell River to store the flood run-off water and reduce peak flood flows in the proposed channel, thus permitting a smaller channel to be constructed. However, four of the most effective identified sites for the optional flood regulating storages on the Upper Morwell River, Little Morwell River, O'Grady Creek and Middle Creek have since been shown by geotechnical investigations to be unsuitable for the construction of water storages. An alternative upstream site on Middle Creek was found to be suitable.
- 3.9 The river diversion scheme proposed by the SEC would provide for existing and future open-cut works to be protected against the probable maximum flood. The magnitude of such a flood has been estimated on the basis of advice from the Bureau of Meteorology. This event can be described as having a probability of occurrence less than once in 10 000 years.



FIGURE 3
 SEC proposed scheme for diversion of the Morwell River showing existing major land use controls.

-  Proposed flood regulating storages showing estimated probable maximum flood and 1 in 20 year flood levels
-  Proposed diversion channel
-  Land title boundaries (1980)
-  Residential & Village zones
-  Rural zones
-  Rural residential zones
-  Industrial zones
-  Reservation - Public Purposes

Note: SEC land not shown.

0 1 2 3 km

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- 3.10 The SEC considers that it is necessary to design against such a low probability event because of the severe consequences of flooding the open-cut works which supply most of the fuel for the State's electricity generating facilities. This occurred with a lesser magnitude flood in 1934.
- 3.11 During this flood, waters from the Latrobe River completely inundated the Yallourn Open Cut, disrupting normal coal winning operations for several months and alternative arrangements to supply coal to the Yallourn Power Stations were necessary. Following the flood, it took four and a half months to pump the water from the open cut.
- 3.12 During the same flood, the flow in the Morwell River has been estimated as being somewhat greater than that which would result from a one in a thousand year flood.
- 3.13 The proposed scheme has also been designed to avoid aggravation of flooding in the Latrobe River. Studies by SEC consultants, Binnie and Partners, indicate that the probability of occurrence of floods of any size between the "break-bank" condition and the one in a hundred year flood would not be increased.
- 3.14 For the proposed river diversion, the following works would be required :
- (a) A large open channel to carry flood flows to the east of the western coalfield with a smaller meandering waterway designed to carry normal river flows within the broader floodway;
 - (b) A diversion and flood regulating dam at Boolarra to intercept and divert the existing Morwell River to the new river channel;
 - (c) Flood regulating storages on Wilderness, Stocks and Stony Creeks, together with associated outlet works, to regulate the flood waters from the western tributaries of the Morwell River;

- (d) A diversion pipeline from Wilderness Creek to the Boolarra storage to divert the waters from the Wilderness, Stocks and Stony Creek catchments to the new river channel;
- (e) A flood storage at Yinnar to protect possible future open-cut works from flood waters which would derive from the catchment downstream of the Boolarra dam, the diversion channel and the flood-regulating storages; and
- (f) A pumping station and rising main to empty the Yinnar storage and discharge water to the new diversion channel.

- 3.15 In excavating the proposed river diversion channel, it would be necessary to provide areas for the disposal of approximately 35 million cubic metres of excavated material.
- 3.16 Ten proposed spoil disposal areas and a number of feasible alternative sites have been identified.
- 3.17 A recent review by the SEC of the direct capital cost of the proposed scheme indicates a cost of around \$330 M. at 1983 price levels compared with the figure of \$275 M. in 1980 dollars, given in the Driffield EES.
- 3.18 The State Rivers and Water Supply Commission (SRWSC), in evidence to the Committee, indicated that it had a clear responsibility to ensure that the proposed river diversion works met accepted standards in relation to safety and performance.
- 3.19 In the opinion of the SRWSC, the high standards of safety that the SEC adopted as a basis of design of the diversion works will ensure that the probability of flooding along the diverted river resulting from design failure of the system is negligible.

- 3.20 The main concern of the SRWSC has been the possibility that the proposed works could adversely affect flooding adjacent to the storages or adjacent to the Latrobe River downstream of the confluence of the diverted river. The SEC engaged consultants to investigate these and other matters.
- 3.21 Following discussions and a review of the consultants' reports, the SRWSC considered that the investigations by the consultants provided a suitable basis for decisions on the design parameters for the basic flood regulation storages.
- 3.22 The SRWSC gave general endorsement to the design of the proposed Morwell River diversion scheme consisting of a "large" channel and the basic storages on Wilderness, Stocks and Stony creeks and the Morwell River at Yinnar and Boolarra, and agreement with the consultant's view that there is little justification for an additional flood storage on Middle Creek as part of the river diversion scheme.
- 3.23 On the understanding that full development of the Western Coalfields will require the ultimate diversion of the Morwell River, the SRWSC endorsed the principle of the proposed diversion subject to the proposed works meeting appropriate environmental, social and technical objectives. The SRWSC considers that the planning carried out by the SEC in conjunction with other agencies to date, is sound and consistent with providing river diversion works that are physically and environmentally satisfactory.

DISCUSSION AND CONCLUSIONS

3.24 The Committee concludes that:

- (a) The most important factor to be considered in determining the most appropriate route for the diversion of the Morwell River is the long term stability of the diversion;

- (b) Failure of the diversion could result in the loss of life and equipment and, in addition, would result in loss of power-generating capacity for a prolonged period of time;
- (c) The risks involved in constructing the diversion along the western edge of the coalfield or over fill material in the open cuts are clearly greater than the risks involved in constructing a diversion to the east, particularly if this eastern diversion is constructed so as to contain flood flows below the natural ground level for the majority of the route;
- (d) At this time, on the evidence put before it, the Committee believes that diversion of the Morwell River to the east along the general alignment proposed by the SEC must be considered to be the most probable route for any future diversion of the Morwell River; and
- (e) Evidence put forward by the SEC and SRWSC indicates that, in principle, it will be technically possible to build a diversion of the Morwell River along the proposed eastern alignment with associated flood regulating storages, so that the peak flood flows in the Latrobe River are not substantially altered from the present peak flood flows.

CHAPTER FOUR

THE MOST PROBABLE LOCATION OF FLOOD REGULATING STORAGES AND DIVERSION CHANNEL FOR THE EASTERN ALTERNATIVE

FLOOD REGULATING STORAGES

- 4.1 The following flood regulating storage dams were proposed as necessary headworks for the proposed eastern diversion of the Morwell River:
- (a) Wilderness Creek;
 - (b) Stocks Creek;
 - (c) Stony Creek;
 - (d) Yinnar; and
 - (e) Boolarra.
- 4.2 The location of these dams and the area of land affected by the floodwaters in each case is shown in figure 3.
- 4.3 Apart from evidence submitted to the Committee by the SEC, no other evidence specifically relating to these dam sites was given to the Committee other than a request from Australian Paper Manufacturers Ltd (APM) that it be given alternative land for pine plantations to replace pine plantations lost at Stocks and Stony creeks.

Stocks and Stony Creek Dams

- 4.4 These proposed dams would result in the occasional flooding of land which is not currently affected by floodwater. This land is currently used in both cases approximately 50 per cent for agricultural purposes and 50 per cent for APM pine plantations.

- 4.5 No houses are affected by these proposed dams although a proportion of the Stocks Creek land is currently zoned "Rural Residential".

Wilderness Creek Dam

- 4.6 Land affected by this proposed dam was delineated by the Driffield Order in Council of August 1980. This Order in Council allows owners of the land to apply to the SEC for compulsory acquisition of the land should they desire to move.
- 4.7 Four houses would be directly affected by construction works should construction of this dam eventually be approved. Another house would be potentially affected by a peak maximum flood.

Boolarra Dam

- 4.8 This proposed dam would have very little effect on current flood levels.
- 4.9 One house would be very close to the construction works required for the dam but, with careful planning of the works, the effects of the works on this house could be kept to a reasonable level. Another house would be inundated by the permanent water in the storage. The owner of this house has built himself a new house away from the areas which might be flooded as a result of the construction of the storages and now leases the threatened house to a tenant.

Yinnar Dam

- 4.10 The proposed dam would have very little effect on current flood levels. However, it is possible that up to seven houses could be affected in extreme flood conditions (less frequently than once in one hundred years). Of these seven houses, four will probably be more seriously affected than would have been the case without the construction of the dam.

DETAILED ALIGNMENT OF THE MOST PROBABLE ROUTE FOR THE EASTERN DIVERSION

- 4.11 Some 34 houses occupied by an estimated 120 people would be directly affected by the route proposed by the SEC in the Driffield EES for the diversion of the Morwell River to the east of Morwell.
- 4.12 During the course of the Driffield Coal Reserves Inquiry and during the course of this inquiry, several modifications to the detailed alignment of the eastern route for the river diversion have been raised.
- 4.13 These modifications are specifically related to the proposed route alignment and to the proposed spoil disposal areas adjacent to the following:
- (a) The entry to the Latrobe River;
 - (b) The crossing of the Princes Highway;
 - (c) Jeeralang Gas Turbine Station;
 - (d) Nadenbouschs Road;
 - (e) Eel Hole Creek;
 - (f) Middle Creek - Speargrass Road;
 - (g) Withams Road; and
 - (h) Belbrook Creek.

The entry to the Latrobe River

- 4.14 APM were concerned that the route as originally proposed would encroach on to the dyke of APM's secondary irrigation stabilisation pond. The pond is used for treatment of some of the waste water from APM's Maryvale Paper Mill.
- 4.15 The SEC indicated, in response, that a minor revision to the proposed diversion channel alignment had been investigated and would resolve the problem without incurring additional cost, or any technical or social implications. This revision is shown in figure 4.

- 4.16 APM raised a series of other matters mainly related to the location of overburden dumps. Mr. M. Hague and Mr. J. R. Pollock, appearing on behalf of APM, agreed that most of these matters could be addressed in detail and resolved when the project was being considered for construction.
- 4.17 The question of the effect of the river diversion on the dilution of APM's waste discharges to the Latrobe River was discussed. The matter appeared to be capable of resolution if and when the river diversion is constructed.
- 4.18 At this stage, the Committee concluded that the minor revision to the proposed river diversion to clear APM's waste water treatment works should be adopted. Other matters raised by APM should be resolved between APM, the SEC and the Government, as and when this became necessary.

The crossing of the Princes Highway

- 4.19 Two alternative crossings of the Princes Highway by the proposed river diversion were put forward by the SEC in the Supplementary Information of May 1983.
- 4.20 The Princes Highway will be diverted along a new alignment during the next few years so that it by-passes Morwell. This will be followed by changes to the alignment between Morwell and Traralgon. These proposals and the effects of the alternative routes for the proposed river diversion are shown in figure 5.

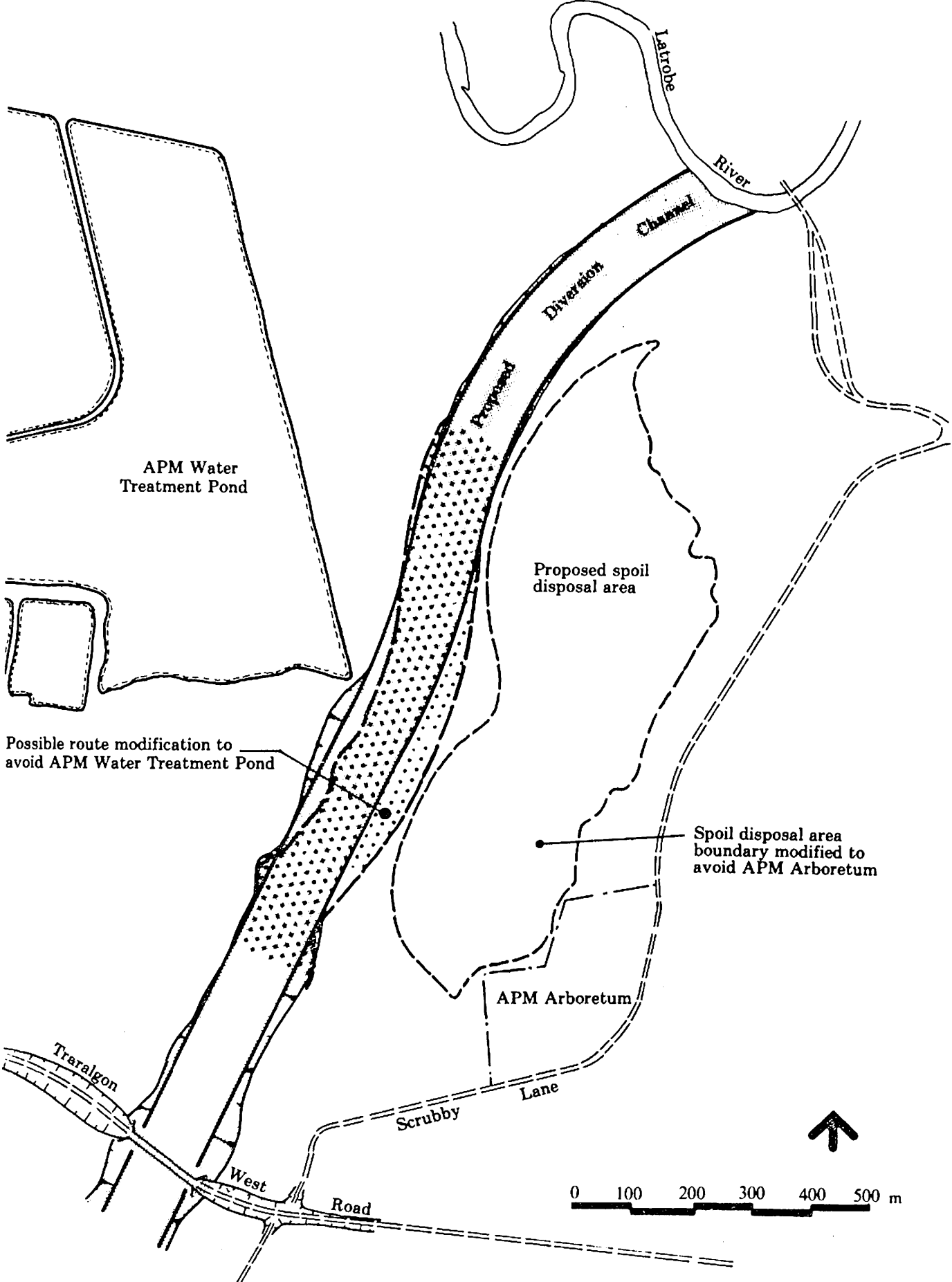
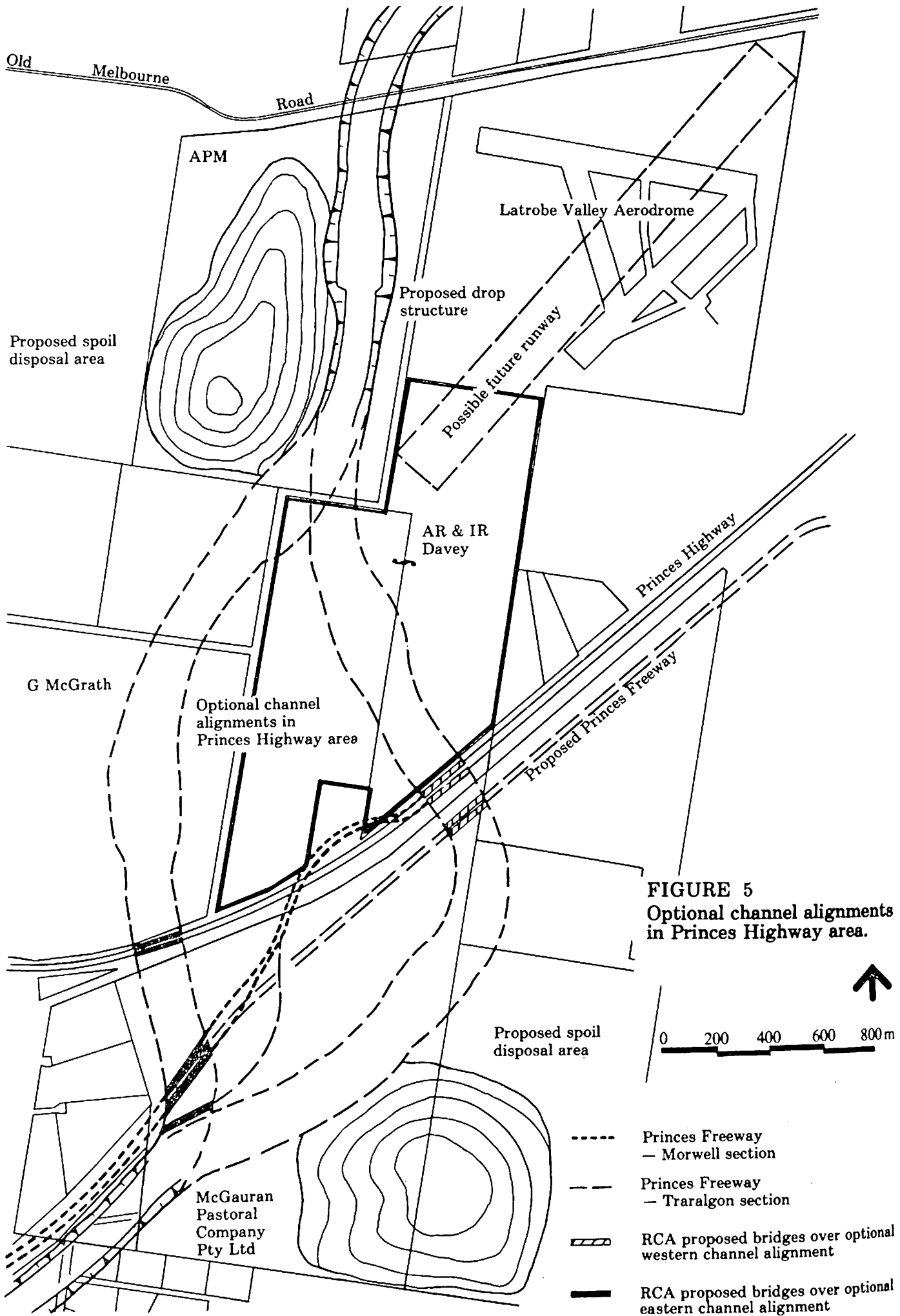


FIGURE 4
Proposed Morwell River Diversion
 showing possible modification to
 channel route on APM land north
 of the Traralgon West Road.



4.21 The Road Construction Authority (RCA) indicated to the Committee that it favoured the eastern alignment of the proposed river diversion because:

- *approximately \$5 000 000 will be saved in structure costs, assuming that both the Morwell and Traralgon sections of the Princes Freeway are fully constructed.*
- *with the eastern MRD alignment, no Princes Freeway structures need to be built at the time the Morwell section of the Princes Freeway is linked to the Princes Highway. As it is likely that the Traralgon section would follow several years later, this would defer any costs involved with freeway bridging of the MRD (if the western MRD alignment were selected, it is likely that structures would need to be constructed at the same time as the Princes Freeway - Morwell section, in advance of the MRD, to avoid traffic disruption); and*
- *it is understood that the eastern MRD alignment would require the excavation of an additional 700 000 cubic metres of spoil (by SEC), which could cost between \$2 000 000 and \$3 000 000. Hence the nett saving would be about \$2 000 000.*

4.22 The RCA considered that once a decision is made in principle as to the location of the MRD in this vicinity, there will be a need for both the RCA and the SEC to carry out further, more detailed, studies to obtain an optimum solution.

4.23 Messrs. A. R. and I. R. Davey own land affected by the eastern alternative for the proposed river diversion. Their land is also affected by proposals for up-grading the Latrobe Valley Airport and by the proposed diversion of the Princes Highway around Morwell.

4.24 Mr. A. R. Davey gave evidence to the Committee and indicated that he and his brother were about to retire and wanted to sell the property in order to dissolve their partnership. He preferred the western alternative for the proposed river diversion as this would leave his property as a viable dairy farm which could be sold as such. If the eastern alternative were to be approved, he wanted the SEC to acquire his farm. In particular, Mr. Davey

indicated that he wanted a decision to be made on the matter as soon as possible. In view of the many proposals affecting his land, Mr. Davey has made an application to the Minister for Planning and Environment requesting that the Government give special consideration to the purchase of his land.

- 4.25 Mr. P. Wallace, the Shire Engineer for the Shire of Traralgon indicated that his Shire would prefer the western alternative for the river diversion, as this is well clear of the Latrobe Valley Airport. However, upon questioning by the Committee, it became clear that neither the eastern nor the western alternative would interfere with the proposed future extension to the airport. This was later confirmed when a letter from the Secretary of the Department of Transport to the SEC, dated 3 February 1982, was forwarded to the Committee by the SEC. The letter contained the following comment:

I can confirm that the modified eastern channel alignment would appear not to jeopardize the possible airport expansion as outlined in the above letter.

This confirmation is on the basis that embankments or spoil areas do not infringe aircraft clearance surfaces of any future runway on an alignment and location as copies on to your sketch No. P22/233.

- 4.26 Details of the possible airport expansion shown in sketch No. P22/233 have been added to figure 5 of this report.
- 4.27 Mr. Wallace indicated that, provided the situation with regard to the airport was resolved, the Shire of Traralgon had no objection to the eastern alternative for the MRD.
- 4.28 The Shire of Morwell is understood to favour the eastern alternative for the river diversion as this would allow for some expansion of the urban areas of Morwell. Morwell is surrounded on three sides by existing or proposed open cuts and the only space left available for expansion of the town lies in the general area of the proposed diversion.

- 4.29 At the public hearing on 29 September Mr. Mitchell, the Chief Executive - Town Clerk of the City of Traralgon, said in evidence that (at page 153 of the Minutes of Evidence):

..... In formal discussion the council (of the City of Traralgon) has expressed a preference for the western diversion but it is really without a great deal of substance and it was qualified by saying that we would need to give it a lot more assessment; we do not have any rationale to present for it.

At the public hearing on 28 November Mr. Mitchell provided the following reasons as to why the City of Traralgon preferred the western diversion:

This route follows Plough Creek which is a natural geographic feature. It is submitted that a more aesthetically pleasing and naturally landscaped result could be achieved by utilising the natural topography.

An existing stream and flooding zone could be utilized and therefore from a land use planning view point this route is a logical one.

The western option minimizes the costs, interference and potential hazards (during construction phase) in relation to the high pressure natural gas line.

- 4.30 The Committee concluded that in the light of the evidence presented, there was strong reason for adopting the eastern alternative route for the proposed MRD in the vicinity of the Princes Highway.

Spoil disposal area adjacent to Jeeralang Gas Turbine Station

- 4.31 The SEC has proposed a spoil disposal site on Gas and Fuel Corporation land adjacent to the Jeeralang Gas Turbine Station. It is possible that at some time in the future this site may be required for a possible future plant to produce a substitute for natural gas.
- 4.32 An alternative proposal involves the use of two areas owned by the SEC.

4.33 One of the two areas forming part of the alternative proposal is located at the junction of Tramway Road and Firmins Lane, and the other on both sides of the Midland Highway just south of the proposed diversion crossing near Brodribb Road.

4.34 Because of the uncertain timing for the possible diversion of the Morwell River and because alternative spoil disposal areas have been identified on SEC land, the final selection of these sites can be delayed, provided that both alternatives are protected by the appropriate planning controls.

Spoil Disposal Area at Nadenbousch's Lane

4.35 A hostel, which is owned and operated by Rohricla Nominees, is on land leased from the SEC on a six-year term, with an option for a further six years. The lease commenced in 1979 and, if the option is exercised, the term will expire in 1991.

4.36 Rohricla Nominees expressed concern at the location of a spoil disposal area adjacent to their Hazelwood Accommodation Centre on the basis of noise, appearance and the cutting of access north along Nadenbousch's Lane. They suggest either using the excavated material in the Yinnar dam or disposal to an area more remote from the centre.

4.37 It is unlikely that construction of the river diversion will begin before 1991. The land is owned by the SEC and should the hostel still exist when construction work commences, measures could be taken to provide access and reduce problems caused by noise and dust.

4.38 The Committee has concluded that this matter should be resolved by the SEC at the appropriate time.

Eel Hole Creek

4.39 Two alternative routes are shown in figure 6. These would affect the following numbers of houses and properties -

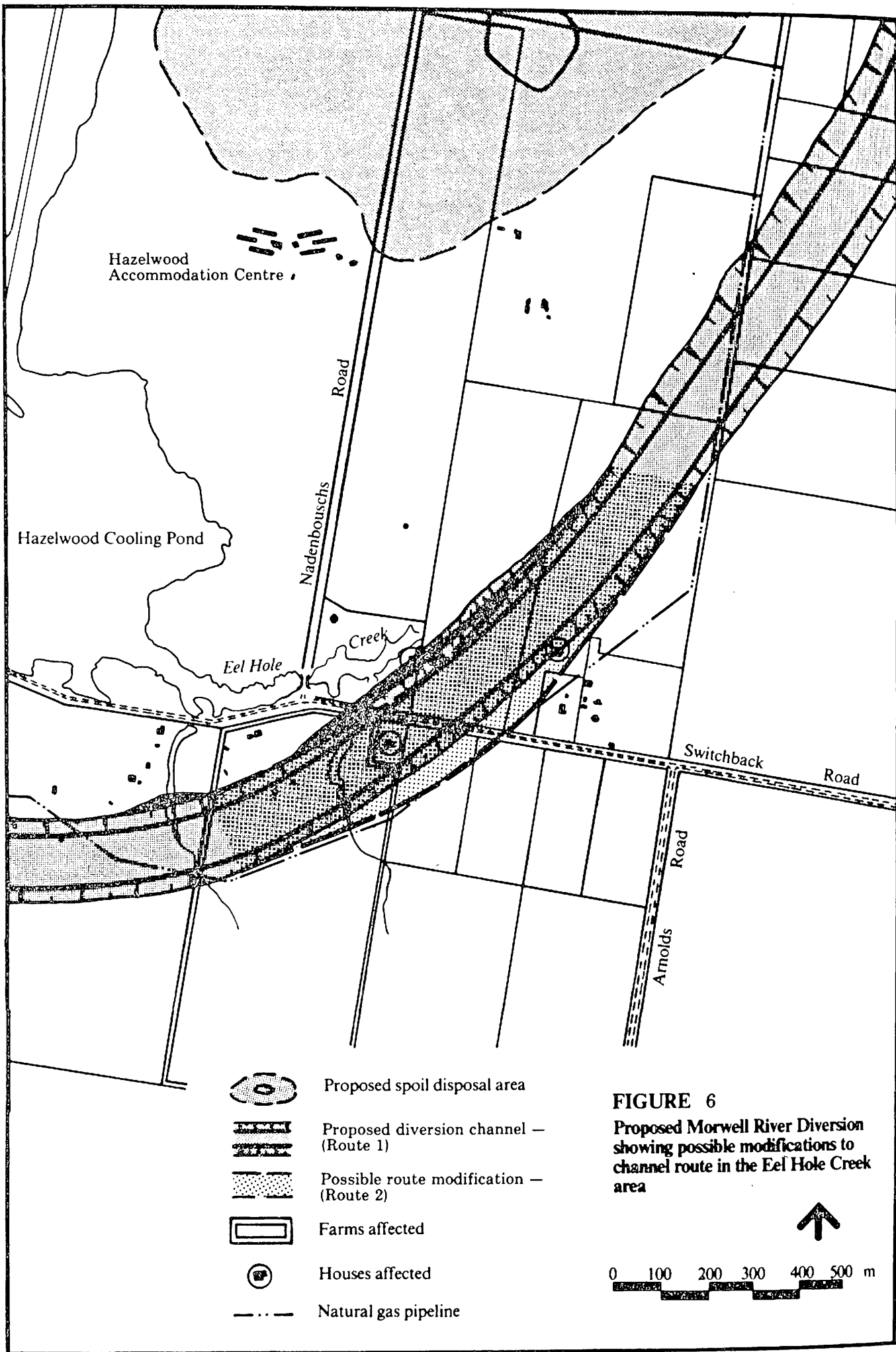
| | Route 1. | Route 2. |
|---------------------------|----------|----------|
| Houses affected | 3 | 2 |
| House properties affected | 4 | 7 |
| Farms affected | 1 | 1 |

4.40 Two of the above houses are affected by both routes and these have already been purchased by the SEC.

4.41 The third house owned by a Mr. W. Gardin is not affected by Route 2; however, it is likely that the amenity of Mr. Gardin's house would be severely affected during the construction period if Route 2 was selected and it would be necessary to adopt special construction techniques and possibly to delete the construction zone alongside the channel in this area.

4.42 Route 2 would increase the effect on one house property and affect two additional house properties. During the construction period, the amenity of the houses on the two additional properties, and the amenity of a further house property, would be affected.

4.43 One productive dairy farm would be affected by Routes 1 or 2, with about 30 per cent of its land required for the diversion channel. The channel also would bisect the remaining area and isolate an additional area of the farm south of the channel.



- 4.44 Route 2 would not significantly alter the effect on this farm but would require the re-location of about 0.5 kilometres of an existing Gas and Fuel Corporation pipeline. The additional cost of the modification is estimated to be approximately \$0.5 M. after including earthwork costs, property acquisitions and re-location of the gas pipeline.
- 4.45 Mr. Gardin was unable to appear before the Committee but made a written submission enclosing recent correspondence he had had on various related issues with the SEC and the Shire of Morwell. It would appear that Mr. Gardin is seeking compensation for the frustration of several alleged potential future developments on his property and wishes the SEC to acquire his property.
- 4.46 The Committee has concluded that whichever route is selected, Mr. Gardin will be seriously affected during the construction period. Route 2 would affect additional landholders and would be more expensive. The Committee has therefore concluded that Route 1 should be adopted.

Middle Creek - Speargrass Road

- 4.47 During the Committee hearings in Morwell on 29 September 1983, Mr. R. Brister, a property owner in the Middle Creek area, presented a submission regarding the effects of the proposed MRD on farm properties in the Middle Creek area and suggested a modification to the proposed route of the diversion in the area. Also, in commenting on the Supplementary Information published in May 1983, Dr. D. Carragher, another landowner in the same general area, suggested that the proposed diversion route be moved closer to Speargrass Road to lessen the effects to his property.
- 4.48 An assessment by the SEC of the suggested route modifications was discussed with affected landowners during a meeting in the Yinnar Hall organised by the Shire of Morwell on 11 October 1983.

- 4.49 The suggested route modifications in the Middle Creek - Speargrass Road area, together with the SEC proposed diversion route are shown in figure 7.
- 4.50 A slight northern re-location of the channel in the Speargrass Road/Carragher farm area, when largely confined to the west of the Speargrass Road crossing, would not contravene the objective of containing flood flows generally in in situ ground and would not incur additional excavation costs.
- 4.51 The possible modification of the route in this Speargrass Road area would be compatible with route Modification 3 in the Withams Road area. Modifications 1 and 2 would require adjustment to become compatible, but Modification 2 would still attain its objective of avoiding housing in the area. The route modification in the Speargrass Road area would affect the location of the channel through the O'Hara farm but the overall effect of the channel on this farm holding would be similar to the other possible route modifications indicated.
- 4.52 The route modification in the Middle Creek area suggested by Mr. Brister would re-locate the diversion channel up to 400 metres further north and downslope of the alignment indicated by the SEC.
- 4.53 Just east of Speargrass Road, the SEC proposed diversion route passes through the southern portion of Mr. T. Keogh's property and avoids the relatively steep drop to the lower ground of the Middle Creek flood plain further to the north. In this manner, the design objective of generally maintaining the design flood flows in in situ ground would be maintained. In the area where the diversion would cross Middle Creek, the proposed route indicated by the SEC would require a levee bank of varying height forming the south side of the proposed spoil disposal area in order to contain flood flows up to the probable maximum flood level. Moving the route further

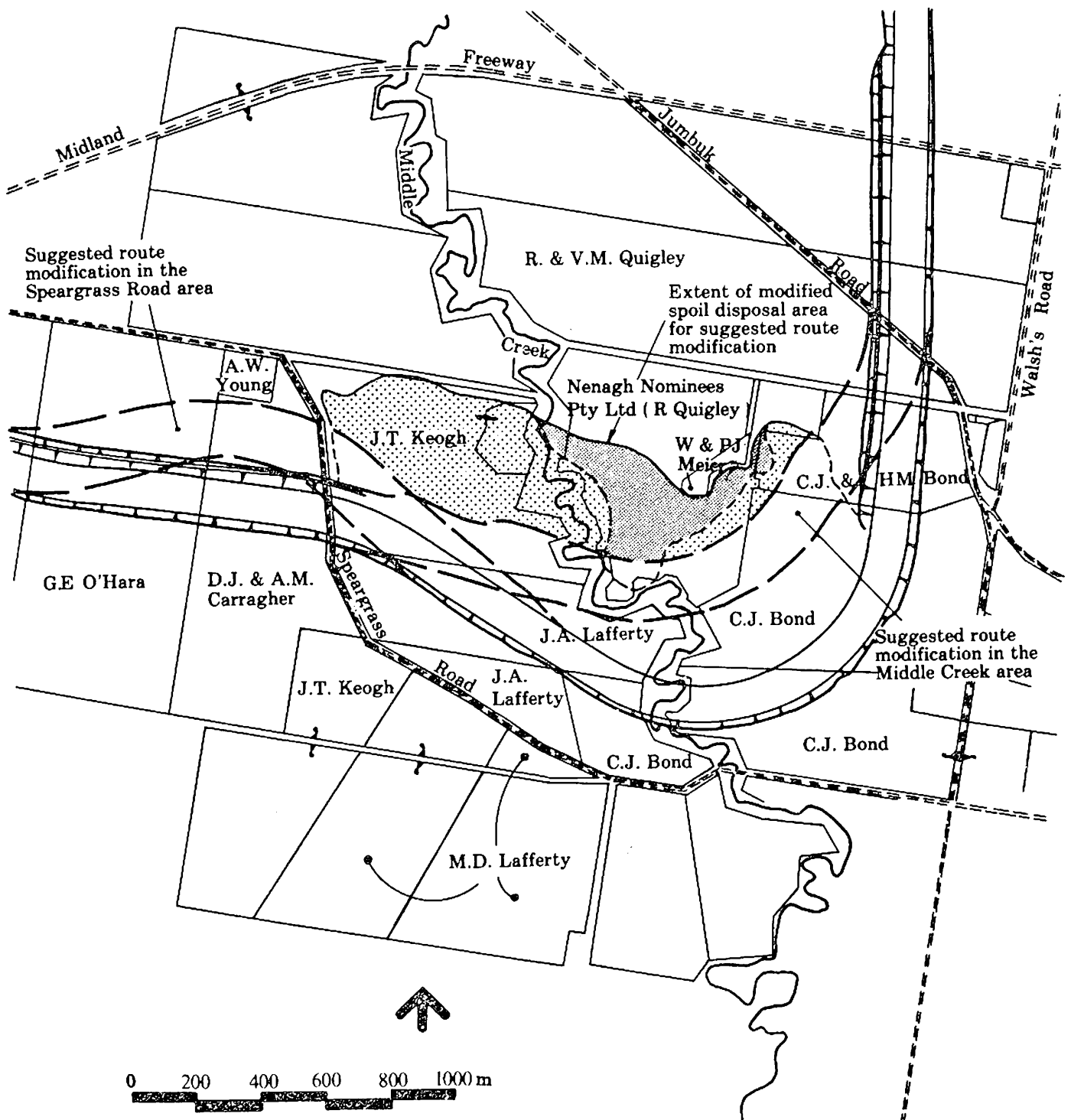


FIGURE 7
Suggested route modifications
in Middle Creek — Speargrass
Road area.

north in the Middle Creek area would increase the height and length of these works, with the increase in height being up to 2 metres for the modification suggested by Mr. Brister. The normal river flows and minor flood flows would, however, be contained within in situ ground.

- 4.54 While the nature of the soils in the area make it desirable that, as far as practicable, design flood flows be kept below the natural surface, it would be possible to design special levee construction works with consequent increased costs to contain flood flows. Even though a significant height of levee bank would be required, the placement of a substantial amount of spoil against the downstream side of such levee works would make the suggested re-location of the channel technically acceptable in this area provided that the placement of material in the adjoining spoil disposal area was closely supervised.
- 4.55 The reduced excavation depth and shorter length of the suggested route modification would decrease the amount of earthworks excavation by approximately 0.4 million cubic metres. However, it has been estimated that the increased costs of the extra levee construction works, possibly requiring sand filter drains and surface protection, would about equal the savings in costs due to reduced excavation. In regard to both local ground topography and the estimated cost of works, this suggested route modification would appear to be the most northerly practicable alignment of the channel route in the area.
- 4.56 The proposed diversion channel crosses the upper flood plain of Middle Creek just north of Speargrass Road.
- 4.57 By locating the diversion channel further north in the upper flood-plain area as suggested by Mr. Brister, more land to the south of the proposed diversion between the channel and the higher land along Speargrass Road would be subject to flooding both from flood flows down the diverted river as well as flows down Middle Creek and from the local catchment.

- 4.58 As the proposed diversion would be excavated into the in situ ground, it would readily drain the flood waters from the local catchment or the upstream Middle Creek catchment.
- 4.59 If both suggested modifications were adopted, the quantity of material to be excavated would reduce when compared with the SEC proposed route and the volume of the spoil which would need to be placed in the spoil disposal site to the north of the channel in the Middle Creek area could be reduced by about 25 per cent. As a considerable portion of the spoil disposal area identified by the SEC would be encroached upon by the suggested route modifications, it would be necessary to extend the spoil disposal further onto Mr. R. Quigley's property south of Miss Bonds Lane. In this area (shown shaded in figure 7) the spoil would be placed to build up the ground surface south of Mr. W. Meier's residence, between the higher ground of the Meier property and the levee works which would be required along the north side of the diversion channel in this area. While placement of spoil in this area would be adjacent to the Meier property, no spoil would however need to be placed on the Meier land.
- 4.60 In the Speargrass Road area, the proposed diversion route identified by the SEC would affect three farms including one house. For the modification suggested by Dr. Carragher, the same three farms would also be affected. For each farm the area of land required for the diversion and spoil disposal area would be about the same as the proposed alignment. However, the area of land in the G. O'Hara property isolated south of the channel would increase. For the Carragher property, the area of land isolated north of the channel would decrease.
- 4.61 Mr. O'Hara submitted that he was opposed to this modification because:
- (a) Extra area of his land would be required for the easement;
 - (b) More productive and established pasture would be lost than under the original route;

- (c) His property would lose more road frontage depth thus reducing its valuation further; and
- (d) The reduced area on the north side of the river will increase the management problems of pasture grazing the south side during winter because of the difficulty in moving stock.

4.62 The third farm, that of Mr. T. Keogh, would be affected to the same extent as the proposed alignment. The complete area of that part of the farm located east of Speargrass Road would be required for channel and spoil disposal works. This part of the farm contains a house.

4.63 In the Middle Creek area, the Keogh house and farm and four additional farms would be affected by the proposed diversion channel. The same house and area of the Keogh farm as previously mentioned in the Speargrass Road area would be affected.

4.64 The suggested modification would affect the house and area of the Keogh farm to the same extent as the proposed channel route. The area of affected land on three of the farms would reduce. However, there would be a greater effect on the area of the R. Quigley farm due to the spoil disposal area extending further north into this farm.

4.65 The amenity of an additional house (the Meier residence) would be affected to a greater extent than for the proposed channel alignment during the construction period due to the proximity of the spoil disposal area.

4.66 By combining the suggested modifications in the Speargrass Road - Middle Creek area, there would be no significant difference in the effect on farms compared with the effect of the modifications considered separately.

4.67 The Committee has concluded that both the suggested modifications should be adopted.

Withams Road

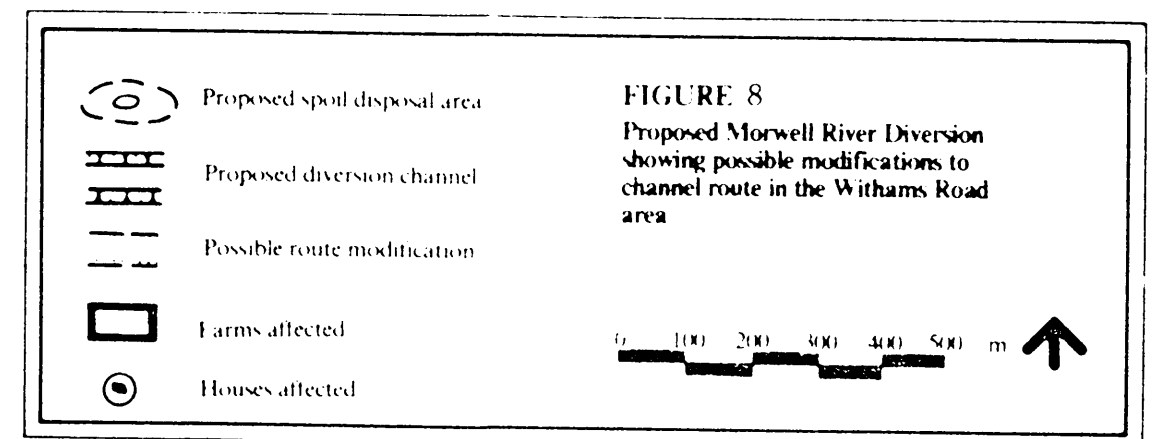
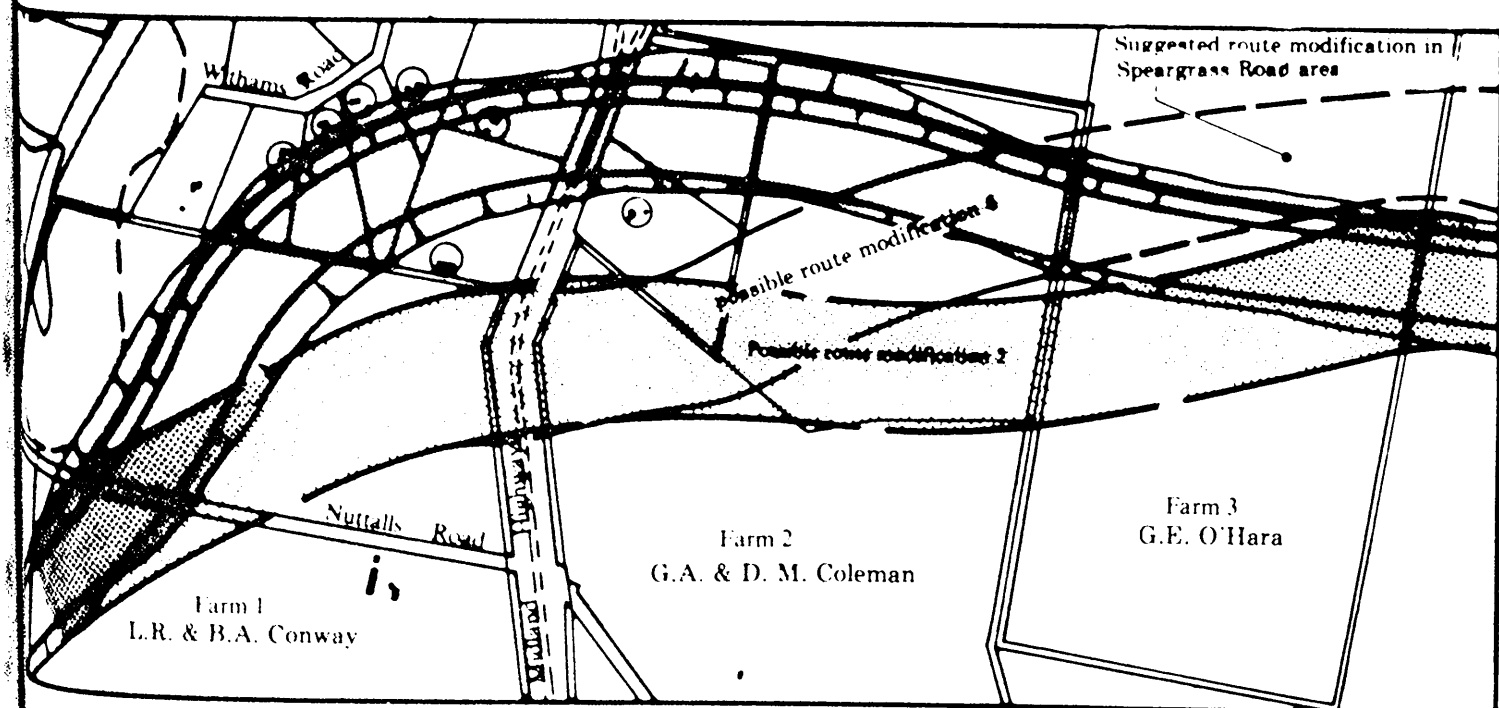
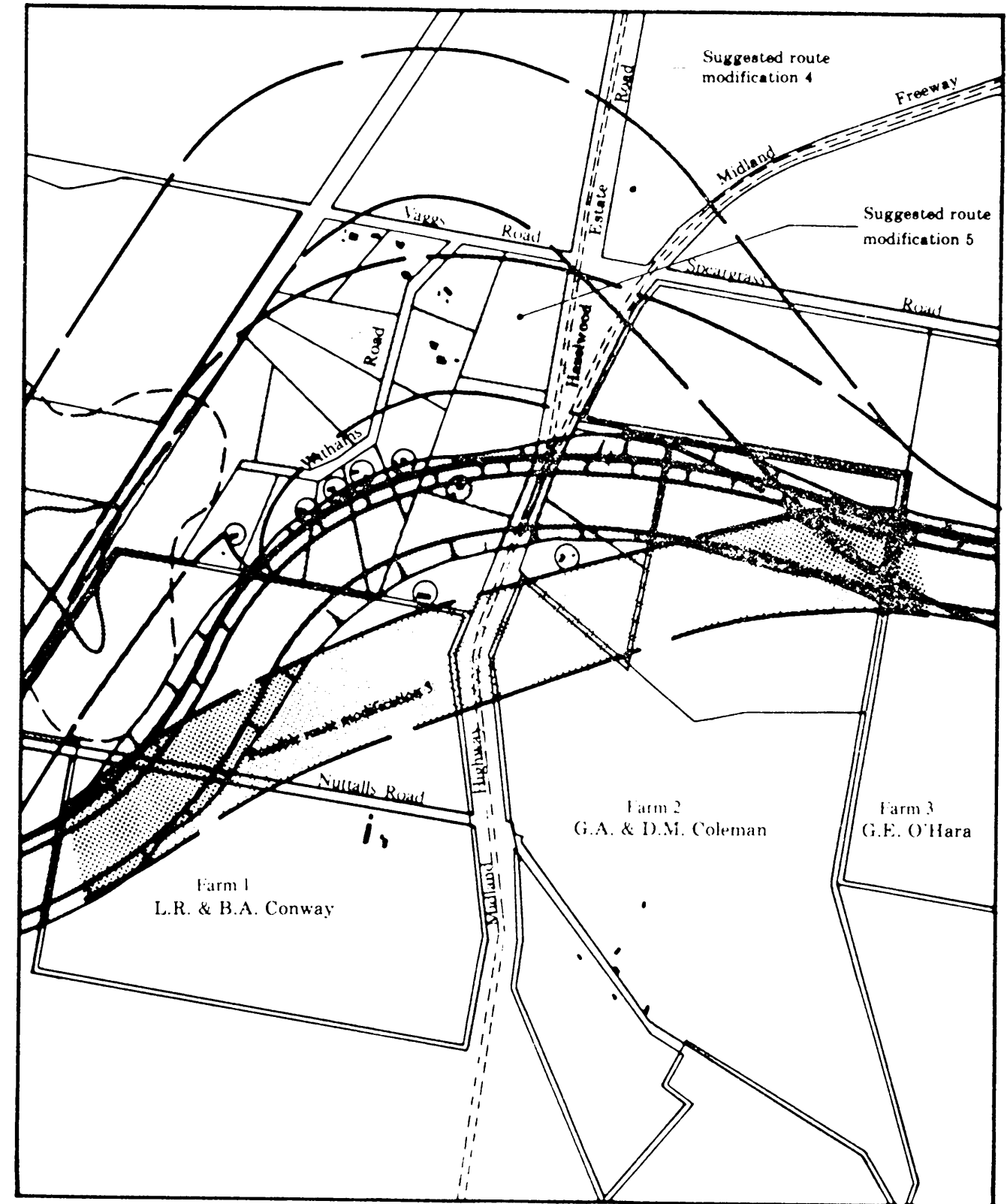
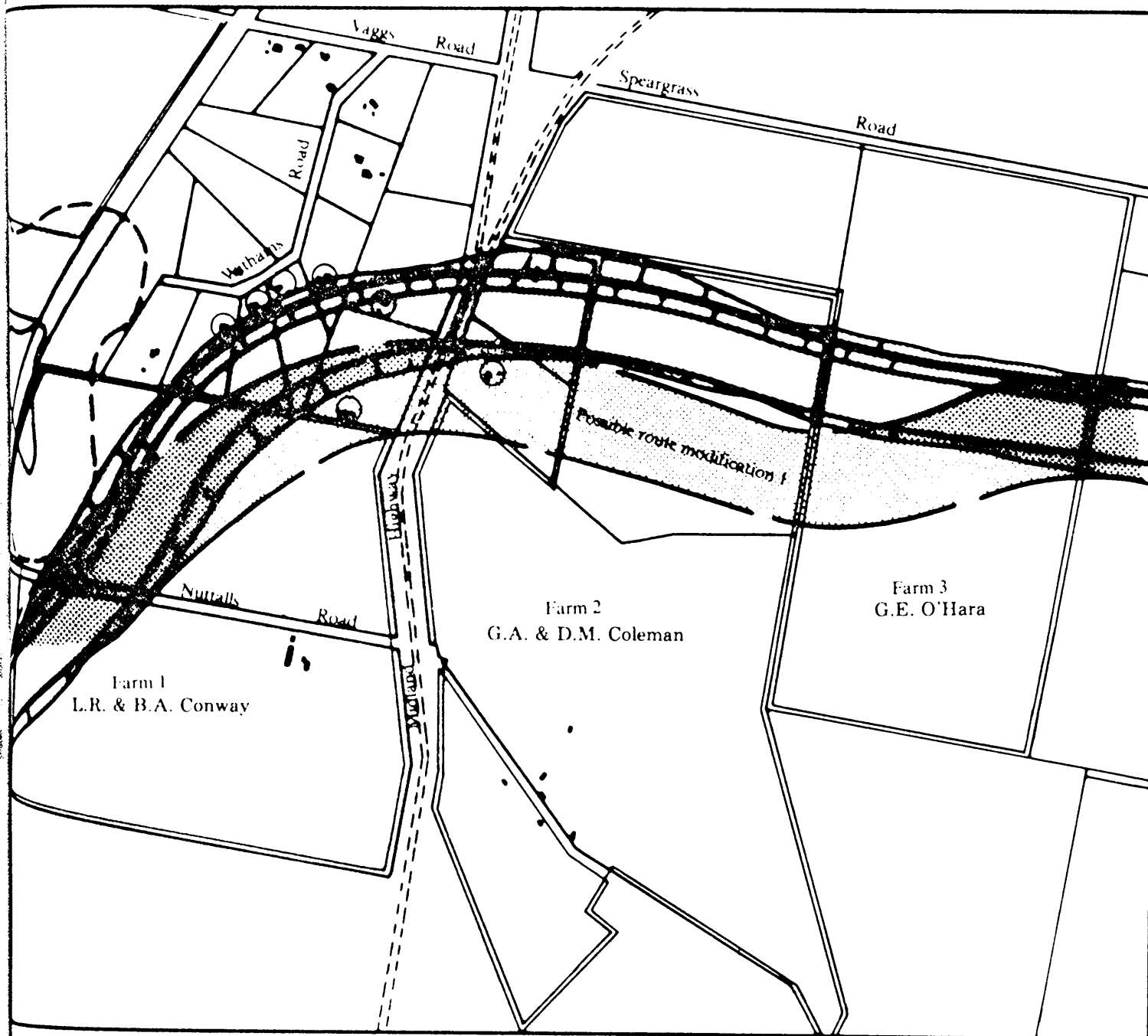
4.68 Three alternative routes were put forward by the SEC in the Supplementary Information.

4.69 In commenting on the Supplementary Information, Mr. G. A. and Mrs. D. M. Coleman of Whitelaws Road, Yinnar, suggested some alternative alignments which would take the channel to the west and north of the earlier alternatives. All the above alternatives are shown in figure 8.

4.70 The SEC's response to these suggestions was that for both of the suggested modifications put forward by Mr. and Mrs. Coleman, the channel would be located downslope of the proposed alignment; therefore, to maintain the same slope of the floodway channel, the natural surface would have to be built up by placing and compacting earthfill, effectively making the diversion an elevated aqueduct over this section. This would contravene the SEC's engineering objective of containing the design floods below the natural surface and would result in a reduction to the long-term security of the channel.

4.71 Because of this technical constraint, both of the suggested modifications were not considered viable alternatives by the SEC when compared with the originally proposed alignment, or the possible modifications 1, 2 and 3 described in the Supplementary Information document.

4.72 The SEC also pointed out that for modifications 4 and 5, levee banks would be required on both sides of the channel to contain flood flows and special provision for drainage of the catchment behind the up-hill levee would be required to prevent the build-up of floodwaters.



- 4.73 Two houses would be affected by the suggested Modification 4 and the amenity of two additional houses would be affected during the construction period. A greater land area would also be required for this suggested channel alignment. Eight houses would be affected by the suggested Modification 5 and the amenity of an additional house would also be affected during the construction period. Additionally, both suggested modifications would affect the existing access to the properties along Withams and Vaggs Roads and re-alignment of these roads would be necessary to provide access to the major road system.
- 4.74 Modifications 4 and 5 would also increase the length of the originally proposed channel in the area of the suggested modifications. By increasing the length of the proposed channel, it would be necessary to lower the level of the downstream section of the channel in order to maintain the same channel grade and invert level at Boolarra. This would involve increased excavation costs.
- 4.75 The SEC considered that the suggested route modifications were not viable alternatives to the originally proposed alignment or the possible route modifications 1, 2 and 3 described in the Supplementary Information.
- 4.76 A further Modification 6 was put forward by the SEC following discussion of modifications in the Middle Creek - Speargrass Road area. This modification was a variation on Modification 2 and is illustrated in figure 8.
- 4.77 The following comments have been extracted from Mr. Coleman's evidence to the Committee (at page 211 and following of the Minutes of Evidence)::

Dairy farming land cannot be isolated from the main part of the farm, that is, dairy and sheds, and still be managed as an economic unit because dairy cattle have to travel from end to end of the property daily. A farm must be run as a singular unit and the bridging does not seem to me to be the satisfactory answer. It would be like having one's kitchen in one house and the dining room

in another - an impossible situation. Cattle do not like the hollow sound of bridges, and the fencing requirements to maintain those bridges as an access thoroughfare make it hard for fencing and grazing management to take place satisfactorily on a highly productive property.

The bridges the SEC is suggesting will not be of a high enough level to be used as year-round crossings and will not be accessible during flood times. Therefore, we say that the bridges required by dairy farmers would be unacceptable to the SEC, or so the SEC tells us at this stage.

Also, cattle walking up and down slopes will create a tremendous erosion situation. If one talks to people who are farming in the hills, one will realize the erosion problems of slopes and laneways. Each farmer has put in an immeasurable amount of time, money and effort over many years into creating a national productive asset which employs many people and also stimulates further employment. In my own case, I have been employing seven part-time workers weekly for over thirteen years, and my neighbour, Mr. Conway, referred to in the report as Farm 1, employs five people on a similar basis. Therefore, between us, we are the largest employer of labour in the Yinnar district. This fact is worthy of serious consideration in view of the serious unemployment statistics facing this Government.

If any of the three alternatives were accepted as the proposed river diversion route, then my farm would become uneconomic to be kept running as a dairy farm because of the reduction of area. Acreage loss from Modification 1 - 25 per cent; Modification 2 - 35 per cent; Modification 3 - 25 per cent.

In conclusion, we believe that the Commission's most economic route for the river diversion should be the one to be considered, if modifications four and five are not feasible.

Productive farmland, a prime natural resource, should be preserved at all costs because farms are community assets employing local people and contributing to the local community. Farmland is irreplaceable but a house can be re-located.

- 4.78 Mrs. Chapman, Mr. Hamilton and Mr. Benson, landholders affected by the proposed river diversion, giving evidence on behalf of themselves and the South West Yinnar Small Landowners Association; stated that if the river diversion is proved to be necessary, then the association favoured Modification 2 as the route which would minimise social disruption. They went on to say (at pages 133 and 134 of the Minutes of Evidence):

We believe that the viability of home units should be a very important consideration in the planning of the SECV. Each individual family has placed an immeasurable amount of effort, time, money and emotion into their own home. We would all find difficulty in repeating this performance should we be forced to move. Each loss of a home unit would be a loss to the local community as well as to the Morwell Shire ratepayers.

Regardless of which route is eventually chosen, the viability of some homes could be threatened by the choice of siting for the access roads - and a 20 metre to 30 metre access road would be required on at least one or both sides of the diversion excavation for construction purposes.

The proposed Morwell River Diversion and the threat of the SECV's acquisition of land has caused varying degrees of social disruption. The most persistent and worrying feature is the uncertainty. This uncertainty creates difficulties for people trying to plan their daily and future lives.

- 4.79 Mr. Miller, an affected landholder from the same area, said that from a purely selfish point of view he preferred Modification 2 or 3. Mr. Miller also made the following statement (at page 240 of the Minutes of Evidence):

In closing my submission, I believe that the best interests of local individuals, the local communities and the public of Victoria would best be served if your Committee was able to decide, as soon as possible, whether the diversion is necessary, and if so, when and what planning controls need to be placed.

- 4.80 In reaching its conclusions on this part of the route alignment, the Committee took into account the following factors :

- (a) The diversion of the Morwell River might not occur for some considerable time. However, the possibility of diverting the river may be raised on many occasions as successive power station projects are evaluated;
- (b) Modification 2 or 6 would remove the threat to seven houses and the properties surrounding all but one of these houses would remain intact. However, this modification would have a greater effect on the viability of Farm 2 (G. A. and D. M. Coleman) which is a highly productive dairy property;

- (c) The Committee has concluded that Modification 6 should be adopted, as considerable time will probably elapse before the diversion is constructed and during that period possibilities may well arise for the purchase and consolidation of adjacent farm properties with Farm 2. Meantime, there is no reason why the farm should not continue to operate as at present;
- (d) Adoption of the SEC's original proposal may well result in the SEC having to purchase random individual house-lots over a period of time. In this situation, the SEC would either have to maintain and rent the houses or demolish them and rent the land for grazing purposes. The Committee sees this as a less desirable option than Modification 6; and
- (e) On balance the Committee believes that it is preferable that a definite route be defined and that the matter should not be left open to on-going debate.

Belbrook Creek

4.81 In the Belbrook Creek area, three houses (including one house on a farm property) and three farms would be affected by the proposed diversion works. A comparison between the effects of the proposed alignment and possible route modification is given below:

| Details of effects | Proposed alignment | Possible route modification |
|---------------------------|--------------------|-----------------------------|
| Houses affected | 3 | 0 |
| House properties affected | 2 | 1 |
| Farms affected | 3 | 4 |

The alternatives are delineated in figure 9.

4.82 The proposed alignment would severely affect two houses in the Belbrook Creek area. A significant area of a third house property would be required for the diversion and the amenity of the associated house would probably be affected for about two years during construction activities.

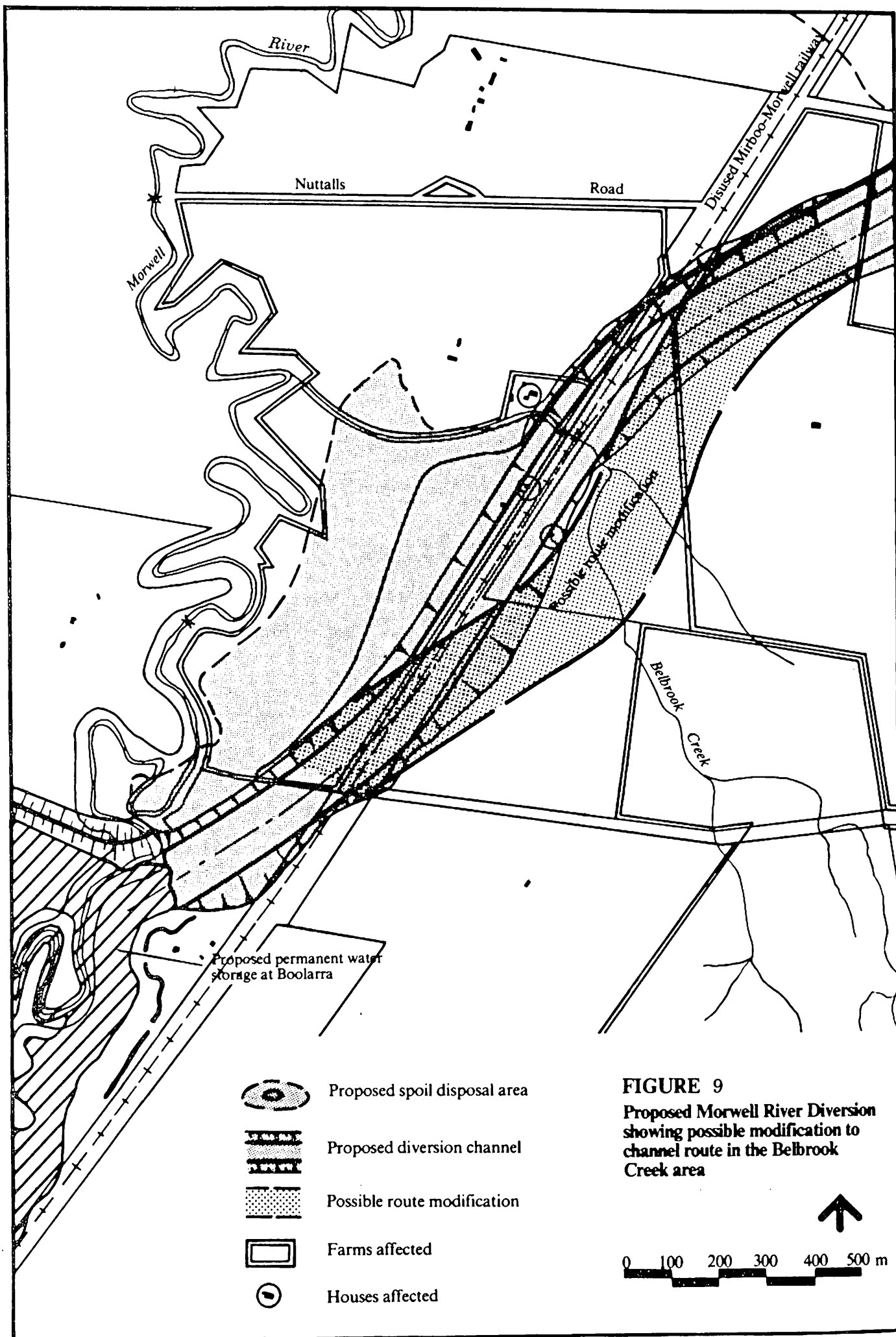


FIGURE 9
Proposed Morwell River Diversion
 showing possible modification to
 channel route in the Belbrook
 Creek area

- 4.83 If the modified alignment were adopted, only the amenity of one of the three houses (Mr R. B. Goldsbrough) would be affected by the construction activities, although a greater portion of land belonging to that one house would be affected.
- 4.84 Three farms in the Belbrook Creek area would be affected by the proposed channel route whereas four would be affected by the possible route modification.
- 4.85 One farm would be severely affected by the proposed alignment and adjacent spoil disposal area and its operation probably would become uneconomic due to the spoil disposal area. The possible modification of the channel route through higher ground to the east would not alter the situation. The route modification in general would not alter the effect on the other two farms. However, it would increase the effect on a timbered property and marginally infringe the corner of an adjacent farm.
- 4.86 After considering the amount of additional earthworks needed to construct the channel and the property acquisition costs, the estimated additional cost of the modified alignment would be between \$0.5 M. and \$1 M. at June 1982 price levels.
- 4.87 The Committee met the three householders directly affected in this area when inspecting the possible modifications. Mr. R. B. Goldsbrough subsequently gave evidence to the Committee and the following excerpts are taken from that evidence (at page 129 of the Minutes of Evidence):

I came along because I may be able to help someone in the future in the same position as myself. My wife and I bought the property we currently live on approximately five years ago. Since then, we have built a house and developed it into a reasonable property and are making money out of it. It was to be my retirement property.

Approximately eighteen months after we bought the property, the interim development order was issued. We received a letter from the State Electricity Commission stating that the property was under the order and, as such, thought we were far enough away to escape the planning blight. Because the order is on the property, we cannot do with it the things we would like. We have already put too much capital into it as we expected to see my life out there.

We spent money on the property that we normally would not have spent if we were going to sell it. My wife's health is not good, and we have quite a few problems with the family. We are not arguing whether the river development should go ahead; we are simply asking that the Committee comes to a decision as soon as possible so that we know exactly where we stand and, if necessary, can buy another property and start again before I am too old to do anything else.

The first option for the diversion takes my house and creek and leaves only several acres on the other side of the creek, which would be useless for what I want. The alternative to that requires the building of an embankment at the side of the house and takes the creek and the rest of the property. It would leave me with a strip of land about half a kilometre in length and about 100 yards wide, which is completely unsuitable. If the property is to go, I want the whole lot to be taken, I have no preference regarding the routes - neither suits me.

My preference is that it either does not go ahead or, if it is to go ahead, to know as soon as possible.

- 4.88 The Committee has concluded that the route as originally proposed by the SEC should be adopted as the most probable route for any future diversion in the Belbrook Creek area.

CHAPTER FIVE

PROTECTION OF AFFECTED LANDOWNERS

- 5.1 As mentioned in paragraph 1.12 of this report, the Government has initiated a review of land acquisition and compensation legislation and this is likely to lead to new or revised legislation being placed before Parliament during 1984.
- 5.2 In addition, as mentioned in paragraph 1.14 of this report, the Government has established the Latrobe Regional Commission which, amongst other things, will prepare and implement regional strategy plans for the Latrobe Valley.
- 5.3 These two courses of action should eventually lead to areas of land affected by developments based on the brown coal resource being treated in a uniform manner. However, it could take some considerable time for the uniform policy to become established and implemented. In the interim, landholders along the route of the proposed MRD should not be unnecessarily disadvantaged and it is on this aspect that the Committee focused its attention.
- 5.4 Land affected by other possible future projects, identified at about the same time as the MRD, was covered by Orders in Council, as illustrated in figure 10. The areas were:
- (a) Driffield Power Station (August 1980);
 - (b) Hernes Oak Power Station (March 1982);
 - (c) Tyers Power Station (March 1982);
 - (d) Hazelwood South Power Station (March 1982);
 - (e) Bennetts Creek Power Station (March 1982); and
 - (f) Andersons Creek Overburden Dump (March 1982).

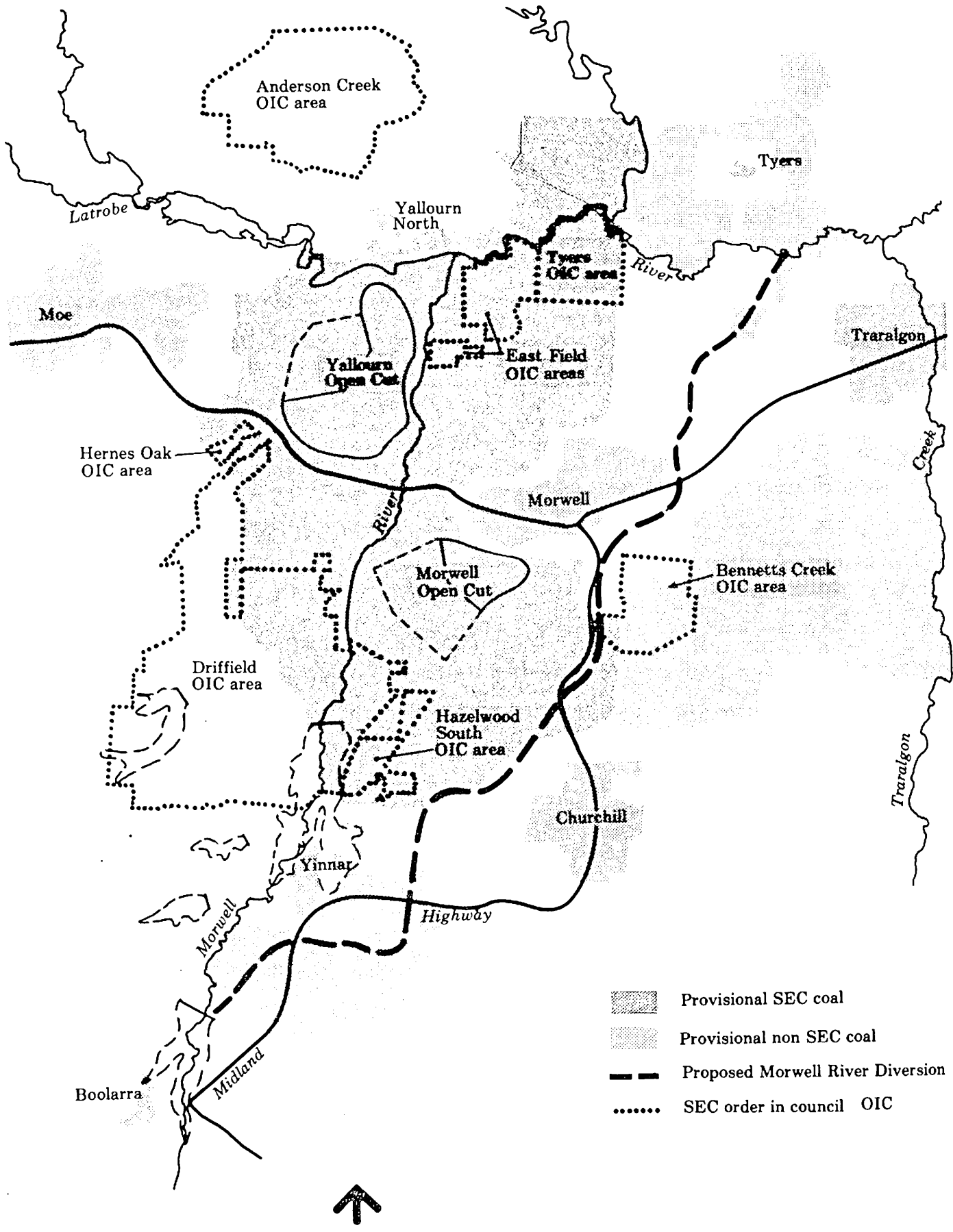


FIGURE 10
 Latrobe Valley Western
 Coalfield Land Planning.

- 5.5 Those Orders in Council allow the SEC to compulsorily acquire land in the above areas and to pay not only the value of the property but also the costs incurred in selling, removal and purchase of a new property, plus a solatium of up to 10 per cent of the value of the property. The SEC will compulsorily acquire land at the request of the landholder in these areas even if the land is not required by the SEC at that time.
- 5.6 Land affected by the proposed MRD was not covered by an Order in Council at the time when the diversion was first proposed, partly because alternative routes were subject to review by the PWC, and partly because of some difficulty encountered in the framing of a suitable Order in Council, as the river diversion would mostly require the acquisition of parts of properties.
- 5.7 Instead, the previous Minister for Minerals and Energy gave an assurance that the SEC would purchase properties in "hardship" cases. "Hardship" was defined as a demonstration that the property could not be sold on the open market at a price equivalent to that which could have been obtained if the proposed diversion had not been announced. **No** selling costs, removal expenses or solatium are paid in a "hardship" case, although some costs incurred in proving that the property cannot be sold may be paid.
- 5.8 The present Minister for Minerals and Energy is understood to have continued this policy in the interim until the land compensation issue has been resolved by new legislation.
- 5.9 The Stuart Morris Report (mentioned in paragraph 1.12) recommended that, in future, land required for purposes such as the MRD should be reserved in the planning scheme as "Public Purposes Reservation". This recommendation was taken up by the SEC and detailed proposals for reserving the land were set out in the Supplementary Information of June 1983.

5.10 The SEC in evidence stated that nine properties had been sold along the route of the proposed diversion since the proposal was first announced. In seven of these cases the owners had been unable to obtain a reasonable price on the open market for their properties and the properties had then been purchased by the SEC under the "hardship" provisions.

5.11 The Stuart Morris Report also recommended that land in the Latrobe Valley currently covered by Orders in Council but not immediately required for development purposes be reserved as "Public Purposes Reservations" and that the Orders in Council be rescinded.

5.12 The Ministry for Planning and Environment made a submission to the Committee (Appendix 3). This submission contained the following statements :

Any new planning controls which were introduced should have the effect of:

- (a) identifying where the proposed river diversion site would be;*
- (b) ensuring that the proposed development will not be prejudiced by inappropriate subdivision or development - such as inappropriate types of or locations for development, densities of development, etc.;*
- (c) limiting the extent of impact and the number of people who would be likely to be affected by any proposed development; and*
- (d) protecting reasonable interests of landowners, such as the right to continue existing uses, and if appropriate, to enable compensation or acquisition claims to be made.*

5.13 The Ministry for Planning and Environment believed that adequate fulfilment of the principles outlined for a preferred river diversion would require the introduction of a Public Purpose Reservation for all areas which would be directly and permanently affected by the proposal. These areas would include new river alignments and immediate surrounds (including areas

directly affected by construction and operational requirements), spoil disposal areas and areas which would be permanently or frequently inundated due to flood regulation storages.

5.14 There are other areas, generally abutting one or more of the areas which the Ministry for Planning and Environment suggested should be included in a "Public Purpose Reservation", which would be subject to very limited and/or very infrequent effects of the river diversion proposals but to an extent which would not prejudice the effective continuation of existing land uses. It was suggested that it would be appropriate for these areas to be included in a "Special Policy Area". The "Special Policy Area" would "overlay" the existing basic zoning of the planning controls and introduce some additional planning requirements to those in the zoning provisions. The additional planning requirements would include a requirement to refer planning permit applications to the SEC for comment. This arrangement would ensure that new houses and any other new developments which might be permitted would not be incompatible with the proposed river diversion arrangements. It was suggested that it would be appropriate to introduce "Special Policy Area" controls of the type outlined in two types of situations, viz:

- (a) land subject to very infrequent flood (say, less than one in every twenty years) due to the flood regulation storages; and
- (b) land abutting the diversion channel or spoil disposal areas (perhaps "strips" of land about 100 metres wide) which could be indirectly affected by construction activity.

5.15 With these latter areas, once a river diversion was completed and fully operational it might not be necessary to retain the "Special Policy Area".

- 5.16 If the affected land resulted from a proposed Public Purpose Reservation, then a landholder would be entitled to claim compensation if, when he actually sold the land, he could demonstrate that he had sold it below the normal market price because of the fact that the land had been declared a proposed Public Purpose Reservation.
- 5.17 In this situation, the amount of compensation paid to the landholder by the SEC would equal the agreed loss of value incurred and would be marked on the title deeds of the property.
- 5.18 Further to the "loss on sale" entitlements, there is provision for an owner to claim compensation for loss or damage suffered by, or as a result of, the operation of a reservation.
- 5.19 At a later stage, if the land was actually acquired for the construction of a river diversion, then the rules for compulsory acquisition of land would apply. However, the compensation already paid would be taken into account in determining the amount of compensation paid on acquisition.
- 5.20 The Ministry for Planning and Environment indicated that areas zoned "Special Policy Area" would not carry any right to compensation for any loss of value resulting from the zoning.
- 5.21 Mr. D. J. Wakefield, representing the Council of Victorian Fly Fishing Clubs, made the following statement when giving evidence to the Committee (At pages 195 and 196 of the Minutes of Evidence):

The council supports planning controls, but not the controls recommended by the commission because they do not give an inherent right of public access to the stream surrounds. The planning controls should be the same as those that currently exist on the river.

The council also points out that in the literature produced so far, practically no one has drawn attention to the existing controls and planning uses of the current river. If it is the commission's expressed policy to take and replace a river, in other words, to lift it from where it is and put it somewhere else, it should be done in toto, keeping intact the existing public rights which are in place with regard to the old river.

A number of reasons exist as to why the council believes that should be done. Historically, because of the shortage of water in Australia, the protection of water as an asset of the country rather than an individual's asset is extremely strong. Relevant portions in Victoria are specifically dealt with in section 4 and section 5 of the Water Act, and there is a substantial body of case law taking the rights that would have otherwise been inherited under English law and replacing them with regulations that are far more relevant to a country that has a real water problem.

The council submits that, traditionally, this form of common public right to water and water flow should be continued. The commission's planning controls, however, indicate a limited control, in the future, of the commission over the water course to be created.

I draw the attention of members of the Committee to page 68 of the document. The commission likens the new stream's legal status to that of an irrigation channel. That is clearly inconsistent with the stated aims of to the existing controls and the rest of the policy document.

If the river is given the status of an irrigation channel and if the commission's controls are allowed to exist when it is created, one will find that the commission will eventually feel some form of responsibility for it. Therefore, it would like to exercise some form of control over it for reasons such as limiting its own liability as an occupier. It may then feel compelled to restrict public access to the river and its environment.

The de facto control that could then be exercised by the commission would give it a liability and it would find it far easier, therefore, to restrict access to the public in much the same way as the Australian Paper Manufacturers Ltd. has found it easier to restrict public access to its forest. The same thing could happen if the commission were given control over the new river.

I draw the attention of members of the Committee to Appendix 3 of the council's submission. Figure 1 shows the planning controls on the existing Morwell River. The Council submits that those planning controls should be duplicated with the new river.

5.22 In a written submission to the Committee, APM made the following statement:

Public Access to APM Lands

We agree to the development of the area prior to the proposed junction with the Latrobe as a wildlife habitat reserve

However, we further express our concern for the security of our No. 2 Aeration Lagoon, its outfall and instrumentation, all of which are integral parts of the Maryvale Mill process. Frequent flooding in this area does not permit normal security fencing. We therefore request that public access to the river is restricted between the Old Melbourne Road and the Traralgon - Morwell Road together with the area north to the Latrobe River.

Replacement land

While the area of land presently under plantation is 310 hectares, the total area of Company land likely to be lost is 527 hectares. It is absolutely essential that replacement land be made available in order to supply installed and planned capacity of the processing plants in the future and if the SEC is incapable of arranging replacement land, then provision must be made for another arm of Government to fulfil this undertaking, and this matter needs to be addressed now.

5.23 In relation to land management the Shire of Morwell submitted at the public hearing on 28 November that:

.....it should be possible to implement a proposal whereby land adjacent to the proposed diversion and for that matter boundaries of other projects (open cuts, roads and possibly electricity transmission lines) can be reconstituted to the greater benefit of all. At present, roads, river diversions and the like are placed as determined best in engineering terms and the social and community dislocations are then attempted to be solved.

The Shire of Morwell contends that these impositions on the landowners and the community are not in the best interests of land management or planning. The involvement of the project proponent does not stop at the boundary of the easement. In terms of land use, the difficulties are created by trying to solve what to do with the land remnants after the easement has been created. We believe that this is a responsibility of the project proponent but it is also within the responsibilities of the proposed Latrobe Regional Commission and would be better addressed by the L.R.C.

The principle of the land management plan is to consolidate the land parcels around the proposed easement with the aim of providing viable land units based upon the easement as the new boundary.....

If the river diversion project were approved, the S.E.C.V. would be able to acquire land for the diversion of the Morwell River. It would appear to be a simple further step to reconsolidate those parcels of land remaining after the diversion. Existing land compensation legislation appears as if it could give the acquiring authority the ability to pursue these actions, but in any event it should be a simple procedure to either amend this legislation, or allow for it, subsequent to the "Morris Report" on land acquisition.

DISCUSSION AND CONCLUSIONS

5.24 In paragraph 2.8 the Committee concluded that:

- (f) *Landholders along the route of a possible diversion will be subjected to planning blight at intervals when new power station projects are reviewed; and*
- (g) *The minimum number of landholders will be affected by future power station project reviews if the most probable route of any diversion is defined at this time.*

5.25 The Committee then went on to examine the most probable future route for the diversion and the options available for defining this route by statutory or other procedures.

5.26 Four alternative courses of action were then considered by the Committee. These were to recommend:

- (a) That the "status quo" remain and no action be taken until the new land acquisition and compensation legislation has been passed and strategic planning has been carried out and implemented by the Latrobe Regional Commission. Landholders should continue to be protected by the existing "hardship" policy of the SEC; OR
- (b) That the land be defined in the appropriate planning schemes as a proposed Public Purpose Reservation and that the compensation provisions of the *Town and Country Planning Act 1961* should apply; OR

(c) That the land should be covered by an Order in Council which would require that the SEC to compulsorily acquire land if requested to do so by a landholder; OR

(d) That a modified form of "hardship" purchase be introduced.

5.27 In reviewing these alternatives, the Committee concluded that there were four stages of anxiety for landholders affected by the possibility of the acquisition of their land for projects such as the river diversion.

5.28 First, there was the general uncertainty inherent in areas overlying or adjacent to the major coalfields. This uncertainty is a fact of life in the Latrobe Valley and very little can be done to remove or compensate for it.

5.29 Secondly, there is the fairly severe trauma which occurs when mention is first made that a specific project may affect a particular property.

5.30 Thirdly, there is the period following the first announcement and leading up to the point where land is actually acquired. In the Latrobe Valley this period can be of the order of 50 to 100 years although, hopefully, in most cases it would not be more than fifteen years.

5.31 Fourthly, there is the period when land is actually acquired. This is a period of positive action which, although traumatic in many cases, can be dealt with in a fairly positive and constructive manner.

5.32 In the case of the proposed MRD, the Committee is faced with reviewing the aftermath of the second stage and its continuation into the third stage.

- 5.33 During the third stage it is desirable that land use continue, as far as possible, as though no threat of land acquisition existed. This is best met by having certainty of a fair and equitable process of compensation available for when the land is eventually required and, in the meantime, loss of value on sale compensation should the landholder decide to leave for his own unrelated reasons. The provisions of the *Town and Country Planning Act 1961* applying to land reserved for public purposes appear to adequately meet these requirements.
- 5.34 During the second stage of anxiety immediately following the announcement of a possible project, some landholders may find themselves faced with an unacceptable long term prospect and may wish to find a new property immediately. Moving to a new property involves costs over and above those which can be recouped from the sale of their property (e.g., removal and legal costs), and landholders in this situation see these costs as being a direct consequence of the announcement of the project, the threat of future acquisition having damaged their expectations of their long-term lifestyle and, in some cases, of their future source of income.
- 5.35 The difficulty in dealing with the second stage arises from the fact that if special consideration were given in the situation just described, it would be almost impossible to differentiate between the "genuine" cases and those who simply wished to take advantage of the situation.
- 5.36 In addition, the possibility that during the third stage only loss on sale compensation might be paid could well result in all landholders wishing to sell their land now in order to receive the special consideration just mentioned.
- 5.37 The Committee has therefore concluded that the second stage should be treated no differently from the third stage.

- 5.38 The Committee is also of the opinion that APM should maintain communications with the State Government and the SEC to coordinate the harvesting and planting of pine trees in areas affected by the proposed MRD. Within this context the matter of replacement land for APM may be pursued.
- 5.39 In relation to other affected landowners, opportunities may arise for the SEC or an alternative appropriate body to embody the concept of restructuring land ownership as proposed by the Shire of Morwell.
- 5.40 The questions of the most appropriate long term planning controls and use of land affected by the diversion were raised in detail by the Council of the Victorian Fly Fishing Clubs, APM., and others. The Committee is of the opinion that these matters should not, and in many cases cannot be resolved until a decision is made to construct the diversion.

CHAPTER SIX

OTHER ISSUES

6.1 Issues were raised during the course of the inquiry which in the Committee's opinion would be better dealt with either during a further inquiry, if and when a further proposal to actually construct a diversion of the Morwell River is put forward, or by direct negotiation with the SEC or other appropriate authorities.

6.2 Specific issues mentioned were:

- (a) Allocation and supply of water to landholders along the route of the proposed diversion and along the existing route of the river;
- (b) Provision of fish passes at creek entries;
- (c) Studies of existing fish;
- (d) Replacement of Crown lands;
- (e) Public access to Crown lands;
- (f) Establishment of recreational facilities;
- (g) Fish ladder trials on the East Field Diversion;
- (h) Discharge of water from the Hazelwood Pond to the proposed diversion;
- (i) Boolarra - Wilderness Creek pipeline;

- (j) Compensation for loss of fishing dams;
- (k) Establishment of a consultative committee;
- (l) Preparation of an audio-visual record;
- (m) Cattle bridges across the proposed diversion;
- (n) Allocation of costs of road construction;
- (o) Rating of land owned by the SEC;
- (p) Effect on APM use of Latrobe River waters;
- (q) Public access to APM lands;
- (r) The appropriate authority to carry out the diversion works;
- (s) The detailed design of the low flow channel for the proposed diversion; and
- (t) Use of water in flood-regulating storages for fire-fighting purposes.

CHAPTER SEVEN

SUMMARY

- 7.1 The need for, and the possible timing of, a major diversion of the Morwell River cannot be established at the present time.
- 7.2 A route for the diversion of the Morwell River and the locations of the associated spoil disposal areas and flood regulating storages were proposed during the Driffield inquiry. These proposals were publicised again during this inquiry. The value of property affected by these proposals has probably changed as a result of the proposals being publicised. This condition is often referred to as "planning blight". The "planning blight" caused by these proposals will be reinforced on each occasion on which the available alternatives for major new power station projects are publicly reviewed.
- 7.3 If the most probable route of any future diversion and the most probable locations of the associated spoil disposal areas and flood regulating storages are defined and proclaimed as Public Purpose Reservations now, then the amount of land affected by "planning blight" will be minimised and affected landholders selling their property will be able to claim compensation from the SEC for any loss in value arising from the declaration of the reservation.
- 7.4 The most probable route for any future diversion of the Morwell River and the most probable locations of the associated spoil disposal areas and flood regulating storages are shown in figures 11 to 20.

7.5 Many of the issues raised during the inquiry regarding the detailed design of the diversion and associated works, and the use and tenure of land associated with the diversion will best be resolved if and when it is decided to proceed with the diversion.

CHAPTER EIGHT

RECOMMENDATIONS

8.1 The Committee recommends that:

- (a) The option of diverting the Morwell River to the east of Morwell to provide full access to the Western Coalfields should be retained. The need for and timing of the diversion should be reviewed as part of future inquiries into major power station projects;
- (b) In order to minimise future "planning blight", protect existing landholders and reduce general uncertainty, the route of the diversion and the location of associated works should be defined now and not subjected to further detailed evaluation until a decision is made that the diversion is actually required;
- (c) Any future diversion of the river should be designed and constructed to achieve as close an approximation to a naturally formed watercourse, as technically feasible;
- (d) The most probable route for any future diversion and the most probable location of spoil dumps and flood regulating storages is defined in figures 11 to 20. The land which is directly affected, as defined in the above drawings, should be declared a Proposed Public Purpose Reservation (River Diversion);









- (e) Land which would be affected by additional infrequent flooding if the flood regulating storages are constructed and land abutting the possible future diversion channel and spoil areas which would be indirectly affected by construction works, as defined in figures 11 to 20, should be zoned in the appropriate planning schemes as a Special Policy Area (Land Subject to Inundation) and as a Special Policy Area (Construction Buffer);

- (f) The Special Policy Areas should be overlying zones complementing the existing planning controls. Development proposals by landholders within the Special Policy Area should be referred to the State Electricity Commission for comment before any decision is made on these development proposals by the responsible authority; and

- (g) If a decision is eventually made that a diversion is required as part of a major power station project, then the detailed technical and environmental aspects of the diversion should be thoroughly reviewed before the construction of the diversion is approved. This review should include consideration of the long-term ownership and use of land affected by the diversion and the appropriate planning controls following completion of the diversion works.

* * *

Legend

-  Proposed flood regulating storage showing probable maximum flood and 1 in 20 year storage level
-  Permanent water storage
-  Proposed diversion channel
-  Proposed spoil disposal area
-  Land title boundaries (1980)
-  Proposed Public Purpose Reservation (River Diversion)
-  Special Policy Area (Land Subject to Inundation)
-  Special Policy Area (Construction Buffer)

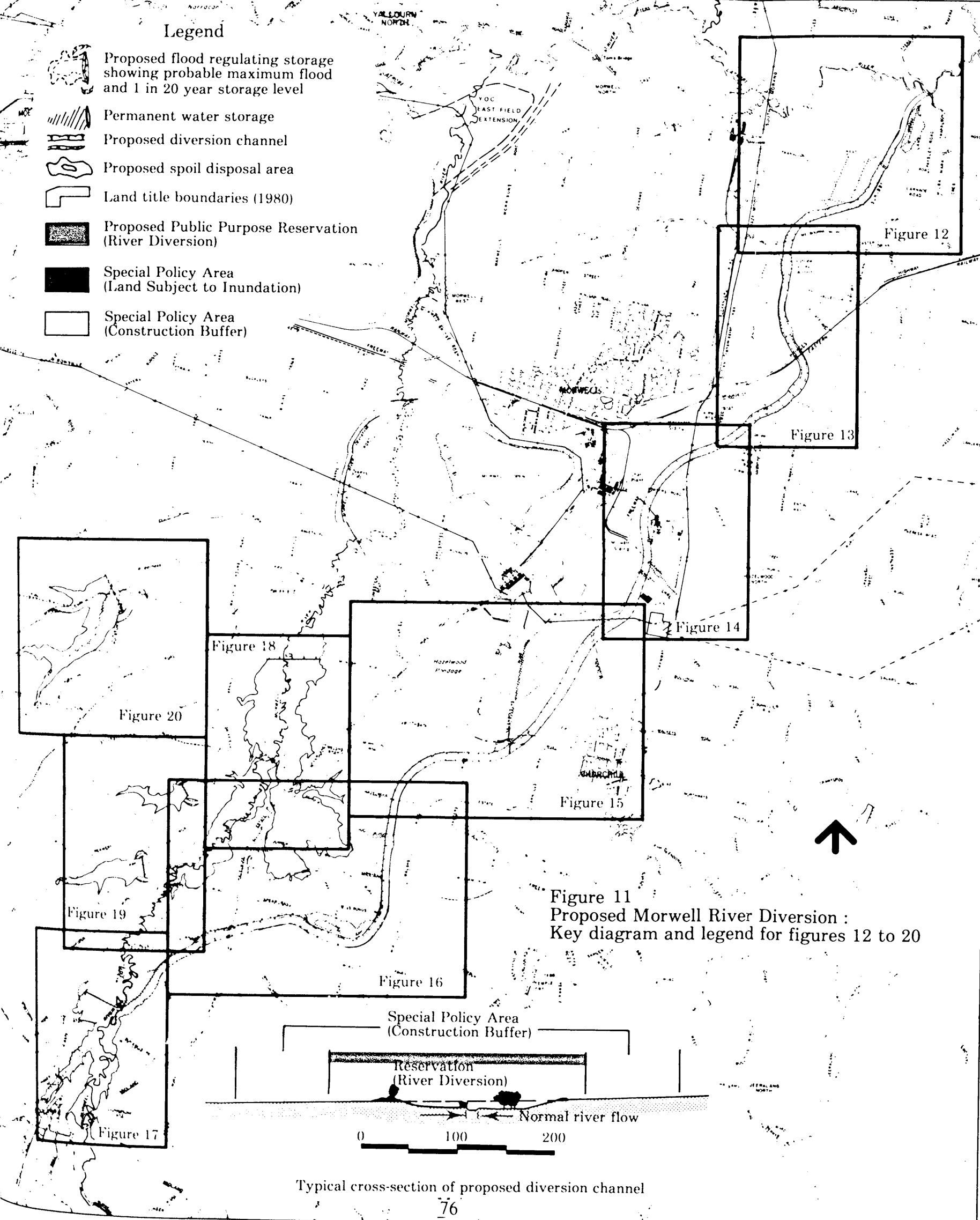
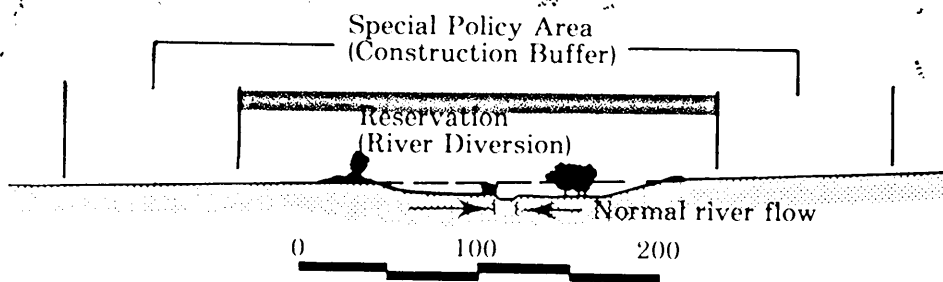


Figure 11
Proposed Morwell River Diversion :
Key diagram and legend for figures 12 to 20



Typical cross-section of proposed diversion channel

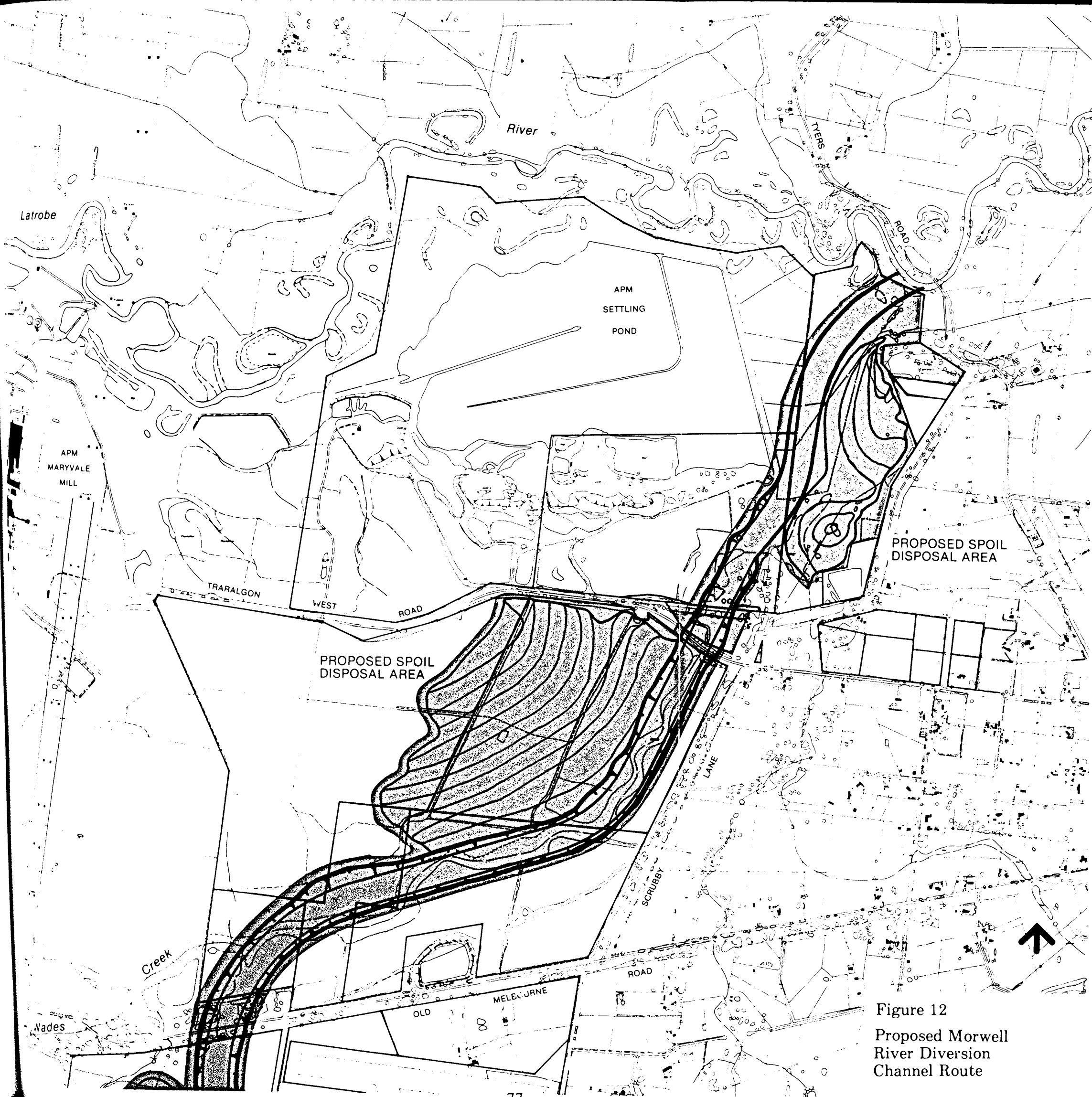


Figure 12
Proposed Morwell
River Diversion
Channel Route

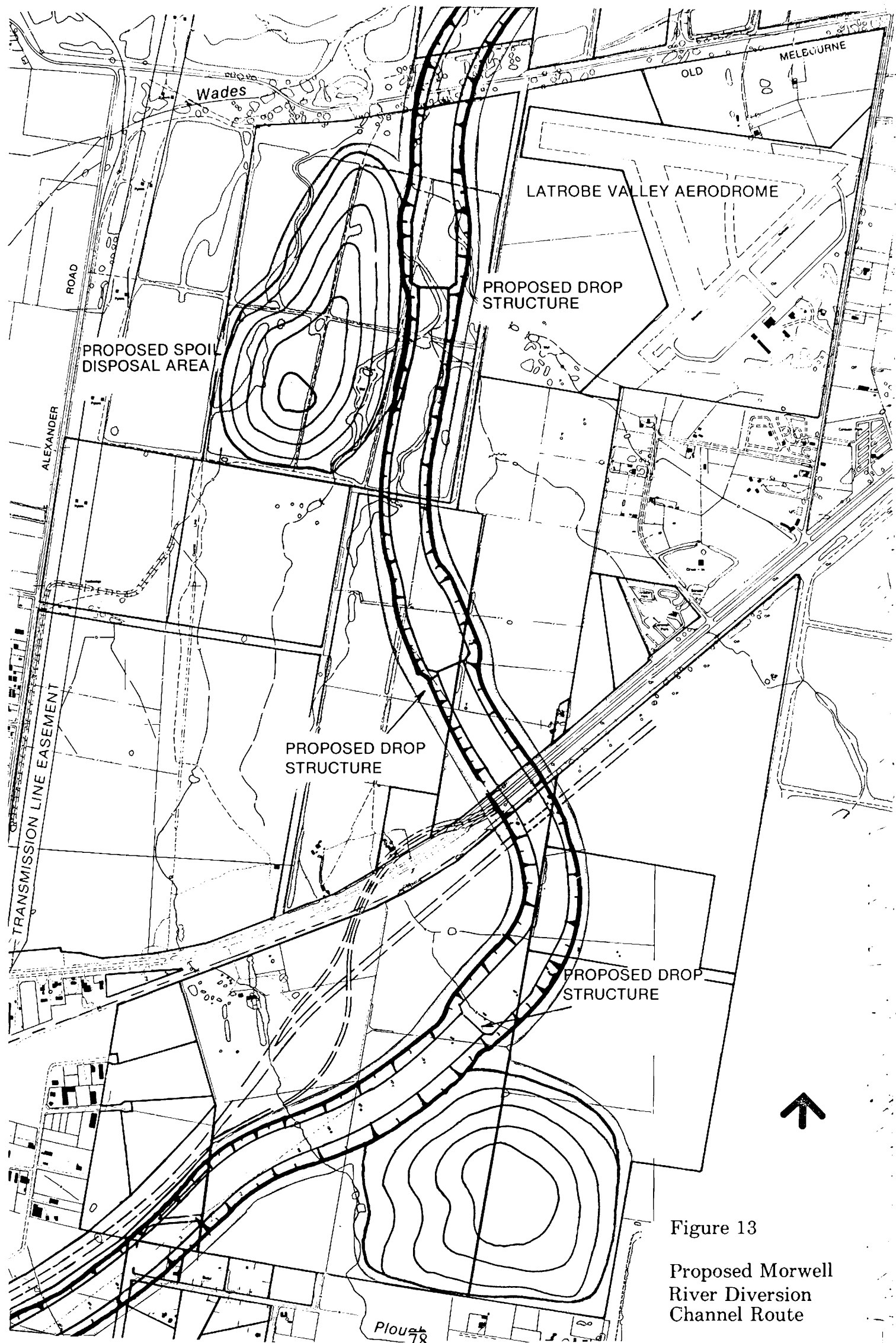
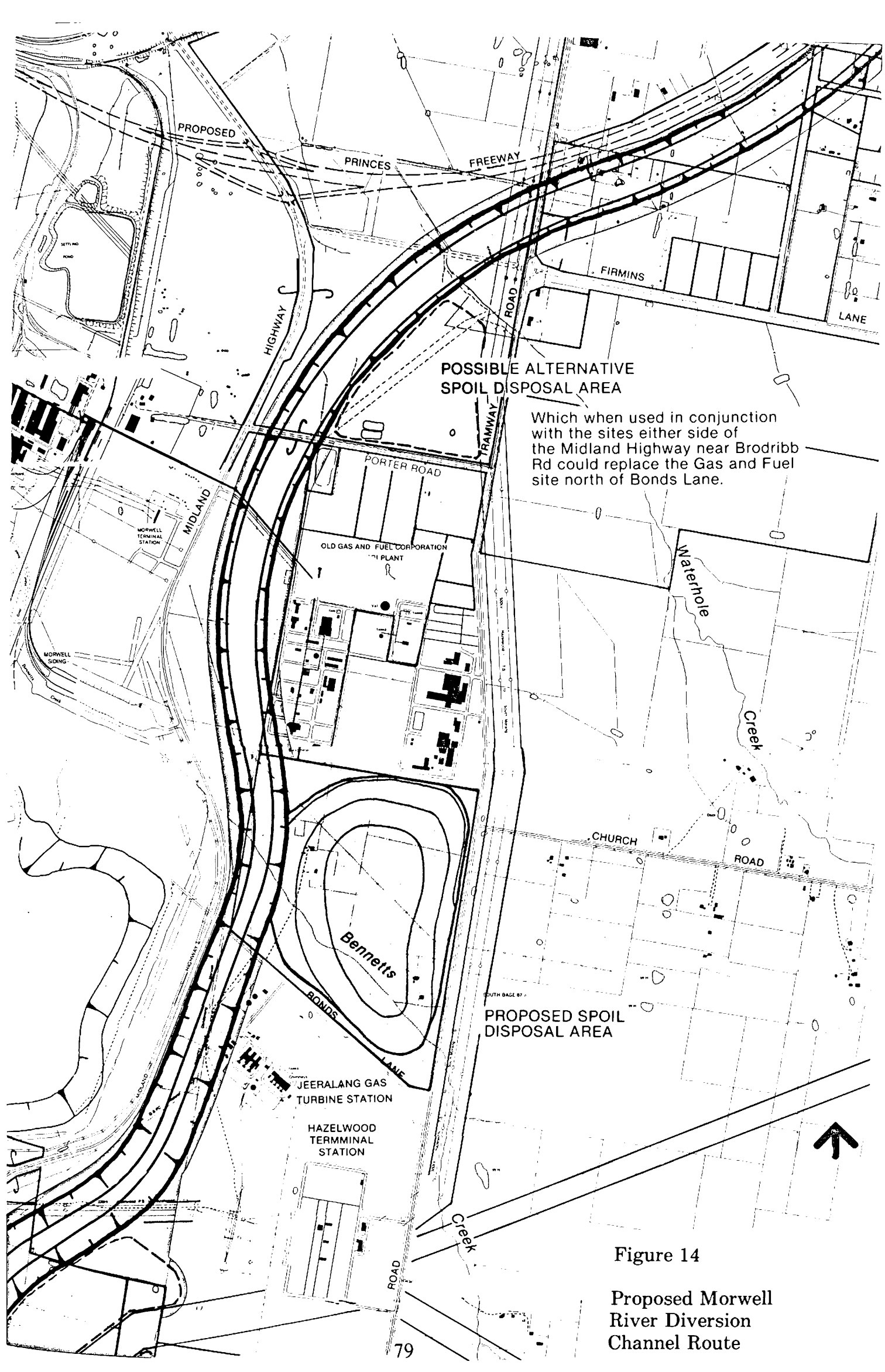


Figure 13

Proposed Morwell River Diversion Channel Route



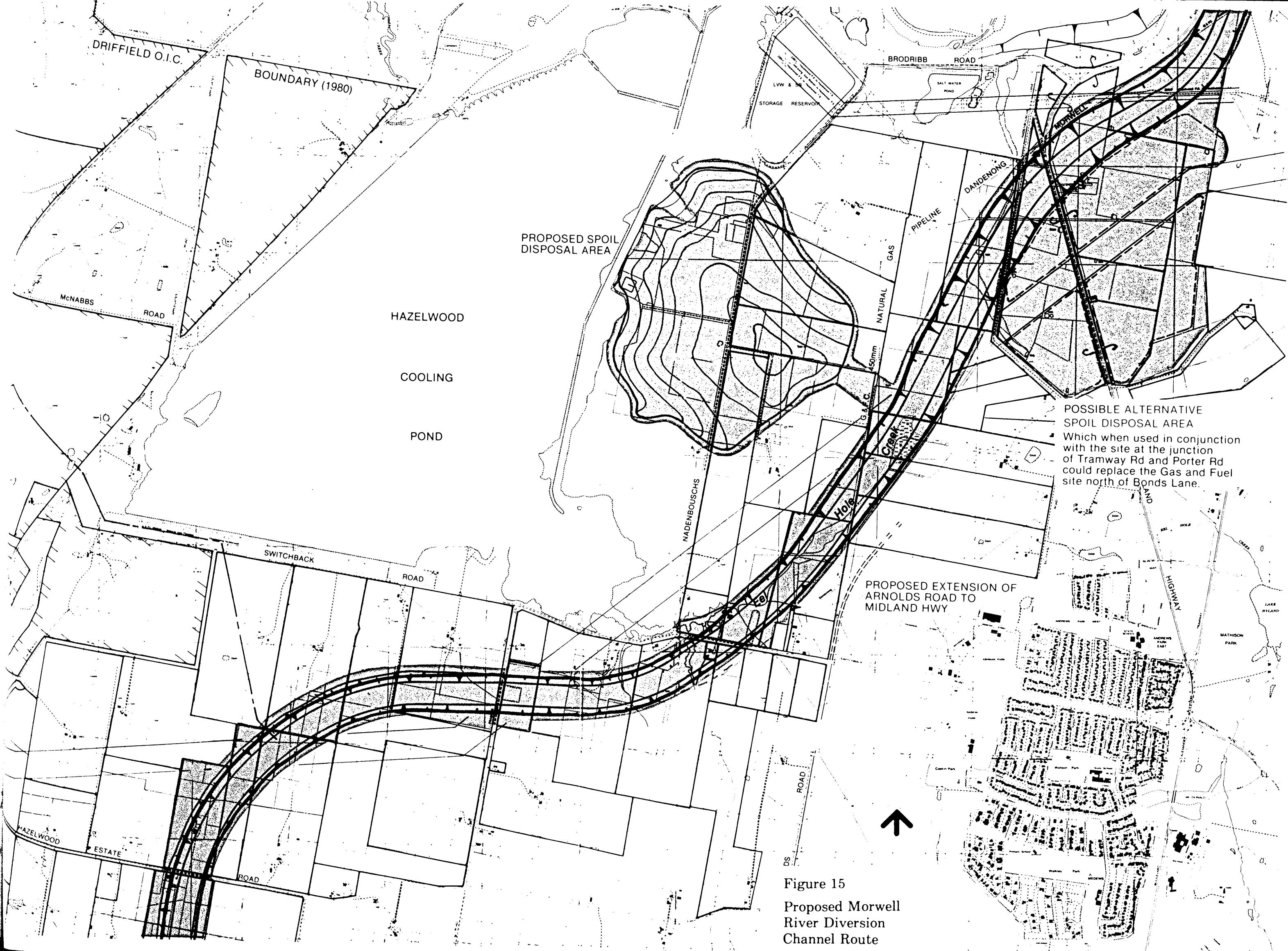
POSSIBLE ALTERNATIVE SPOIL DISPOSAL AREA

Which when used in conjunction with the sites either side of the Midland Highway near Brodrigg Rd could replace the Gas and Fuel site north of Bonds Lane.

PROPOSED SPOIL DISPOSAL AREA

Figure 14

Proposed Morwell River Diversion Channel Route



PROPOSED SPOIL DISPOSAL AREA

HAZELWOOD
COOLING
POND

POSSIBLE ALTERNATIVE SPOIL DISPOSAL AREA
Which when used in conjunction with the site at the junction of Tramway Rd and Porter Rd could replace the Gas and Fuel site north of Bonds Lane.

PROPOSED EXTENSION OF ARNOLDS ROAD TO MIDLAND HWY



Figure 15
Proposed Morwell
River Diversion
Channel Route



POSSIBLE ALTERNATIVE
SPILLWAY LOCATIONS

YINNAR

PROPOSED SPOIL
DISPOSAL AREA

Creek

Billy

Middle

Creek

SPEARGRASS

R.O.W.

PROPOSED SPOIL
DISPOSAL AREA

JUMBURK

ROAD

HIGHWAY

Figure 16
Proposed Morwell
River Diversion
Channel Route



PROPOSED SPOIL DISPOSAL AREA

Figure 17
Proposed Morwell River Diversion
Channel route and Boolarra flood
regulating storage

**PROPOSED YINNAR
FLOOD STORAGE DAM**

1:20 YEAR FLOOD RL 60.4
1:100 YEAR FLOOD RL 62.0
P.M.F. RL 68.0
PERMANENT STORAGE RL 56.0
EMBANKMENT HEIGHT 15m

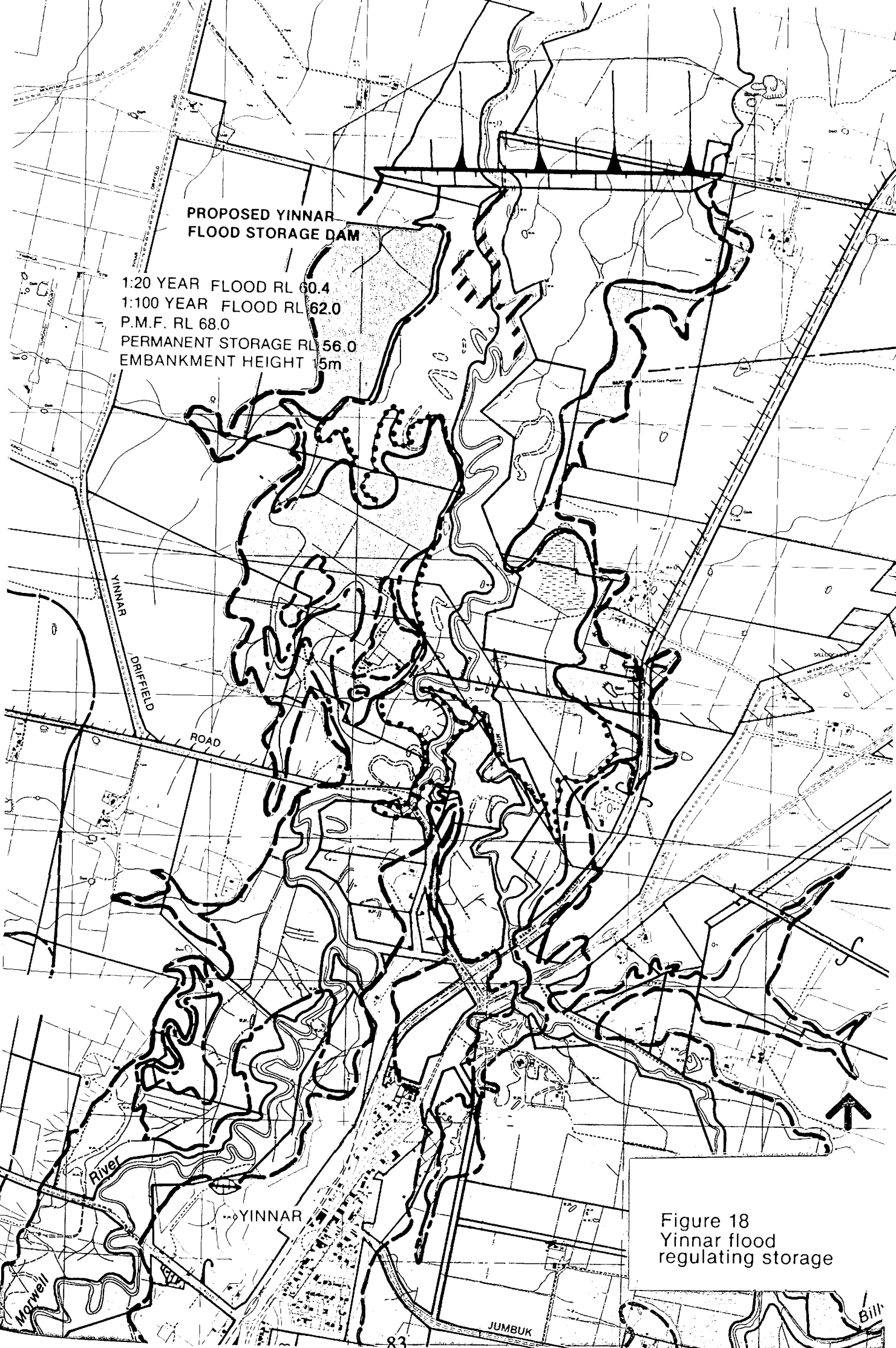


Figure 18
Yinnar flood
regulating storage

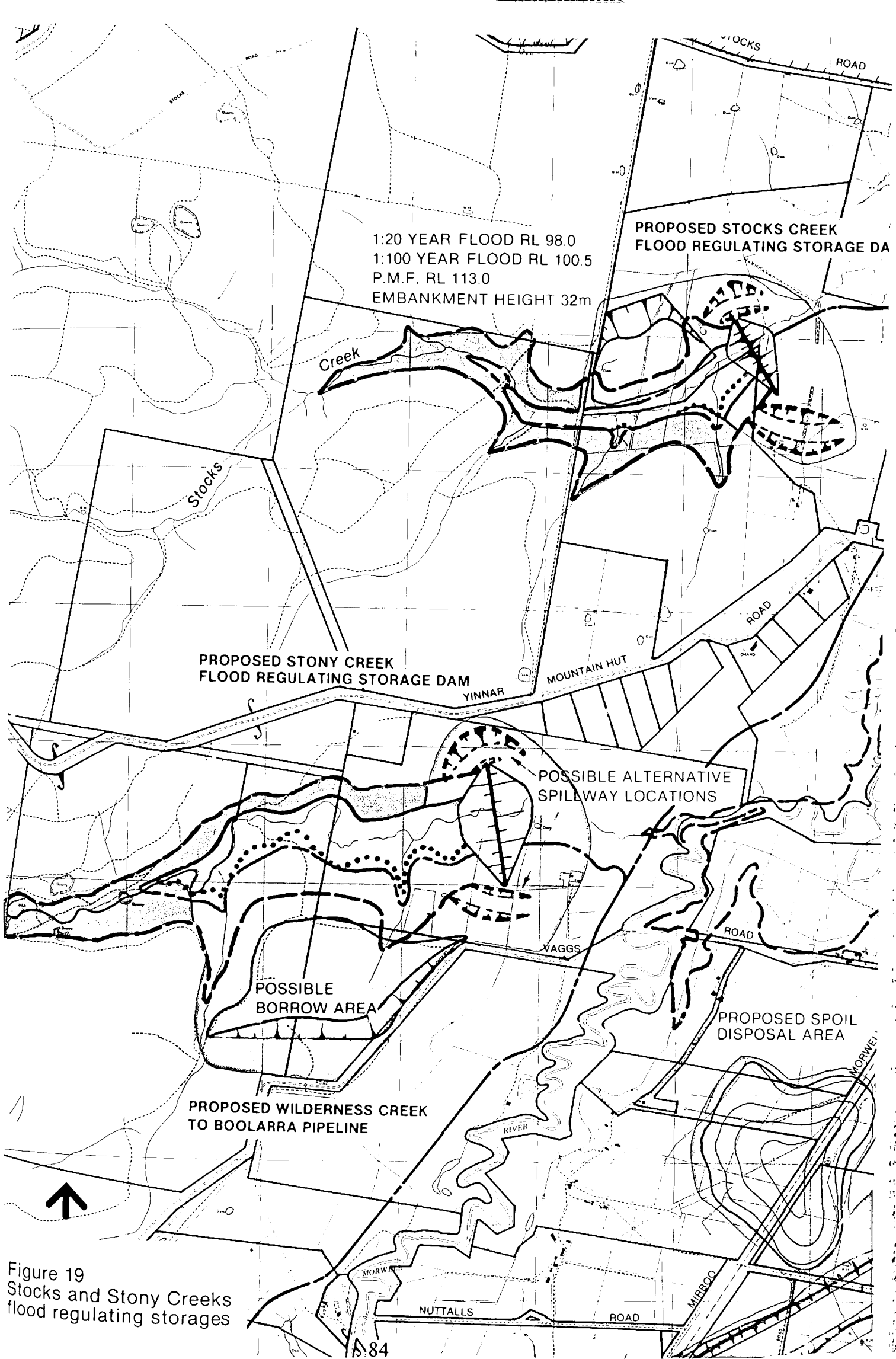
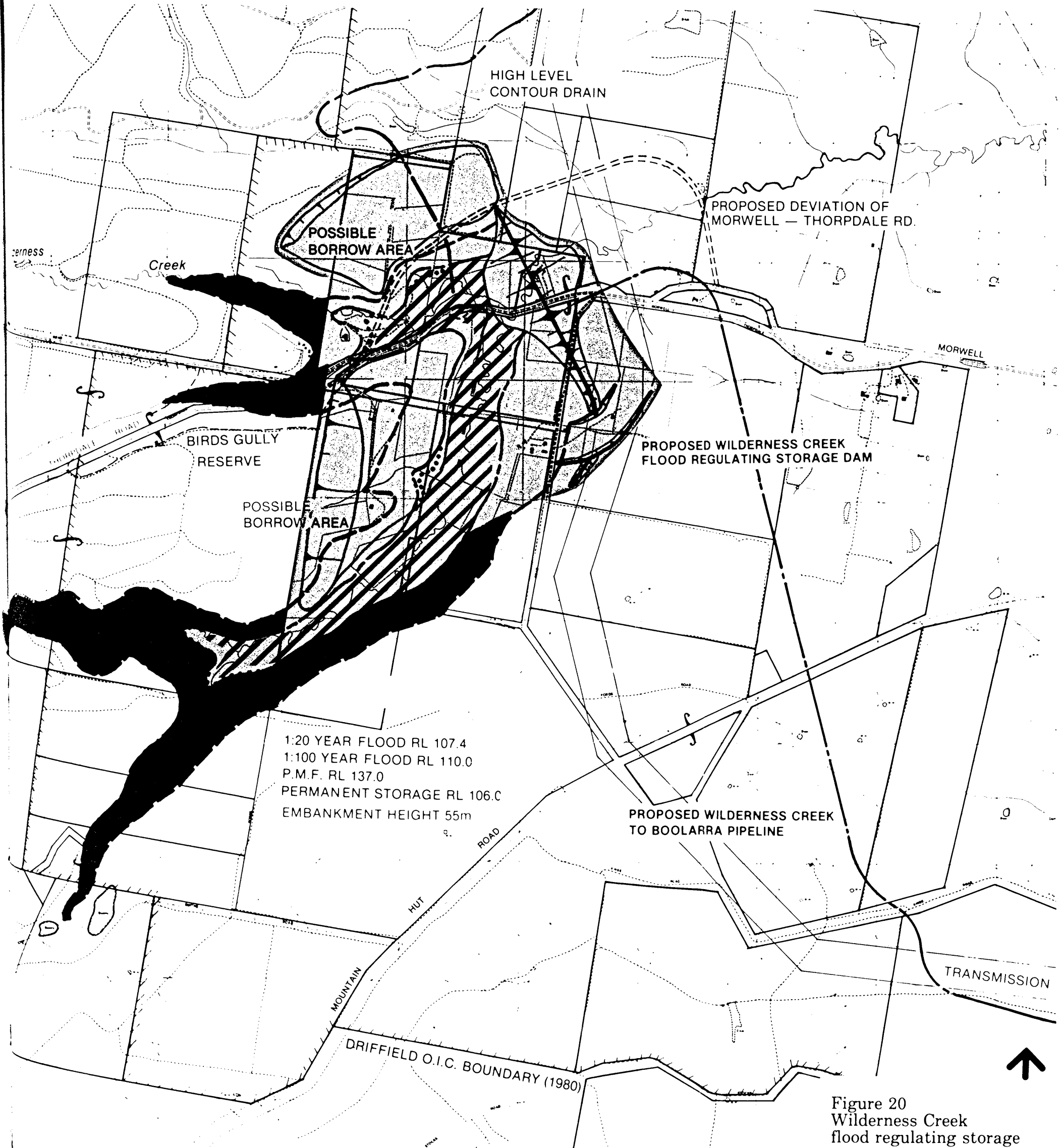


Figure 19
 Stocks and Stony Creeks
 flood regulating storages



HIGH LEVEL
CONTOUR DRAIN

PROPOSED DEVIATION OF
MORWELL — THORPDALE RD.

POSSIBLE
BORROW AREA

Creek

MORWELL

BIRDS GULLY
RESERVE

PROPOSED WILDERNESS CREEK
FLOOD REGULATING STORAGE DAM

POSSIBLE
BORROW AREA

1:20 YEAR FLOOD RL 107.4
1:100 YEAR FLOOD RL 110.0
P.M.F. RL 137.0
PERMANENT STORAGE RL 106.C
EMBANKMENT HEIGHT 55m

PROPOSED WILDERNESS CREEK
TO BOOLLARRA PIPELINE

TRANSMISSION

DRIFFIELD O.I.C. BOUNDARY (1980)



Figure 20
Wilderness Creek
flood regulating storage

MINISTRY FOR
PLANNING AND ENVIRONMENT

ANALYSIS OF SUBMISSIONS RECEIVED IN RESPONSE TO
THE EXHIBITION BY THE STATE ELECTRICITY

COMMISSION OF:

STRATEGY PLANNING FOR VICTORIA'S BROWN COAL
SUPPLEMENTARY INFORMATION ON THE
PROPOSED MORWELL RIVER DIVERSION

* * *

INTRODUCTION

A total of 27 submissions was received from Government bodies (11), private groups and organisations (10), and individual people (6). Two of these submissions were standard letters, one from three members of the South West Yinnar Small Landowners' Association and one from 83 individuals.

In general the submissions fall into 3 groups; those seeking further detailed information on specific aspects of the proposal, those suggesting changes or additions to the proposal, and those discussing the need for broader coal development matters to be considered and decided before this proposal is addressed.

Submissions neither accepted nor rejected the proposal outright but provided qualified support or objection, and no comparison of these numbers is presented. Some submissions were stated in a manner that supported the proposal provided certain detailed matters were satisfactorily resolved whilst others stated they objected to the proposal until certain matters were satisfactorily resolved.

ISSUES

Analysis of the submissions on the proposal revealed the following points and issues. These have been listed under appropriate headings in logical groupings and sequence and are not in an order based upon the number of submissions containing each point or issue.

| | Gov. bodies | Groups/Org. | Individuals |
|---|-------------|-------------|-------------|
| NEED FOR PROPOSAL | | | |
| . Accept need for proposal at some time. | 1. | 1. | 1. |
| . Need for proposal not adequately substantiated. | 0. | 1. | 0. |
| . Proposal may not be needed as proposed. | 0. | 0. | 1. |
| NEED FOR PLANNING CONTROLS | | | |
| . Planning controls are needed to reduce uncertainty. | | | |
| . Planning controls will not reduce uncertainty because planning reservation is not a decision on the proposal. | 0. | 1. | 0. |

PROPOSED PLANNING CONTROLS

Gov. bodies
Groups/Org.
Individuals

- . Planning process is inappropriate because it has been inverted in that planning reservation is proposed before a decision is made on the proposal. 0. 1. 0.
- . Planning controls should not allow public access to Australian Paper Manufacturers' Ltd. stabilisation lagoon or improve public access to Company's plantations. 0. 1. 0.
- . Temporary buffer adjacent to the diversion is appropriate provided current activities permitted under existing zoning are not limited and the buffer is removed at the completion of construction. 0. 1. 0.
- . Proposed planning controls are inappropriate for pre-and post-construction periods. Proposed planning controls consist of: -
 1. Public Purposes Reservation, 2. Special Policy Area - land subject to inundation, 3. Special Policy Area - buffer. These planning controls are relevant to the construction period and are likely to unnecessarily limit public access to the areas in the pre-and post-construction periods. Public access should be permitted to the maximum extent and suggested post-construction planning controls to allow this include: -
 1. Reserve Waterways (for meandering normal flow channel and permanent water storages),
 2. Reserve Public Open Space (for crown land at base of channel as frontage to permanent water storage and for picnic/camping reserves),
 3. Special Policy Area - Stream Protection and Floodway (for the diversion channel embankment and for areas subject to inundation)
 0. 1. 0.

ADEQUACY OF SUPPLEMENTARY INFORMATION REPORT

- . Report clear and adequate. 0. 1. 0.
- 1. Deficiencies
 - . A number of major issues and questions not addressed or answered. 2. 1. 0.
 - . Some specific deficiencies include: -
 - lack of consideration of broader biological, economic and social issues 1. 0. 0.
 - only two alternative routes seriously investigated 0. 1. 0.

Gov. bodies
Groups/Org.
Individuals

- western route rejected on insufficient evidence 0. 1. 0.
- insufficient evidence to justify eastern route 0. 1. 0.

2. Discrepancies and incorrect information

- Supplementary Information report referred to 4000 Mt of coal being available with river diversion whereas the figure was 2000 Mt in the Proposed Driffield Project EES. 0. 1. 1.
- Position of farmer in Speargrass Road area misrepresented by information in Supplementary Information report. Report only shows part of the farm on the northern side of Speargrass Road whereas a substantial and integral part of the farm is also south of the road. 0. 0. 1.
- Misrepresentation of comments received from landowners (p.40 of report). Report refers to letter from 7 landowners indicating 12 first preferences for route modification 2 in Withams Road area. Query-how can 7 landowners indicate 12 preferences? Another letter (2 signatures - this information omitted from report), indicated a preference for the originally proposed route. 0. 0. 1

3. Lack of consultation

- Lack of notification or consultation with obviously interested parties including: -
 - directly affected accommodation enterprise 0. 1. 0.
 - recreation user groups 0. 1. 0.

RELATED BROAD COAL DEVELOPMENT ISSUES

Some broader scale coal development issues relevant to this proposal have been raised including: -

- State Energy Policy incorporating energy conservation initiatives and decentralised power generation policies need to be developed before this proposal is considered 0. 1. 1.
- Relative advantages of Western Coalfields development: -
 - Western Coalfields development is preferred and needed to ensure adequate power

generation capacity for State development; also dependent industries are established and located to facilitate Western Coalfields development.

Gov. bodies
Groups/Org
Individuals
0. 1. 0.

- Matter of development of Western Coalfields compared with Eastern Coalfields should be addressed before this proposal is considered.

0. 1. 1.

. Government policy on future power generation.

The proposal was based on the previously proposed Driffield project. This approach to power generation in the future may not be appropriate and a Government policy on future approaches to power generation should be considered prior to this proposal being considered.

0. 1. 1.

OTHER OBJECTIONS

- . Uncertainty created by proposal interferes with the daily lives of affected landholders.

0. 0. 1.

- . Lack of confidence in SECV's planning capabilities based on past record of proposed projects which have been substantially modified or abandoned.

0. 0. 1.

RIVER DIVERSION ROUTE

1. Criteria for selection of route

- . Economic criteria should be used to select preferred route. Such criteria would favour reduced farmland disruption compared with rural - residential land in areas where these provide alternatives, eg Yinnar area.

0. 0. * & #

- . Economic criteria which incorporates full cost to community of compensation to affected landholders.

0. 1. 0.

2. Preferred alternative routes - eastern route or western route.

- . Eastern route preferred for following reasons: -

- economic - cheaper than western route
- environmental and social - tunnelling associated with western route provides lower fish habitat values and does not provide recreational opportunities.
- provides for simpler flood control strategies.

1. 1. 0.

1. 1. 0.

1. 0. 0.

* 83 copies of standard letter.

3 copies of different standard letter

| | Gov. bodies | Groups/Org. | Individuals |
|--|-------------|-------------|-------------|
| 3. <u>Suggested route modifications</u> | | | |
| . Withams Road area Modification 2 (figure 3.4, supplementary Information report) preferred because it reduces the disruption to houses. | 0. | 1. | 2. |
| . A new route suggested north of and parallel to Speargrass Road which avoids farmland traversed by proposed route. | 0. | 0. | 2. |
| . Belbrook Creek area Originally proposed route preferred because less disruption to creek access and loss of farmland for spoil disposal. | 0. | 0. | 1. |
| . Morwell - Thorpdale Road area Proposed route which avoids APM Bird Gully Reserve is supported. | 0. | 1. | 0. |
| . Wades Creek - Latrobe River area A realignment of the route to avoid encroachment onto APM's water treatment pondage should be incorporated. | 0. | 1. | 0. |
| . South of Old Melbourne Road area Spoil disposal area in this vicinity should be relocated as it is in conflict with Latrobe Valley Water & Sewerage Board's waste water plans to use this area. | 1. | 0. | 0. |

LANDHOLDERS AND OTHER ASSETS DIRECTLY AFFECTED

1. Disruption to livelihood

| | | | |
|---|----|----|-------|
| . Farming Agricultural use of land should be a higher priority than other uses because of socio-economic importance at local, regional and national levels. Specifically farming is more important than: - | 0. | 0. | 1.& * |
| - residential use | 0. | 0. | 1.& * |
| - spoil disposal areas | 0. | 0. | 2. |
| Specific adverse effects include: - | | | |
| - loss of fertile farming land | 0. | 0. | 3. |
| - loss of irrigation rights | 0. | 0. | 2. |

* 83 copies of standard letter.

3 copies of standard letter from community group.

- splits or disrupts viable economic farming unit to extent that unit's viability is severely reduced or removed.

0. Gov. bodies
0. Groups/Org.
2. Individuals

Specific suggestions should proposal proceed include:

- satisfactory compensation for all losses.

0. 0. 2.

- replacement of land lost, irrigation rights lost and land unavailable during construction.

0. 0. 2.

- Speargrass Road - road to be maintained and provide stock bridge across diversion channel.

0. 0. 1.

- provide lease or purchase option on any land adjacent to farm holdings which may become available through resumption.

0. 0. 1.

Forestry - fire fighting

Proposed route involves resumption of 527 hectares of APM's land of which 310 hectares is pine plantation. Specific suggestions include reduction of this by relocation of spoil disposal area north and west of the Traralgon Airport and return of spoil disposal areas to APM for subsequent reforestation.

0. 1. 0.

Recommend that new permanent storages on Wilderness, Stocks and Stony Creeks be available as water points for fire fighting

0. 1. 0.

Industry

No direct physical affect on established industries.

0. 1. 0.

Other businesses

Accommodation centre at Hazelwood directly affected by spoil disposal area at Nadenbousch's Road as well as indirectly by interference with nearest convenient road access to main towns and SECV's works areas.

0. 1. 0.

Suggested that spoil disposal dump not be established and spoil be carted for use as fill material for Yinnar storage embankment.

0. 1. 0.

2. Other assets affected

. Extractive Industries

Proposed route will compromise some major APM extractive mineral deposits including basalt in Silver Creek area near south-west arm of Wilderness Creek, basalt in Stony Creek area near the proposed flood regulation storage and sand deposits (greater than 5 million tonnes) near Wades Creek - Traralgon West Road area. Minor route modifications or protection is recommend to protect these resources.

Gov. bodies
0.
Groups/Org.
1.
Individuals
0.

. Latrobe Valley Water and Sewerage Board's pipelines

A number of pipelines would be crossed or buried under spoil with the eastern route. Pipeline relocation must be to satisfaction of LVWSB and possible problems including maintenance of access to and along pipelines, scour protection over pipelines, protection from damage during diversion channel construction and maintenance need to be resolved.

1. 0. 0.

. Other assets - two large dams on Davey's property developed by Latrobe Valley Fly Fishers Club would be affected by proposed routes in the Princes Highway area. The dams are used by club members who have spent considerable time and money on fencing, tree planting and stocking with fish. It is requested that alternative comparable facilities be provided should the existing facilities be reduced or become unavailable because of the proposal.

0. 1. 0.

ENVIRONMENTAL ASPECTS

1. Naturalistic design

Adoption of naturalistic design principles is appropriate and commendable with support in most submissions being qualified by need for further attention to detailed effects on biological and physical environments. (These, as well as other general questions on environmental issues, are discussed below.)

2. 5. 0.

2. Flood regulation

. Omission of optional flood regulation storages is supported on social and economic grounds.

1. 0..0.

| | Gov. bodies | Groups/Org. | Individuals |
|--|-------------|-------------|-------------|
| . Flooding regime used for planning flood control requirements is not adequately detailed or justified. | 1. | 2. | 0. |
| . There is no consideration of the beneficial effects of flooding including deposition of fertile silt on farmland and flushing of river and Gippsland Lakes, and no comparison with alternative flood control techniques such as upstream land management and conservation with small storage dams. | 0. | 1. | 0. |
| . The question of liability of SECV for damage from any future flooding associated with the diversion was raised. | 0. | 0. | 1. |
| . Information on the rates of rise in permanent storages during filling periods is sought. | 1. | 0. | 0. |
| 3. <u>Soils and soil erosion</u> | | | |
| . Detailed erosion control prescriptions are required based on Soil Conservation Authority's 'Guidelines for Minimising Soil Erosion and Sedimentation from Construction Sites in Victoria'. | 2. | 0. | 0. |
| . A broad study of siltation effects of proposal as well as other major works should be initiated. | 0. | 1. | 0. |
| . Suspended solid loads for the Latrobe River are currently of concern and proposed tree clearing in flood areas will exacerbate this. It is recommended that such clearing is of minimal benefit and in balance, should not occur. | 0. | 1. | 0. |
| . Top soil removed during construction should be stored for reuse in rehabilitation works. In addition to being fertile, such soil contains seeds of local species which assist in naturalistic rehabilitation. This principle should be adopted in all construction proposals. If the top soil is not needed for rehabilitation on this proposal, it should be available for rehabilitation in other areas. | 0. | 1. | 0. |
| 4. <u>River flows</u> | | | |
| . Proposed diversion will result in Morwell River flows joining the Latrobe River below the present APM outfall. Reduced flows in this section of the Latrobe River will | | | |

Gov. bodies
0. 1. 0.
Groups/Org.
O. Individuals

compromise APM's ability to comply with existing and future discharge licenses. Resolution of this matter is required.

. Eel Hole Creek flows

Crossing Eel Hole Creek and incorporating inflows from this source represent significant engineering difficulties. Further information is sought to demonstrate this can be satisfactorily achieved and the integrity of the river diversion embankment in this area is maintained.

1. 0. 0.

. There has been no information given on the possibility of irrigation from the diverted river. Any future drawing of water must be consistent with guaranteeing at least minimum environmental flows in the river.

0. 1. 0.

5. Surface and ground water

. Detailed plans on runoff and aquifer discharge are requested.

0. 1. 0.

. Information on the effect of dewatering caused by construction is not provided and is sought.

1. 0. 0.

. Information on downstream impacts, such as lowering of water tables, due to major differences in stream flows resulting from steepening grade of some small tributaries is not provided and is sought.

1. 0. 0.

6. Aquatic fauna

. A study of the effects of SECV water works on aquatic biology of Gippsland Lakes is requested.

0. 1. 0.

. More information and detailed studies are requested on a number of matters related to aquatic fauna. Some specific matters include: -

- need for detailed aquatic habitat prescriptions to be developed

1. 1. 0.

- information on downstream effects on aquatic fauna from reduced stream flows

0. 1. 0.

- effects on aquatic fauna during construction.

0. 2. 0

| | Gov. bodies | Groups/Org. | Individuals |
|---|-------------|-------------|-------------|
| - effects of pipeline between Boolarra and Wilderness Creeks on aquatic habitats | 0. | 1. | 0. |
| - provision for passage or migration of fish past storage barriers | 0. | 1. | 0. |
| - effects of discharges from Hazelwood pondage into diverted river on aquatic fauna | 0. | 1. | 0. |
| - need for further information to assess overall effect of drop structures | 1. | 1. | 0. |

Some specific recommendations are proposed including: -

| | | | |
|---|----|----|----|
| - open earth channel instead of pipeline between Boolarra and Wilderness Creeks if western route is selected | 0. | 1. | 0. |
| - discharges from Hazelwood pondage into diverted river not be permitted due to likely adverse effects on aquatic fauna | 0. | 1. | 0. |
| - special attention to section of river between the Princes Highway and the Latrobe River following diversion as this section will become stagnant from time to time | 1. | 0. | 0. |
| - a rescue operation should be undertaken to capture fish from the old river for release in the new stream | 0. | 1. | 0. |
| - trial sections are to be incorporated in the Yallourn East Field River Diversion to determine the most suitable fish ladders for indigenous fish and test the meander pattern for the diversion channel. Fish ladders should be designed for trout as well as native species and these trials should be conducted by the Fisheries and Wildlife Division and involve the Council of Victorian Fly Fishing Clubs and Latrobe Valley Fly Fishers Club. Results from such studies should be published. | 0. | 1. | 0. |

7. Landscape values

| | | | |
|---|----|----|----|
| - Landscape values will be significantly affected, particularly since this proposal forms part of the extensive development of brown coal open cuts in this area. | 0. | 2. | 0. |
|---|----|----|----|

Gov. bodies
0. 1. 0.
Groups/Org.
Individuals

- . Specifically it is suggested that the spoil disposal area at Nadenbousch's Road will have long-term adverse effects on the landscape. 0. 1. 0.
- . No part of the landscape that will be affected by the proposal has been considered for classification or recording by the National Trust of Australia (Victoria). 0. 1. 0.
- . Some specific recommendations have been made including: -
 - there is a need for a high level of landscape planning of the natural environment because of the obtrusiveness of the industrial landscape. An opportunity exists to soften the visual impact of the existing industrial landscape in the heavily industrial section of the river route by carefully planning changes to the natural landscape. 0. 1. 0.
 - there is an opportunity to offset losses of landscape values associated with the proposal by broadscale landscape planning incorporating re-establishment of the Latrobe River as a river of high ecological, landscape and recreation value. 0. 1. 0.
 - special attention should be directed to the visual amenity of the river to be cut off between the Princes Highway and the Latrobe River. (The special importance of this section is referred to in the above discussion on Aquatic fauna). 1. 0. 0.

8. Recreation values

- . Current recreational opportunities along the existing river will be reduced and plans for recreational activity along the new river are noted. Detailed information is sought on these recreational plans. 0. 2. 0.
- . Mention is not made of the possible recreational use of permanent water storage areas. It is recommended that these areas be available for passive recreational pursuits including fishing. 0. 1. 0.
- . Provision for additional crown land along the length of the diversion in exchange for crown land lost from existing river is supported. However, this does not recognise other crown land lost in the proposal

including frontage reserves on Wilderness, Middle and Billys Creeks below their respective points of diversion. This is a considerable area and should be compensated by: -

- | | Gov. bodies | Groups/Org: | Individuals |
|--|-------------|-------------|-------------|
| (a) providing additional public land such as suggested access to permanent water storage areas, and/or | | | |
| (b) provision of money to enable the development of additional public facilities on the proposed crown land strip along the length of the diversion. | 0. | 1. | 0. |

9. Rehabilitation works

- | | | | |
|--|----|----|----|
| . The Supplementary Information report states that revegetation and rehabilitation will be undertaken where appropriate. It is suggested a commitment for this work should be in all circumstances and not just where appropriate. | 0. | 1. | 0. |
|--|----|----|----|

10. Criteria for environment protection

- | | | | |
|---|----|----|----|
| . Latrobe River Catchment State Environment Protection Policy should be used as the criteria for water quality in the diverted river. | 0. | 1. | 0. |
|---|----|----|----|

11. Consultative Committee for design, construction, operation and maintenance of the diversion.

- | | | | |
|--|----|----|----|
| . The need for a consultative committee for the success of the proposal is endorsed. | 1. | 2. | 0. |
| . Such a consultative committee should include membership from: - | | | |
| - other river engineering authorities | 0. | 1. | 0. |
| - recreational user groups | 0. | 1. | 0. |
| . Day to day operation, maintenance and monitoring of river flows and water quality could be undertaken by a Regional Water Board. | 1. | 0. | 0. |

ECONOMIC DEVELOPMENT - EMPLOYMENT MATTERS

- | | | | |
|--|----|----|----|
| . Economic activity in the Latrobe Valley would be facilitated by providing private industry access to major parts of the brown coal resource. | 0. | 1. | 0. |
|--|----|----|----|

Gov. bodies
 Groups/Org.
 Individuals

- . All work associated with the proposal should be undertaken by local (Gippsland) industries to encourage regional economic growth and provide employment opportunities locally.

TRANSPORT

1. Restoration of access

- . Plans to restore transport access are adequate. Costs of disruption or restoration of transport access must be identified as valid costs of the project. Continued consultation with Ministry of Transport is necessary. 1. 0. 0.

2. Transport corridors

- . Reactivation of the Morwell-Traralgon Corridor Committee to consider the proposal is recommended. 1. 0. 0.
- . Recognition must be made of influence of diversion passing through Morwell-Traralgon Corridor east of Morwell on possible future urban development. 1. 0. 0.
- . Existing Moe-Morwell Transport Corridor should be retained because of its significance to the towns as well as the whole Latrobe Valley. Serious deficiencies exist with alternative schemes. 1. 0. 0.

3. Land use controls

- . Existing reservation for future development of the Princes Freeway and Midland Highway/Freeway was omitted from the report. This should be rectified. 1. 0. 0.
- . There is a need for careful integration of existing reservations with any determined future reservations for the diversion. 1. 0. 0.
- . The need for planning reservations for both alternative diversion routes in the vicinity of the Latrobe Valley Airport is not supported. Adoption of one route is recommended and the eastern route is preferred. 1. 0. 0.

4. Other specific transport matters

- . Continued consultation is required on the location of spoil areas along the Midland Highway in the vicinity of Brodribb Road to ensure a possible future interchange is not compromised. 1. 0. 0.

- | | Gov. bodies | Groups/Org. | Individuals |
|--|-------------|-------------|-------------|
| . Detailed information is required to assess the impact of a bridge for the river diversion crossing of the East Gippsland railway line. | 1. | 0. | 0. |
| . The possibility of reopening the Mirboo-Morwell railway line was not addressed in the report. This matter should be considered. | 0. | 1. | 0. |

OTHER SOCIAL ISSUES

- | | | | |
|--|----|----|----|
| . The alternative modifications to the route put forward to reduce the direct affect on houses has resulted in conflict between farming landholders and rural-residential landholders. | 0. | 0. | 1. |
|--|----|----|----|

PARLIAMENTARY COMMITTEE HEARINGS

- | | | | |
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| . A number of respondents stated an intention to present information to the Natural Resources and Environment Parliamentary Committee hearings. | | | |
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Submissions were received from the following: -

GOVERNMENT AND STATUTORY BODIES

Department of Agriculture Victoria
State Rivers and Water Supply Commission
Forests Commission Victoria
Ministry of Transport
Environment Protection Council
Melbourne and Metropolitan Board of Works
Latrobe Valley Water and Sewerage Board
Latrobe Valley Consultative Committee
City of Traralgon
Shire of Morwell
Shire of Mirboo
Shire of Narracan

GROUPS AND ORGANISATIONS

National Trust of Australia (Victoria)
Conservation Council of Victoria
Council of Victorian Fly Fishing Clubs and
Latrobe Valley Fly Fishers Club
Latrobe Valley Field Naturalists Club
Morwell Shire Landowners Protection Association
South West Yinnar Small Landowners Association
Australian Paper Manufacturers Limited
Victorian Chamber of Manufacture
Rohricla Nominees Pty. Ltd.

Three standard letters were received from members of the South West Yinnar Small Landowners Association.

INDIVIDUALS - 83 standard letters

R.W. Auchterlonie, Driffield
I. Bentham, Morwell
R.J. Bluhn, Yinnar
A.M. Bond, Yinnar
N.A. Bond, Yinnar
H. Bond, Yinnar
W. Bond, Yinnar
F.J. Bridge, Morwell
L. Briggs, Churchill
A. Brister, Yinnar
A.E. Burge, Boolarra
C. Burns, Morwell
K.R. Clark, Yinnar
J. Clark, Yinnar
A.J. Coleman, Traralgon
C. Coleman, Morwell
D.J. Coleman, Morwell
B. Conway, Yinnar
G. Conway, Yinnar
J. Conway, Yinnar

A. Cook, Yinnar
F. Cook, Yinnar
S. Cook, Yallourn North
L.J. Cox, Morwell
L. Crozier, Morwell
G.J. Deppler, Yinnar South
J.M. Deuter, Ringwood
M.D. Deuter, Ringwood
E. Fergus, Newborough
G. Fratta, Yinnar
L. Fratta, Yinnar
J. Glas, Morwell
A.K. Gorrie, Thorpdale
C. Greenough, Morwell
I. Greenough, Morwell
B. Haywood, Morwell
W.F. Heeson, Yinnar
M. Heriban, Yinnar
R. Hill, Traralgon
J. Hopkins, Yinnar
R.G. Hopkins, Yinnar
C.P.L. Heat, Morwell
P. Kersten, Yarragon
C. Lock, Morwell
K.H. Lucas, Yinnar
N. McIver, Yinnar
J. Manson, Morwell
A. Mathieson, Traralgon
A. Mills, Yinnar
J. Mills, Yinnar
T. Minster, Yinnar
C.E. Morrison, Yinnar
V.B. Morrell,
N.P. Murphy, Thorpdale
B. Neaffrare, Yinnar
E.H. Owen, Budgeree via Boolarra
P.S. Owen, Driffield
R.E. Perry, Mirboo North
T. Philip, Morwell
H. Prater, Yinnar
K. Quigley, Yinnar
W.F. Rendell, Yinnar
B. Reynolds, Yinnar South
D. Sadler, Glen Waverly
A.W. and O. Smith, Tinamba
G. Smith, Yinnar
T. Tamanui, Morwell
R. Trent, Boolarra
H.M. Vary, Yinnar
W.H. Vary, Yinnar
I. Volvardy, Churchill
A.H. Walker, Yinnar South
A.K. Walker, Yinnar
E. Warfe, Morwell
V. Wearne, Yinnar
W.G. Welsh, Yinnar
M. Whitelaw, Churchill
L. Williams, Yinnar

N. Williams, Yinnar
J. Willis, Newborough
R. Woodward, Yinnar
C. Wyeth, Morwell
M.A. Zonneveld, Yinnar

OTHER INDIVIDUALS

J.A. and R. Bennett, Yinnar
D. Carragher, Yinnar
G.A. and D.M. Coleman, Yinnar
J.A. and M.D. Lafferty, Yinnar
M.W. Little, Yinnar

STATE ELECTRICITY COMMISSION

PROPOSED MORWELL RIVER DIVERSION

REVIEW OF CONCEPTS FOR DIVERSION OF THE RIVER
THROUGH THE WESTERN EDGE OF THE COALFIELD

September 1983

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The diversion of the Morwell River to enable full development of the coalfields in the Morwell to Yallourn area has been recognised since the mid 1940s as an essential part of the strategic planning for the long-term development of the coal reserves located at the western end of the Latrobe Valley.

In the Proposed Driffield Project Environment Effects Statement (EES) (August 1981), and later in evidence to the Parliamentary Public Works Committee (PPWC) Driffield Coal Reserves Inquiry, the SEC described a proposal to divert the river to the east of Morwell township. The Supplementary Information on the Proposed Morwell River Diversion published in May 1983 contained supplementary information to the EES and identified some possible route modifications to the proposed eastern diversion channel.

In both the EES and Supplementary Information, the SEC advised that a number of western alternatives were evaluated with the assistance of specialist consultants, but had been rejected on either social, technical or economic grounds.

This report summarises previous work on the western alternatives and evaluates concepts for a western diversion having regard to the latest technical information.

2 SUMMARY OF PREVIOUS ASSESSMENT OF WESTERN OPTIONS TO DIVERT THE RIVER

The coal deposits in the Western Coalfield extend into the rising foothills of the Haunted Hills leaving no room to divert the Morwell River in an open channel, off the coal further to the west.

Various schemes have, however, been evaluated by the SEC, with the aid of consultants, to divert the river through the western edge of the coalfield.

In evaluating the various schemes, the SEC was concerned to ensure security of open cut operations and at the same time to minimise the risk

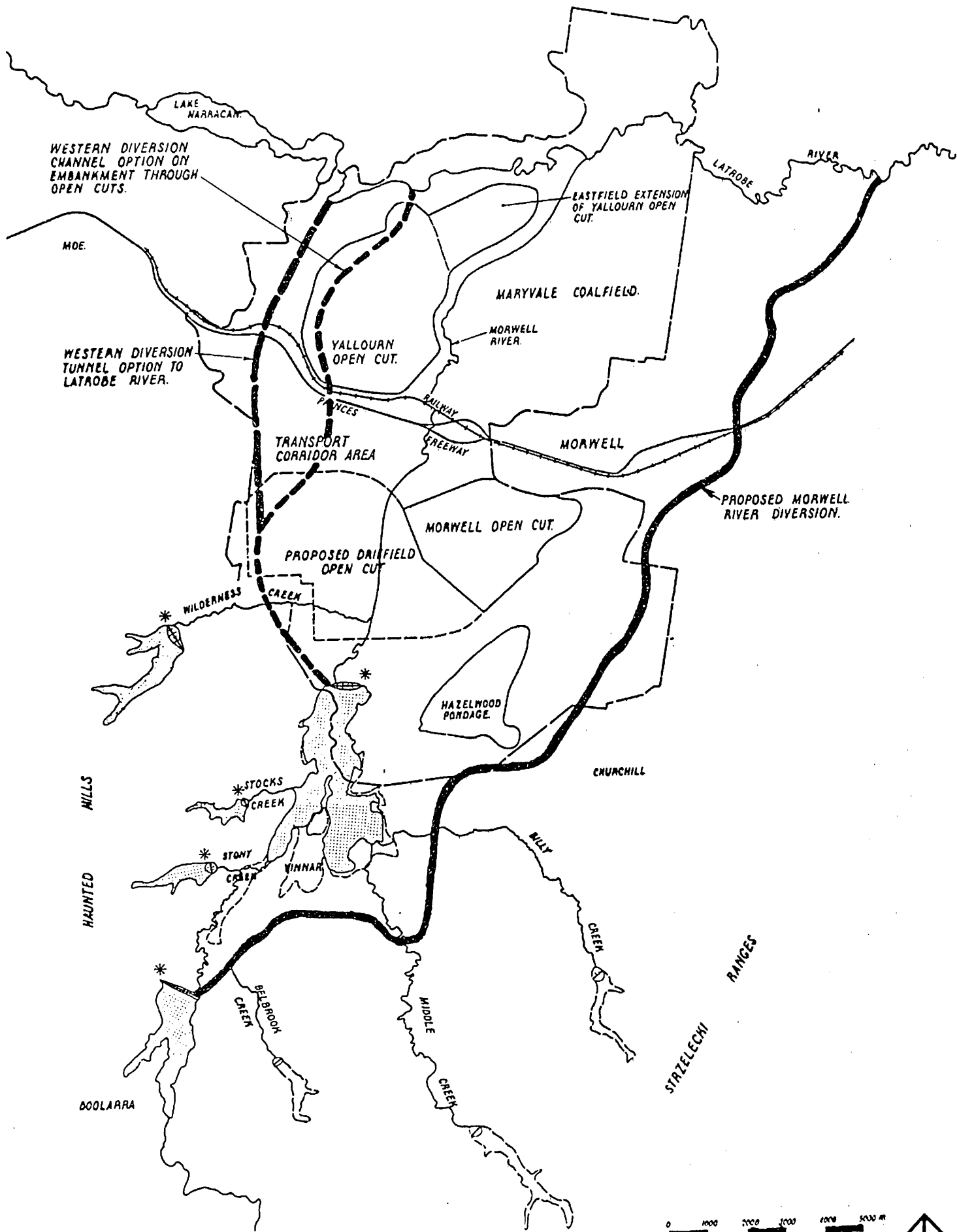
of flooding Yinnar township which is situated just upstream of the main area for future coalfield development, as shown in Figure 1.1.

The most likely western scheme, as described in the Driffield EES, would have required flood regulating storages on all upland tributaries of the Morwell River as well as storages at Boolarra and Yinnar. The Yinnar storage level of 71 m would result in part of the town being flooded. However, with this degree of flood regulation a scheme was developed whereby all floodwaters could be stored in time of flood and released through a 5 m diameter tunnel after the flood. The scheme did not provide security to open cut operations comparable to that of the proposed eastern river diversion as it would have required the construction of a channel into the proposed Driffield open cut, an embankment through the western portion of that open cut and a tunnel from the north-western corner of the open cut to the Latrobe River, upstream of the Yallourn Power Stations.

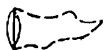
The concept of a tunnel to empty the flood stored in the regulating storages was seen as having significant advantages over a low capacity channel and piped system through the western edge of the remainder of the coalfield. In addition to likely greater costs, an open channel through the transport corridor would need relocating with later development of that part of the coalfield. The feasibility of constructing a water-retaining structure on dumped overburden through the Yallourn Open Cut was questionable, and congestion in the Yallourn Power Station area was assessed as likely to require that flows be piped through that section of the route to the Latrobe River.

The concept of an open channel on embankments through the open cuts, as well as posing significant risks, did not offer environmental advantages over a tunnel as, in order to ensure that leakage of water did not aggravate open cut batter stability, it would have been necessary to pipe the normal river flows for a major part of the route through the western edge of the coalfields. This would have required a 3 m diameter buried pipeline starting well south of the proposed Driffield open cut.

Concern regarding the location of water-retaining structures adjacent to open cuts in the Latrobe Valley was highlighted in 1970 when major cracking beneath the No 2 fire service reservoir south of the Morwell



FLOOD REGULATING STORAGE FORMING PART OF THE PROPOSED SCHEME FOR DIVERSION OF THE MORWELL RIVER.



ADDITIONAL FLOOD REGULATING STORAGES REQUIRED FOR WESTERN DIVERSION CONCEPT.



BOUNDARY OF PROVISIONALLY ALLOCATED WESTERN COALFIELD.

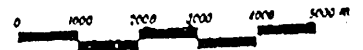


FIGURE 1.1
CONCEPTS FOR THE DIVERSION OF THE MORWELL RIVER.

Open Cut was identified. The reservoir was immediately drained and alternative arrangements utilising storages further away from the open cut were made. In addition, in 1972, as a result of consultant advice, the No 1 fire service reservoir some 300 m away from the eastern crest of the Morwell Open Cut was also drained and relocated. Earth movements in these areas at the time were of the order of 0.2 m to 1.2 m horizontal and about 0.8 m vertical.

Concern was felt regarding the effect of open cut earth movements on an embankment structure through the proposed Driffield open cut as movements of the magnitude of about 1.5 m vertical and 2 m lateral could be expected at the northern crest of the open cut during M1 seam coal winning operations. This, coupled with the risks to men, machines and the State's power supplies inherent in the construction of a major water-conveying structure well above the working faces of an operating Driffield open cut, led to the SEC's consultants also evaluating a western scheme involving a tunnel from Yinnar to the Latrobe River, well clear of future open cut excavations. Such a concept would, however, have partially inundated Yinnar and carried significant cost penalties.

The scheme involving complete flood regulation and a 5 m diameter tunnel from the north-west corner of the proposed Driffield open cut was therefore seen as the most likely western scheme, although it was recognised to pose significant risks to open cut security and to involve the questionable assumption that future open cut earth movements could be accommodated.

3 REVISED BASIS FOR DESIGN

3.1 Geotechnical Assessment of Flood Storage Sites

In the eastern river diversion schemes evaluated by the consultants Binnie and Partners, the capacity of the diversion channel could be varied by the use of up to seven optional storages. In the EES, the SEC advised that, subject to confirmation that flooding would not be aggravated in the Latrobe River, there would be advantages in only constructing the minimum number of storages and a correspondingly larger channel. The consultants later confirmed that Latrobe River flooding

would not be aggravated and the SEC subsequently proposed to the PPWC Inquiry a scheme involving the construction of five basic storages and a diversion channel to the east of Morwell.

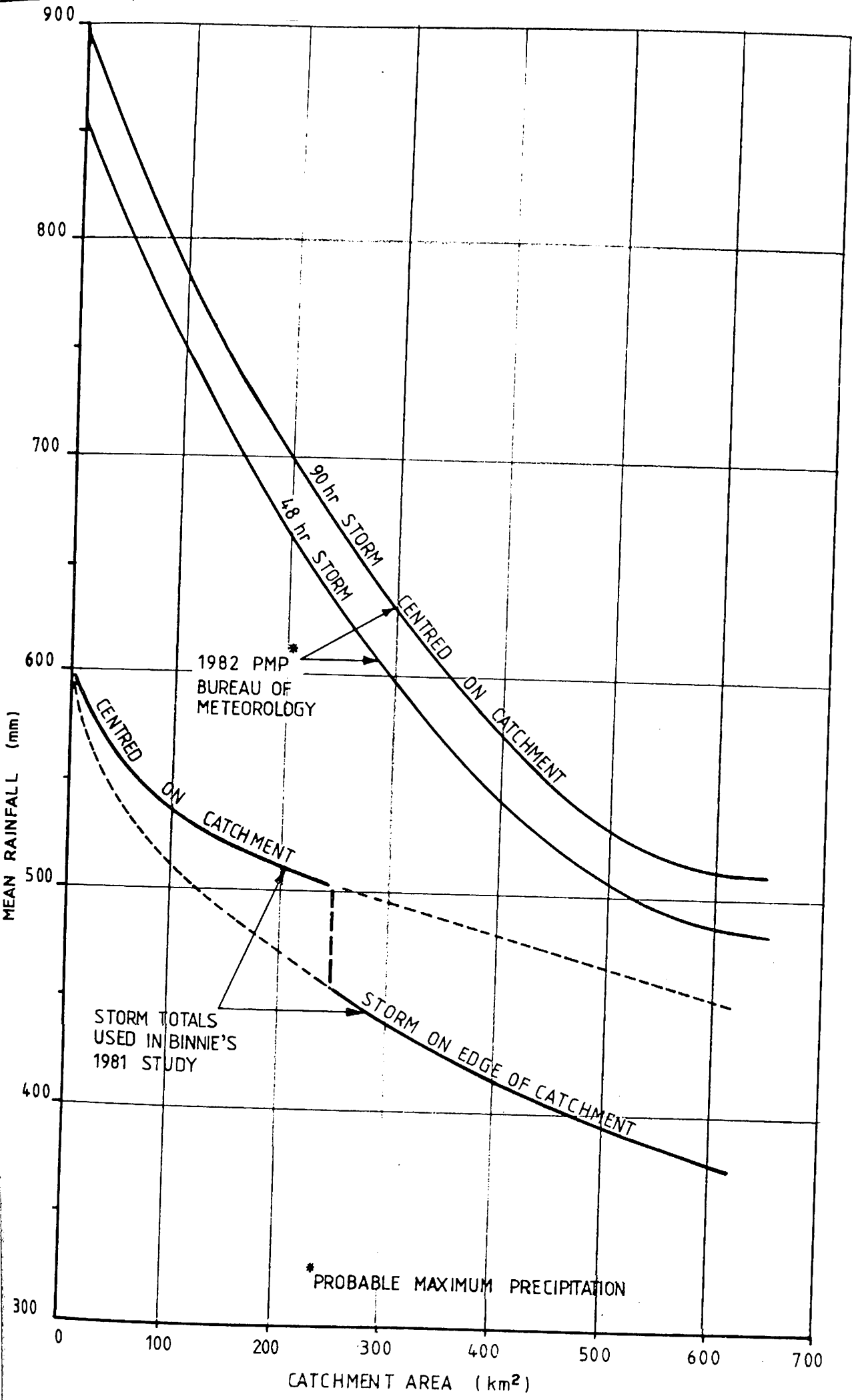
Subsequent to these studies by the SEC and consultants, a preliminary review of the geotechnical suitability of each dam site was undertaken with the assistance of geotechnical and dam consultants, Mr I Pinkerton and Professor D Stapledon. It was concluded that four of the optional flood regulating storage sites were unsuitable for dam construction due to the evidence of past and present landslide activity and potential future slope stability problems. These sites were Upper Morwell River, O'Grady Creek, Little Morwell River and Middle Creek. A satisfactory alternative site on Middle Creek upstream of the original site was identified but the storage capacity would be less than that of the original site.

The effect of excluding these storages reduced the maximum available flood regulation storage capacity by 45% to approximately 140×10^3 ML.

3.2 Revised Hydrological Estimates

Because of the disastrous consequences that would arise from flooding of one or more of the open cut areas, a major design requirement for the diversion is the ability to carry a flood of very low probability. Such an event is outside the range of historical records and therefore involves a hydro-meteorological approach to estimate the magnitude of the extreme flood event. The method of doing this and the data on which it is based are subject to continual review and refinement.

Early studies of the Morwell River diversion used storm estimates from a 1980 Snowy Mountains Engineering Corporation (SMEC) Review of 1974 Bureau of Meteorology rainfall data. In 1982, at the request of the SEC, the Bureau of Meteorology reviewed earlier rainfall estimates and recommended new probable maximum precipitation estimates and revised rainfall patterns which resulted in estimated flood discharge increases of more than 200% for small duration storms and approximately 50% increase in longer duration storms. Figure 3.1 shows the revised rainfall totals compared with those previously used.



RAINFALL v CATCHMENT AREA
LONG STORMS

4 IMPLICATIONS OF DESIGN REVISIONS ON THE WESTERN DIVERSION CONCEPT

The predicted increase in the probable maximum flood and the loss of flood regulating storage capacity means that a fully regulated western diversion which did not completely flood Yinnar would not be possible.

A key component of the most likely western diversion scheme, described earlier, that is a low capacity channel/tunnel to drain the stored floodwaters following a major flood, would be lost.

Following the revision of the magnitude of the probable maximum flood and the loss of some of the optional storages, it would be necessary to place reliance upon the channel/tunnel through the western edge of the coalfields to carry a significant portion of the flood flow during the duration of the flood. The implications, both in terms of the required size and capacity of the necessary works, and also in respect of the increased risks to open cut operations, are now described.

4.1 Size of Channel/Tunnel Works

Using the revised probable maximum precipitation and probable maximum flood data, the available flood retention storages at Boolarra, Wilderness, Stocks, Stony, Middle, Billy and Belbrook Creeks, and a water level in Yinnar to prevent township flooding, the major implications for the necessary works would be -

- . a diversion channel with an 80 m wide floodway base (designed to carry 1100 m³/s), compared with a 5 m base width for the earlier concept;
 - . a large embankment varying from 10 m to 50 m high through the proposed Driffield open cut, requiring the compaction of some 30×10^6 m³ of selected earthfill; and
- either . two 12.5 m diameter tunnels through to the Latrobe River,

- or
- . a large excavation varying from 10 m to 40 m deep through the transport corridor area, with a crest width up to about 400 m; and
 - . a large embankment of up to 75 m high largely constructed on previously dumped uncompacted overburden within the Yallourn Open Cut, requiring some 100×10^6 m³ of compacted earth fill; and
 - . two 12.5 m diameter tunnel/conduits, or a larger number of smaller conduits, from the Yallourn Open Cut to the Latrobe River.

4.2 Increased Risks to Open Cut

Reliance on the diversion channel/tunnel to pass flood flows through open cuts on the western edge of the coalfields during the duration of a major storm event would significantly increase the risk to men, machines and the State's power supplies compared with the earlier evaluated concept of low capacity works to drain the flood storages after a flood.

4.2.1 Embankment Through the Proposed Driffield Open Cut

The passage of significant flood flows on an embankment through the proposed Driffield open cut is seen as raising major practical issues of concern relating to embankment stability and integrity. Whether flows could be conveyed in open channel through the area, or by tunnel to bypass the northern portion of the coalfield, it would still expose the works to the full magnitude of the significant absolute and differential earth movements which would be expected adjacent to the proposed open cut.

Earth movements from possible long-term coal winning activities in the area are predicted to be around 2.5 m settlement and up to 3 m horizontal movement at the crest of the open cut. The use of an embankment subject to such earth movements to carry flood flows is considered to involve exceptional risk.

The base of the open cut slopes downwards to the working faces and the possibility of a major failure during flood flows would result in the major inundation of the open cut workings and an unacceptable risk to both men and equipment. The consequences to the State's power supplies would be immense as it has been estimated that dewatering such an open cut excavation would take some four to six months using the largest available pumps.

A channel of the indicated magnitude perched above operational areas of the open cut would be considered to be a safety hazard of exceptional proportions and would be unlikely to be accepted by the workforce, even if safeguards could be incorporated in its design.

4.2.2 Large Channel Through the Transport Corridor

North of the proposed Driffield open cut a channel would encounter the Yallourn and Morwell seam coal and would require lining to minimise the possibility of seepage to the coal and the consequent risk of major open cut batter failure. Because of this the low flows would also need to be contained in a pipe through this area, as is the case for the existing Morwell River diversion around the Morwell Open Cut and the minor diversion designed for the Yallourn East Field extension.

4.2.3 Large Tunnel Option to the Latrobe River

The alternative to passing a channel through the transport corridor and an embankment in Yallourn Open Cut would involve two massive tunnels west of the coalfield through difficult geological conditions. As described earlier, the two tunnels would need to be about 12.5 m diameter and would be much larger in size than current Australian experience of tunnelling in both soft and mixed ground.

The concept of a single tunnel of this size was earlier evaluated when extreme floods of lower magnitude were indicated and significant cost penalties were shown to apply. The risks of tunnel blockage would also have to be considered.

Tunnelling in the area would be likely to encounter high groundwater tables and uncertain geological conditions varying from hard rock to soft

ground with folding and faulting. It is probable that special high cost tunnelling techniques would have to be adopted.

4.4.4 Large Embankment to Support a Channel Through the Yallourn Open Cut

The diversion channel would need to be supported on an earthfill embankment up to 75 m high through the Yallourn Open Cut. The embankment would have to be constructed on previously dumped uncompacted overburden up to 30 m thick.

Preliminary estimates of the likely long-term regional earth movements resulting from possible future deep open cut developments, and likely embankment settlements, indicate that the embankment and diversion channel on the embankment would have to be designed to accommodate absolute vertical movements of about 5 m, differential vertical movements of about 1 m, and significant horizontal movements throughout the length.

Development of the coal deposits in the transport corridor would involve lateral movements of about 3 m adjacent to the southern portion of the embankment.

The differential movements which would occur within the embankment, and between the embankment and the channel excavation through in situ ground in the transport corridor area, raises doubt about the technical feasibility of such a major water-retaining structure.

These feasibility concerns place greater emphasis on the resulting increase in risk to open cut operations for the winning of coal in the Yallourn East Field and possible future coal winning in the Maryvale area, both of which would be subject to risk of inundation with failure of an embankment through the Yallourn Open Cut.

5 EVALUATION

Revision of the basic hydrological requirements and the loss of some regulating storages has meant that a fully regulated diversion of the

Morwell River through the western edge of the coalfield is no longer possible.

A fully regulated scheme has been described in the EES as the most likely western option for diversion, although reservations were felt regarding the risks such a scheme would pose for open cut security, given the likely future open cut earth movements.

With a partially regulated western scheme a channel or tunnel to transport flood flows to the Latrobe River would need to be of much greater size than indicated in the EES and, due to the identified future earth movements, the feasibility of such structures within, and adjacent to, open cut workings is subject to considerable doubt.

The establishment of a major channel of the size which would be required on an embankment within the proposed Driffield open cut or Yallourn Open Cut would not be acceptable because of the high risk to life and equipment and resulting loss to the State's power generation system if a failure was to occur which led to flood waters inundating the open cut.

The feasibility of constructing an embankment to contain flood flows on loosely dumped overburden within the Yallourn Open Cut is questionable. This, coupled with the resultant loss of overburden dump capacity in the Yallourn Open Cut, and the need to stage open channel construction through the transport corridor area with possible future open cut development, and congestion in the Yallourn Power Station area, had led to the earlier identification of a tunnel to drain flood flows to the Latrobe River.

With the partially regulated western diversion concept which would now apply, two tunnels of about 12.5 m diameter, some 8 km long, would be required.

The cost implications of the channel or tunnel, western diversion concepts, without consideration of the increased risks and questionable feasibility of the works, would be considerable. Some indicative costs would be as follows:

- . Embankment through the proposed Driffield open cut; based on the need for compacted earth fill of about $30 \times 10^6 \text{ m}^3$ and assuming that an embankment could be constructed largely from open cut overburden material, an estimated cost of approximately \$120M, would apply.

- . Embankment through the southern part of the Yallourn Open Cut; based on the need for compacted earth fill of about $100 \times 10^6 \text{ m}^3$ and assuming that an embankment could be constructed largely from overburden material, an estimated cost of approximately \$400M would apply.

- . Channel/conduit through to the Latrobe River from the Yallourn Open Cut. Without consideration of the technical feasibility and costs associated with rearrangement of services and buildings in the Yallourn Power Station area, basic cost estimate for the installation of conduits through the area, or an earth embankment, assuming available space, would be of the order of \$120M.

- . Two 12.5 m diameter tunnels to the Latrobe River, in lieu of a channel through the transport corridor and channel/conduit through the Yallourn Open Cut, would be required. The two tunnels, each about 8 km long through difficult terrain, are estimated to cost in the range of \$500M to \$1000M.

- . The additional three flood regulating storages, over those storages proposed for the eastern diversion of the Morwell River, would cost a further \$50M.

These cost implications, excluding other works, total to some \$700M for a channel/conduit western concept through the edge of the coalfield and some \$600M to \$1100M for a dual tunnel concept to the west of the Yallourn Open Cut. Such cost implications are considerably in excess of the \$330M estimated cost of the proposed eastern diversion in 1983 dollars.

MINISTRY FOR
PLANNING AND ENVIRONMENT

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE'S

MORWELL RIVER DIVERSION INQUIRY

REGARDING

Possible Planning Controls for the State Electricity
Commission of Victoria's Preferred Route for a
Proposed Diversion of the Morwell River

SEPTEMBER 1983

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1. INTRODUCTION

The Ministry for Planning and Environment has given consideration to the need for, and possible types of, planning controls which might be appropriate for a proposed Morwell River Diversion route.

The broad principles relating to planning controls for a potential diversion and associated flow regulation of the Morwell River which are outlined later in this submission, are considered to be applicable to any river diversion proposal. The subsequent detailed comments relate only to the State Electricity Commission of Victoria's preferred proposal for the diversion of the Morwell River. In providing these later comments, the Ministry for Planning and Environment wishes to emphasise that the Ministry is not, in any sense, endorsing, or not endorsing, the State Electricity Commission's preferred route.

It is also assumed in this submission, that issues relating to acquisition and compensation matters will be dealt with separately from the Natural Resources and Environment Committee Inquiry.

2. BROAD PRINCIPLES RELATING TO PLANNING CONTROLS FOR A POTENTIAL DIVERSION AND ASSOCIATED FLOW REGULATION OF THE MORWELL RIVER

There are a number of principles which the Ministry believes would be applicable with regard to the determination of the appropriate type or combination of types of planning controls which should be applied to any river diversion proposal.

Any new planning controls which were introduced should have the effect of:

- a) identifying where the proposed river diversion site would be;
- b) ensuring that the proposed development will not be prejudiced by inappropriate subdivision or development - such as inappropriate types of or locations for development, densities of development, etc;
- c) limiting the extent of impact and the number of people who would be likely to be affected by any proposed development; and
- d) protecting reasonable interests of landowners, such as the right to continue existing uses, and if appropriate, to enable compensation or acquisition claims to be made.

In general terms, meeting the requirements of preventing a possible project from being prejudiced and limiting the extent of social impact, are likely to be most easily achieved by the maintenance or introduction of planning controls comparable to those applying in most rural areas, i.e. with relatively large minimum subdivision levels and with uses and developments primarily restricted to farming and other matters which are compatible with farming areas.

It is particularly critical, of course, that new houses and other significant developments should not be permitted to be established on a preferred alignment for a river diversion.

3. REVIEW OF SUITABILITY OF POSSIBLE PLANNING CONTROLS FOR THE SEC'S PREFERRED PROPOSAL FOR THE DIVERSION OF THE MORWELL RIVER

If it were considered appropriate to provide for the possibility of a diversion of the Morwell River and it was considered that the SEC's preferred proposal for the diversion was an option which should be protected, then the Ministry offers the following comments regarding the present and future planning controls for that option.

3.1 EXISTING PLANNING CONTROLS

3.1.1 Shire of Morwell

The majority of the length of the SEC's proposed diversion channel and all of the flood regulating storages are within the area covered by the Shire of Morwell Planning Scheme 1977.

The SEC's proposed route and flood regulating storages are located in several zones. The majority of the SEC's proposed project is within land zoned Rural 'A'. Much smaller proportions of the channel route are within the Industrial 'B' and Industrial 'A' zones, and small proportions of the flood regulating storages are in Rural 'B' zones. Depending on the precise determinations of the proposed route and storages it is possible that very small sections of land zoned Industrial 'C', Village Zone, Public Purpose Reservation, SEC and Public Open Space could be involved.

A major proportion of the length is also covered by the Special Policy Area - Brown Coal Resource Areas A1 and A2. The major provisions of the zones which would be significantly involved and the special policy areas are as follows:

Rural 'A' Zone

- a) Subdivision minimum of 25 hectares;
- b) Construction of houses - no permits required provided that
 - i) allotment is 25 hectares or larger;
 - ii) allotments of not less than 0.4 hectares which have been permitted as 'one-off' excisions from 'parent' allotments of 25 hectares or more;
 - iii) the land existed as a separate parcel of land before the date of approval of the Planning Scheme;
- c) Agriculture, animal husbandry, public open space and forestry (provided a few limited conditions are met) do not require approval;
- d) A wide range of uses and developments other than those specified above require planning approval by the Council;
- e) Many uses and developments are prohibited in the zone.

Industrial 'B1' Zone (proposed Brown Coal Industry)

- a) Subdivision minimum of 0.2 hectares;
- b) Agriculture, animal husbandry, major transmission line and a few 'minor' uses do not require approval;

- c) A wide range of uses and developments may be permitted subject to the planning approval by the Council;
- d) A very wide range of uses including houses are prohibited in the zone.

Industrial 'A' Zone (General Industry)

- a) Subdivision minimum of 0.2 hectares;
- b) Agriculture, animal husbandry and a few 'minor' uses do not require approval;
- c) A very wide range of uses and developments may be permitted subject to the planning approval by the Council;
- d) A significant number of uses and developments are prohibited in the zone.

Rural 'B' Zone

- a) Subdivision minimum of 2 hectares or an average size of not less than 2 hectares with an absolute minimum size of 1 hectare;
- b) Construction of houses - no permits required provided that the allotment is of 0.4 hectares or more, or on allotments created in accordance with the above subdivisional provisions;
- c) Agriculture, animal husbandry, public open space do not require approval;
- d) Wide range of uses require approval by the Council;
- e) Many uses and developments are prohibited in the zone e.g. commercial premises and industrial uses.

Brown Coal Resource - Special Policy Area

The Brown Coal Resource Special Policy Area applies some additional provision to those applying in the basic zonings which the Policy Area overlies, viz:

- a) no dwelling or building or group of buildings may be constructed on an area less than 25 hectares or with an area of more than 300 square metres without a planning permit;
- b) all planning permit applications must be referred for consideration to the SEC.

3.1.2 Shire of Traralgon

The existing planning control in the Shire of Traralgon is the Shire of Traralgon Interim Development Order. All the area which the SEC suggest would be affected by its preferred routing for a Morwell River Diversion is in the Rural General Farming Zone. However, most of the length is also affected by the provisions relating to one or other of three Special Policy Areas, viz. Brown Coal Resource Area A2, Brown Coal Resource Buffer Area, or Airport Environment Policy Area.

The major provisions of this Zone and the Special Policy Areas are as follows:

Rural General Farming Zone

- a) All subdivision requires Council approval and may be permitted only if the lots created are not less than 25 hectares (except in a very limited number of circumstances);
- b) Farming and houses (on allotments of not less than 25 hectares) are permitted in the zone;
- c) Potentially a large range of uses may be permitted if they are granted a permit by Council;
- d) A significant number of uses and developments (mostly matters of an 'urban' nature) are prohibited.

Brown Coal Resource Area A2

All planning permit applications in this Special Policy Area must be referred to the Department of Minerals and Energy and the Ministry for Planning and Environment for comment.

Brown Coal Resource Buffer Area

In this Special Policy Area all new uses and developments, except farming, forestry or works ancillary to a Brown Coal Open Cut, require a planning permit and the application for this must be referred to the SEC, the Department of Minerals and Energy and any other affected Party.

Airport Environment Policy Area

In this Special Policy Area, houses are subject to a permit regardless of the zoning provisions. All planning permit applications must be referred to the Ministry for Planning and Environment.

3.2 EVALUATION OF THE SUITABILITY OF THE EXISTING AND POSSIBLE FUTURE PLANNING CONTROLS

The existing planning controls applying along almost the whole length of the SEC's proposed diversion channel and associated flood regulating storages do prevent the proposed project from being seriously prejudiced. The effect of all the basic zonings, in combination with any overlying special policy area provisions, is to generally limit:

- a) Subdivision minimum to 25 hectares;

- b) uses and developments permitted (without the requirement for a planning permit) to farming and other very low intensity uses;
- c) uses and developments involving greater density or capital intensive development are either prohibited or subject to permit (with a requirement to refer to one or more Government Agency prior to consideration by the Responsible Authority).

The only significant sized area which is zoned in a way which does not impose constraints similar to those listed above, is the relatively small length of the SEC's preferred diversion route which is zoned Industrial 'A' in the Shire of Morwell Planning Scheme. It is clear that it would be necessary to rezone the section of the preferred route currently zoned Industrial 'A' if the potential for types and densities of uses which might prejudice the preferred route are to be prevented.

Nevertheless, there are some matters referred to in the broad principles outlined in Section 2 of this report which the existing planning control provisions, to a greater or lesser extent, do not fulfill, viz:

- a) identifying where the proposed river diversion and regulation arrangements would be;
- b) limiting the location (and to a much lesser extent, the number and types of developments) in which permitted developments occur so that they are not within an area which might be affected by a preferred alignment for a river diversion;
- c) protecting the reasonable interests of landowners, e.g. to enable compensation of acquisition claims to be made.

In order to meet the above requirements, which are not adequately met by the provisions of the existing planning controls, it would be necessary to make some appropriate types of amendments to the existing controls.

Consideration has been given to several different broad approaches which could possibly be used to meet these objectives. The broad approaches which were considered were the introduction of:

- a) Public Purpose Reservation (appropriately titled) into the relevant planning controls;
- b) "Special Policy Area" (appropriately titled) into relevant planning controls;
- c) a new "Zone" (appropriately titled) into relevant planning controls;
- d) of special "covenants" onto land titles;
- e) "easements", through appropriate acquisition arrangements and placement in titles.

Of these broad approaches, the last three are not considered to be appropriate.

A new "zone", while identifying the route for a river diversion proposal and potentially containing appropriate planning provisions relating to it, would represent a defacto reservation without ensuring landowners opportunities to compensation or acquisition.

The introduction of "covenants" on to the relevant titles would be impractical due to difficulty and complexity associated with negotiating their inclusion on to titles and would not result in the proposed project being publically identified.

The use of easements is not considered appropriate to the situation since, if completed, the actual diverted river and its immediate surrounds would probably need to be in some form of ownership by the Crown.

The Department believes that adequate fulfillment of the principles outlined in Section 2 for a preferred river diversion would require the introduction of a Public Purpose Reservation for all areas which would be directly and permanently affected by the proposal. These areas would include new river alignments and immediate surrounds (including areas directly affected by construction and operational requirements), spoil disposal areas and areas which would be permanently or frequently inundated due to flood regulation storages. It is inherent in the introduction of a Public Purpose Reservation that appropriate compensation and acquisition opportunities would be available for affected landowners.

There are other areas, generally abutting one or more of the areas which it is suggested would be included in a 'Public Purpose Reservation', which would be subject to very limited and/or very infrequent effects of the river diversion proposals but to an extent which would not prejudice the effective continuation of existing land uses. It is suggested that it would be appropriate for these areas to be included in a 'Special Policy Area'. The 'Special Policy Area' would 'overlay' the existing basic zoning of the planning controls and introduce some additional planning requirements to those in the zoning provisions. The additional planning requirements would include a requirement to refer planning permit applications to the SEC for comment. This arrangement would ensure that new houses and any other new developments which might be permitted or sited or built in a way which would not be incompatible with the proposed river diversion arrangements. It is suggested that it would be appropriate to introduce 'Special Policy Area' controls of the type outlined in two types of situations, viz:

- a) land subject to very infrequent flooding (say, less than one in every 20 years) due to the flood regulation storages;
- b) land abutting the diversion channel or spoil disposal areas (perhaps 'strips' of land about 100m wide) which could be indirectly affected by construction activity.

With these latter areas, once a river diversion was completed and 'fully operational' it might not be necessary to retain the 'Special Policy Area'.

It is possible that there may be a few existing houses in areas which could be subject to infrequent flooding for which some special arrangements would need to be arrived at.

4. CONCLUSION

There are a number of issues which will need to be addressed to the Parliamentary Natural Resources and Environment Committee Inquiry into the SEC's proposal for the diversion of the Morwell River in 1983. A number of these matters will need to be resolved before it would be appropriate to deal with the specific issues of planning controls. The Ministry has outlined some general principles which it believes would be relevant to the provision of appropriate planning controls for any river diversion and flow regulation proposal. A suggested way in which these general principles could be applied to the SEC's preferred Morwell River diversion and flow regulation proposals has been outlined. It is hoped that the comments provided in this submission will be of benefit to the Natural Resources and Environment Committee and the parties participating in the Morwell River Diversion Inquiry.

APPENDIX 4

LIST OF WITNESSES

| | | |
|-----------------------|---|--|
| Dr. J. P. James |) | |
| Dr. R. Hutchings |) | |
| Mr. P. J. Vines |) | Representing the State Electricity |
| Mr. D. W. J. Burton |) | Commission |
| Mr. J. J. B. Leyden |) | |
| Mr. K. G. Culley |) | |
| Mr. D. C. Green |) | |
| | | |
| Mr. D. J. Dole | - | Representing the State Rivers and Water Supply Commission |
| | | |
| Cr. K. G. Hamilton |) | Representing the Shire |
| Mr. R. H. Waters |) | of Morwell |
| | | |
| Mr. D. F. Williams |) | Representing the Ministry |
| Mr. D. Langmore |) | for Planning and Environment |
| | | |
| Mr. J. Lafferty | - | Landowner |
| | | |
| Dr. D. T. Currie | - | Representing the Road Construction Authority |
| | | |
| Mr. R. B. Goldsbrough | - | Landowner |
| | | |
| Mrs. J. Chapman |) | Landowners and representing the |
| Mr. I. Hamilton |) | South West Yinnar Small Landowners |
| Mr. G. J. Benson |) | Association |
| | | |
| Mr. R. W. C. Brister | - | Landowner |
| | | |
| Cr. P. F. Wood |) | Representing the City of |
| Mr. J. L. Mitchell |) | Traralgon |
| Mr. M. J. Ryan |) | |

| | | |
|-----------------------|---|--|
| Mr. R. P. Wallace | - | Representing the Shire of Traralgon |
| Mr. G. E. O'Hara | - | Landowner |
| Mr. R. Quigley | - | Landowner and representing the Morwell Shire Landowners Protection Association |
| Mr. J. R. Pollock |) | Representing Australian Paper Manufacturers Ltd |
| Mr. M. Hague |) | |
| Mr. W. H. Coventry |) | Representing the Council of Victorian Fly Fishing Clubs |
| Mr. D. J. Wakefield |) | |
| Mr. F. Lewis |) | |
| Mr. A. R. Davey | - | Landowner |
| Mr. L. J. O'Connor | - | Representing S. Custance and Associates (Planning Consultants) |
| Mr. G. A. Coleman | - | Landowner |
| Mr. P. E. Strickland |) | Representing the Latrobe Valley Community Forum |
| Mr. J. P. Larson |) | |
| Messrs. G. & T. Walsh | - | Landowners |
| Mr. F. A. Miller | - | Landowner |
| Cr. K. G. Hamilton | - | Representing the Latrobe Valley Consultative Committee |

* * * * *

APPENDIX 5

LIST OF SUBMISSIONS RECEIVED BY THE COMMITTEE

(In addition to those submissions initially directed to the Ministry for Conservation and listed in Appendix 1)

State Electricity Commission
Mr. J. A. and Mrs. R. Bennett
Department of Minerals and Energy
Shire of Morwell
Road Construction Authority
State Rivers and Water Supply Commission
Ministry for Planning and Environment
Mr. P. Morgan
Mr. G. E. O'Hara
Mrs. J. Chapman
Morwell Shire Landowners Protection Association
Australian Paper Manufacturers Ltd
Ministry of Transport
The Council of Victorian Fly Fishing Clubs
Latrobe Valley Consultative Committee
Latrobe Valley Community Forum
Latrobe Valley Water and Sewerage Board
McGauran Properties Pty Ltd
Latrobe Valley Field Naturalists
Latrobe Valley Airfield Advisory Committee
M. W. and J. Hopper

* * * * *

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

REPORT

upon

DEPOSIT LEGISLATION

Ordered to be Printed

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

MEMBERSHIP

The Honourable R. I. Knowles, M.L.C. (Chairman)
Dr. G. M. Vaughan, M.P. (Deputy Chairman)
The Honourable W. R. Baxter, M.L.C.
Mr. C. W. Burgin, M.P.
The Honourable D. E. Henshaw, M.B.E., M.L.C.
Mr. G. R. Ihlein, M.P.
Mr. M. J. McDonald, M.P.
Mr. W. D. McGrath, M.P.
Mr. D. K. McKellar, M.P.
The Honourable B. A. Murphy, M.L.C.
The Honourable B. T. Pullen, M.L.C.
Mr. E. M. P. Tanner, M.P.

COMMITTEE STAFF

Mr. M. R. Knight - Director of Research
Mr. G. H. Westcott - Secretary

* * * * *

DEPOSIT LEGISLATION INQUIRY SUB-COMMITTEE

Mr. G. R. Ihlein, M.P. (Chairman)
The Honourable D. E. Henshaw, M.B.E., M.L.C.
Mr. W. D. McGrath, M.P.
Mr. D. K. McKellar, M.P.
The Honourable B. T. Pullen, M.L.C.
Mr. E. M. P. Tanner, M.P.

* * * * *

TERMS OF REFERENCE
PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

P R E A M B L E

In presenting this Report to the Parliament, the Committee indicates that the Report was agreed to by a majority of Members present at the meeting when the Report was adopted. This Report is accompanied by minority report by Mr. M. J. McDonald, M.P. and the Honourable B. T. Pullen, M.L.C., and a minority report by Dr. G. M. Vaughan, M.P., in accordance with S4N(4) of the *Parliamentary Committees Act* 1968.

* * *

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The Natural Resources and Environment Committee appointed pursuant to the provisions of the *Parliamentary Committees Act 1968* (No. 7727) has the honour to report as follows:

INQUIRY INTO BEVERAGE CONTAINER DEPOSIT LEGISLATION

CHAPTER ONE

INTRODUCTION

TERMS OF REFERENCE

1.1 On 26 October 1982, the Committee was directed by His Excellency the Governor in Council:

To investigate, make recommendations and report to Parliament by 1 November 1983 in relation to beverage and drink container deposit legislation with particular regard to the following:

- (1) *Future prices, sales and investment in the drink, beverage and related packaging industry;*
- (2) *Employment;*
- (3) *Conservation and allocation of natural resources and energy;*
- (4) *Littering and aesthetics;*
- (5) *Waste collection and disposal or recycling; and*
- (6) *Alternative waste control methods.*

- 1.2 On 4 October 1983, His Excellency the Governor in Council extended the period of time in which the Committee was required to make its final report to 1 April 1984.

Procedure adopted by the Committee

- 1.3 Following the Order in Council of 26 October 1982, advertisements were placed in the National and State press on 22 November 1982 and submissions were called for by 15 February 1983. A list of submissions received as at 14 May 1984 is attached as Appendix 1. All submissions other than those submitted on a confidential basis were available for public inspection throughout the course of the inquiry. Various letters and supplementary materials have also subsequently been received and taken into account by the Committee. All this information will remain available for public inspection by appointment at the Committee's offices on the 7th Floor, 100 Exhibition Street, Melbourne, during normal working hours.

- 1.4 On 11 November 1982 the Committee appointed a Sub-committee consisting of the following Members to carry out the inquiry:

Mr. G. R. Ihlein, M.P. (Chairman)

The Honourable D. E. Henshaw, M.B.E., M.L.C.

Mr. W. D. McGrath, M.P.

Mr. D. K. McKellar, M.P.

The Honourable B. T. Pullen, M.L.C.

Mr. E. M. P. Tanner, M.P.

- 1.5 On 29 March 1983, the Sub-committee received an informal briefing in Melbourne from officers of the South Australian and New South Wales Governments on the South Australian deposit legislation and the New South Wales Litter Reduction Campaign.

- 1.6 From 5 to 8 April 1983, the Sub-committee visited South Australia to inspect the operation of the South Australian deposit legislation and to discuss various aspects of the legislation with Members of the South Australian Government, Government officers, representatives of industry, local government and Keep South Australia Beautiful Inc.
- 1.7 On 9, 10, 11, 16, 17 and 18 May, and 13 and 14 July 1983, public hearings were held in Parliament House and a representative cross-section of people and organizations who had made written submissions were invited to give evidence.
- 1.8 From 22 to 24 June 1983, the Sub-committee visited New South Wales. On 23 June 1983, inspections were held at the Comalco aluminium recycling plant at Yennora and the Metropolitan Waste Disposal Station at Rockdale. On 24 June, the Sub-committee took evidence from representative bodies involved with and concerned about litter control and waste management in New South Wales.
- 1.9 On 7, 19 and 20 July, and 11 August, 1983, the Sub-committee visited the following:
- Western Bottlers Pty. Ltd. - bottle filling plant - Footscray.
 - ACI International Ltd. - glassworks - Spotswood.
 - United Bottle Merchants - bottle reclamation and washing plant - Abbotsford.
 - Containers Limited - can manufacture - Dandenong.
 - J. Gadsden Australia Ltd. - can manufacture - Clayton.
 - Carlton United Breweries Limited - bottle and can filling - Abbotsford.
 - Manufacturers Bottle Company of Victoria - beer bottle reclamation - Abbotsford.
 - ACI Petalite - PET bottle manufacture - Moorabbin.

Coca Cola Bottlers - bottle and can filling plant - Moorabbin.

Cadbury Schweppes Pty. Ltd. - bottle and can filling plant - Tullamarine.

City of Knox - recycling centre - Knox.

City of Nunawading - transfer and recycling centre - Nunawading.

1.10 A transcript of all the evidence given (other than evidence given in camera) is tabled with this report.* A list of witnesses is attached as Appendix 2. This transcript can be inspected by appointment at the Committee's offices during normal working hours.

1.11 On 15 July 1983, the Sub-committee appointed Peat, Marwick, Mitchell Services (PMMS), Management Consultants, as consultants to the Committee with a brief to prepare:

- (1) A detailed quantitative description of the drink, beverage and packaging industry;
- (2) An analysis of the effects of a specific deposit legislation scenario.

The information was to be provided so as to assist the Sub-committee in the preparation of its report rather than as a separate independent review. It was made clear that the report from Peat, Marwick, Mitchell Services would not be made public and it is not available for public inspection.

* Minutes of Evidence not printed.

Format of the Report

- 1.12 The subject of deposit legislation for beverage and drink containers is extremely complex and a great deal has been written on the subject both in Australia and overseas. A short list of relevant references is contained in Appendix 3. A summary of beverage packaging legislation in the United States of America is provided in Appendix 4, and a review of the effects of deposit legislation in the United States of America is included in Appendix 5. Appendix 6 is a synopsis forming part of a submission from the Department of Industry, Commerce and Technology and highlights the complexity of the inquiry.
- 1.13 Rather than attempt to reiterate much of the earlier research work, this report focuses on the present situation in Victoria and the alternative forms of action which could be taken within the present Victorian environment.
- 1.14 The Committee interpreted its terms of reference widely to include all matters related to waste and litter control, including especially - but not exclusively - beverage and drink containers and including especially - but not exclusively - container deposit legislation.
- 1.15 The Committee started its inquiry by advertising its terms of reference and calling for written submissions.
- 1.16 As a result of these submissions, the Committee defined, in particular, the words "beverage", "drink" and "beverage container". These definitions and others are contained in Chapter Two.
- 1.17 In this inquiry, the Committee has dealt with a huge amount of detailed and complex material in a situation in which many interest groups have strongly held their widely divergent views. A major task has been to analyse all

material presented and to separate assertions from facts. The Committee's work has been complicated because, particularly in respect of economic matters, strong claims have been made but detailed data to test these claims has been difficult to assemble.

- 1.18 In addition, the submissions and evidence were lacking in comprehensive information about the industry. Indeed, it became clear that at that time such information was not publicly available. The Committee therefore employed the consultants, Peat, Marwick, Mitchell Services to collect and compile information which would adequately describe the present situation in the Victorian Packaged Beverage Industry, including historical trends. This information is summarised in Chapter Three.
- 1.19 Based on the submissions received, evidence presented to the Committee, information collected about the industry and estimates of probable future trends if no further action were taken by Government, Chapter Four then goes on to discuss, within the framework of the Committee's terms of reference, the nature of problems which exist in Victoria and factors which would have to be taken into account if any form of Government action was contemplated. Conclusions are reached as to the need for Government action.
- 1.20 Chapter Five reviews the methods employed in South Australia and New South Wales to deal with the problems identified in the previous Chapter and also reviews the recommendations of an earlier Federal inquiry into the same issue.
- 1.21 The Committee draws its findings to a conclusion in Chapter Six and puts forward its recommendations.

- 1.22 Four hundred and ninety-seven submissions were received and 127 people gave evidence to the Committee. The names of those who made submissions and gave evidence are listed in Appendices 1 and 2. (These submissions and the transcript of evidence can be inspected by appointment at the Committee's offices.)
- 1.23 The terms of reference for the inquiry required the Committee "to investigate beverage and drink container deposit legislation". These words had different connotations for many people and, consequently, the majority of submissions and evidence presented either very general opinions or opinions based on a variety of different conceptions of the meaning of these words.
- 1.24 A few submissions were received which either provided particularly relevant information, summarised the overall range of problems involved or presented specific proposals. These submissions are referred to in the later chapters of this report and parts of some of these submissions have been included either in the text of the report or as appendices to the report.
- 1.25 An article appeared in the February 1983 edition of "The Australian Municipal Journal" containing arguments for and against deposit legislation. Ms Annie Austin, Executive Officer for the Municipal Association of Victoria, (Energy Guidelines Project) argued the case in favour of container deposit legislation. Mr. Tony O'Brien, representing the Packaging Council of Australia, presented the case against the legislation.

This article is repeated in this introduction as an indication of the tenor of the community debate during the course of the inquiry.

THE CASE IN FAVOUR

Fifteen years ago, Victorians purchased most beverage products - beer, milk and soft drink - in returnable bottles. Today, these beverages are sold mostly in single-use throwaway containers.

This trend, together with the development of a large variety of packaging forms for foodstuffs, has resulted in a dramatic increase in the generation of domestic refuse, the problem of litter, and the emergence of the "disposable" norm - the throwaway society.

An EPA garbage analysis survey has shown that packaging accounts for more than 30 per cent of domestic refuse. Other EPA surveys have shown that per capita generation of refuse is increasing at approximately 3 per cent per annum. The associated increased costs of collection and disposal of this refuse are borne directly by local government.

Although they form a relatively small part of total waste, beverage containers form a highly conspicuous element of the waste stream - on our beaches, beside our roads, in our cities and towns. They make an obvious target for any refuse reduction campaign.

Apart from the correct disposal of litter, container deposit legislation is about reducing the volume of refuse. The objective of compulsory deposit legislation is primarily to halt the growth of non-returnable containers by encouraging the use of refillable containers, thereby achieving a reduction in this component of the waste stream.

Container deposit legislation requires a deposit to be placed on all bottles and cans, redeemable upon return to a retailer or redemption centre. The bottles would then be refilled and the cans recycled.

The life of a glass container is thus extended from one to approximately ten "trips", and the overall beverage container component of the waste stream reduced by as much as 80 per cent. Bottle and can litter could be reduced by more than 60 per cent.

Local government waste management costs would be significantly reduced

The financial incentive of returning containers would encourage most consumers to recycle, and also the collection of thrown away returnable containers for redemption. The reduced collection and disposal costs would accrue to local government.

After the introduction of container deposit legislation in South Australia, the return rate of cans was approximately 85 per cent, virtually eliminating the litter and waste problems of cans in that State.

The consumer will pay less

Beverages purchased in throwaway containers include the full cost of the new container. South Australian experience shows that the financial impact of the legislation on breweries has been negligible, and that soft drink sales were not discernibly affected. Price increases barely kept up with inflation.

Compulsory recycling would save energy and resources

Recycling and refilling bottles and cans would considerably reduce the amount of energy now used in the manufacture of new throwaway containers.

Recycling an old aluminium can uses approximately 95 per cent less energy than manufacturing a new can from raw materials; a refillable bottle re-used ten times uses about one third of the energy required to make 10 throwaway bottles. Significant reductions in the use of raw materials in manufacture would be achieved.

While the amount of energy and raw materials consumed may appear small when compared with total industrial consumption, such economies are becoming increasingly important.

Jobs would be created

The introduction of compulsory deposit legislation would create jobs in the handling of recycled containers. Refilling and recycling old bottles and cans is a process that employs far more workers than manufacturing new throwaway containers, which is performed mostly by machine. The cost of establishing redemption centres in South Australia has not proved to be significant - a handling fee is provided for in the Act.

Community awareness about recycling will occur

Community awareness about recycling and appropriate refuse disposal will occur as a result of direct participation and involvement, together with the financial rewards.

A survey of South Australians conducted by the Australian Conservation Foundation in 1982 found that an overwhelming 72 per cent believed that the beverage container legislation was effective in reducing litter.

Other direct benefits include:

- maintenance of the recycling infrastructure, thereby ensuring the continuing economic use of resources and energy; and
- market stability in the beverage industry, and subsequent savings to consumers.

Are there alternatives?

The "systematic approach" to litter control favoured by the packaging industry focuses on the correct disposal of litter - not on reducing the generation of litter.

This approach, while educating the consumer about appropriate disposal of waste, does nothing to reduce the quantity of waste generated.

It increases the cost to the local government of waste management by increasing the number of bins and associated collection costs.

It increases the cost to the consumer, who pays for the cost of the campaign (either directly if publicity campaigns are funded by manufacturers or indirectly if funded by government) as well as the cost of a new container every time a drink is purchased.

There are obvious benefits of creating an awareness in the community about appropriate refuse disposal, especially from an aesthetic point of view.

However, any practical beneficial effects of such public relations exercises are difficult to assess, and the increasing volume of refuse and litter remains a problem, in spite of Keep Australia Beautiful campaigns. We just get better at throwing things away.

Container deposit legislation has been successfully implemented in several States of the United States of America and in South Australia, where all the benefits outlined above were achieved, as was a great deal of public enthusiasm for the system.

THE CASE AGAINST

The imposition of compulsory deposits legislation on beverage containers has been advanced by its supporters as a means of encouraging a move back to refillable containers. As such, the legislation attributes some assumed value to a refillable container.

In reality however, refillable containers in a modern society are about as outmoded as the out-house and the night cart (also based on a refillable system).

The single fill packaging concept has evolved over many years as the product of manufacturing and distribution economies, free market forces, and very strong consumer preference. And it's a concept that is here to stay.

Many bad effects

Compulsory deposits would certainly penalise consumers. They will have to pay an inflated price for their beverages - the deposit value plus various on costs - and in order to recoup their deposit outlay they will then incur additional costs in transport, time and inconvenience.

The legislation would be particularly hard on those consumers who, for reasons of old age, lack of a motor vehicle, or living some distance from a collection centre, are unable to return empty containers to redeem their deposits.

Packaging and beverage manufacturers certainly are opposed to compulsory deposits because they would lead to loss of jobs and a huge reinvestment in converting and filling equipment. Retailers also are anxious to avoid the added costs of establishing facilities to handle returned containers.

From a conservation viewpoint, there is really no justification for compulsory deposits.

In the first place, any advantage refillables have in terms of energy and material resource use depends very much on good trippage rates - something refillables here do not have. In fact, the advantage can disappear when high return rates are achieved for single fill container recycling schemes, something that is happening in Australia.

Secondly, the amount of resources used by packaging in total is so miniscule that even under the most favourable conditions, a 100 per cent refillable beverage container system would have virtually no measurable impact on conserving resources. And most of the resources involved are available in abundant supply anyway.

Little in it for Local Government

But what about compulsory deposits legislation as it directly affects local government, charged with the responsibility for cleaning up litter and collecting and disposing of solid waste? Here again, the benefits of legislation are illusory.

A litter survey of 62 city and country sites conducted last November by Keep Australia Beautiful Council with EPA participation showed that beverage containers represented just 7.3 per cent of the items counted, so as a litter control measure, deposit legislation would leave the vast majority of items untouched.

All the legislation would do is to provide a financial incentive for consumers to return rather than discard their beverage containers and for scavengers to get in the way of council clean ups in their search for empties to return to collect the deposits payable. It does nothing to discourage the act of littering itself.

So far as waste generation is concerned. EPA surveys show that total packaging represents about 12 per cent by weight of total urban waste in Victoria. Beverage containers would therefore account for only around 4 per cent, so even their complete removal from the waste stream would do little to extend the life of sanitary landfill sites or to reduce collection and disposal costs.

Alternatives available

Other states in Australia, notably NSW and West Australia, have demonstrated that litter can be effectively reduced across-the-board by employing a systematic approach that addresses itself to all litter by discouraging the initial act of littering. This approach is not dissimilar to the policy of education,

equipment and enforcement long practised by the Keep Australia Beautiful Council.

Proponents of compulsory deposits seem to conveniently overlook the fact that deposits legislation is just one element of South Australia's fight against litter and that it is the other measures introduced there some years previously that are primarily responsible for South Australia's reputation as a clean state.

The packaging industry is funding the various states' litter control programmes far out of proportion to its products' share of the litter stream. Even so, it is prepared to more fully support efforts in Victoria to ensure the already successful work done by Keep Australia Beautiful Council is further strengthened.

The Government could also be giving encouragement to enable recycling activities to be increased. The already high return rates being achieved here are due almost entirely to industry's own initiatives.

Some of this Government assistance should be to local government authorities for the establishment of resource recovery programmes similar to that operated by the City of Knox. This scheme, launched with industry encouragement and assistance, includes the use of co-operative neighbourhood depots and regular house to house collection of source separated materials, and is providing a number of benefits to both the council and the community it serves.

What Victoria needs is positive waste management programmes such as those just outlined. What we do not need is punitive compulsory deposit legislation which is disruptive, inflationary, discriminatory, and ineffective in achieving any worthwhile objective.

- 1.26 Great interest has been generated by the inquiry throughout Australia amongst the general community, various levels of government and industry, employee and conservation groups. Many conflicting claims have been made to the inquiry and through the media, particularly in terms of possible economic effects of the various alternative policy measures. The Committee found that many of these claims could not be substantiated and urges that care and caution be exercised when considering claims made in relation to the kinds of issues which have been addressed in this inquiry.

CHAPTER TWO

DEFINITIONS

BEVERAGES AND DRINKS

- 2.1 Throughout the rest of this report, the word "BEVERAGE" will be used in isolation as a generic term for beverages and drinks.
- 2.2 For the purposes of this report, a BEVERAGE is defined as any drink which is normally consumed in the form in which it is sold without the need for addition or dilution.

Beverages, such as the following, are INCLUDED in the above definition:

- Beer
- Wine
- Carbonated soft drinks
- Mineral waters
- Fruit juices
- Milk.

The following beverages are EXCLUDED from the above definition:

- Tea
- Coffee
- Powdered beverages
- Spirits
- Cordials

BEVERAGE CONTAINERS

- 2.3 For the purposes of this report, BEVERAGE CONTAINERS are defined as closed containers of between 190 millilitre and 6 litre capacity designed for the purpose of selling beverages to the consumer.

REFILLABLE BEVERAGE CONTAINERS

- 2.4 In practice, the only beverage containers which may be legally refilled are glass bottles as it is possible to thoroughly wash and fully sterilize these containers before refilling. Glass does not become impregnated with liquids with which it comes into contact.

For the purposes of this report, REFILLABLE BEVERAGE CONTAINERS are defined as glass bottles which have been expressly designed to be refilled as opposed to glass bottles designed for filling once only.

RECYCLABLE BEVERAGE CONTAINERS

- 2.5 For the purposes of this report, containers which can be fed back into a manufacturing process in place of the normal raw materials used to produce either similar containers or some other useful product are termed RECYCLABLE. All refillable beverage containers are recyclable.
- 2.6 In Victoria, at the present time, the only containers which are satisfactorily recycled in significant numbers are made of glass and aluminium. Small numbers of steel cans and plastic bottles have been recycled. Glass bottles designed by the container manufacturer to be filled once only are referred to in this report as "recyclable" even if some of these are refilled. These bottles frequently have the words "Recyclable - Not to be Refilled" embossed in the glass. However, other bottles (such as wine bottles) are not embossed but, nevertheless, are purchased by the beverage filler on the basis that he intends to use the bottle once only. These bottles have also been classified as "recyclable" rather than "refillable" for statistical purposes.

Glass collected for re-use as a raw material is commonly referred to as CULLET.

RECYCLING

- 2.7 In this report, a wide meaning has been given to the term RECYCLING to cover both the process of feeding the materials back into the manufacturing process and the refilling of containers.

LITTER AND WASTE

- 2.8 For the purposes of this report, LITTER is defined as material improperly discarded or dropped in a public place. This excludes material discarded into a litter bin, although if the material falls from the bin at some later time, it then becomes litter. Also, material discarded at major spectator events in confined areas, such as the Melbourne Cricket Ground, is not regarded in the terms of this inquiry as litter if it is cleaned up by the caterers as part of their agreement with the event operators.
- 2.9 For the purposes of this report, WASTE includes material which is collected for disposal generally as landfill. Materials reused and litter prior to collection are excluded from waste.

CHAPTER THREE

OVERVIEW OF THE VICTORIAN PACKAGED BEVERAGE INDUSTRY

3.1 The following factual material has been prepared primarily from reports produced for the Committee by the consultants, Peat, Marwick, Mitchell Services. This chapter provides an overview of the present Victorian packaged beverage industry, including recent trends, and covers the following:

- Structure
- Key features
- Raw materials
- Types of beverage containers
- Types of beverages
- Distribution of packaged beverages
- Prices
- Refilling and recycling of beverage containers
- Litter
- Waste disposal
- Energy
- Industry ownership
- Employment
- Capital investment
- Sales revenue.

STRUCTURE

3.2 The Victorian beverage industry structure includes raw material supply and conversion, container manufacture, beverage filling, distribution, retailing and disposal/re-use. This is illustrated in Figure 1.

THE PRESENT SYSTEM
1982-1983

Figures relate to beverages consumed in Victoria.

17

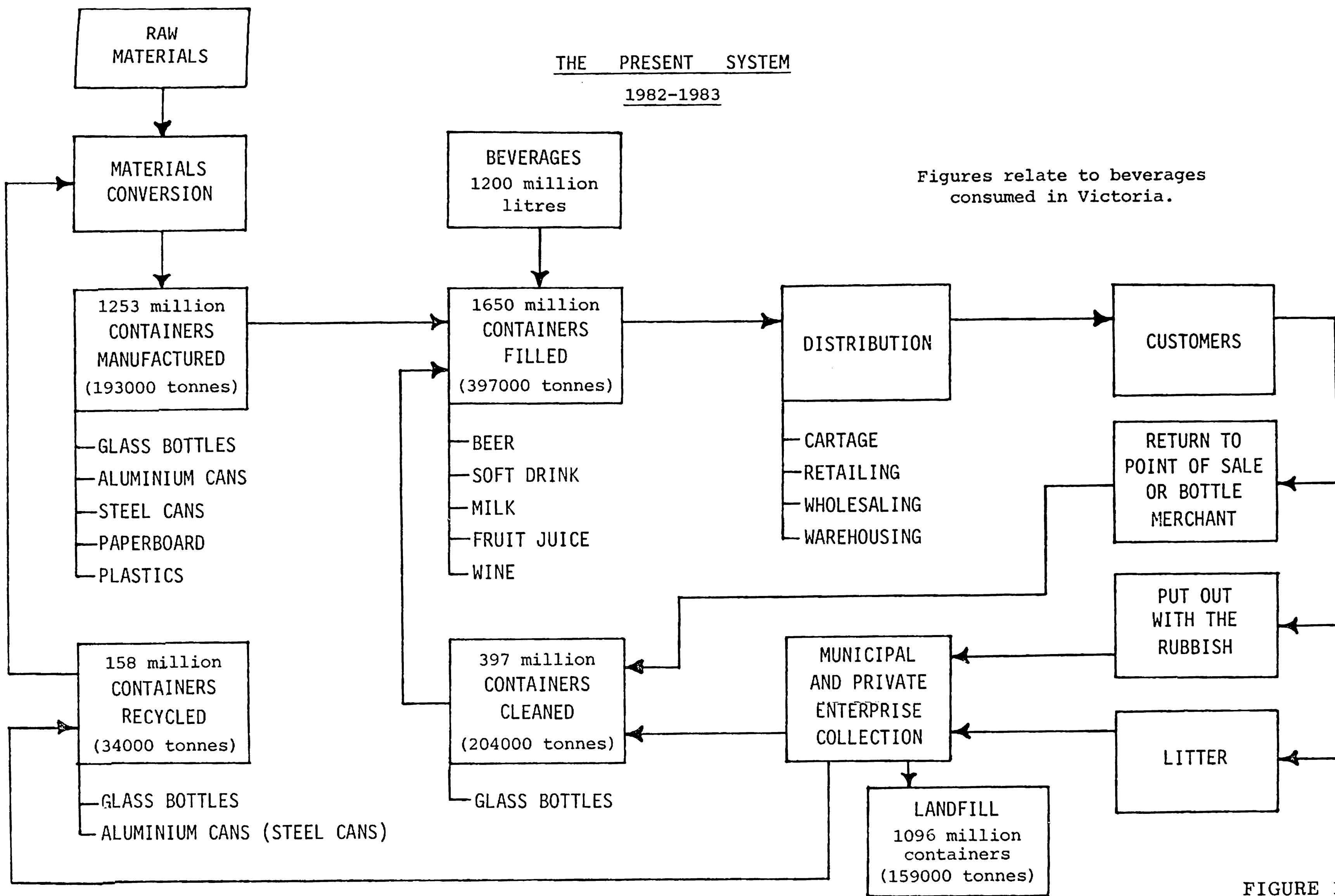


FIGURE 1

KEY FEATURES

3.3 Major features of beverage container usage in Victoria in 1982-83 are set out below. Details are included in Tables 1 and 2.

- (1) 1650 million new and used beverage containers were filled with beverages which were later consumed in Victoria. These containers weighed 397 000 tonnes and contained 1200 million litres of beverages.
- (2) These 1650 million containers were made up of:
 - (a) 1253 million new manufactured beverage containers, weighing 193 000 tonnes; and
 - (b) 397 million used glass bottles which were recovered, washed and re-filled, weighing 204 000 tonnes.
- (3) After these 1650 million containers reached the consumer (in addition to the 397 million used glass containers which were recovered, washed and refilled as mentioned above):
 - (a) 157 million used glass and aluminium containers were recycled as substitute raw materials, weighing 34 000 tonnes.
 - (b) 1096 million used containers were disposed of as litter and to landfill, weighing 159 000 tonnes. This comprised approximately 5 per cent by weight of all solid waste disposed of to landfill in Victoria. Collection and disposal of beverage containers including the cost of cleaning up beverage container litter cost Victorian local government approximately \$3.8 million or approximately 0.35 cents per container disposed of to landfill.

The net waste disposed of to landfill included 169 million refillable glass bottles (69 000 tonnes), 182 million non-refillable glass bottles (61 000 tonnes), 158 million aluminium cans (3000 tonnes), 88 million steel cans (6000 tonnes), 65 million plastic containers (5000 tonnes), and 434 million paperboard containers (15 000 tonnes).

- (4) Of the 1650 million containers sold, 64 per cent were potentially recyclable (33 per cent refillable and/or recyclable, 31 per cent recyclable) and 36 per cent were not recyclable. Of these containers 554 million - 34 per cent - were recycled or refilled (24 per cent refilled, 10 per cent recycled).

| 1982-83 UNITS | NEW CONTAINERS (MILLION) | SALES THROUGHPUT (MILLION) | REFILLED THROUGHPUT (MILLION) | RECYCLED (MILLION) | NET WASTE (MILLION) |
|-------------------------------|--------------------------------|----------------------------------|-------------------------------------|-----------------------|---------------------------|
| REFILLABLE/RECYCLABLE | | | | | |
| <u>Glass</u> | | | | | |
| • Beer | 161 | 413 | 252 | - | 161 |
| • Soft drink | 6 | 77 | 71 | - | 6 |
| • Milk | 2 | 62 | 60 | - | 2 |
| TOTAL REFILLABLE | 169 | 552 | 383 | - | 169 |
| NON-REFILLABLE/RECYCLABLE | | | | | |
| <u>Glass</u> | | | | | |
| • Soft drink | 189 | 198 | 9 | - | 189 |
| • Wine | 38 | 43 | 5 | - | 38 |
| • Fruit juice/Beer | 26 | 26 | - | - | 26 |
| TOTAL | 253 | 267 | 14 | - | 253 |
| LESS: Cullet* | | | | 71 | (71) |
| Net Recyclable Glass | | | | | 182 |
| TOTAL GLASS | 422 | 819 | 397 | 71 | 351 |
| <u>Aluminium</u> | 244 | 244 | - | 86 | 158 |
| TOTAL RECYCLABLE | 497 | 511 | 14 | 157 | 340 |
| NON-REFILLABLE/NON-RECYCLABLE | | | | | |
| Tinplate | 88 | 88 | - | - | 88 |
| Plastic | 65 | 65 | - | - | 65 |
| Paperboard | 434 | 434 | - | - | 434 |
| TOTAL NON-RECYCLABLE | 587 | 587 | - | - | 587 |
| TOTAL | 1253 | 1650 | 397 | 157 | 1096 |

* The weighted average weight of glass bottles in the beverage industry (1982-83) is 447 grams, and this has been used to derive the units figure from the cullet tonnage.

| 1982-83 TONNES | NEW CONTAINERS (000's) | SALES THROUGHPUT (000's) | REFILLED THROUGHPUT (000's) | RECYCLED (000's) | NET WASTE (000's) |
|--------------------------------------|------------------------------|--------------------------------|-----------------------------------|---------------------|-------------------------|
| REFILLABLE/RECYCLABLE | | | | | |
| <u>Glass</u> | | | | | |
| • Beer | 61 | 179 | 118 | - | 61 |
| • Soft drink | 7 | 61 | 54 | - | 7 |
| • Milk | 1 | 24 | 23 | - | 1 |
| TOTAL REFILLABLE | 69 | 264 | 195 | - | 69 |
| NON-REFILLABLE/RECYCLABLE | | | | | |
| <u>Glass</u> | | | | | |
| • Soft drink | 62 | 68 | 6 | - | 62 |
| • Wine | 24 | 27 | 3 | - | 24 |
| • Fruit juice/Beer | 7 | 7 | - | - | 7 |
| TOTAL | 93 | 102 | 9 | - | 93 |
| LESS: Cullet | | | | 32 | (32) |
| Net Recyclable Glass | | | | | 61 |
| TOTAL Glass | 162 | 366 | 204 | 32 | 130 |
| <u>Aluminium</u> | 5 | 5 | - | 2 | 3 |
| TOTAL RECYCLABLE | 98 | 107 | 9 | 34 | 64 |
| NON-REFILLABLE/NON-RECYCLABLE | | | | | |
| Tinplate | 6 | 6 | - | - | 6 |
| Plastic | 5 | 5 | - | - | 5 |
| Paperboard | 15 | 15 | - | - | 15 |
| TOTAL NON-RECYCLABLE | 26 | 26 | - | - | 26 |
| TOTAL | 193 | 397 | 204 | 34 | 159 |

TABLE 2 FLOW OF BEVERAGE CONTAINERS VICTORIA 1982-83

WEIGHT OF CONTAINERS

RAW MATERIALS

3.4 The materials used in the manufacture of beverage containers are listed below, together with the major naturally occurring raw materials (excluding fuels) from which the container materials are derived:

Glass: Sand, limestone and sodium chloride.

Aluminium: Bauxite, limestone, sodium chloride and fluorspar.

Steel: Limestone and iron ore.

Laminated
Paperboard: Pulpwood and low density polythene (derived from oil or gas).

Plastic: Various polymers derived from oil or gas.

The quantities of these raw materials used in 1982-83 to manufacture beverage containers for beverages consumed in Victoria were estimated to be:

| | |
|-----------------------------|----------------|
| Sand | 123 000 tonnes |
| Limestone | 40 000 " |
| Sodium chloride | 60 000 " |
| Bauxite | 43 000 " |
| Fluorspar | 11 000 " |
| Iron ore | 18 000 " |
| Pulpwood (as dry woodchips) | 30 000 " |
| Plastic polymers | 8 000 " |

TYPES OF BEVERAGE CONTAINERS

3.5 The numbers, weight and volumetric content of full beverage containers sold to consumers in Victoria during 1982-83 are set out in the following table. The majority of these containers were manufactured in Victoria:

TABLE 3

FULL CONTAINERS SOLD IN VICTORIA 1982-83

| Container Material | Number Millions | Contents Millions of Litres | Container Weight Thousands of Tonnes |
|--------------------|-----------------|-----------------------------|--------------------------------------|
| Glass | 819 | 512 | 366 |
| Aluminium | 244 | 92 | 5 |
| Steel | 88 | 34 | 6 |
| Plastic | 65 | 125 | 5 |
| Paperboard | 434 | 437 | 15 |
| Total | 1 650 | 1 200 | 397 |

3.6 Glass, aluminium, steel and, more recently, some plastic containers are used to package carbonated beverages (beer, some wines and soft drinks). Carbonated beverages require a container which will withstand the carbonation pressures and retain the carbon dioxide over the shelf life of the beverage which is normally of the order of one to six months. The carbon dioxide acts as a preservative by excluding oxygen from the container.

3.7 Non-carbonated beverages (milk, fruit juices and most wine) were originally sold in glass containers but are now increasingly sold in paperboard and plastic containers. Ninety-two per cent of all packaged milk, most fruit juices and 15 per cent of wine are now sold in the more recent forms of packaging. Various methods and combinations of methods are used to preserve these beverages. These include refrigeration, the addition of sugar and/or vitamin C, pasteurization and packaging methods which exclude oxygen by virtue of the method of package formation and closure. The shelf life of the beverages ranges from days to many years.

3.8 The numbers, weights and volumetric contents of full glass beverage containers sold in Victoria during 1982-83 are set out in the following table:

TABLE 4
FULL GLASS CONTAINERS SOLD IN VICTORIA 1982-83

| Container | Beverage | Number Millions | Contents Millions of Litres | Container Weight Thousands of Tonnes |
|------------------|---------------|-----------------|-----------------------------|--------------------------------------|
| Refillable Glass | Beer | 413 | 247 | 179 |
| | Soft Drink | 77 | 60 | 61 |
| | Milk | 62 | 37 | 24 |
| | Sub-total | 552 | 344 | 264 |
| Recyclable Glass | Soft Drink | 198 | 116 | 68 |
| | Wine | 43 | 42 | 27 |
| | Fruit Juice) | 26 | 10 | 7 |
| | Beer) | | | |
| | Sub-total | 267 | 168 | 102 |
| ALL GLASS | TOTAL | 819 | 512 | 366 |

TYPICAL CONTAINERS USED FOR
CARBONATED BEVERAGES



BEER



SOFT DRINKS AND MINERAL WATERS

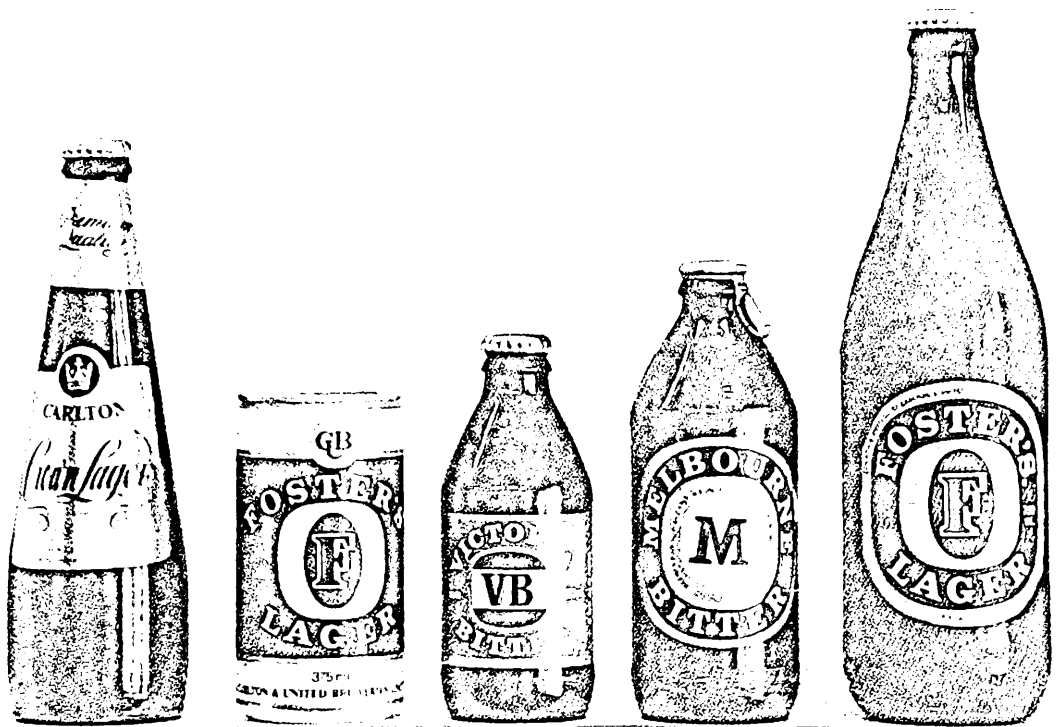
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| | Beer) | | | |
| | Sub-total | 267 | 168 | 102 |
| ALL GLASS | TOTAL | 819 | 512 | 366 |

TYPICAL CONTAINERS USED FOR
CARBONATED BEVERAGES



BEER

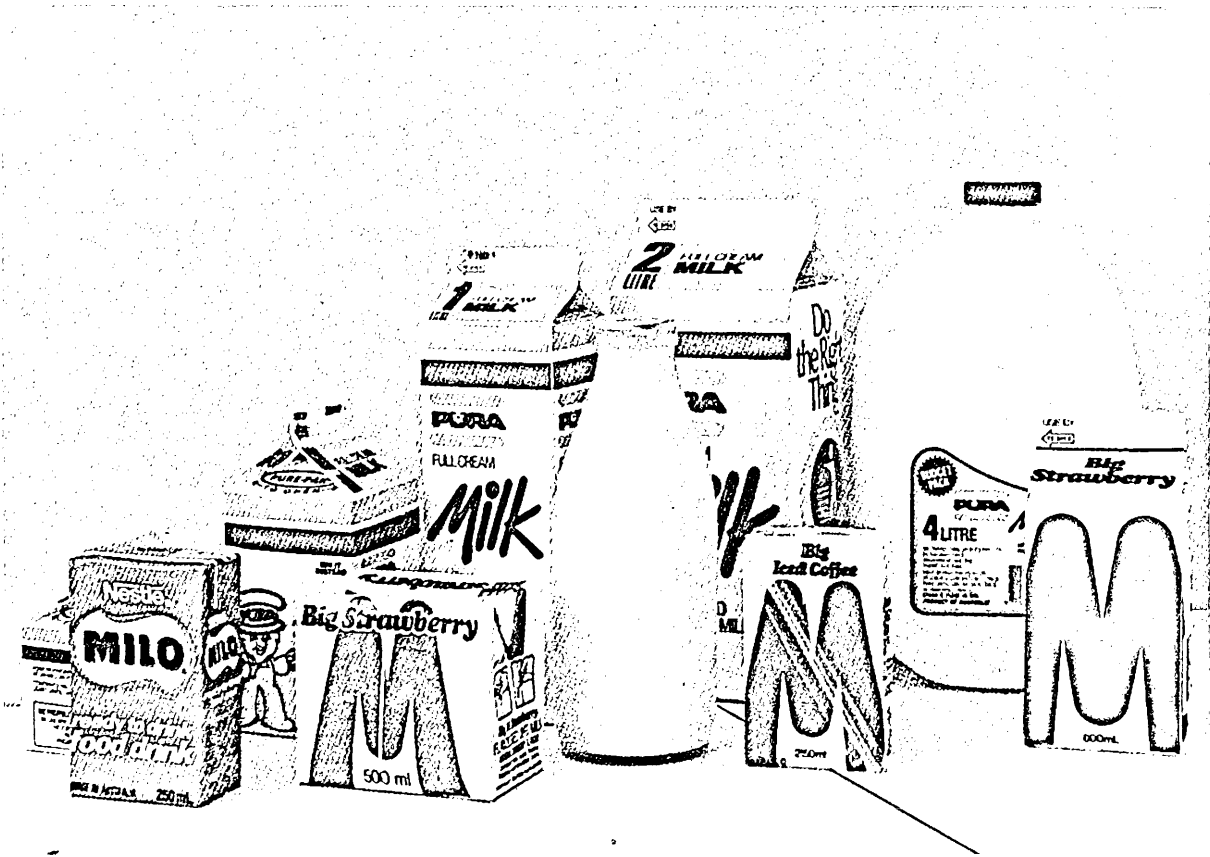


SOFT DRINKS AND MINERAL WATERS

TYPICAL CONTAINERS USED FOR
NON-CARBONATED BEVERAGES



FRUIT JUICES



MILK

TYPICAL CONTAINERS USED FOR
CARBONATED AND NON-CARBONATED



WINES

3.9 The longer term historical trends for the various types of containers used are shown in figures 2, 3, 4 and 5. The dates when various types of packaging were introduced and had a major impact in the market place are shown in Table 5.

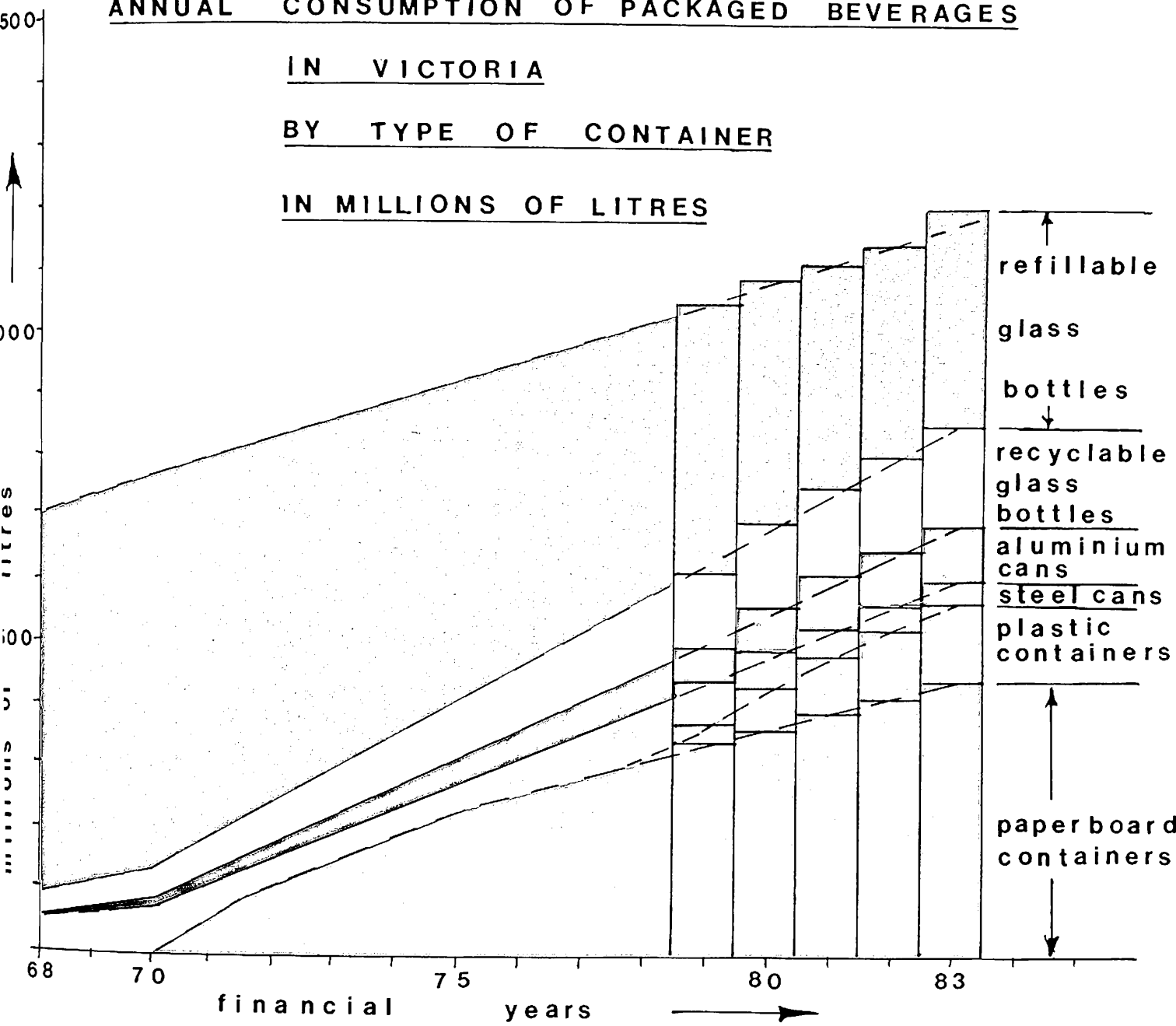
TABLE 5

THE INTRODUCTION OF NEW TYPES
OF BEVERAGE PACKAGING BY THE VICTORIAN
PACKAGING INDUSTRY

| Package | Year of Introduction | Year of Major Impact |
|--|----------------------|----------------------|
| Steel cans | 1958 | 1959 |
| Non-refillable, recyclable glass bottles | 1964 | 1975 |
| Soft pack "wine" casks | 1968 | 1972 |
| Aluminium cans | 1968 | 1972 |
| Polythene laminated paper-board cartons | 1970 | 1970 |
| Polythene laminated paper-board "briks" | 1972 | 1978 |
| Plastic PET bottles | 1979 | 1979 |

FIGURE 2

ANNUAL CONSUMPTION OF PACKAGED BEVERAGES
IN VICTORIA
BY TYPE OF CONTAINER
IN MILLIONS OF LITRES



MILLIONS OF BEVERAGE CONTAINERS FILLED
AND SOLD ANNUALLY IN VICTORIA
BY TYPE OF CONTAINER

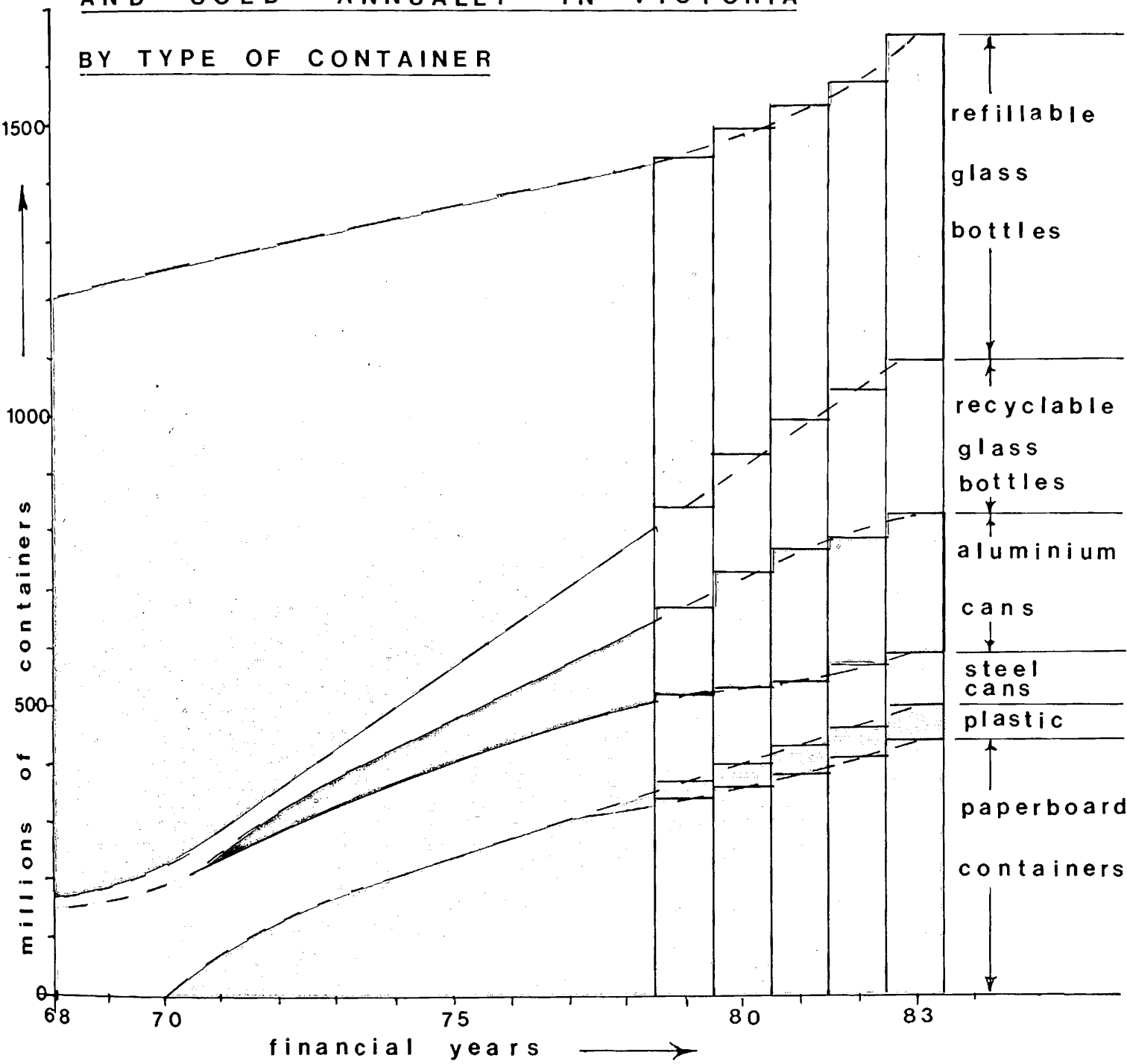


FIGURE 4

**MILLIONS OF BEVERAGE CONTAINERS FILLED
AND SOLD IN VICTORIA EACH YEAR
IN VARIOUS CONTAINER SIZES**

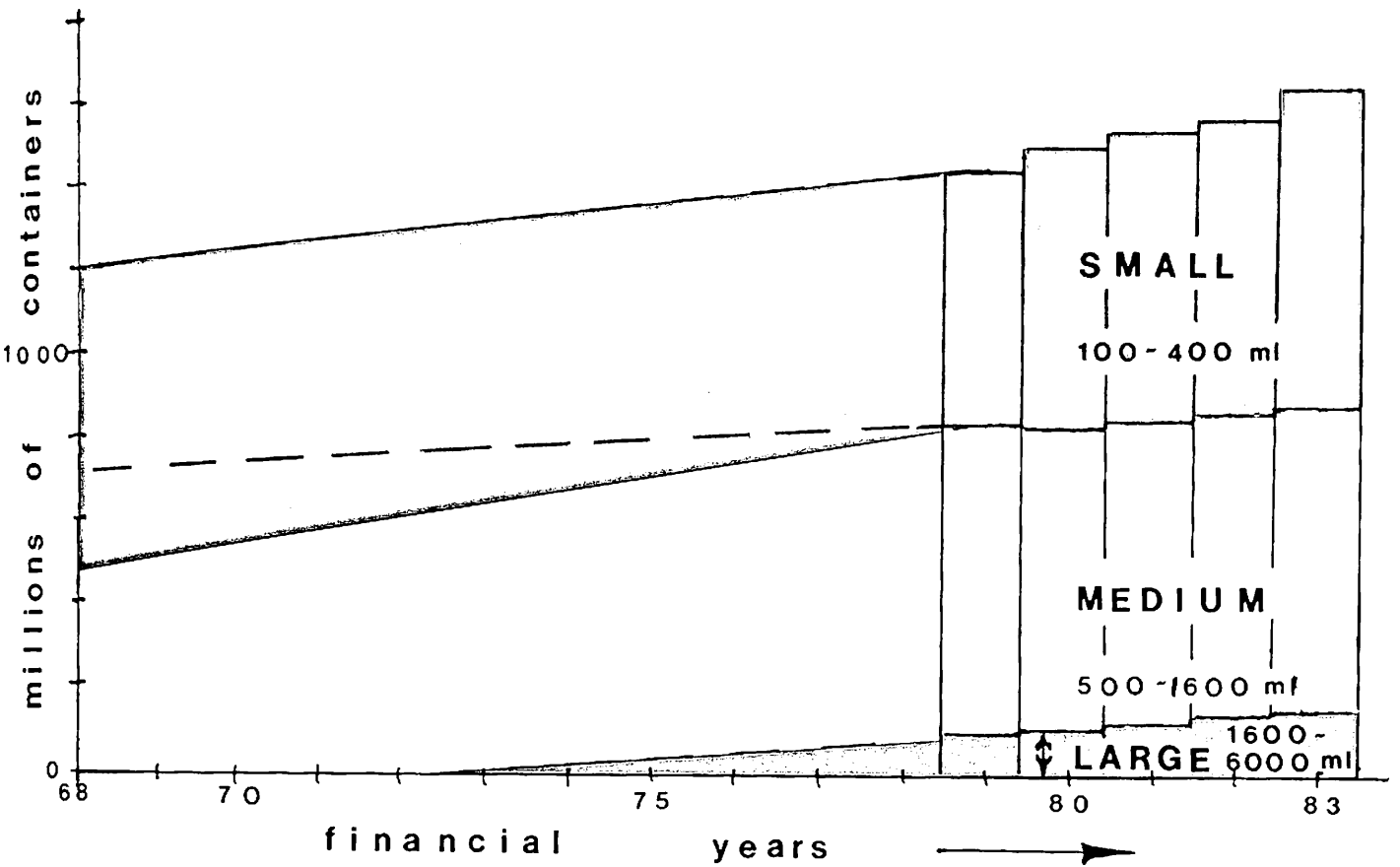
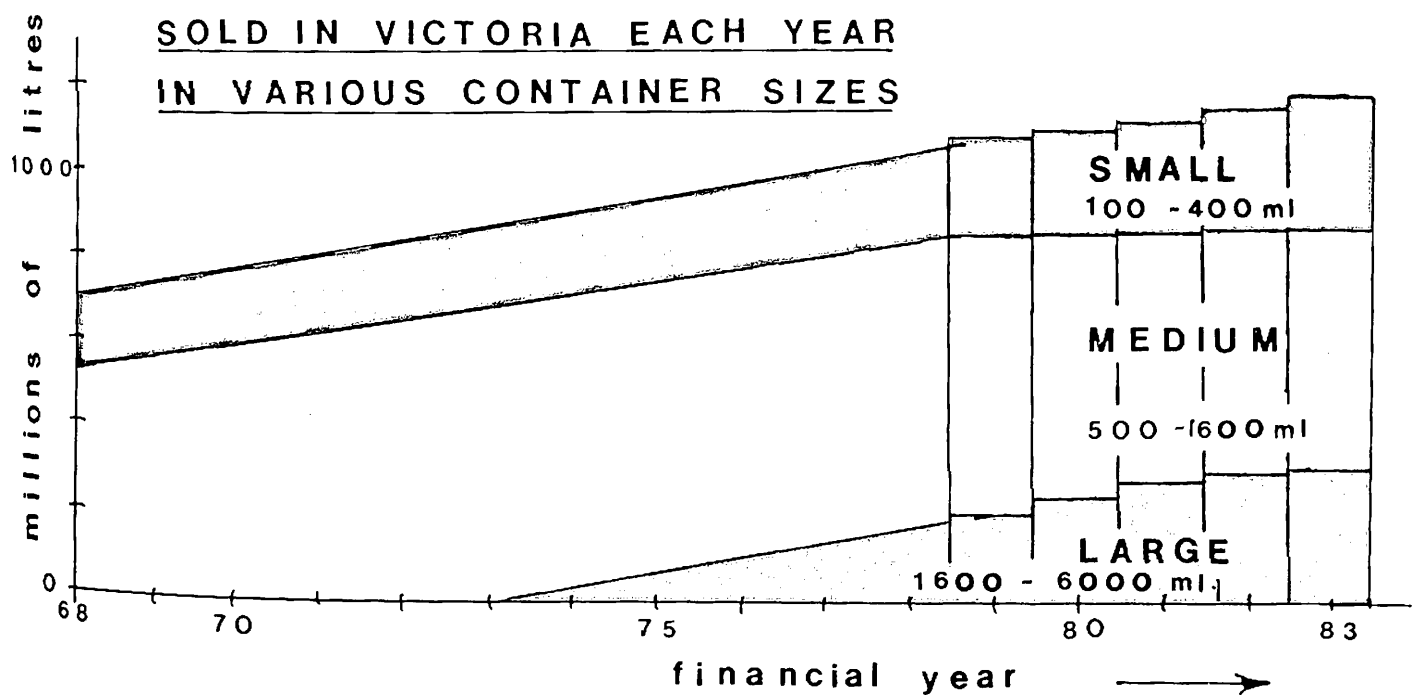


FIGURE 5

**MILLIONS OF LITRES OF PACKAGED BEVERAGES
SOLD IN VICTORIA EACH YEAR
IN VARIOUS CONTAINER SIZES**



3.10 The major changes which have occurred over the last fifteen years in the packaging of beverages are:

- Non-carbonated beverages (milk, fruit juice and wine) have increasingly been packaged in plastic and paperboard containers.
- About 21 per cent of all carbonated beverages have been packaged in 375 ml steel or aluminium cans. Aluminium cans have almost completely replaced steel cans during the past year.
- The container sizes in use have changed considerably as shown in Figure 5. Large plastic and paperboard containers now contain a significant proportion of the total volume of beverages consumed in the non-carbonated beverage sector. The number of small single serve containers sold has also increased in both the carbonated and non-carbonated sectors.
- The polyethylene terephthalate (PET) two litre container was introduced in Victoria in 1979-80 for soft drinks. A 1250 ml PET container has been in use in New South Wales since 1982-83 but has not yet been introduced into the Victorian marketplace. Fifteen per cent, by volume, of all soft drinks sold in Victoria was packaged in the two litre PET container in 1982-83.
- The percentage of all soft drinks, by volume, packaged in refillable glass bottles dropped from 40 per cent in 1978-79 to 21 per cent in 1982-83.
- Packaged beer was sold in containers of two sizes - 375 ml and 750 ml until the end of 1982-83. Late in 1983, a 250 ml glass bottle was introduced to compete with beer in a similar container imported from New South Wales. Most beer in both 375 ml glass and 375 ml aluminium (steel) containers is currently sold at approximately the same price and therefore the balance between these two containers is largely a matter of consumer preference. Sales in cans are slowly declining. Sales in 375 ml glass bottles

are increasing at a very fast rate mainly at the expense of 750 ml bottles and bulk beer purchased over the bar at a club or hotel.

TYPES OF BEVERAGES

3.11 Estimated beverage sales in Victoria during 1982-83 were:

TABLE 6

ESTIMATED BEVERAGE SALES - VICTORIA 1982-83

| | Millions of Litres | | |
|-------------|--------------------|----------|-------|
| | Bulk | Packaged | Total |
| Beer | 121 | 311 | 432 |
| Soft Drink | 12 | 282 | 294 |
| Milk | 14 | 431 | 445 |
| Wine | 2 | 72 | 74 |
| Fruit Juice | 5 | 103 | 108 |
| Total | 154 | 1 199 | 1 353 |

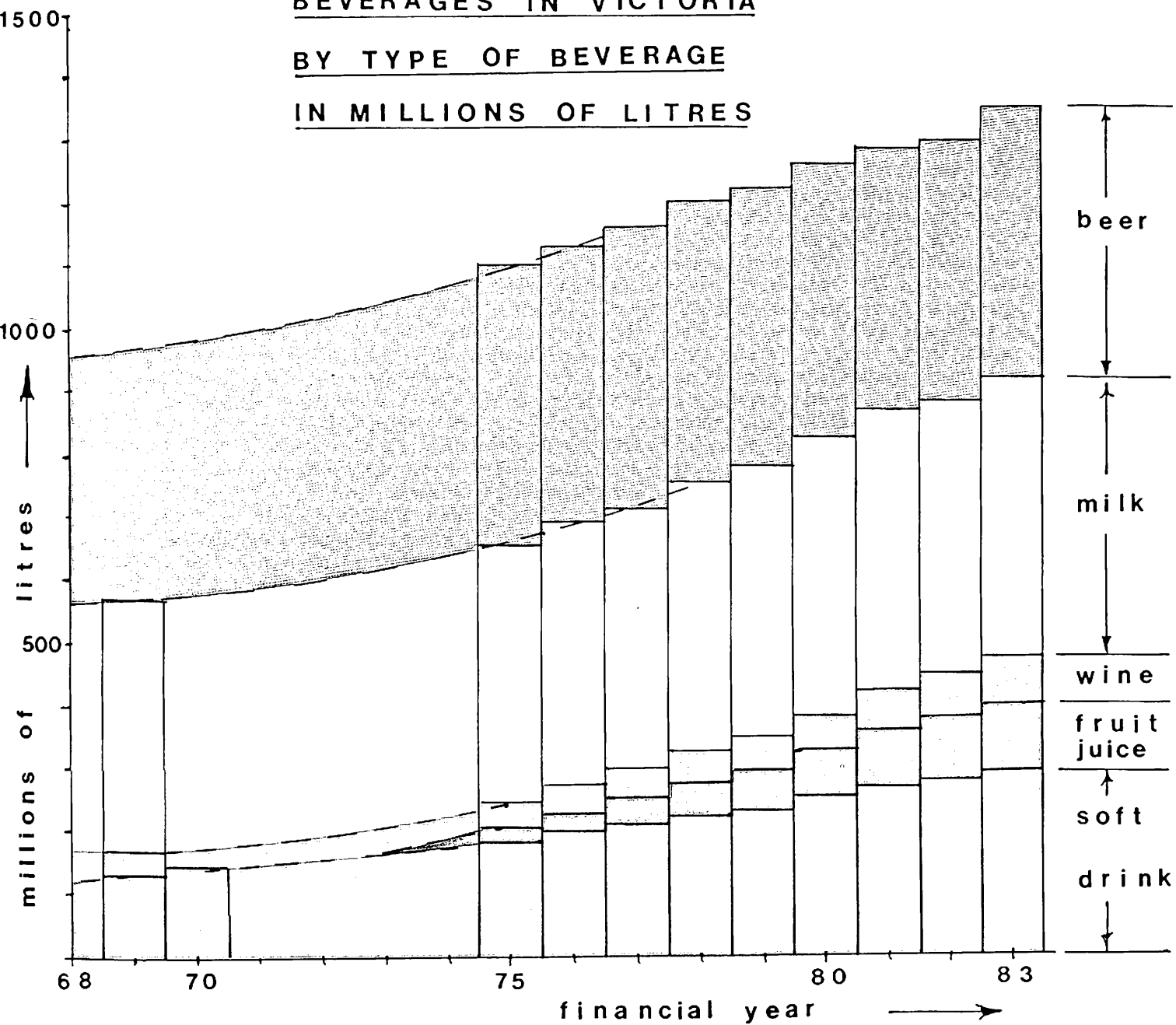
3.12 Figure 6 indicates the growth in Beverage sales over the last fifteen years.

ANNUAL CONSUMPTION OF BULK AND PACKAGED

BEVERAGES IN VICTORIA

BY TYPE OF BEVERAGE

IN MILLIONS OF LITRES



3.13 The following estimates were made of the per capita consumptions over the past five years:

TABLE 7

ESTIMATED ANNUAL PER CAPITA CONSUMPTION - VICTORIA

| LITRES | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
|-------------------|---------|---------|---------|---------|---------|
| Bulk Beer | 37 | 35 | 35 | 30 | 30 |
| Packaged Beer | 77 | 75 | 73 | 73 | 77 |
| Soft Drink | 63 | 64 | 67 | 67 | 69 |
| Milk | 108 | 108 | 114 | 108 | 107 |
| Wine | 14 | 15 | 16 | 17 | 18 |
| Fruit Juice | 16 | 19 | 21 | 24 | 26 |
| Total Consumption | 317 | 316 | 325 | 319 | 320 |

Bulk sales of soft drink, milk, wine and fruit juice are included in the above figures but bulk sales are a relatively small proportion of sales except in the case of beer.

These estimates indicate a relatively stable per capita total consumption of beverages of approximately 319 litres per year (plus or minus two per cent). Total sales of beverages over recent years are therefore increasing at approximately the same rate as the population is increasing which for Victoria in the period 1971-1981 was 0.92 per cent, per annum.

3.14 Within this generally stable pattern some changes have occurred during recent years which can be summarised as follows:

- Sales of bulk beer have fallen considerably whilst sales of packaged beer are fairly static;

- Milk sales have kept pace with population levels;
- Soft drink sales have increased at a rate of approximately 2-3 per cent per annum;
- Fruit juice sales have increased from virtually nothing in the early 1970's to approximately 8 per cent of the total beverage market in 1982-83; and
- Wine sales have increased by approximately 33 per cent over the last five years. However, wine sales only represent approximately 5.5 per cent of the total beverage market.

DISTRIBUTION OF PACKAGED BEVERAGES

3.15 Table 8 lists the type and numbers of retail outlets for beverages in Victoria and Table 9 provides an estimate of the distribution pattern for the various beverages through these outlets.

TABLE 8
VICTORIAN RETAIL PACKAGED BEVERAGE
OUTLETS - 1982-83

| | <u>Nos.</u> |
|--|-------------|
| Grocery: (1) | |
| Supermarkets | 480-500 |
| Grocery Store | 850-900 |
| Route: (2) | |
| Convenience Stores | 70-80 |
| Milk bars/Mixed businesses | 4900 |
| Licensed Hotels | 1450 |
| Licensed Bottle Outlets ⁽³⁾ | 770 |
| Clubs, Licensed Restaurants, etc. | 1100 |
| Independent Licensed Milk Vendors | 186 |

- (1) Grocery stores (including supermarkets) retail fresh fruit, vegetables and meats and have limited opening hours.
- (2) Route stores (including convenience stores) retail limited fruit and vegetables but not fresh meat, and have unlimited opening hours. Convenience stores including Seven-Eleven and Food Plus can be classified as "super" milk bars and have unlimited retail hours but are limited by law to a specified range of products.
- (3) Licensed bottle outlets include licensed supermarkets, grocery and convenience stores, and there is therefore an element of double counting in the above figures.

TABLE 9

VICTORIAN RETAIL DISTRIBUTION PATTERN
OF PACKAGED BEVERAGES - 1982-83

| Beverage | Super- markets/ Grocery % | Milk bars/Mixed businesses % | Hotels ¹ % | Liquor Stores ² % | Home Delivery ³ % |
|-------------|------------------------------------|---------------------------------------|--------------------------|------------------------------------|------------------------------------|
| Beer | - | - | 60-65 | 35-40 | - |
| Soft Drink | 45-50 | 45-50 | - | - | 5 |
| Milk | 25-30 | 55-60 | - | - | 15 |
| Fruit Juice | 30-40 | 60-70 | - | - | - |
| Wine | - | - | 35-40 | 60-65 | - |

(1) Included in hotels are club, restaurant and other outlets.

A small amount of packaged milk, fruit juice and soft drink would be consumed in hotels, clubs, restaurants, etc., but the majority of consumption will be bulk products including "post mix" soft drink.

(2) The liquor licences held by supermarkets are treated as liquor stores.

(3) Milk vendors often deliver fruit juice also.

3.16 The following historical trends affecting the distribution of beverages were noted:

- A growth in the number of supermarket outlets;
- A decline in the home delivery of milk products, particularly in the metropolitan area;
- The establishment of 24 hour "convenience" stores;
- The development of liquor "chain" stores, discount stores and liquor sales by supermarkets;
- The imposition and suspension of minimum price fixing for beer;
- The impact of the *Trade Practices Act* in preventing retail price setting by beverage fillers; and
- The gradual extension of shop trading hours until recently, particularly by supermarkets.

3.17 These trends, together with other social and economic factors have contributed to:

- The proportion of packaged beer sold in Victoria by the 1450 hotels declining relative to the sales of 770 competing licensed bottle shops;
- The increasing proportion of milk, fruit juice and soft drinks sold by supermarkets;
- The uncertain financial viability of many of Victoria's 5 000 milk bars/mixed businesses;
- The home delivery service for milk provided by distribution dairies and vendors being phased out; and

- Supermarkets not selling refillable containers. A major reason for the trend to non-refillable soft drink bottles has been the influence of supermarket retailing. In general, the nature of such retailing encompassing high stock turnovers, low storage capacity and high shelf space utilisation works against the development and maintenance of a refillable bottle system.

PRICES

3.18 The aspect of beverage prices which is of particular concern in relation to the Committee's inquiry is the effect of using different container systems on the price of the product. The approximate relative container prices in cents are shown in the table below (absolute prices are subject to a number of factors such as the quantity ordered etc.):

TABLE 10A
CONTAINER PRICES

| Capacity | Glass | Aluminium | Paperboard | Plastic | PET |
|------------|-----------------------|-----------|------------|---------|-----|
| | (Cents per Container) | | | | |
| 250-375 ml | 7 | 11 | 3 | 6 | - |
| 500 ml | - | - | 3 | 8 | - |
| 600 ml | - | - | 4 | - | - |
| 750 ml | 18 | - | - | - | - |
| 1 litre | - | - | 6 | 19 | - |
| 1.25 litre | 19 | - | - | - | - |
| 2 litre | - | - | 11 | 21 | 37 |
| 4 litre | - | - | - | 26 | - |

3.19 Refillable glass soft drink bottles have traditionally been heavier than other glass bottles and as a result would cost more than the prices indicated above even if purchased in large quantities. However, refillable bottles are used many times and thus the prime cost of the bottle can be spread across the

total number of trips completed by each bottle. This saving in container cost must be offset by the cost of recovery and washing.

3.20 The majority of the beer was sold during 1982-83 in 375 ml and 750 ml returnable glass bottles and 375 ml cans. At the return rates achieved in 1982-83, the cost of recovering a 375 ml glass bottle for refilling was approximately 5 cents and the cost of recovering a 750 ml bottle was approximately 6.5 cents. The cost of a new 375 ml bottle was less than 7 cents and the cost of a new 750 ml bottle was less than 18 cents. It was therefore marginally economic to recover the 375 ml bottles and highly economic to recover 750 ml bottles. It is probably not economic to recover the new 250 ml bottle introduced in late 1983, although Carlton and United Breweries are recovering these bottles as a matter of policy.

3.21 In 1982-83, soft drinks were sold mainly in containers which fall into one of the following four categories:

| | | |
|-------------|---|-----------------|
| 285 ml | - | glass bottles; |
| 375 ml | - | aluminium cans; |
| 750-1250 ml | - | glass bottles; |
| 2000 ml | - | PET bottles. |

A comparison of soft drink prices, in cents per litre, for soft drinks (colas) sold in various containers is shown in Table 10B. The recommended retail prices are taken from the fillers' price lists current on the week ending 26 October 1983 and represent the minimum prices charged by milk bars and other small outlets. The supermarket prices are taken from a routine market survey by A. C. Nielsen during the week ending 26 October 1983. The prices shown are a simple average of the 15 to 20 prices reported for the eleven supermarket chains covered by the survey.

TABLE 10B

COMPARISON OF SOFT DRINK (COLA) PRICES -
METROPOLITAN VICTORIA
WEEK ENDING 26 OCTOBER 1983

| Filler & Package | Recommended Retail Price Cents/litre | Supermarket Price Cents/litre |
|-------------------------|--------------------------------------|-------------------------------|
| C.C. 285 ml bottle | 164.9 | 129.0 |
| C.C. 375 ml can | 151.4 | 112.7 |
| C.S. 750 ml bottle | 117.3 | 94.8 |
| C.S. 900 ml bottle** | 97.8* | - |
| C.C. 1 litre bottle** | 86.0* | - |
| C.C. 1.25 litre bottle | 91.2 | 70.7 |
| C.C. 2 litre PET bottle | 85.5 | 66.2 |

C.C. Coca-Cola Bottlers; C.S. Cadbury-Schweppes.

** Returnable bottle.

* Price net of deposit.

3.22 In 1982-83, the majority of milk was sold in 250, 300, 600, 1000 and 2000 ml paperboard cartons and 600 ml refillable glass bottles. Some 4000 ml and 2000 ml plastic containers were introduced towards the end of 1983.

No new glass milk bottles were manufactured in Victoria in 1982-83 but the estimated cost of these bottles would lie between 20 cents and 50 cents a bottle, depending upon the quantity manufactured and the bottle design.

The equivalent costs of paperboard and plastic containers expressed in cents per 600 ml of container capacity and cents per litre of container capacity are:

TABLE 11

COMPARISON OF MILK CONTAINER COST - VICTORIA
1982-83

| | Cents per 600 ml of capacity | Cents per litre of capacity |
|-----------------------|---------------------------------|--------------------------------|
| 250/300 ml Paperboard | 6.0 | 10.0 |
| 600 ml " | 4.0 | 6.7 |
| 1000 ml " | 3.6 | 6.0 |
| 2000 ml " | 3.3 | 5.5 |
| 4000 ml Plastic | 3.15 | 5.25 |

Approximately 79 per cent of the milk sold in Victoria in 1982-83 was contained in 1000 and 2000 ml paperboard containers. (A further 11 per cent of the milk sold was contained in smaller paperboard containers.) The cost of these larger paperboard and plastic containers is less than the estimated costs of recovering and washing an equivalent number of 600 ml refillable glass bottles.

3.23 Fruit juice is sold in much the same range of containers as milk except that in addition 250, 375, 500, 1000 and 2000 ml plastic bottles are used. The smaller plastic bottles are up to 100 per cent more expensive than the equivalent paperboard containers but have properties related to the transport and preservation of the product which in certain instances outweigh this disadvantage.

3.24 Wine is sold mainly in 750 ml non-refillable bottles, 2000 ml non-refillable flagons or 4000 ml soft pack casks. Some of the wine bottles and flagons are collected and re-used by the smaller vineyards.

New empty winecasks are approximately 25 per cent cheaper than new 750 ml wine bottles if the price of both is expressed in cents per litre of capacity. However, glass bottles and flagons have barrier properties which make them preferable to wine casks when keeping good quality wine for long periods. The main reason for selling wine in wine casks is that it has opened up a completely new market based on the concept of medium quality wine being readily available in large volume containers which, by their design, prevent oxidation of the wine during consumption. This was undoubtedly one of the factors which resulted in increased sales of wine over recent years.

REFILLING AND RECYCLING OF BEVERAGE CONTAINERS

3.25 The only beverage containers which are refilled and sold to the public are made of glass. Glass and aluminium containers can be recycled.

3.26 Approximately 20 per cent of the volume of soft drinks sold in Victoria is still sold in refillable glass bottles, the majority of which carry either a 10 cent or 20 cent deposit depending on their size.

There are three distinct segments of the soft drink refillable glass bottle operations and these are:

- Deposit bearing bottles sold through milk bars, petrol stations etc: The deposit can be reclaimed at the point of purchase. The soft drink filler collects empty bottles from the point of sale when delivering filled bottles.
- Refillable bottles distributed and collected by home delivery tradesmen: Deposits are not normally charged on these bottles. The home delivery tradesmen return the empty bottles to the filler for re-filling.
- "Non-refillable" bottles collected through bottle merchants: These are washed and sold to small soft drink fillers for re-use.

3.27 Approximately 8 per cent of all milk sold in Victoria is now sold in bottles. Some of this bottled milk is still delivered each day to individual households, the remainder being sold through milk bars and the like. Milk bottles do not normally carry a deposit and they are either collected by the daily milkman or returned to the point of sale when further bottles are purchased. The dairies collect the empty bottles when delivering filled bottles.

3.28 Approximately 40 per cent of all wine sold in Victoria is sold in glass bottles and a further 20 per cent is sold in glass flagons; the remaining 40 per cent is sold in wine casks. Some small vineyards re-use bottles and flagons which have been collected and washed by the United Bottle Merchants Company (a company wholly owned by Victorian bottle merchants). These bottles and flagons number approximately 14 per cent of all wine bottles and flagons sold in Victoria.

3.29 Approximately 79 per cent of all packaged beer is sold in refillable beer bottles. A very high proportion of the Victorian beer market was supplied in 1982-83 by the one company, Carlton & United Breweries (CUB). Three types of bottle were involved up to the end of 1982-83 - a 750 ml. and a 375 ml. capacity refillable bottle and a 375 ml. non-refillable bottle (Crown lager). In late 1983, a 250 ml "refillable" bottle was introduced to compete with beer in a similar container imported from New South Wales.

A wholly owned subsidiary of Carlton & United Breweries, the Manufacturers Bottle Company of Victoria (MBCV), owns all the refillable beer bottles used by Carlton & United Breweries. The MBCV purchases bottles from the bottle manufacturers, ACI and GCL, and leases them to CUB. The MBCV also organizes the collection of empty used beer bottles and supplies these unwashed to CUB.

CUB undertakes the washing of beer bottles as part of the beer-filling process. All 750 ml. beer bottles, old or new, are washed before being filled by washing plant installed in-line with the filling plant. New 350 ml. beer bottles are rinsed but not put through a full washing process before filling. No in-line washing facilities were provided when the new 375 ml. line was commissioned in 1981. Used 350 ml. beer bottles are washed on spare out-of-line washing plant in other parts of the plant before being placed on the filling line.

The MBCV has over 100 authorized agents (bottle merchants) throughout the State who in turn have their own extensive network of used bottle recoverers and suppliers.

Most of the beer bottles are collected from private households by a range of activities:

- A telephone call to an MBCV agent (bottle merchant) initiates a direct collection by the agent;
- Scout groups and other voluntary groups carry out bottle drives;
- Many areas are still serviced by "bottle-oh's" who have regular rounds; and
- Many garbage collectors collect bottles and have either a direct arrangement with their local MBCV agent or the municipal council operates a bottle recovery scheme.

Although the bottle merchants are MBCV agents and the system is predominantly a beer bottle recovery operation, the system provides the financial cornerstone for a recycling system for other bottles and glass cullet.

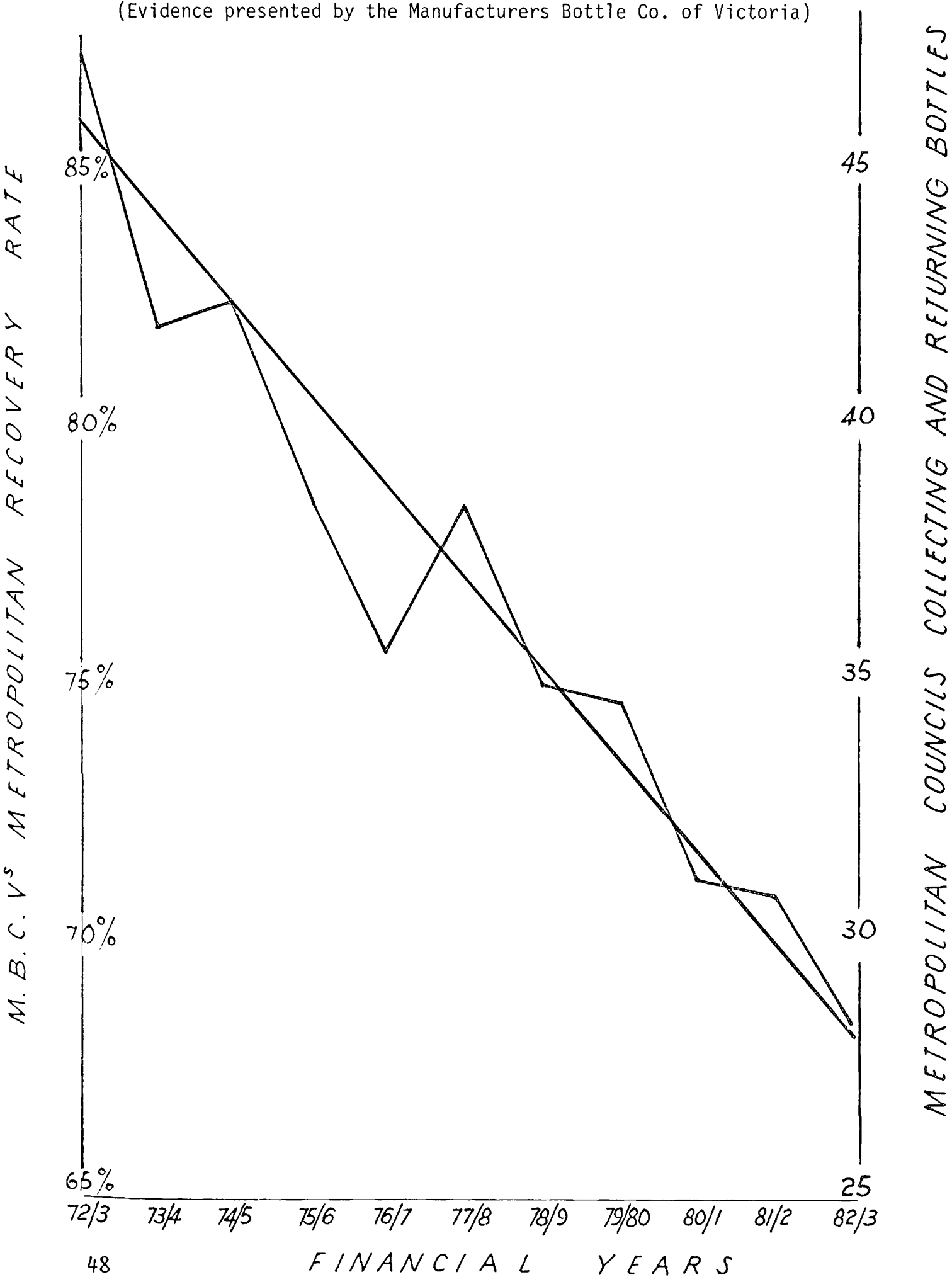
The MBCV currently recovers 70-75 per cent of its 750 ml. beer bottles and 40 per cent of its 375 ml. "stubby" beer bottles.

MBCV believes that beer bottle return rates in recent years have been adversely affected by community attitudes and by a trend in municipal councils not to collect and return bottles and other recyclable materials. During the last ten years, many municipalities have adopted new forms of waste collection services. In many cases bottles are no longer collected separately and, consequently, are buried in the municipal tip. Figure 7 was produced as evidence by the MBCV to demonstrate this trend.

FIGURE 7

METROPOLITAN RECOVERY RATE FOR BEER BOTTLES AND THE NUMBER OF METROPOLITAN COUNCILS COLLECTING AND RETURNING BOTTLES

(Evidence presented by the Manufacturers Bottle Co. of Victoria)



Estimates of bottles refilled

3.30 The following estimates of the throughput of refilled bottles have been made by Peat, Marwick, Mitchell Services:

TABLE 12
ESTIMATED NUMBERS OF BOTTLES REFILLED IN VICTORIA

| Thousands | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
|--------------|----------------|----------------|----------------|----------------|----------------|
| Beer | 237 624 | 238 908 | 228 000 | 214 944 | 252 156 |
| Wine | 4 056 | 4 394 | 4 732 | 5 026 | 4 813 |
| Soft Drink | 119 009 | 93 672 | 91 306 | 80 271 | 80 152 |
| Milk | 135 199 | 111 614 | 90 778 | 71 628 | 59 926 |
| TOTAL | 495 888 | 448 588 | 414 816 | 371 869 | 397 047 |

TABLE 13
ESTIMATED GLASS WEIGHT OF BOTTLES REFILLED IN VICTORIA

| Tonnes | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
|--------------|----------------|----------------|----------------|----------------|----------------|
| Beer | 127 481 | 125 486 | 117 676 | 111 271 | 118 294 |
| Wine | 2 344 | 2 540 | 2 735 | 2 905 | 2 780 |
| Soft Drink | 99 436 | 77 495 | 74 079 | 64 881 | 59 962 |
| Milk | 51 781 | 42 748 | 34 768 | 27 434 | 22 952 |
| TOTAL | 281 042 | 248 269 | 229 258 | 206 491 | 203 988 |

3.31 The collection of glass cullet and aluminium cans for recycling involves two quite distinct systems, as outlined below:

Bottles, jars and other glass items which are not suitable for refilling are collected and sold by both bottle merchants and local councils to ACI International Limited as cullet for \$60 per tonne. The cullet is blended with the virgin materials used in the manufacture of new glass.

Aluminium cans are returned by the public to 249 Victorian buy-back centres which purchase the cans for \$600 per tonne (approximately one cent per can). The centres are operated on behalf of Alcoa of Australia Limited and Comalco Limited, the two manufacturers of rolled aluminium can sheet. Approximately 92 centres are operated by community groups, while the remainder are operated by commercial firms. The centres receive a collection fee of approximately \$200 per tonne for handling the cans.

Alcoa's buy-back centres send their crushed cans to Simsmetal Pty. Ltd. which sorts and bales the cans. Simsmetal receives a fee for this service. Some of the cans are re-melted and converted to ingot by Simsmetal. The remainder are sold to Alcoa. Alcoa and Simsmetal sell the baled cans and re-melt ingot on the secondary (scrap) metal markets in Australia and overseas.

Comalco's buy-back centres send their crushed cans to Comalco's recycling plant at Yennora in New South Wales for melting, alloying with virgin aluminium and other elements, and casting into aluminium ingot. The ingot is rolled into aluminium can sheet and sold as first grade can sheet to the can manufacturers.

3.32 The value of glass cullet and aluminium cans is a direct function of the cost of equivalent raw materials and energy to the manufacturers. Evidence indicates, however, that over the period 1980-81 and 1981-82, the amounts paid to the cash-a-can centres by Alcoa could not be recouped by sales to secondary scrap markets due to low world aluminium prices. Substantial losses on can recycling activities were therefore borne by the company.

On the other hand, Comalco feed the aluminium can scrap directly back into their can sheet process, making maximum use of the alloy materials and placing a value on the scrap equivalent to new ingot material (less costs of collection and re-heating). Comalco indicated to the Committee that the recycling of scrap at present levels of cost is profitable.

- 3.33 It was estimated that, in 1982-83, 2000 tonnes of aluminium (the equivalent of 86 million cans) and 32 000 tonnes of glass cullet were recycled in Victoria.
- 3.34 The Sub-committee examined municipal centres for recovery of materials at Rockdale in Sydney and at the Cities of Nunawading and Knox in Melbourne.
- 3.35 As part of its submission to the Committee, the City of Knox included a paper by its Chief Health Surveyor, Mr. K. N. McLennan. Parts of that paper detailing the City of Knox programme of materials recovery are reproduced in Appendix 10. The City of Knox system commenced in 1975. Up to 1981, the volume of materials processed had increased by over 200 per cent and receipts had increased by over 600 per cent. The programme has expanded to include a central depot, a garbage collection service and eleven neighbourhood depots.
- 3.36 The City of Nunawading commenced its materials recovery centre in 1978 and the following table gives the expenditure and income figures for the financial years 1978-79 through to those estimated for 1983-84:

TABLE 14

CITY OF NUNAWADING RECOVERY CENTRE -
INCOME AND EXPENDITURE

| FINANCIAL YEAR | INCOME \$ | EXPENDITURE \$ |
|----------------|--------------|-------------------|
| 1978-79 | 32 555 | 29 754 |
| 1979-80 | 28 698 | 26 667 |
| 1980-81 | 45 883 | 52 668 |
| 1981-82 | 98 900 | 127 101 |
| 1982-83 | 120 250 | 142 003 |
| 1983-84 | 142 600 | 158 000 |

Since May of 1981, the centre has operated as an integral part of the Nunawading Waste Transfer Centre. In 1983-84, an estimated 3400 tonnes of material will be recovered for re-use. There is a cost benefit to council resulting from the recovery operation by comparison with the alternative of transporting this material for disposal to landfill.

The following figures cover the recovery of various materials for re-use and the quantities of each recovered in 1981-82 and 1982-83:

TABLE 15

**CITY OF NUNAWADING RECOVERY CENTRE -
MATERIAL RECOVERED**

| | 1981-82 | 1982-83 | |
|---------------------|---------|---------|-----------|
| Paper and Cardboard | 851 | 976 | tonnes |
| Metal | 116 | 87 | bins |
| Beer bottles | 81 308 | 88 361 | dozen |
| Cullet | 915 | 1 023 | tonnes |
| Soft drink bottles | 547 | 574 | dozen |
| Car batteries | 99 | 134 | |
| Aluminium cans | 17 | 17 | bales |
| Steel cans | - | 710 | kilograms |

LITTER

- 3.37 There are extreme difficulties in assembling objective factual material relating to litter because of methodological problems with litter surveys and difficulties in quantifying effects, particularly aesthetic effects.
- 3.38 The impact of litter is of greatest significance in recreation areas, including parks, reserves, beaches and access roads to such areas, together with major roads, shopping centres, isolated country areas and vacant land. In large part, the impact is related to people's awareness of the litter and how offended they are by it. In this sense, judgement of people's perceptions of litter (including opinion surveys) are important. Where litter is distributed, how long it stays there and what is being done about it may be just as significant as the actual quantity of litter in influencing people's perceptions of it. The Submission (No. 2) from the Victorian Department of Industry, Commerce and Technology concluded on this aspect (at page 8):

The disamenity cost, probably the most important litter cost component, requires a subjective valuation which varies amongst individuals, whose reaction may vary depending on the location, brightness, shape and durability of the object.

- 3.39 Evidence to the Committee indicated that many people in Victoria are concerned about littering, particularly in country and recreational areas.
- 3.40 In early 1983, Brian Sweeney and Associates (Australia) Pty. Ltd. completed a "Study of Community Attitudes towards the Litter Problem". This study was done for the Keep Australia Beautiful Council (KABC) and surveyed 250 adults in the Melbourne metropolitan area. Similar studies were done each year from 1972 to 1980. This study was submitted as evidence to the Committee by the KABC. The major finding of this report was that nearly 80 per cent of respondents believed "that the last ten years have witnessed little diminution in the perceived magnitude of the litter problem".

Composition of Litter

3.41 Some attempts have been made, through various litter surveys, to quantify the composition of litter or littering at various sites. The Submission (No. 2) from the Victorian Department of Industry, Commerce and Technology pointed to some of the problems with litter surveys as follows:

Statistics on the degree of beverage container litter vary considerably due to definitions, survey technique, and the unit of measurement. Ideally the unit of measurement should be related to the purpose of the analysis. For example, unit counts, weight and volume may be the most relevant measures for the cost of litter collection; volume, number and visibility are likely to be the most appropriate measure for aesthetic discomfort; and ability to break into sharp pieces may be an appropriate measure for injury to humans. Most litter statistics are expressed in terms of number of items.

3.42 In Victoria, the KABC (Victoria), in conjunction with the Environment Protection Authority (EPA), carry out litter counts by number of items littered at 62 survey sites throughout Victoria once every three months. The EPA count litter at 32 sites and KABC (Victoria) count at 30 sites. This dual system allows for a degree of self-auditing of the results to occur. The same sites are surveyed every three months. Each site is surveyed on the same day of the week and at the same time as for the previous survey of that site. The types of sites are:

TABLE 16

LOCATION OF LITTER SURVEY SITES IN VICTORIA

| | CITY | COUNTRY | TOTAL |
|--------------|------|---------|-------|
| Industrial | 3 | 2 | 5 |
| Residential | 3 | 2 | 5 |
| Parks | 7 | 5 | 12 |
| Car Parks | 3 | 2 | 5 |
| Retail Areas | 8 | 3 | 11 |
| Beaches | 4 | 4 | 8 |
| Highways | | 16 | 16 |
| TOTALS | 28 | 34 | 62 |

3.43 These counts were standardised throughout Australia in November 1982 so that all states of Australia now use the same system. Each of the major states also carries out surveys at 62 sites falling into comparable categories at three-monthly intervals.

3.44 The recent litter counts carried out in Victoria by the EPA and the KABC (Victoria) indicate that beverage containers, tops and straws comprise nearly half of the number of litter items counted as set out in Tables 17 and 18.

TABLE 17

BEVERAGE RELATED LITTER COUNT 1983 - VICTORIA

| ITEM | Combined Average of Litter Counts February, May, August, November 1983 Percentage of total |
|---|---|
| Cartons <ul style="list-style-type: none"> • Plain milk • Flavoured milk • Fruit drink Glass <ul style="list-style-type: none"> • Beer • Soft drink • Plastishield • Wine and Spirits Cans <ul style="list-style-type: none"> • Steel beer • Steel soft drink • Aluminium beer • Aluminium soft drink Plastic <ul style="list-style-type: none"> • Fruit drink • PET bottles | 0.2 1.3 0.6 2.3 0.3 0.3 - 1.5 - 0.4 1.0 0.2 - |
| Sub-total for Beverage Containers | 8.1 |
| Ring-pull and Zip Tops | 25.9 |
| Bottle Tops and Crown Seals | 3.7 |
| Straws | 7.7 |
| TOTAL BEVERAGE ITEMS | 45.4 |

These figures are carried over into table 18 which describes the remaining 54.6 per cent of litter.

TABLE 18

TOTAL LITTER COUNT 1983 - VICTORIA

| ITEM | Combined Average of Litter Counts February, May, August, November 1983 Percentage of total |
|--|---|
| All Beverage Items (from Table 17) | 45.4 |
| Confectionery wrappings | 11.7 |
| Icecream sticks | 1.5 |
| Cups, take-away food containers, take-away paper food packages and metal foil take-away cartons (& parts of) | 1.6 |
| Newspapers and magazines, and free distribution papers, notices, catalogues etc. | 2.7 |
| Other paper and paper packaging | 17.4 |
| Other various items with small counts | 19.7 |
| TOTAL | 100.0 |

3.45 The above litter counts do not necessarily represent the rate at which various items are littered as the site may have been cleaned between surveys. Another factor which may affect the apparent rate of littering is the possibility that large items such as bottles and cans are usually removed during a clean-up whilst bottle and can closures and straws may often be left behind as being too small to bother with or too difficult to retrieve.

3.46 It should also be noted that beverage containers themselves would constitute a more significant proportion of littered items if measured by weight or volume because, generally, beverage containers are heavier and bigger than most litter.

Costs of litter clean-up

3.47 Many of the costs cannot be accurately estimated. Organizations such as the Department of Conservation, Forests and Lands, the Road Construction Authority and others see emptying of rubbish bins and the collection of litter as part of their normal maintenance activities and do not account for this work on a separate basis.

3.48 Victorian local government authorities allocate costs under three specific headings which might be seen to be related to litter prevention and collection as follows:

TABLE 19

**COSTS RELATED TO LITTER CLEAN-UP -
VICTORIAN LOCAL GOVERNMENT**

| | Expenditure 1981-82 |
|-----------------|---------------------|
| Street cleaning | \$22 733 800 |
| Bins in parks | \$ 764 127 |
| Beach cleaning | \$ 1 013 812 |
| TOTAL | \$24 511 739 |

3.49 From time to time voluntary assistance is also provided, particularly in recreational areas, by local community groups.

3.50 The Australian Environment Council Report No. 8 on litter control (see Appendix 3) made the following remarks about these costs (at pages 4 and 5):

Litter law enforcement and litter clean-up are largely the responsibilities of Local Government. Unfortunately, it has not been possible to obtain accurate figures on the amount of money spent in the undertaking of these responsibilities because of the difficulty of isolating the cost of resources allocated to litter management from the cleansing and tidying up systems used by local government. For example, litter bin collection often comprises part of the solid waste collection system; street sweeping cleans up both litter and fallen leaves; personnel involved in the maintenance of reserves, beaches, public parks, etc. collect litter as part of their other duties; law enforcement officers often perform other duties; and items that are not categorised as litter are often collected during tidying-up programs.

The limited evidence available suggests that direct clean-up and administration costs for litter are in the vicinity of \$2.00 per capita per annum, although they range as high as \$10.00 per capita in the Northern Territory.

To these direct costs must be added such items as anti-litter education campaigns, media advertising, and community contributions in the form of volunteered time and materials. Information from the Keep Australia Beautiful Council (KABC) suggests that these indirect costs possibly add another \$7.5 million per annum, giving a total cost for litter clean-up and abatement of some \$37 million - at the present level of littering and clean-up. Further, the cost of litter collection may be prohibitive to smaller local authorities which have neither the manpower nor financial resources to undertake such collections.

However, information provided by the KABC, following extensive surveys of local government, indicates that litter costs the Australian community some \$50 million each year (approximately \$3.50 per capita) in clean-up and abatement measures alone. There does not appear to be any reason to doubt the validity of this claim.

On this basis, (\$3.50 per capita per year) litter would cost the Victorian community approximately \$14 million each year, up-dated for inflation, at the present level of littering and clean-up. The AEC Report went on to say (at page 5):

As well as economic costs to the community, litter imposes considerable social costs in that, for example, people may have to travel further to avoid badly littered beaches and recreation areas and be put to the costs and time associated with the additional travel. Good swimming areas may be ignored because of the conditions of the surroundings. Similarly people living close to access roads to tips, construction sites and areas of recreation, may be disadvantaged because of litter, possibly to the extent of diminution in property values. Undoubtedly there are many other examples of social costs associated with littering - health risks and danger to people and animals would rate highly in terms of cost, and could arise from broken glass, cuts from crown seals, ring pulls etc. which have been left as litter. People are also annoyed by the sight of litter, whether on a busy city street or at a beautiful park.

These social costs of littering are difficult, if not impossible to estimate and the Committee has no cost information in this important area. The costs could, however, be expected to be considerable.

Existing Victorian litter legislation

- 3.51 The *Litter Act* 1964, as amended in 1977, makes provision for any person convicted of dropping or depositing litter in any public place or on anyone else's land liable to a fine of up to \$500 and up to one month's imprisonment. The court may also order the convicted person to remove the litter.
- 3.52 The Committee notes that the legislation is not generally enforced and some public concern was expressed on this matter.

Keep Australia Beautiful Council (Victoria)

- 3.53 The Keep Australia Beautiful Council (Victoria) was formed in October 1967 and in 1971 became part of the newly-formed national Keep Australia Beautiful Council organization. Its objectives are:

- (a) To promote an appreciation of a clean urban and rural environment;

- (b) To promote litter prevention by community participation;
- (c) To encourage and educate a responsible community attitude on recycling and use of the environment;
- (d) To advise and assist Federal, State and Local Government;
- (e) To develop and co-ordinate research, legislation, projects and exchange of information; and
- (f) To promote Keep Australia Beautiful through statutory, commercial and voluntary bodies.

3.54 Table 20 presents information taken from recent KABC (Victoria) annual reports and indicates the sources of income and areas of expenditure for the KABC (Victoria).

TABLE 20 KABC VICTORIA - ANNUAL INCOME AND EXPENDITURE

| INCOME | 1981 | 1982 | 1983 |
|--|-----------------------|-----------------------|-----------------------|
| Subscriptions | \$ | \$ | \$ |
| Cities and Shires | 8 130 | 8 860 | 11 364 |
| Companies and Organizations | 11 763 | 7 087 | 17 357 |
| Individuals | <u>415</u> | <u>612</u> | <u>676</u> |
| | <u>20 308</u> | <u>16 559</u> | <u>29 397</u> |
| State Government Grant | 50 000 | 55 000 | 55 000 |
| Industry Group - Victorian Chamber of Manufactures | 120 000 | 132 000 | 135 650 |
| State Government 1 for 2 Grant | 60 000 | 66 000 | - |
| Interest | 4 615 | 7 001 | 8 814 |
| Donations | 2 893 | 800 | 270 |
| Sale of Promotional Material | <u>31 579</u> | <u>35 583</u> | <u>26 732</u> |
| | <u>269 087</u> | <u>296 384</u> | <u>226 466</u> |
| TOTAL INCOME | 289 395 | 312 943 | 255 863 |
| EXPENDITURE | | | |
| Administration | | | |
| Salaries | 69 475 | 70 280 | 51 145 |
| Rent | 1 620 | 10 689 | 9 277 |
| Other Office and Administrative Expenses | 26 188 | 33 320 | 42 185 |
| Employee Benefits | 2 328 | (182) | (662) |
| Depreciation | <u>4 323</u> | <u>5 564</u> | <u>5 552</u> |
| | <u>103 934</u> | <u>119 671</u> | <u>107 497</u> |
| Positive Litter Control | | | |
| Salaries and Car Expenses | 52 362 | 66 794 | 71 433 |
| Advertising and Publicity | 16 387 | 357 | 6 775 |
| Administration and Support Services | <u>4 025</u> | <u>7 016</u> | <u>5 694</u> |
| | <u>72 774</u> | <u>74 167</u> | <u>83 902</u> |
| Anti-litter Campaign | | | |
| Advertising | 33 034 | 39 847 | 12 967 |
| Publicity | 20 637 | 12 206 | 35 257 |
| Promotional Material | 28 002 | 8 548 | 18 568 |
| Purchase of Resaleable Material | <u>33 226</u> | <u>31 584</u> | <u>15 894</u> |
| | <u>114 899</u> | <u>92 185</u> | <u>82 686</u> |
| TOTAL EXPENDITURE | <u>291 607</u> | <u>286 023</u> | <u>274 085</u> |
| SURPLUS (DEFICIT) FOR THE PERIOD | \$ (2 212) | \$ 26 920 | \$(18 222) |

3.55 The State and Federal Keep Australia Beautiful organizations work closely together, particularly in the provision of promotional information for schools, local government and television. Particular activities carried out by KABC (Victoria) during 1982-83 were:

- (1) The introduction of the "Tidy Towns" competition to Victoria. One hundred and twenty-three "towns" ranging from small towns to large municipalities took part.
- (2) "Summer Campaign" concentrating on Melbourne beaches with the assistance of the Port Phillip Authority and ATV Channel 10.
- (3) "Keep Australia Beautiful Week" with the themes of resource recovery and planting of Australian native trees. Three thousand six hundred schools received special kits on litter prevention and beautification.
- (4) C.A.R.E. Awards for litter prevention and beautification, schools involvement and school garden beautification.

WASTE DISPOSAL

3.56 Waste Generation

The Environment Protection Authority have recently produced the following estimates of total waste generation in Victoria for the year 1981:

TABLE 21

WASTE GENERATION - VICTORIA 1981

| | Tonnes | kg/capita/yr |
|------------------------|------------------|--------------|
| Greater Melbourne Area | 1 848 100 | 659 |
| Provincial Victoria | 1 266 800 | 1 106 |
| VICTORIA | 3 114 900 | 789 |

On the assumption that waste per capita in 1982-83 was the same as in 1981, the total solid waste generated in Victoria in 1982-83 is estimated to have been 3 181 000 tonnes.

3.57 Peat, Marwick, Mitchell Services collected comprehensive data from the beverage and beverage container industry. They estimated that beverage container waste and litter in 1982-83 weighed 159 000 tonnes. This estimate was derived from the number of full containers sold, less the number of containers recovered for either refilling or recycling.

Waste beverage containers therefore comprise approximately 5 per cent of total waste generation in Victoria by weight.

3.58 Tables 22(a), (b) and (c) provide estimates of beverage containers disposed of to landfill in Victoria between 1978 and 1983.

ESTIMATES OF BEVERAGE CONTAINERS DISPOSED
OF TO LANDFILL IN VICTORIA 1978-83

TABLE 22(a)

| | Thousands of Tonnes | | | | |
|-------|---------------------|---------|---------|---------|---------|
| | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
| Glass | 75 | 104 | 98 | 116 | 130 |
| Other | 26 | 28 | 29 | 30 | 29 |
| Total | 101 | 132 | 127 | 146 | 159 |

TABLE 22(b)

| | Millions of Containers | | | | |
|-------|------------------------|---------|---------|---------|---------|
| | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
| Glass | 238 | 262 | 293 | 340 | 351 |
| Other | 639 | 687 | 710 | 726 | 745 |
| Total | 877 | 949 | 1003 | 1066 | 1096 |

TABLE 22(c)

| | Container Capacity - Millions of Litres | | | | |
|-------|---|---------|---------|---------|---------|
| | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
| Glass | 106 | 137 | 133 | 162 | 160 |
| Other | 481 | 539 | 589 | 623 | 656 |
| Total | 587 | 676 | 722 | 785 | 816 |

N.B. Most containers other than glass containers can be crushed so that they occupy considerably less space than indicated in Table 22(c).

3.59 These tables indicate a considerable increase in the number and weight of containers disposed of during the five-year period. The reasons for these changes can be accounted for as follows:

- (1) The increased tonnage of glass bottles being disposed of to landfill has been made up of almost equal numbers of beer bottles and soft drink bottles. Beer bottles are returnable but the overall return rates have dropped off, particularly since the introduction of the 375 ml "stubby" bottle. Soft drink is increasingly being sold in recyclable - as opposed to refillable - bottles.
- (2) The increased numbers of other types of beverage containers disposed of is accounted for as follows:
 - (a) Milk has been increasingly packaged in paperboard containers instead of glass bottles and this has added a further 33 million containers weighing only 1000 tonnes to the waste stream each year. Glass milk bottles had a very high return rate and contributed very little to the waste stream.
 - (b) Fruit juice has had a fairly high growth rate and is packaged almost entirely in paperboard or plastic. It is estimated that this added a further 52 million containers or 3000 tonnes to the waste stream each year.
 - (c) PET has been introduced for the packaging of soft drinks and it is estimated that this added 21 million containers weighing 2000 tonnes to the waste stream each year.
 - (d) The number of aluminium and steel cans sold has increased but this has been offset in terms of cans disposed of to landfill by the increased rate of recycling of aluminium cans. Aluminium cans have replaced the heavier steel cans and this combined with the improved recycling has reduced the weight of material in the waste stream by approximately 3000 tonnes each year.

Costs of Disposal

3.60 The total outlay by Victorian local government in disposing of all waste material in 1981-82 was as follows:

TABLE 23
VICTORIAN LOCAL GOVERNMENT WASTE DISPOSAL
COSTS 1981-82

| | |
|---|---------------------|
| Collection household garbage and hard rubbish | \$33 337 098 |
| Collection of trade waste | \$ 650 917 |
| Tip disposal | \$13 777 538 |
| Transfer stations | \$ 2 981 178 |
| Recycling depots | \$ 644 234 |
| TOTAL COST | \$51 390 965 |

3.61 Additional costs for street cleaning, bins in parks and beach cleaning were discussed in paragraph 3.48 of this report. If these costs were added to the above figures, the total annual cost of collecting and disposing of approximately 3 114 900 tonnes of waste and litter was \$75 902 704 or 2.4 cents/kg in 1981-82. Allowing for an inflation rate of 11.2% in 1982-83, the cost per kg of waste disposal could be estimated to have increased to 2.7 cents/kg, and therefore the cost of collecting and disposing of the 159 000 tonnes of beverage container waste and litter in 1982/83 would have been approximately \$4 293 000 or approximately \$1.06 per person or 0.39 cents per container.

Changes in domestic waste collection methods

3.62 Several municipalities have started using an up-graded system of domestic garbage collection which involves the use of 240 litre bins mounted on wheels and collected once a week from each household using an automated compactor.

3.63 Two potential effects of the use of these bins were pointed out to the Committee:

- (1) The quantity of garbage would increase considerably as the bin capacity had greatly increased and garden wastes could now be accommodated; and
- (2) The increased capacity would lead to bottles being placed in the containers and recycling activity being discouraged.

3.64 At the request of the Committee, the Municipal Association of Victoria circularised all municipal councils with the following request for information on the present use of the large wheeled rubbish bin system:

- (a) *Does your council currently use, or expect to convert to this system during the next year?*
- (b) *Does your council provide for the separate collection of bottles?*
- (c) *If your council uses the system, has it resulted in an appreciable increase in the total amount of rubbish collected; if so, by what percentage?*
- (d) *The Committee would be interested in any comments or information about your council's experience and/or expectations in relation to this system.*

3.65 On 18 January 1984, the MAV forwarded the following comments:

One hundred and thirty of the 211 councils have responded. Thirteen of these are using the system, and a further 21 are currently investigating the feasibility. Five smaller rural municipalities mentioned that they have investigated the system and found it to be too expensive. There seems to be a sense of inevitability that the system will be widely used in the longer term.

Fifty-six of the councils reported the availability of some kind of bottle recycling facility (21 operated by the council). On the whole, the comments received suggest a general recognition of the need for recycling to be carried out in conjunction with "big bin" operation.

3.66 The December 1982/January 1983 issue of the Australian Municipal Journal contained the following remarks in respect of the potential effects of the "big bin" system as they had been experienced by the first three Victorian municipalities to introduce the system:

City of Caulfield

Under the old system the City had nine trucks with three men each collecting 300 tonnes a week. Now there are four 19 metre trucks, running two shifts, collecting 450 tonnes a week, doing it in less time than before and saving about \$150 000 per annum.

But the most amazing thing is that residents have been persuaded to separate the bottles, papers and other recycling material, providing 2 000 dozen bottles a week compared with the old figure of 900 dozen a week. The amount of papers recycled has increased three-fold.

The crew dropped from the compactor trucks now work on recycling and they are more than paying their way. Not only are they fully employed, but the increase in tonnage has recently forced the Council to put on an extra man.....

Not surprisingly, the weight of garbage has increased by from 50% to 300% - the big bins take tree prunings and lawn clippings just as easily as kitchen scraps.

It was also expected that everyone would toss in their empty bottles as well, but the introduction of the big bins in Caulfield has resulted in a big increase in the amount of recyclable materials neatly stacked beside the bins for collection by Council staff.

Shire of Ballarat

As in other areas, the convenience of the big bins has increased the weight of garbage collected to three times the previous total, though this could be partly due to people getting rid of bricks and non-burnable rubbish which has accumulated over the years.

The anticipated problem of persuading residents to separate their recyclable items at source seems to have been solved by printing brochures about the scheme and attaching a sticker of instructions on the side of each bin.

It advises everyone to place the recyclable items - paper, cardboard, rags, glass bottles and drink cans, beside the bins on the day of collection. A private contractor, Western District Recycling, travels ahead of the Council truck and picks them up beforehand. Anything he doesn't want is just placed in the bin and the service doesn't cost the Council anything.

City of Camberwell

During September 1982, a series of trials was conducted in the City of Camberwell to evaluate alternative "big bin" garbage collection systems. The report on these trials was quoted as stating:

.... that residents made good use of the bins; in fact the amount of waste collected increased by 75%.

Surprisingly, the ability of the big bins to accept a large quantity of bottles did not result in everybody just tossing in their empties and forgetting them - glass salvage per property increased by no less than 91%.

The City of Camberwell has now begun the full introduction of a "big bin" system.

ENERGY

- 3.67 Estimates were made of the total system energy used by beverage containers in Victoria during 1982-83. Total system energy is made up of the energy contained in the raw materials, the energy required to extract and process the raw materials, the energy required to manufacture, fill and deliver the container to the customer, and the energy required to dispose of the container or recover it for refilling or recycling.
- 3.68 The estimates were based on detailed container statistics collected by PMMS and individual container system energy estimates derived by Boustead and Hancock in the United Kingdom (see Appendix 3). The individual container system estimates were adjusted for recycling and refilling rates existing in Victoria. The resulting estimates of the total system energy in Petajoules (1PJ = 10^{15} Joules) used in Victoria in 1982-83 first by container system in Table 24 and then by type of packaged beverage in Table 25, are as follows:

TABLE 24

TOTAL ENERGY USED IN VARIOUS CONTAINER
SYSTEMS IN VICTORIA DURING 1982-83

| Container System | Total System Energy 1982-83 (PJ) |
|------------------|----------------------------------|
| Refillable glass | 5.84 |
| Recyclable glass | 4.32 |
| Aluminium | 2.74 |
| Steel | 0.84 |
| Plastic | 1.19 |
| Paperboard | 3.79 |
| Total | 18.72 |

TABLE 25

**TOTAL ENERGY USED IN THE DELIVERY
OF VARIOUS PACKAGED BEVERAGES IN VICTORIA
DURING 1982-83**

| Container Contents | Total System Energy 1982-83 (PJ) |
|--------------------|----------------------------------|
| Beer | 6.24 |
| Soft drinks | 6.45 |
| Milk | 3.52 |
| Fruit juice | 1.24 |
| Wine | 1.27 |
| Total | 18.72 |

3.69 The total primary energy used in Victoria in 1982-83 was approximately 800 PJ. The energy used in the beverage container system represents approximately 2.3 per cent of this figure.

INDUSTRY OWNERSHIP

3.70 The beer, soft drink and milk markets in Victoria are supplied predominantly by Victorian-based companies; that is, companies which have their investment, employment and productive capacity in Victoria. The wine and fruit-juice markets are supplied by both Victorian and interstate companies. The majority of the glass bottles and all the aluminium cans used in Victoria are manufactured in Victoria. Aluminium can sheet and paperboard containers for the Victorian market are produced in both New South Wales and Victoria.

With the exception of the wine and fruit juice segments, each segment of the industry is dominated by one or two companies each holding from 40 per cent to nearly 100 per cent of the market share.

3.71 As at 1 January 1984 the dominant firms in the Victorian beverage and beverage container industry were:

- ACI International Limited Glass, plastic and PET bottles.
- Glass Containers Limited (NSW) Glass bottles.
- Alcoa of Australia Limited Aluminium can sheet.
- Comalco Limited (NSW) Aluminium can sheet.
- Containers Limited Aluminium and steel cans, paperboard containers.
- J. Gadsden Australia Limited and its subsidiaries: Aluminium and steel cans, paperboard containers.
 - Consolidated Foods Ltd.)
 - Metropolitan Dairies Pty. Ltd.)
 - Kinross Milk Products Pty. Ltd.)
- Brickwood Holdings Pty. Ltd. Plastic bottles.
- Tetra Pak (Australia) Pty. Ltd. (NSW) Paperboard containers.
- Associated Dairies Ltd. Milk packaging and distribution.
- Murray Goulburn Co-op. Co. Ltd. Milk packaging and distribution.
- Carlton United Breweries Limited Brewery.
- Coca-Cola Bottlers, Melbourne Soft drinks.
- Cadbury-Schweppes Australia Limited Soft drinks.
- Beecham Australia Pty. Limited Soft drinks.

EMPLOYMENT

3.72 Total employment in beverage container manufacturing, beverage filling and refilling industry in Victoria in 1982-83, was approximately 10 200 persons, as detailed below:

TABLE 26

**NUMBER OF PEOPLE EMPLOYED IN THE VICTORIAN
PACKAGED BEVERAGE INDUSTRY - 1982-83**

| | | | |
|-----|---|------------|--------|
| (A) | <u>Container Manufacturing Sector</u> (Including Rolled Can Sheet) | | |
| | Glass | 1 000 | |
| | Cans | | |
| | Aluminium tinfoil | 700 | |
| | Rolled can sheet | <u>700</u> | 1 400 |
| | Paperboard | 300 | |
| | Plastics | <u>300</u> | 3 000 |
| (B) | <u>Beverage Filling Sector</u> | | |
| | Beer | 2 600 | |
| | Soft drink | 1 300 | |
| | Milk | 2 200 | |
| | Fruit juice | 300 | |
| | Wine | <u>200</u> | 6 600 |
| (C) | <u>Refilling Sector</u> | | |
| | Bottle companies and agents | 600 | 600 |
| | | <hr/> | <hr/> |
| | TOTAL | | 10 200 |
| | | | <hr/> |

The above figures do not include primary producers, external transport operators or retail distribution personnel.

CAPITAL INVESTMENT

3.73 Fixed assets in the Victorian packaged beverage industry consist principally of:

- land and buildings;
- production plant and equipment; and
- transportation equipment.

In many instances transportation is undertaken by owner drivers or contractors and this transportation equipment is therefore excluded from the figures given here. In general, however, transport equipment represents less than 10 per cent of the depreciated fixed assets of beverage industry firms.

3.74 In 1982-83, the net fixed assets of the Victorian beer and soft drink segments and the container manufacturing sector were estimated by Peat, Marwick, Mitchell Services to be as follows:

TABLE 27

**CAPITAL INVESTMENT IN THE VICTORIAN PACKAGED
BEVERAGE INDUSTRY 1982-83**

| | <u>\$ Million</u> |
|--------------------------------|-------------------|
| Beverage Filling Sector | |
| Beer segment | 110 |
| Soft drink segment | 45 |
| Milk segment | 30 |
| Fruit juice segment | 5 |
| Container Manufacturing Sector | 75 |
| Aluminium can sheet | 110 |
| TOTAL | 375 |

SALES REVENUE

3.75 Total beverage retail sales revenue in 1982-83 was estimated at approximately \$1 255 million. This had increased from approximately \$795 million in 1978-79. Details are included in Table 28.

TABLE 28

**ESTIMATED SALES REVENUE OF THE
VICTORIAN PACKAGED BEVERAGE INDUSTRY**

| DOLLARS (MILLIONS) | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 |
|---|---------|---------|---------|---------|---------|
| Container Sales | 95 | 105 | 110 | 145 | 150 |
| Wholesale Beverage Sales | 455 | 515 | 595 | 680 | 760 |
| ADD: | | | | | |
| • Commonwealth Excise | 155 | 150 | 150 | 150 | 185 |
| • Sales Tax | 15 | 15 | 20 | 25 | 30 |
| • State Licence Fees | 30 | 30 | 35 | 40 | 45 |
| TOTAL - Wholesale Beverage Sales and Taxes | 655 | 710 | 800 | 895 | 1020 |
| Retail Beverage Sales | 795 | 875 | 975 | 1090 | 1255 |
| UNITS (Millions) | 1473 | 1513 | 1546 | 1570 | 1650 |
| LITRES (Millions) | 1097 | 1090 | 1126 | 1147 | 1200 |
| CONTAINER WEIGHT Tonnes (Thousands) | 414 | 413 | 390 | 383 | 397 |

CHAPTER FOUR

FUTURE TRENDS AND THE IDENTIFICATION OF PROBLEM AREAS

4.1 This chapter extrapolates information contained in the previous chapter in order to provide some indication of what might occur in Victoria if no additional Government action occurs. This leads to an identification of existing and potential future problem areas. The other factors which would have to be taken into account when examining possible solutions to the problem areas are also identified.

It should be noted that the changes identified in this chapter are expected to take place against the background of a generally static total annual per capita consumption of beverages.

BEVERAGE CONTAINERS

4.2 If no additional Government action were taken, the following would probably occur:

- Increased competition between, and market share for, paperboard and plastic packaging, and new forms of packaging which are likely to be developed.
- The continued development of an improved plastic bottle made from PET or similar material. This type of container may eventually displace a high proportion of medium and larger sized glass bottles and would be used for a wide range of beverages.
- All, or nearly all, beverage containers would be filled once only; the average weight of these containers would be considerably less than at present.

- 4.3 Some likely future trends in beverage containers for specific beverages are set out as follows:

Soft Drinks

- 4.4 There would be an increased trend towards the use of both larger and smaller containers and away from the medium-sized 750 ml - 1000 ml container.
- 4.5 In the small container size, typically 285 ml, glass bottles are the cheapest available container for carbonated soft drinks and would be likely to remain so for the foreseeable future. The cost of these bottles is under 7 cents each in large quantities and at this price the economics of collecting, washing and re-using these bottles is very marginal. These small bottles compete against the 375 ml aluminium can and are eroding the use of this container. However, the aluminium can has major advantages at sporting functions and in other outdoor venues which would be likely to ensure its continued existence.
- 4.6 In the medium and large container sizes, 1250 ml and 2000 ml, it is highly possible that improved plastic bottles made from PET or similar material would increasingly displace a high proportion of glass bottles.

Beer

- 4.7 Sales of beer in cans could be expected to continue to slowly decline with sales of 375 ml glass bottles increasing mainly at the expense of 750 ml bottles and bulk beer purchased over the bar for consumption in a club or hotel. The introduction of the 250 ml glass bottle would probably accelerate the trend towards the use of smaller containers and away from the 750 ml bottle. The economics of recovering and re-using 750 ml glass bottles are very favourable provided that high return rates can be achieved. There is every reason to believe that Carlton & United Breweries would continue to use 250 ml, 375 ml and 750 ml refillable glass bottles unless the return rates drop to a very low level and/or a suitable one-way glass or PET bottle becomes available.

Milk

- 4.8 It is probable that milk bottles would disappear and all milk would be sold in paperboard or plastic containers. There is a considerable trend towards the use of larger containers, particularly the 2 litre size. Attempts are currently being made to introduce plastic containers of 4 and 2 litre capacity into the market place. If these attempts are as successful as they have been overseas, then a very considerable swing from the one and two litre paperboard containers to the plastic containers could be expected to occur.

Fruit juices

- 4.9 Paperboard and plastic containers would continue to compete with each other for the majority of the market.

Wine

- 4.10 Sales of good quality wine in bottles would continue at present levels. Sales of wine in wine casks would probably continue to increase. However, this aspect of the wine industry is facing difficulties which may eventually affect wine prices and the quantities sold.

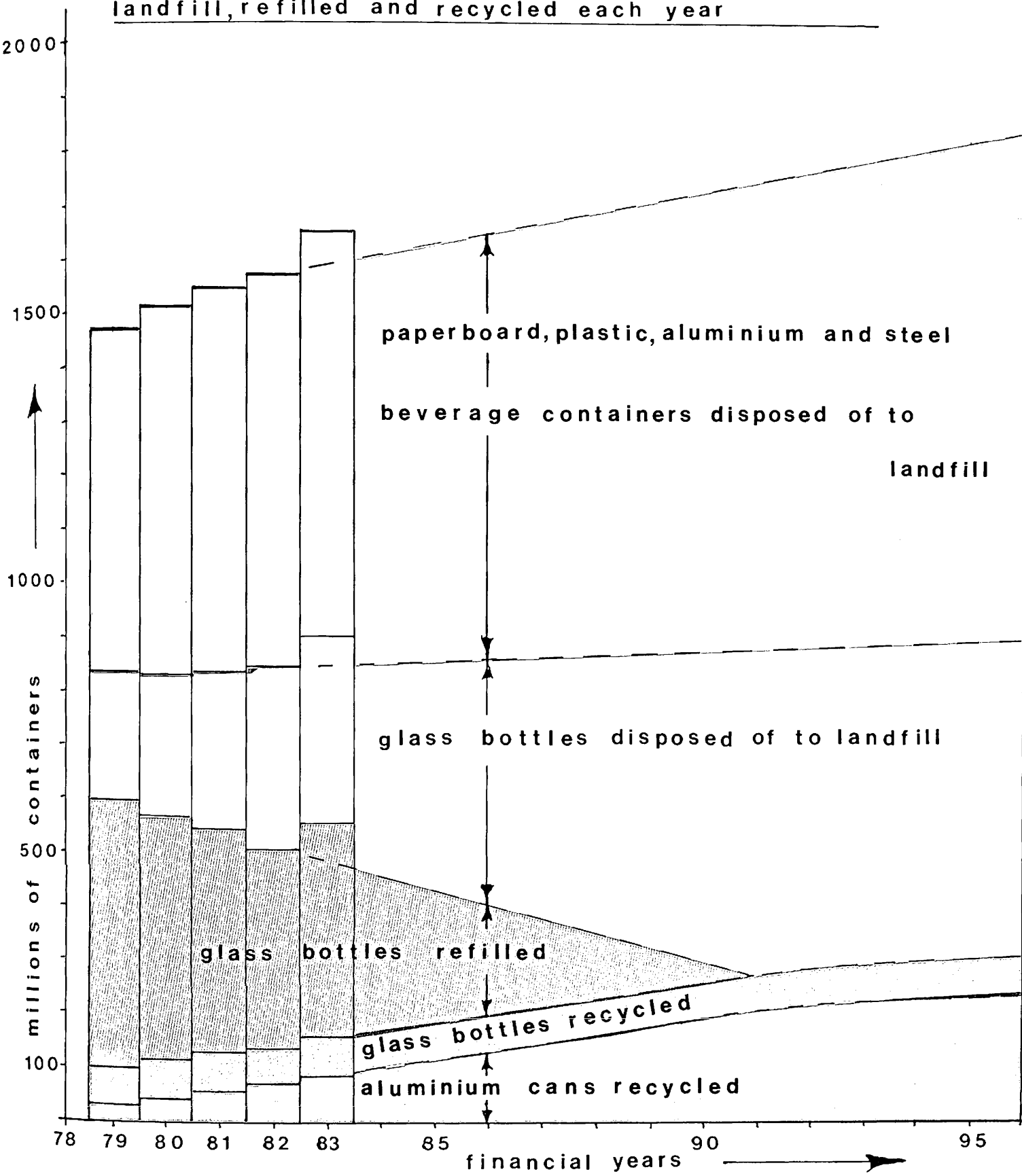
BEVERAGE CONTAINER WASTE

- 4.11 Beverage containers comprised approximately 5 per cent of the total weight of waste and litter in Victoria in 1982-83.
- 4.12 The cost of collecting and disposing of beverage containers in 1982-83 was estimated to be approximately \$4.3 million based on the average cost of collecting and disposing of all solid wastes in Victoria. This cost would be likely to increase with time as landfill sites became less easily accessible.

- 4.13 From 1978-79 to 1982-83, beverage containers disposed of to landfill in Victoria increased from 101 000 tonnes to 159 000 tonnes (57 per cent increase) and from 877 million containers to 1096 million containers (25 per cent increase). Garbage weight is probably the most important factor and in this regard the weight of glass beverage containers disposed of to landfill has increased dramatically and could continue to do so as more containers are used once only. In the longer term, it is expected that many of the heavy glass containers would be replaced by lighter plastic containers.
- 4.14 If the present rate of decline in the rate of return of refillable beer bottles and the replacement of refillable glass soft drink bottles by PET bottles continue, then the trends shown in Figures 8 and 9 might be expected to occur.
- 4.15 Figure 9 indicates that it could be expected that the weight of beverage containers disposed of to landfill each year might double over the next ten years but then would reduce as at that stage no refillable bottles would remain and the effects of lightweighting of glass bottles and the replacement of glass by PET would moderate the trend.
- 4.16 One reason for this trend, as previously mentioned in paragraph 3.29 and illustrated in Figure 7, is the decrease in the number of municipal councils carrying out the segregated collection of glass bottles. In addition, the trend towards the use of larger rubbish bins and more automated methods of collection may accelerate the reduction in the number of glass bottles collected for re-use. Wine, fruit juice, milk and soft drinks have increasingly been sold in one-way containers and the development of the supermarket system has been one of the contributing factors in this trend.

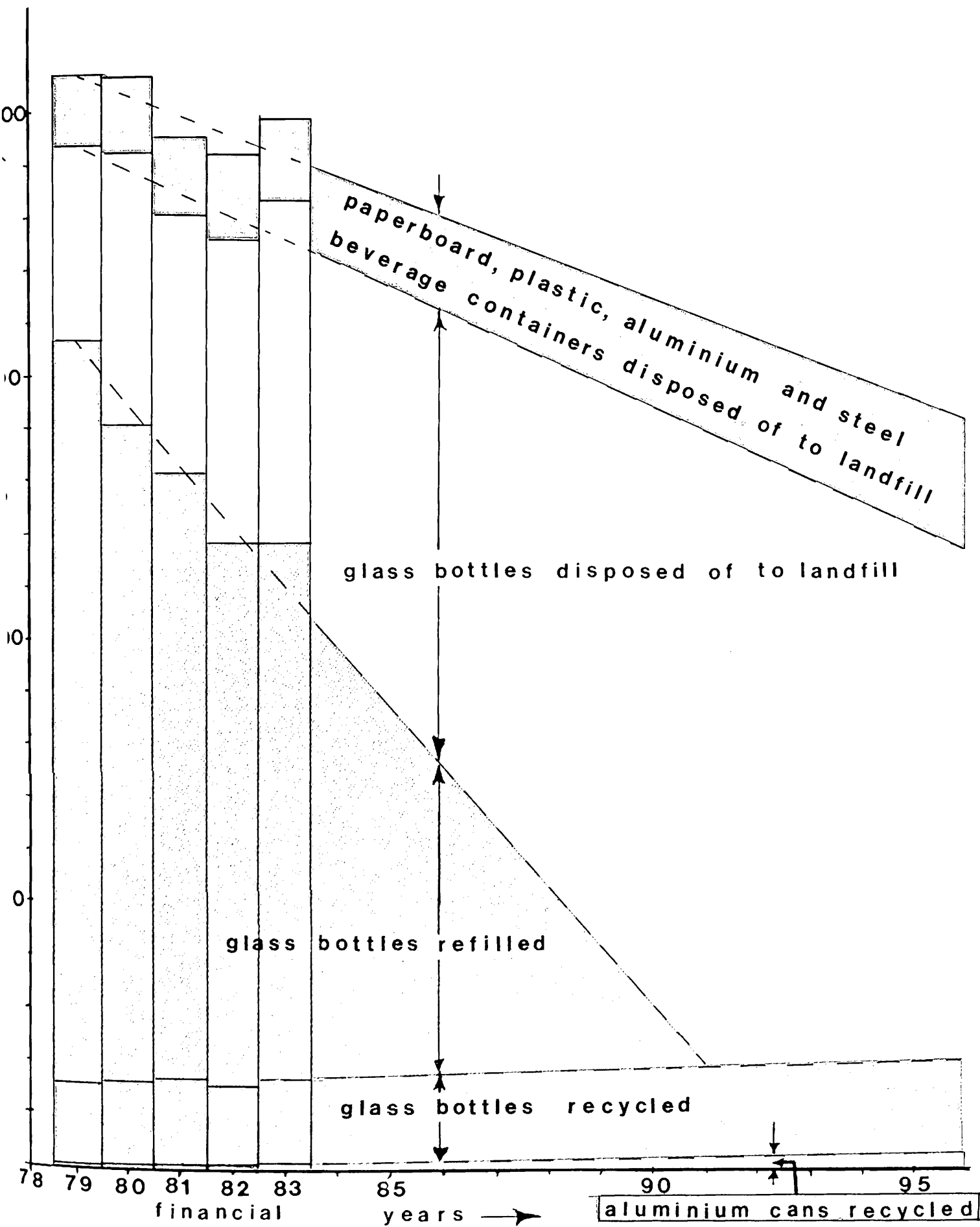
PROJECTION OF CURRENT TRENDS IN VICTORIA

Numbers of beverage containers disposed of to landfill, refilled and recycled each year



PROJECTION OF CURRENT TRENDS IN VICTORIA

Weight of beverage containers disposed of to landfill, refilled and recycled each year



PROJECTION OF CURRENT TRENDS IN VICTORIA

Weight of glass produced each year for beverage containers filled and then sold in Victoria

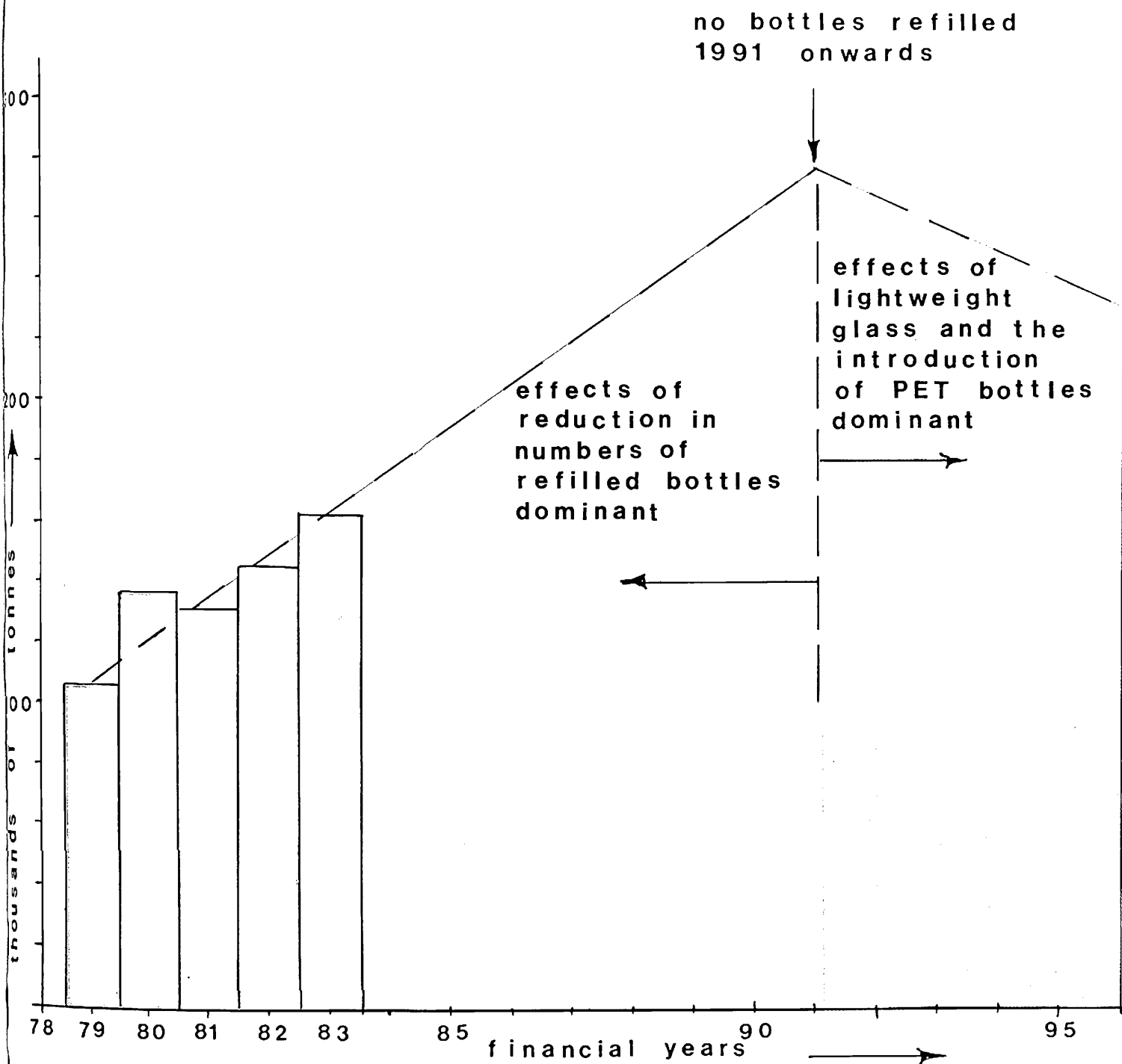


Figure 10 was derived directly from Figure 9 on the basis that the weight of glass produced each year is approximately equivalent to the weight of glass disposed of to landfill plus the weight of glass bottles recycled in the same year.

- 4.17 Figure 10 indicates the very significant effect the trends predicted in figures 8 and 9 would have on the weight of glass bottles manufactured each year. The weight of new bottles required each year is equivalent to the sum of the weight of bottles disposed of to landfill plus the weight of bottles recycled. Each bottle refilled is one less bottle manufactured.
- 4.18 The Committee is concerned that increasing numbers of glass bottles are being disposed of to landfill each year, some of which could be economically recycled.
- 4.19 The Committee is also concerned that the recycling of plastic and paperboard containers would not become practical or economic unless further research is undertaken.

EMPLOYMENT

- 4.20 The total employment levels in the combined glass manufacturing and bottle collection and washing sectors would be expected to decline for the reasons set out in paragraphs 4.23 to 4.25.
- 4.21 If present trends in the collection and refilling of glass bottles continue, it could be expected that the remaining refillable glass bottles would be wholly replaced by one-way glass bottles. This would mean that there would be significant increases in glass bottle production up to about 1990.
- 4.22 In the absence of productivity improvements and other container changes, this could be a factor which moderates the decline in the number of people employed in the manufacture of glass until about 1990 (1982-83 employment estimate 1000).

4.23 However, there are a number of important off-setting factors which would result in future employment reductions. Present trends of substantial productivity improvements within the glass manufacturing industry would be expected to continue and possibly increase. A shift to greater production of one-way bottles automatically implies longer manufacturing runs for particular bottles which would, of itself, improve productivity. A major labour component of the glass bottle manufacturing process arises from the alterations required in the production process when changing from the manufacture of one type of bottle to the manufacture of another type of bottle.

In addition, it could be expected that the present productivity trends occurring within the glass manufacturing industry would continue, and possible increase, particularly if additional capital investment was required to cater for an increase in the number of bottles manufactured.

4.24 A decline in the manufacture of returnable glass bottles would mean that fewer people would be employed in the collection and washing of glass bottles (current employment 600+).

4.25 The decline in the total employment levels in the combined glass manufacturing and bottle collection and washing sectors would be hastened if the introduction of plastic containers accelerates.

RAW MATERIALS

4.26 The present trend towards the use of glass bottles which are used once only as opposed to the collection and refilling of glass bottles would increase the requirement for the raw materials needed to manufacture glass (sand, limestone and salt) in the short term. These materials are not in short supply. The present trend would also lead to a reduction in water used to wash refilled glass bottles. This is not considered to be a significant factor.

4.27 However, as glass bottles are increasingly replaced by plastic containers, the demand for raw materials used in the manufacture of glass would fall off and the requirement for hydrocarbon feedstock would increase. Savings in transport fuel resulting from the reduction in the number of bottles returned for refilling and the reduced weight of bottles to be transported to retail outlets would offset, to some extent, the increased requirement for hydrocarbon feedstock. At this time the increased hydrocarbon feedstock requirements are not seen to present a major problem for the future.

ENERGY

4.28 The 1982-83 total system energy requirement for the Victorian beverage system was estimated to be 19 PJ. If the refillable bottles were replaced by one-way glass bottles, it could be expected that approximately a further 3 PJ/year would be required which would increase the annual total system energy to of the order of 22 PJ, an increase of 17.5 per cent. This would represent an increase from 2.3 per cent to 2.8 per cent of the estimated 800 PJ of total primary energy used in Victoria each year.

4.29 If the return rates for aluminium cans increased at the rates predicted by the aluminium companies and eventually reached 80 per cent, and steel cans are replaced by aluminium cans, then 0.9 PJ would be saved annually. The combined effects of increased aluminium can return rates and one-way glass bottles would be to increase the annual total system energy to the order of 21 PJ, an increase of 12 per cent over present levels. This would represent an increase from 2.3 per cent to approximately 2.6 per cent of the estimated 800 PJ of total primary energy used in Victoria each year.

4.30 It is possible that many glass bottles would be replaced by plastic bottles. If all the glass bottles were replaced by plastic bottles (PET), the total system energy would be slightly less than that required for one-way glass bottles.

- 4.31 Some of the above trends would be offset by technical improvements resulting in lighter weight and less energy intensive containers and considerable savings may occur if greater use were made of the larger capacity containers manufactured from plastic materials.
- 4.32 It is concluded that if present trends continue, the annual total system energy required to manufacture containers, fill them, deliver them to the customer and then to dispose of the empty containers (or, alternatively, collect and refill or recycle these containers) could increase by approximately 5-10 per cent above present levels.
- 4.33 Whilst potential energy savings can be demonstrated, the Committee believes that energy usage is a less significant area of concern than the litter and waste problems, particularly bearing in mind that energy costs are reflected in container prices.

LITTER

- 4.34 Victoria has significant litter problems, particularly in country and recreational areas. As identified in paragraph 3.44 of this report, beverage related items comprise 45 per cent of Victoria's litter by item count (beverage containers were approximately 8 per cent and tops and straws approximately 37 per cent). Litter, particularly on beaches and in recreational areas, can be a safety hazard which is obviously minimised by prevention and cleaning up. However, a certain amount of litter is probably inevitable from time to time, particularly at mass recreational events.
- 4.35 It is not possible to predict future trends in litter generation as they are highly dependent upon attitudes which may exist in future years. Trends in preference for types of containers would be expected to affect the character and extent of litter. For example, although paperboard containers equal approximately half of the number of glass containers in sales (Table 3), the ratio rises to over 70 per cent in litter (Table 17).

Further, there is continuing pressure on municipal councils to reduce the amount of visible litter and this would be likely to increase in the future if the beverage and beverage container industry, and organizations largely supported by the industry, reduced their litter reduction efforts believing that stronger government action had been averted.

- 4.36 It is noted that litter on beaches is derived from at least two sources. The first source is the straight-forward deposition of litter on the beach or in its vicinity by people using the beach. The second source is the deposition of litter carried by the water. Much of this second type of litter originates from sources many miles away and is carried down to the sea through drains and rivers along with storm-water. The wind and tides distribute this litter along large sections of the Victorian coastline, particularly in Port Phillip Bay. During winter this second source of litter is dominant and, because of its mode of transport, comprises mainly lightweight articles which float.

The Melbourne Metropolitan Board of Works has been placing floating booms across the Yarra River in an attempt to trap some of this floating litter before it reaches the beaches. Further efforts of this sort could have significant effects in reducing litter levels on beaches.

- 4.37 Other types of litter are also significant, including many waste paper products and food packaging, particularly confectionery wrapping, ice-cream sticks, take-away food packages, newspapers and advertising material.

COMMUNITY ATTITUDES

4.38 Community attitudes to litter, waste disposal, energy and resource use, and recycling are important in achieving the successful implementation of policies. Future community attitudes towards the prevention and cleaning up of litter and the recycling of waste would be likely to be influenced by:

- Continued promotions by some beverage container companies of their container return and re-use systems, possibly greater future efforts by local councils to improve attitudes and to reduce litter and waste, and some impact from advertising efforts designed to improve attitudes.
- Continued development of the "throw-away society". Many products are successfully promoted as though there were no need to be concerned about the use of the container or packaging after the product has been consumed or used. Most modern retailing is centred around fast one-way, immediate personal convenience products.
- Changes in overall attitudes and priorities brought about by problems current at that particular time. These would include energy crises, the economic climate and other similar factors.
- Any action taken by Government, such as the promotion of recycling and litter reduction programmes or the introduction of deposit legislation.

CONCLUSIONS

4.39 The Committee believes three primary areas of concern can be identified and these are:

- (1) Litter and its management;
- (2) Waste disposal; and
- (3) Energy and resource use.

All these areas of concern are affected by, and in turn do affect:

- (1) Public attitudes to litter, waste disposal, energy and resource use, and recycling;
- (2) The materials used in the manufacture of beverage containers;
- (3) The amount and methods of recycling and refilling of containers which occur; and
- (4) The organisation of waste collection.

4.40 When considering what measures could be taken to put into effect remedies to the problems identified, the following factors need to be taken into account:

- (1) The short, medium and long term effects of any proposed course of action on:
 - (a) Volumes of beverages sold;
 - (b) Mix of beverages and containers;
 - (c) Price of beverages to the consumer;
 - (d) Industry investment;
 - (e) Employment patterns, numbers and quality of work environment;

- (f) Industry structure and distribution;
 - (g) Environmental pollution and public safety; and
 - (h) Innovative development in the beverage and beverage container industry.
- (2) The predictability of the effects of any proposed course of action and the flexibility inherent in the proposal which would allow the Government to make improvements in the light of experience.
- (3) The possible need to generate funds to implement certain proposed courses of action.

4.41 Despite the efforts over the last ten years, the Committee is of the opinion that it is necessary for the Government to take further action which would achieve overall improvements in the reduction of beverage container litter and waste, and place more emphasis on the recycling of beverage containers.

As part of these measures, emphasis should be placed on encouraging practical, effective, comprehensive and non-discriminatory beverage container return systems. However, care should be taken to ensure that any measures taken avoid economic dislocation of industry and that transitional problems can be adequately dealt with.

CHAPTER FIVE

ALTERNATIVE COURSES OF ACTION

- 5.1 The Committee set out to find a specific solution to the problems identified in paragraphs 4.39 to 4.41 and which could be applied in Victoria.
- 5.2 As a first step, the Sub-committee visited Adelaide to evaluate the operation of the South Australian Beverage Container Act.
- 5.3 The Committee also visited New South Wales to evaluate the operation of the New South Wales Government Litter Reduction Campaign. This campaign was similar to proposals put forward for Victoria by industry.
- 5.4 The Committee considered the 1974 Report on Deposits on Beverage Containers (the Jenkins Report) from the House of Representatives Standing Committee on Environment and Conservation which recommended, in particular:

That all beverage containers which do not carry a refundable deposit of at least five cents incur a tax of three cents payable once only at the point of manufacture or import of the container.

A similar proposal was put forward by the Friends of the Earth and is included as Appendix 7.

- 5.5 The Committee considered in detail proposals put forward by the nine major companies from the Victorian beverage and beverage container industry entitled "Positive Litter Control - A Total Alternative to Deposit Legislation" (Appendix 8). This industry proposal was supported by a separate and slightly modified proposal (Appendix 9) from the Keep Australia Beautiful Council (Victoria).

- 5.6 The Committee heard evidence from witnesses from Oregon and Washington D.C. who explained the systems in operation in these two states.

Oregon was the first state of the United States of America to introduce deposit legislation. On the other hand, Washington D.C. generates funds by placing a low level tax on the turnover of retail outlets selling goods which have the potential to be littered. These funds are then used for public awareness and clean-up programmes.

- 5.7 The Committee noted the Australian Environment Council Report on Litter Control (Report No. 8) which set out and examined in detail, a wide range of possible courses of action.

- 5.8 The Committee also considered various alternatives which attempted to combine the best features of all the approaches mentioned so far to suit the Victorian situation and then developed its own preferred approach.

- 5.9 The South Australian Beverage Container Act, the Jenkins Report and the Industry proposals are now discussed in more detail. The Committee's preferred approach is set out in the final chapter.

THE SOUTH AUSTRALIAN DEPOSIT SYSTEM

- 5.10 The South Australian *Beverage Container Act* was passed in 1975 and took full effect in 1977. It was written so that it could apply a compulsory minimum returnable deposit to containers for all beverages (including spirits). Power to exempt containers from this provision is contained in the Act. The system currently in force in South Australia has been limited to steel and aluminium cans for beer and soft drinks, PET soft drink bottles and non-refillable glass soft drink and mineral water bottles.

5.11 The submission from the South Australian Department of Environment and Planning described the legislation as follows (at page 1):

(At page 1 of the submission)

The Act is concerned to limit the proliferation of beverage can and bottle waste in South Australia and to conserve the maintenance of the two-way bottling system which had prevailed in South Australia for over a century. The ensuing debates in Parliament saw amendments to the Act and regulations which resulted in the following:

- (1) Manufacturers using refillable bottles are exempted from the provisions of the Act provided they maintain their returnable refillable bottle system.*
- (2) Non-refillable containers must bear a minimum refund amount of five cents.*
- (3) Refunds on non-refillable glass containers of any brand are obtainable from retail outlets which normally sell that brand, and refunds on non-refillable non-glass containers (e.g. cans, PET bottles) are obtainable from licensed collection depots located in metropolitan and country areas.*
- (4) Ring-pull can tops are banned.....*

(At page 6 of the submission)

The Government of South Australia was not faced with establishing an alternative system so much as maintaining a system which had been in existence prior to the turn of the century. The system worked and people were accustomed to it. The soft drink industry had a fixed deposit system, a refund payable on return of the bottle to any retail outlet which sold soft drinks. The two South Australian brewers used a bottle co-operative system. Since 1897 they have been hiring standard refillable bottles from the Adelaide Bottle Co-operative and paying a refund (currently 30 cents per dozen) at marine store dealers.

The Act provided for the exemption of these bottles on the basis that satisfactory recovery and re-use systems were currently being used.

5.12 Very few, if any, non-refillable bottles were in use in South Australia at the time that the legislation was introduced. The legislation effectively slowed down and prevented the introduction of the non-refillable bottle. In 1982, the plastishield non-refillable glass bottle was specifically banned from use in the State.

5.13 The South Australian Department of Environment and Planning pointed out the following problems with the South Australian system which the Committee considered would be even more significant in relation to the potential situation in Victoria:

(At page 70 of the submission)

..... the return rates on the 375 ml (beer) bottle are not as high as the 740 ml bottle.....

(At page 71 of the submission)

The level of refund, 2½ cents per bottle, may not be sufficient to motivate higher returns. The Department of Environment and Planning is considering the submissions of both KESAB and the Local Government Association for a minimum deposit of at least 5 cents on all beer bottles.

The convenience of return of the bottles is limited by the location of marine store dealers.....

The Government has therefore asked the Department to undertake a review of the system of licensing of can depots, and the appointment of bottle merchants.....

(At page 73 of the submission)

A number of complaints have been received in relation to disparities in refunds paid for spent bottles. Whilst most supermarkets appear to pay the deposit amount in full, some delicatessens are apparently refunding a percentage of the deposit amount, or refunding in goods, not cash. Some stores will refund regular customers only and some will only take back empties on a one-for-one basis. Because these bottles are "exempt" containers, the method of obtaining the refund is not covered by the Act.

These different approaches to refunding deposit are under review.....

(At page 74 of the submission)

It is interesting to note that despite the superb educative efforts of Keep South Australia Beautiful, non-deposit containers remain major litter items. These containers are used for flavoured milk and fruit juice, new products that have enjoyed considerable growth rate throughout Australia, largely due to the success of their promotion as health alternatives to sugar concentrated soft drinks.

There is a problem therefore, as the present Act addresses itself to cans and bottles of beer and carbonated soft drinks. The market

shift to other types of refreshments, which are also contained in materials other than glass or metal, needs to be carefully monitored to determine whether the trend is great enough to warrant extension of cover of the Act.....

(At page 75 of the submission)

The Department relies very heavily on the integrity of the beverage industry in relation to assessment of the efficiency of bottle and can returns. Whilst sales data was provided to the Department in order to conduct the Study in 1979-80, that provision was not prolonged. Consequently, the Department cannot accurately match sales data and return of empty containers.

The Act does not provide for access to sales data and bottle return sales, and for the reasons outlined above such data is desirable. It is acknowledged that industry officials are usually very helpful and may respond to specific requests for information. It is appreciated that sales data is very restricted information in a highly competitive industry. However, this restriction on information severely limits thorough analysis of the system, and limits the scope for the sound development of improvements or modifications to the system. It is in the interests of the total community that any decisions to change or modify the Act may be made from a position of thorough analysis, and not response to pressure, educated guesswork or opinion.

5.14 The Committee was impressed with the actual operation of a number of aspects of the South Australian system. With qualifications, the system is simple, well-understood and popular amongst most sections of the community.

5.15 The Committee noted that, although many aspects of the situation in South Australia could be compared with the present situation in Victoria, there were significant differences which had to be taken into account, in particular:

- The dominance of the refillable bottle in the Victorian soft drink industry has declined in favour of the non-refillable glass or PET bottle.

- Victoria is less isolated as far as the interstate beverage trade is concerned than was South Australia when the *Beverage Container Act* was introduced.
- The significance of non-carbonated beverages and new types of beverage container for non-carbonated beverages has increased significantly since 1975.

5.16 The Committee noted that in addition to the *Beverage Container Act* the Government made significant contributions to the Keep South Australia Beautiful Council (KESAB) amounting in 1982-83 to \$114 000.

The total annual income of KESAB was approximately \$300 000 of which approximately \$200 000 was from cash contributions and \$100 000 was given in the form of goods and services.

KESAB was formed and in operation prior to the introduction of the *Beverage Container Act* and was supported by the Government as being a necessary adjunct to the legislation as it covered all forms of litter and provided essential educational, community and media promotion services.

5.17 Litter counts carried out in 1983 in South Australia suggest that beverage related litter continues to be a significant problem (a third of the total litter by item count). Although there is a particular problem in respect of containers not covered by deposit legislation, there is also evidence of continuing litter problems for containers which are subject to the legislation. The Committee concludes that beverage container deposit legislation should not be seen as a panacea for beverage container litter problems.

5.18 The Committee concluded that if Victoria was to introduce a form of deposit legislation, then the legislation would have to establish a more comprehensive system than the South Australian system. All forms of competing beverages and beverage containers would have to be covered in a fairly even-handed way.

It was clear that the situation in Victoria is now quite different from the situation in South Australia at the time when the *Beverage Container Act* was introduced. Because of the limitations of the South Australian legislation the sudden introduction of identical legislation in Victoria would be very disruptive.

It was also clear that it would be necessary to continue an educational and promotional campaign aimed at all litter and waste and that this would need funding. The on-going need for collection of accurate information about the industry was noted.

THE JENKINS COMMITTEE REPORT

5.19 In 1974, the Federal House of Representatives Standing Committee on Environment and Conservation produced a report entitled "Deposits on Beverage Containers" (the Jenkins Committee Report).

The recommendations of the Jenkins Committee are reproduced below:

RECOMMENDATIONS

Definitions: For the purposes of these recommendations the Committee has adopted the following definitions of the terms 'beverage' and 'beverage container'.

- | | |
|---------------------------|--|
| <u>beverage</u> | - beer and other malt ales, mineral waters, soda water and other carbonated soft drinks in liquid form and intended for human consumption. |
| <u>beverage container</u> | - the individual, separate, sealed glass or metal bottle, can or jar which is designed to contain a beverage and has a capacity of less than 2 litres. |

The (Jenkins) Committee recommends:

1. That all beverage containers which do not carry a refundable deposit of at least 5 cents incur a tax of 3 cents payable once only at the point of manufacture or import of the container.
2. That the responsibility for the collection and disbursement of the recommended tax be with the Australian Government.
3. That metal containers for beverages having detachable parts be banned.
4. That the funds raised by the proposed tax on no-deposit containers should be made available for the following purposes:
 - (a) to enable local government and other authorities responsible for litter prevention and collection and waste disposal to carry out their responsibilities more effectively;
 - (b) to fund the establishment and continued operation of a unit within the Commonwealth Scientific and Industrial Research Organisation (C.S.I.R.O.) to investigate in co-operation with State Governments, local authorities and industry the recovery of resources from waste and the recycling of waste materials;
 - (c) to provide financial assistance to voluntary organisations involved in combating litter and encouraging the re-use of resources.
5. That, as far as is possible, manufacturers, retailers and fillers involved in the proposed system of re-use of beverage containers should involve the existing network of marine dealers.

5.20 It should be noted that these recommendations applied to beer, mineral waters and carbonated soft drinks only. At that time, plastic and paperboard containers for milk and fruit juices were in the early stages of introduction to the marketplace.

5.21 The Jenkins Committee believed that the proposed system would have the following results:

- (a) *considerably reduce the beverage container component of litter;*
- (b) *achieve substantial savings in the use of resources currently employed in the manufacture of non-returnable beverage containers;*
- (c) *contribute to a significant extent to the reduction of the total volume of solid waste;*
- (d) *reduce the costs of litter collection;*
- (e) *produce a monetary incentive for the collection of littered deposit-bearing beverage containers;*
- (f) *provide funds for the collection of littered containers;*
- (g) *create greater awareness of the desirability of conserving finite resources and encourage the development of a community philosophy directed to this end;*
- (h) *reduce other forms of litter as a secondary impact since litter is known to encourage further littering;*
- (i) *provide an equitable contribution to the beverage container litter problem since litterers would forfeit their deposits or pay a tax to be used for the collection of litter; and*
- (j) *consumers would enjoy lower net prices for beverages assuming a tax and deposit scheme led to a move away from non-returnable containers.*

5.22 The Committee recognised a number of positive features with the Jenkins Committee proposal:

- It could be extended to apply to all beverage containers;
- It was fairly simple and easy to understand; and
- It would generate revenue which could be used to initiate comprehensive waste and litter control schemes and recycling schemes.

5.23 The Committee also recognised some features of this proposal which would require review and modification if it were to be applied in Victoria in the present environment:

- The difficulties of implementing this proposal in one State were noted including possible legal difficulties;
- The relationship between the level of the tax and the level of the minimum deposit would require careful consideration if unnecessary or undesirable discrimination between containers or beverages were to be avoided;
- Consideration would need to be given as to whether the same levels of tax and deposits should be applied to all sizes of container;
- The short term effects of introducing such a proposal are unpredictable and dependent on various perceptions of the longer term intentions of the proposal. Consideration would have to be given to a mechanism whereby such a proposal could be introduced in stages with adequate flexibility being left to the Government to improve the system in the light of experience; and
- The final recommendation of the Jenkins Committee that existing recycling systems be used was seen to be significant.

INDUSTRY'S POSITIVE LITTER CONTROL APPROACH

- 5.24 Detailed proposals were put forward by the "Victorian Industry Group" representing nine major companies in the beverage and beverage packaging industry and these proposals were supported by a similar proposal from the Keep Australia Beautiful Council (Victoria). Extracts from these proposals are included in this report as Appendices 8 and 9.
- 5.25 The Victorian Industry Group offered \$2.5 million over three years to fund a programme which is detailed in Appendix 8.
- 5.26 The Victorian Industry Group argued that litter (and waste) problems should be seen and tackled as a whole, that beverage containers make only a small contribution to these problems, that existing activities are achieving basically satisfactory results in terms of beverage containers and that further improvements can and should be achieved by building on the existing efforts of industry, local government and community organizations.
- 5.27 The Sub-committee visited New South Wales to evaluate the New South Wales Litter Reduction Campaign which is similar to the programme proposed by the Victorian Industry Group.
- 5.28 Written evidence given by Dr. P. J. Crawford, Director of the New South Wales State Pollution Control Commission read as follows:

In December, 1978, the New South Wales Government launched a three year litter reduction campaign aimed primarily at reducing littering and litter throughout the State. The funds for this campaign are being provided by private industry, predominantly by those associated with the production and use of beverage containers. This campaign is directed primarily at just one facet of government concern, the acts of littering, within the very wide area of waste management.....

In 1981 industry agreed to continue funding the campaign for a further three years.

5.29 Dr. D. R. Leece of the State Pollution Control Commission made the following statement when giving evidence to the Committee (at page 720):

The actual management of waste and litter in New South Wales is a local government responsibility. The State Government establishes the policies and over-all guidelines and assists local government to the extent it can.

The litter reduction campaign is seen as a State Government effort to assist local government in its waste management role. The only way the State Government is involved in waste is through the Metropolitan Waste Disposal Authority, which handles waste on behalf of local councils in Sydney areas in which there are particular difficulties and where they need to be co-ordinated.

5.30 The Committee concluded that there were positive and negative features in the "systematic" or "positive" litter control approach as it was proposed to the Committee in this inquiry.

5.31 Positive features include:

- Action is proposed to tackle litter, waste and recycling problems beyond the beverage container sector.
- Concentrated media efforts such as the New South Wales "Do-The-Right-Thing" campaign would be a useful component of an overall effort; however, other efforts would be also needed and considerable ingenuity would be necessary if the impact of media campaigns was to be maintained.
- There is considerable merit in involving industry, community organizations and local government in improving litter and waste control and recycling. Similarly, there is great value in providing some flexibility to allow industry, community organizations and local government to achieve desired results by building on existing efforts.

- The majority of the funding would come from industry and the government would incur only minimal levels of administrative overheads.

5.32 Negative features include:

- Beverage containers and related items are a significant component of litter in New South Wales.
- The proposals are very nebulous and open-ended, particularly in respect to performance targets. For example, no commitments are included as to return rates expected for recyclable and refillable containers.
- The proposals are very much dependent upon the effort put in voluntarily by industry and the degree of co-operation they receive from municipal councils. There is no positive motivation and, in particular, no financial incentive - other than the fear of possible future deposit legislation - which would ensure that significant improvement occurs.
- Further, there is no means of dealing with industry sectors whose performance results are below the standard for other sectors. The proposals suggest various administrative structures to encourage the implementation of improvements. However, if specific actions were called for to, for example, increase container return rates, these could be rejected by the companies affected. The necessary powers to implement improvements in these circumstances are not proposed.

5.33 The Committee concluded that, taking account of the New South Wales experience, the positive litter control approach would not in itself solve the problems which the Committee has identified.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

- 6.1 Having identified areas of concern in paragraphs 3.39 to 3.41 and critically reviewed three different Australian approaches in Chapter Five, the Committee has sought to develop an approach it believes to be appropriate to the Victorian situation.
- 6.2 The Committee is aware of the changes that have occurred in both the form and size of beverage containers. Further changes are likely in response to changes in consumers' needs, marketing, convenience and pricing aspects.
- 6.3 However, the Committee believes that society has a right and an obligation to demand a degree of responsibility to be exercised in relation to the fate of used beverage containers.

The various individuals involved in the provision and consumption of the contents of a container should not have the right to impose the cost of managing the empty container (and conserving its resource value) on society as a whole.

There have been commendable expressions from various parts of the beverage industry that it does have some social responsibility in this respect. There is a large measure of goodwill towards the Committee's objectives within industry and every endeavour should be made to build constructively on this goodwill.

- 6.4 Whilst recognising that primary decision-making responsibility should remain with the Government, the Committee believes that promotion of a negotiated co-operative management structure involving governments, industry and the community can lead to the desired improvements.

- 6.5 There is considerable merit in involving industry, community organisations and local government in improving litter and waste control and recycling. Similarly, there is great value in providing some flexibility to allow industry, community organisations and local government to achieve the desired results by building on existing efforts.
- 6.6 Submissions from most of the industry strongly sought the opportunity to produce satisfactory results, with government and community co-operation, as against the introduction of compulsory returnable deposit legislation. The Committee believes that industry should be given this opportunity on the understanding that performance standards, accountability and action in the case of non-compliance would be clearly laid down.
- 6.7 The Committee's preferred approach is for the Government to negotiate an agreement with the beverage and beverage container industry for a five-year programme, including funding contributions from industry, as detailed in paragraph 6.11 (1) and (2), aimed at achieving significant improvements in litter reduction and the increased recycling of beverage containers.
- 6.8 The agreement should provide for the Government, in consultation with the industry and the advisory committee recommended in paragraph 6.11 (3), to set annual objectives for recycling rates and other matters. The achievement or otherwise of these objectives should be reported annually in detail to the Parliament.
- 6.9 If a mutually acceptable agreement cannot be negotiated with the beverage and beverage container industry or if adequate progress were not made during the course of the five-year programme, then the Government should adopt the legislative measures which are detailed in the recommendations contained in paragraph 6.11 (6).

6.10 Positive advantages of the Committee's preferred approach include:

- (a) The approach would adequately tackle the problems identified in Chapter Four, especially in paragraphs 4.39 to 4.41, and in particular is in accord with paragraph 4.41. The preferred approach would also incorporate the strengths and overcome the weaknesses of the alternative courses of action reviewed in Chapter Five;
- (b) The approach would achieve overall improvements in the reduction of beverage container litter and waste;
- (c) The approach would not be disruptive. It would include retention of the best features of existing recycling systems plus new measures necessary to achieve the negotiated programme, whilst taking account of the state of industry, including any special features in different industry sectors;
- (d) It would not have any significant or harmful impact on economic factors within the industry, including employment. It would enhance future innovation, research and development;
- (e) The approach would be fairly simple and easy to understand and would not be administratively difficult;
- (f) The approach would include clear performance targets, positive motivation to perform, accountability, and a means of handling industry sectors which perform below the standards of other sectors; and
- (g) The approach would generate funding for on-going campaigns aimed at all litter and waste, including concentrated media efforts and assistance to municipalities and others in establishing and developing recycling initiatives. Most funding would come from the industry, with limited cost to the Government.

RECOMMENDATIONS

6.11 Taking account of all the evidence and submissions, the Committee makes the following recommendations:

- (1) The Government should negotiate with the Victorian beverage, beverage container, aluminium can sheet and retail industry to establish funding for, and co-operation in, the implementation of a specific five-year programme having as its major objectives the achievement of significant improvements in litter reduction and the increased recycling of beverage containers.

The Committee notes that the Victorian Industry Group offered \$2.5 million over a period of three years to fund a programme which was detailed for the first year only. Aspects of this proposed programme and funding appear to be inadequate. Funds should be negotiated on the basis of an agreed thorough on-going programme and should be indexed for inflation.

In these negotiations, the Government should urge that individual company contributions bear some relationship to recycling performance and clean-up costs for their containers.

- (2) The negotiated programme should include:
 - (a) The setting of definite annual achievable recycling targets for each type of recyclable container where recycling is justifiable on social, economic or environmental grounds, and performance measures which relate to both recyclable and non-recyclable containers.
 - (b) The promotion of public awareness programmes aimed at the prevention and collection of litter and improved container recycling.

- (c) Assistance to municipalities and others in establishing and developing recycling initiatives.
- (d) Research into, and promotion of, matters associated with litter, beverage container recycling and management.
- (e) The employment of an independent auditor to collect comprehensive data annually about beverage containers in Victoria so that progress can be monitored. (This data should be presented at the level of detail contained in Tables 1 and 2 of this report. This would necessitate the collection of data from major companies and organizations but would not require the collection of data from the smaller companies.); and
- (f) Assistance in the preparation of an annual report to be presented to Parliament by the Minister for Planning and Environment setting out:
 - (i) the recycling targets for past years and the year ahead;
 - (ii) the recycling rates actually achieved and the numbers of the various types of beverage container manufactured, sold, refilled and recycled in Victoria during the year covered by the report;
 - (iii) reasons for differences between the target and achieved rates of recycling;
 - (iv) a report on the overall programme carried out during the previous year; and
 - (v) the programme proposed for the year ahead.

- (3) The Government should establish an advisory committee consisting of ten members. The membership should comprise:
- Two members from the Government;
 - Two members from local government (one from an urban municipality and one from a rural municipality);
 - Two members from the beverage and container industry;
 - Two members from the unions in the above industries; and
 - Two members from community organisations similar to the Keep Australia Beautiful Council (Victoria) and Friends of the Earth.
- (4) The advisory committee should advise the Minister for Planning and Environment on matters associated with the programme and any other matters referred to it by the Minister.
- (5) The Government should establish a unit in the Environment Protection Authority to administer matters referred to in these recommendations.
- (6) If a mutually acceptable agreement cannot be negotiated with the beverage and beverage container industry or the performance is not satisfactory in terms of achieving significant improvements in litter reduction and increased recycling of beverage containers, then the Government should adopt legislation having the following effect:
- (a) All beverage containers, except as exempted under 6(c), would be subject to a minimum five cent refundable deposit. The value of the deposit would be required to be clearly marked on the container.

- (b) Retailers of beverages subject to a container deposit would be bound to refund deposits on return of the containers, subject to dispensation due to the proximity of licensed retrieval depots or, in other circumstances, as determined by the responsible Minister.
- (c) The responsible Minister would be able to exempt from the deposit requirement:
 - (i) Classes of containers where a filler or container manufacturer can satisfy the Minister that the industry would implement an acceptable and effective container return system;
 - (ii) Containers for which an appropriate fee or contribution in lieu of the deposit requirement has been paid; and
 - (iii) Containers for unflavoured milk. (The Committee believes that unflavoured milk is an important household foodstuff rather than a recreational beverage.)
- (d) In determining whether a return system is acceptable under recommendation (6)(c)(i), the Minister should accept as a guideline a return rate of 80 per cent, this being phased-in commencing at 60 per cent and increasing at 5 per cent per year. This would include direct replacement home delivery systems and alternative systems instituted by industry to achieve the desired performance standard.
- (e) In respect of containers for which a fee or contribution would apply, the Government should negotiate with the relevant sections of the beverage industry on a suitable method of annual payments. Failing such an agreement, the fee should be collected by a business franchise fee in respect of these containers. The fee should be based on

one cent per container increasing by one cent per two years up to five cents.

- (f) Funds generated should not be seen or used as a general revenue-raising measure but should be used for the programme outlined in recommendation 2.
 - (g) All recommendations other than (1) and (2) would still apply if recommendation (6) were to be implemented.
- (7) The above recommendations are intended to encourage practical, effective, comprehensive and non-discriminatory beverage container return and recycling systems, with minimal transitional problems and economic dislocations. They should form part of a wider programme designed to achieve overall improvements in litter, waste and resource use generally.
- (8) The Committee recommends that, as part of the general effort to reduce litter and waste, problems involving the unsightly dumping of large amounts of rubbish (including builders' rubble and old cars) in country areas, litter problems in recreational areas and the predominance generally of paper products amongst litter (including, particularly, confectionery wrappers, cigarette packets, papers and circulars) be tackled by the Government.
- (9) Research and organisation efforts should be undertaken to increase the standardization of containers and to increase the practical recyclability of containers not currently recycled (particularly PET bottles).
- (10) Independent technical research is also required to determine, adjust and enforce objective safe standards for bottles to be refillable.

- (11) That detachable can tops should be prohibited and that research should be undertaken to overcome problems leading to the littering of bottle tops. The Committee also recommends that action be taken to ensure that beverage straws and pack connectors are manufactured from decomposable material so as to reduce their long-term impact when littered.

- (12) Co-operative efforts with other States in line with the recommendations of this report should be encouraged.

- (13) The operation of the *Litter Act* 1964 should be reviewed.

* * *

Committee Room

14 August 1984.

APPENDICES

1. List of written submissions.
2. List of witnesses appearing before the Committee.
3. Significant reference documents.
4. Beverage packaging legislation, U.S.A.
5. The effects of deposit legislation on beer and soft drink sales and package mix in six States of the U.S.A.
6. Synopsis from submission by Department of Industry, Commerce and Technology.
7. Part of submission from Friends of the Earth.
8. Part of a proposal from "Victorian Industry Group".
9. Part of a proposal from KABC.
10. Part of a paper submitted by Mr. K. N. McLennan, Chief Health Surveyor, City of Knox.

* * *

LIST OF SUBMISSIONS

ACI Packaging Group
 ACI Petalite
 Mr. J. Adomeit, Hampton Park
 Affinity Metals Pty. Ltd.
 Mrs. M. A. Ahearn, North Geelong
 Alcan Australia Limited
 Alcoa of Australia Ltd.
 Alternative Technology Association
 Aluminium Can Group
 Amalgamated Metal, Foundry and Shipwrights Union
 Amatil Limited
 Amstel Golf Club
 Apex Club of Ringwood
 Australian Conservation Foundation
 Australian Consumers' Association
 Australian Environment Council
 Australian Federation of Business and Professional Women
 Australian Glassworkers' Union
 Australian Hotels Association
 Australian Labor Party (Tally-Ho, Wangaratta, Highett West/
 Moorabbin, Syndal/Pinewood, Hamilton Branches)
 Australian Paper Manufacturers Ltd.
 Australian Railways Union
 Australian Safeway Stores Pty. Ltd.
 Dr. F. Balkau, Fitzroy
 Mr. J. Ball, Carlton
 Ballarat North Bowling Club
 Ms. S. Banks, East Brunswick
 Mrs. V. Bartholomew, Highett
 Belmont Bowling Club
 Bendigo Apex Club
 Bentleigh R.S.S. & A. Club

Dr. W. S. Benwell, Carlton
Berkel Pty. Ltd.
Berri Fruit Juice Co-operative Ltd.
Beverage Packers Pty. Ltd.
Bicycle Institute of Victoria
Ms. J. Blythe, Macleod
Mr. R. Boardsen, Ashburton
Mr. A. Boddington, East Brunswick
Mr. F. Bort, Brunswick
Box Hill Golf Club
Mrs. P. Brew, Cheltenham
Brotherhood of St. Lawrence
Broken Hill Proprietary Company Limited
Brunswick Club
Brunswick Community Health Service
Mr. G. Burlison, Clayton
Mr. T. Burns, Shepparton
Cadbury Schweppes Pty. Ltd.
Carlton and United Breweries Limited
Carlton Cricket and Football Social Club
Mr. C. M. Carroll, Sandringham
Centre for Education and Research in Environmental Strategies
Cheltenham Golf Club
Chirnside Park Country Club
Churchill Community Health Centre
Ms. S. Clark, Frankston
Ms. S. Clarke, Maldon
Clelands Cold Stores Pty. Ltd.
Coca-Cola Bottlers - Melbourne
Coca-Cola Export Corporation
Ms. J. Coghlan, Brunswick
G. J. Coles & Coy. Ltd.
Collingwood Community Health Centre
Comalco Limited
Commonwealth of Kentucky
Composite Buyers Ltd.

Conservation Council of Victoria
Consolidated Foods Limited
Consumers Anonymous, Clayton
Containers Limited
Cook's Eganstown Spa
Cottee's General Foods Ltd.
Mr. J.E. Cousins, Donvale
Mr. J. Covic
Dr. G. Cumming, McLeod
Mr. J. Curtis, Orbost
Dandenong RSL Club
Ms. D. Davies, Mornington
Mr. R. Davies, Portland
Mrs. R.M. Dempster, Hamilton
Department of Conservation - Augusta - Maine
Department of Crown Lands and Survey
Department of Environment and Planning, South Australia
Department of Industry, Commerce and Technology
Mr. J. G. J. Dickinson, Cheltenham
Ms. A. Doi, Beaufort
Ms. D. J. Dyason, Research
Eaglehawk Golf Club
Eastern Region Refuse Disposal Group
Environment Protection Authority
The Hon. D. M. Evans, M.L.C.
Mr. P. Farrell, Pascoe Vale
Federated Ironworkers' Association of Australia
Federated Liquor and Allied Industries Employees' Union
Foodland Stores Pty. Ltd.
Ms. J. Francis, Sassafras
Friends of the Earth (Perth)
Friends of the Earth (Sydney)
Friends of the Earth (Victoria)
Mr. R. H. Frogley, Hamilton
J. Gadsden Australia Limited
Ms. M. Gannon, Flemington

Mr. W.J. Gardner, Elwood
Geelong Club
Geelong Golf Club
Ms. J. Gething, East Brunswick
Dr. L. Gillbank, North Carlton
Glass Containers Pty. Ltd.
Glass Packaging Institute of Australia
Glaxo Australia Pty. Ltd.
Ms. V. Gordon, Portland
R. M. Gow & Co. Ltd.
Grocery Manufacturers of Australia Ltd.
Mr. P. Halsall, Ferntree Gully
Hamilton Golf Club
Ms. K. Hamilton, Highett
Mr. N. Hamilton, Aspendale
Healesville Bowling Club
Mr. J. Heeps, Richmond
Mr. D. R. Henley, Port Melbourne
Hepburn Spa Pty. Ltd.
Mr. M. Hill, Brunswick
Mr. B. Hedge, Brunswick
Hill End and Grove Rovers Football Club
Ms. C. Hooper, St Kilda
Horsham Returned Servicemen's Club
ICI Operations Pty. Ltd.
Mr. P. Jeans, Wodonga
Keep Australia Beautiful Council - National
Keep Australia Beautiful Council (New South Wales)
Keep Australia Beautiful Council (Victoria)
Keep Australia Beautiful Council (Western Australia)
Keep Sandringham Beautiful Committee
Keep South Australia Beautiful (Inc)
Keep Werribee Shire Beautiful Committee
Keilor East RSL Club
Mr. G. R. Kenafacke, Glen Iris
F. & K.G. King

Mr. H. J. Klauer, Seaford
Mr. A. Kynazis, Brunswick
Lakes Entrance Community Health Centre
Latrobe Valley Community Health Co-ordination Committee
Mrs. C. Leatham, Baxter
Licensed Clubs' Association of Victoria
Mr. D. Liddiard, East Brighton
Light Car Club of Australia
Liquor Industry Consultative Council
Litter Research Association
Mrs. L. Loftus Hills, Lower Plenty
Macedon Range Conservation Society
Maribyrnong Park Bowling Club
Masonic Club of Victoria
Maroondah Social Health Centre
S. E. McGregor Pty. Ltd.
McKinnon Bowls Club
Mr. P. Melvaine, Ivanhoe
Mentone Sub-branch of the Returned Services League of Australia
Merri Creek Co-ordinating Committee
Mr. M. Meszaros, Alphington
Metropolitan Refuse Disposal Committee
Metropolitan Waste Disposal Authority of New South Wales
Michigan Department of Natural Resources
Mid Murray Field Naturalists' Trust
Minister of Housing
Mitcham Scout Group
Moe and District Community Health Centre
Mr. J. Morris, Hurlstone Park
Morwell Sub-branch of the Returned Services League of Australia
Municipal Association of Victoria
Mr. F. Murphy, Hawthorn
Native Forests Action Council
National Parks Service
Natural Beverages
Nature Conservation Council of New South Wales

Natural Mineral Water Bottlers
Neangar Park Golf Club
Ms. R. Neville, Oakleigh
Nhill Golf Club
Northern Golf Club
Oakleigh District Environmental Group
O'Brien's Catering Pty. Ltd.
Mr. J. R. O'Donohue, Elsternwick
Ms. H. M. O'Reilly, Moonee Ponds
Packaging Council of Australia
Pascoe Vale Naturalists
Paper and Allied Industries Resource Alliance
Mr. I. Pausacker, Gembrook
Mr. R. Pawsey, Blackburn
Mr. G. Perkins, Frankston
Petitions lodged by:

Dr. K. A. Coghill, M.P.
Mr. J. E. Delzoppo, M.P.
Mr. G. K. Ernst, M.P.
Mr. J. D. Harrowfield, M.P.
Mrs. J. M. Hill, M.P.
Mr. G. S. Hockley, M.P.
Mr. K. S. Jasper, M.P.
Mr. A. D. Kennedy, M.P.
Mr. G. G. Leigh, M.P.
Mr. D. K. McKellar, M.P.
Mr. T. R. Norris, M.P.
Mr. K. H. Remington, M.P.
Mr. P. Ross Edwards, M.P.
Mr. H. K. Shell, M.P.
Mr. B. E. H. Steggall, M.P.
Mr. E. M. P. Tanner, M.P.
Mr. T. W. Templeton, M.P., and
Dr. G. M. Vaughan, M.P.

L. Phillips, Portland
Plastics Institute of Australia
Mr. R. M. Plowright
Mr. D. Poland, Rose Bay
Port Phillip Conservation Council
Printing and Kindred Industries Union
Mr. P. Proops, Southerland
Pure-Pak (Australia) Pty. Ltd.
Mr. A. H. Ralph, Surrey Hills
Recyclers' Association of Victoria
Mr. A. Reeves, Alphington
Ms. J. Reicteford, North Melbourne
Repco Engine Parts
Retail Confectionery and Mixed Business Association
Retail Liquor Merchants' Association of Victoria
Retail Traders Association of New South Wales
Retail Traders' Association of Victoria
Riversdale Golf Club
Ms. R. Robinson, Moonee Ponds
Road Construction Authority
Roadsides Conservation Committee
Mr. L. Rushton, Wodonga
San Remo Wine and Spirit Merchants
Mrs. J. Sawford, Mulgrave
Mr. B. W. & Mrs. U. R. Schieper, Forest Hill
Self Service Wholesalers Pty. Ltd.
7X Beverages (Central) Pty. Ltd.
Mr. R. Shears, Malvern
Mr. A. G. Shell, Beaumaris
Mr. M. K. Shore, Hawthorn
Simsmetal Ltd.
Soft Drink Manufacturers' Association of Western Australia
Ms. S. Sondreal, Brunswick
South Australian Brewing Company Ltd.
South Australian Soft Drink Manufacturers' Association
State of Oregon

State Bicycle Committee
State Pollution Control Commission (New South Wales)
State Rivers and Water Supply Commission
Sunburst Regency Foods
Sunbury Bowling Club
Sunshine RSL Club
Tasmanian Conservation Trust
Tasmanian Environment Protection Advisory Council
Tetra Pak (Australia) Proprietary Limited
Mr. G. E. Thompson, Glen Waverley
Trafalgar Golf Club
Traralgon Bowling Club
Traralgon Community Health Service
Transport Workers Union - South Australia
Transwest Haulage Pty. Ltd.
Ms. D. Tremayne, Thornbury
Mrs. E. Tudor, Blackburn
Union Carbide Australia Limited
United Bottle Merchants Company Pty. Ltd.
United Distillers Pty. Ltd.
United Trades and Labour Council of South Australia
Ms. M. Vessey, Gisborne
Victorian Chamber of Manufactures
Victorian Chilled Fruit Juice Association
Victorian Dairy Industry Authority
Victorian Federation of State School Parents' Clubs
Victorian Soft Drink Manufacturers' Association
Victorian Trades Hall Council
Victorian Waste Management Association
Mr. D. Walter, Maldon
Warragul Golf Club
Mrs. K. Wasylyk, South Yarra
Werribee Bowling Club
Werribee River Association
West Coburg Progress Association
West Heidelberg Community Health and Welfare Centre

Western Bottlers Pty. Ltd.
Wholesale Spirit Merchants Association of Victoria
Wine and Brandy Producers' Association
Mr. S. M. Wong, Abbotsford
Mr. J. Wood, East Malvern
Woolworths (Victoria) Limited
Yallourn Bowling Club
Yarraville Club

Municipalities

City of Altona
Shire of Bacchus Marsh
City of Ballarat
City of Ballan
City of Benalla
Shire of Benalla
Shire of Bellarine
Shire of Bright
City of Broadmeadows
Shire of Bulla
Shire of Buln Buln
Shire of Buninyong
Town of Camperdown
City of Caulfield
City of Chelsea
Shire of Cranbourne
City of Croydon
City of Coburg
City of Collingwood
Shire of Corio
Shire of Diamond Valley
Shire of Dimboola
City of Doncaster and Templestowe
Borough of Eaglehawk
City of Echuca
Shire of Eltham

City of Fitzroy
Shire of Flinders
Shire of Gordon
Shire of Hampden
Shire of Hastings
City of Hawthorn
Shire of Healesville
City of Keilor
City of Knox
Shire of Korumburra
Shire of Lillydale
Shire of Maldon
Shire of Mansfield
City of Maryborough
Melbourne City Council
City of Mildura
Shire of Mildura
Shire of Mornington
Shire of Newstead
City of Newtown
City of Nunawading
Shire of Minhamite
City of Northcote
City of Oakleigh
Shire of Otway
Town of Portland
Shire of Portland
City of Preston
Borough of Queenscliffe
City of Ringwood
Shire of Rochester
Shire of Rosedale
City of Sale
City of Sandringham
Shire of Seymour
Shire of Sherbrooke

City of Springvale
City of South Barwon
City of Sunshine
Shire of Stawell
Town of Stawell
Shire of Strathfieldsaye
City of Swan Hill
Shire of Swan Hill
City of Traralgon
Shire of Traralgon
Shire of Tullaroop
Shire of Upper Murray
Shire of Wannon
Shire of Waranga
City of Warrnambool
Shire of Werribee
Shire of Whittlesea
Shire of Wimmera
Rural City of Wodonga
Shire of Wycheproof

In addition, 123 signed submissions were received on pre-typed sheets which were distributed with the Friends of the Earth Newsletter in February 1983.

* * *

LIST OF WITNESSES

Adelaide6 April 1983

| | |
|-----------------------------|--|
| Hon. D. J. Hopgood, M.H.A.) | |
| Mr. G. R. Inglis) | Representing the Department of Environment and Planning |
| Mr. R. Debelle) | |
| Mr. R. Naismith) | |

7 April 1983

| | |
|-----------------------|--|
| Mr. G. W. Wheatland) | Representing the South Australian Brewing Company Limited |
| Mr. E. J. Taylor) | |
| Mr. R. L. Folley) | |
| Mr. W. T. Cooper | Representing Cooper & Sons Ltd. |

8 April 1983

| | |
|----------------------|--|
| Mr. L. Swain | Representing Keep South Australia Beautiful Inc. |
| Mr. W. T. Cooper | Representing Cooper & Sons Ltd. |
| Mr. R. L. Folley) | Representing the South Australian Brewing Company Limited |
| Mr. E. J. Taylor) | |
| Mr. M. A. Lennon | Representing the Local Government Association of South Australia |
| Mr. J. Sneddon | Representing the South Australian Mixed Business Association |
| Mr. H. R. Harrington | Representing G. J. Coles & Co. Ltd. |
| Mr. M. J. Barry | Representing the Independent Grocers' Co-operative Ltd. |
| Mr. G. McAllister | Representing Woolworths (South Australia) Ltd. |
| Mr. J. Chaston) | Representing the South Australian Marine Store Dealers' Association |
| Mr. I. Alexander) | |

| | | |
|----------------------|---|---|
| Mr. L. T. Bourn |) | |
| Mr. B. W. Hunt |) | Representing the South Australia Soft Drink |
| Mr. P. Griffith |) | Manufacturers' Association Inc. |
| Mr. R. Hall |) | |
| Dr. R. Shearer |) | |
| | | |
| Hon. G. R. Broomhill | | Former Minister of Environment and Planning |
| | | |
| Mr. E. J. Phipps |) | |
| Mr. G. L. Inglis |) | Representing the Department of Environment |
| Mr. R. Debelle |) | and Planning |
| Mr. R. Naismith |) | |
| | | |
| Hon. D. W. Simmonds | | Former Minister for the Environment |

Melbourne

9 May 1983

| | | |
|----------------------|---|---|
| Cr. G. B. Frecker |) | Representing the Municipal Association of |
| Mr. I. R. Pawsey |) | Victoria |
| Ms. A. Austin |) | |
| | | |
| Mr. F. V. Phillips |) | Representing the Victorian Chamber of |
| Mr. J. A. N. Norgard |) | Manufacturers |
| | | |
| Mr. W. Winter |) | Representing the Victorian Soft Drink |
| Mr. D. J. Henry |) | Manufacturers' Association |
| | | |
| Mr. R. Nankin |) | |
| Ms. B. J. Hutton |) | Representing the Friends of the Earth |
| Ms. S. Sondreal |) | |
| | | |
| Mr. A. O'Brien |) | Representing the Packaging Council of |
| Mr. W. M. Maunder |) | Australia |
| Mr. G. R. Murray |) | |
| | | |
| Mr. I. Pausacker | | Representing the Conservation Council of |
| | | Victoria |

10 May 1983

| | | |
|----------------------|---|--|
| Mr. J. P. Burrows |) | Representing Australian Consolidated |
| Mr. T. Kuiper |) | Industries Ltd. |
| Mr. G. L. Richardson |) | |
| | | |
| Mr. P. D. Moverley |) | Representing the Broken Hill Proprietary |
| Mr. T. Gibson |) | Company Limited |
| Mr. T. Pennifold |) | |
| | | |
| Mr. K. J. Mansfield |) | Representing Alcoa of Australia Ltd. |
| Mr. K. A. Angwin |) | |

| | | |
|----------------------|---|---|
| Mr. J. F. McGough |) | Representing the Plastics Institute of Australia Inc. |
| Mr. D. G. Boyle |) | |
| Mr. D. Durlacher |) | |
| Mr. G. L. Richardson |) | |
| Mr. J. L. Roberts | | Representing the Recyclers' Association of Victoria and the United Bottle Merchants Company Pty. Ltd. |
| Mr. W. T. Duggan | | Representing J. Gadsden Australia Ltd. |
| Mr. G. Lafitte | | Private Individual |

11 May 1983

| | | |
|--------------------------|---|--|
| Mr. J. A. N. Norgard |) | Representing Carlton and United Breweries Limited |
| Mr. P. Ormond |) | |
| Mr. T. J. Waters |) | |
| Mr. P. J. McQuilten | | Representing 7X Beverages (Central) Pty. Ltd. |
| Hon. D. M. Evans, M.L.C. | | Member for North Eastern Province |
| Mr. J. Newman |) | Representing the Mineral Waters Bottlers' Association |
| Mr. H. W. Grist |) | |
| Mr. G. C. Delbridge |) | |
| Mr. P. A. Robinson |) | Representing Simsmetal Limited |
| Ms. M. Buse |) | |
| Mr. K. E. Macdonald | | Representing the Retail Traders' Association of Victoria |

16 May 1983

| | | |
|--------------------|--|---|
| Dr. F. Balkau | | Private Individual |
| Dr. L. R. Gillbank | | Private Individual |
| Mr. P. Melvaine | | Private Individual |
| Mr. A. G. Shell | | Private Individual |
| Mr. B. N. O'Brien | | Representing O'Brien Catering Pty. Ltd. |
| Dr. W. S. Benwell | | Private Individual |
| Mr. C. W. Schaller | | Representing the Environment Protection Authority |
| Mr. R. G. Hodges | | Representing the Department of Crown Lands and Survey |

Mr. J. R. May Representing the National Parks Service

17 May 1983

Mr. N. W. Ford)
Mr. P. G. Howard) Representing Comalco Limited
Mr. N. J. McNeill)

Mr. A. D. Mortimer) Representing the Victorian Dairy Industry
Mr. D. J. Perrin) Authority
Mr. H. G. A. Ellis)

Mr. J. N. Halford) Representing the Metropolitan Refuse Disposal
Mr. P. Cecil) Consultative Committee

Mr. P. R. Marsden Representing the Victorian Waste Management
Association

Mr. K. N. McLennan Representing the City of Knox

Ms. G. A. Brown Representing the Brunswick Community Health
Centre

Mr. M. Rye Representing the Australian Consumers'
Association

18 May 1983

Dame Phyllis Frost Representing the Keep Australia Beautiful
Council (Victoria)

Mr. P. G. White) Representing the Keep Sandringham Beautiful
Ms. P. Reynolds) Committee

Mr. R. P. Sewell) Representing the Keep Werribee Shire
Mr. N. Tsardakis) Beautiful Committee
Mr. R. K. Andrew)

Mr. G. J. Broderick Representing the Liquor Industry Consultative
Council

Mr. I. D. Stewart Representing the Retail Confectionery and
Mixed Business Association

Sydney

23 June 1983

Mr. N. W. Ford)
Mr. P. G. Howard) Representing Comalco Limited
Mr. P. A. Crooke)
Mr. M. C. Wrench)

24 June 1984

Mr. R. A. Guest)
Dr. D. R. Leece) Representing the State Pollution Control
Commission of New South Wales

Mr. K. H. Youdale) Representing Amatil Limited

Mr. R. Paterson)
Mr. W. R. Widerberg) Representing the Litter Research Association
Mr. N. J. Eastment)

Mr. J. Wachter Respresenting the Friends of the Earth (Sydney)

Mr. C. H. Pratten)
Dr. H. Panter) Representing the Nature Conservation Council
of New South Wales

Mr. B. van den Broek Representing the Metropolitan Waste Disposal
Authority

Mr. B. Wilton)
Lady Galleghan) Representing the Keep Australia Beautiful
Mr. D. Abbott) Council of New South Wales

Melbourne

13 July 1983

Mr. W. R. Bree Representing the Department of Environmental
Quality, State of Oregon, U.S.A.

Mr. J. Biggs Former Director of the Department of Ecology,
State of Washington, U.S.A.

14 July 1983

Mr. J. Barron Representing the Australian Glass Workers'
Union and the Victorian Trades Hall Council

Mr. K. M. Cys Representing the Transport Workers' Union -
South Australian Branch.

| | | |
|-----------------|--|---|
| Mr. V. Marks | | Representing the Amalgamated Metals, Foundries and Shipwrights Union |
| Mr. F. J. Brown | | Representing the Federated Ironworkers' Association of Australia |

19 July 1983

| | | |
|----------------------|---|---|
| Mr. A. J. E. Lawson |) | |
| Mr. J. Sanderson |) | Representing Containers Limited |
| Mr. W. R. McCann |) | (Evidence in camera) |
| Mr. L. E. Thorn |) | |
| Mr. B. Black |) | |
| Mr. W. T. Duggan |) | Representing J. Gadsden Australia Limited |
| Mr. N. J. Eastment |) | (Evidence in camera) |
| Mr. B. D. Pearson |) | |
| Mr. J. A. N. Norgard |) | |
| Mr. T. J. Waters |) | Representing Carlton and United Breweries |
| Mr. P. Ormonde |) | Limited (Evidence in camera) |
| Mr. J. R. Jopling |) | |

20 July 1983

| | | |
|----------------------|---|---|
| Mr. K. B. Godson |) | |
| Mr. T. Kuiper |) | Representing Australian Consolidated Industries |
| Mr. G. L. Richardson |) | Limited (Evidence in camera) |
| Mr. E. A. Chatwin |) | |
| Mr. K. Murphy |) | |
| Mr. M. R. Slinger |) | |
| Mr. K. H. Youdale |) | Representing Amatil Limited |
| Mr. P. F. Fricke |) | (Evidence in camera) |
| Mr. C. N. Prince |) | |
| Mr. D. J. Henry |) | Representing Cadbury Schweppes Pty. Ltd. |
| Mr. F. J. Swan |) | (Evidence in camera) |
| Mr. B. N. Burnett |) | |

19 October 1983

| | | |
|----------------------|---|--|
| Mr. B. N. Burnett |) | |
| Mr. T. Kuiper |) | |
| Mr. W. R. McCann |) | Representing the Victorian Industries Group, |
| Mr. J. A. N. Norgard |) | Victorian Chamber of Manufactures |
| Mr. M. R. Slinger |) | (Evidence in camera) |
| Mr. C. N. Prince |) | |

SIGNIFICANT REFERENCE DOCUMENTS

AUSTRALIA

1. Deposits on Beverage Containers: Report from the House of Representatives Standing Committee on Environment and Conservation: Parliament of Australia 1974.
2. The Management of Packaging Waste: Australian Environment Council: February 1979.
3. Report on Litter Control - Report No. 8: Australian Environment Council: June 1982.
4. Study of the Economic Impact of Beverage Container Deposit Legislation: W. D. Scott: August 1983.
5. Recycling of Refuse and After Use of Tip Sites: L. R. Boyd: December 1981.

EUROPEAN

7. Beverage Containers - Re-use or Recycling: Organisation for Economic Co-operation and Development - Paris: 1978.
8. Household Waste Management in Europe - Economics and Techniques: A. Bridgewater and K. Lidgren.
9. Energy and Packaging: I. Boustead and G. F. Hancock - Ellis Horwood Ltd. 1981.

U.S.A.

9. Materials and Energy from Municipal Waste: Office of Technology Assessment, Congress of the United States: July 1979.
10. Materials Competition in the Beverage Container Industry. The outlook for Aluminium, Glass and Plastics to 1990: Chase Econometric Sabre Associates: August 1982.

**BEVERAGE PACKAGING LEGISLATION
IN THE UNITED STATES OF AMERICA**

An analysis of the current status of legislation in the
United States, prepared by the Public Affairs Department
of the Owen-Illinois Group in May 1982

- Chart A Overall Summary: Beverage Packaging legislation
 - Chart B Statewide Forced Deposit legislation
 - Chart C Statewide Litter/Recycling legislation
 - Chart D Multipak Carrier Restrictions
 - Chart E Pull-Tab bans
 - Chart F Miscellaneous Beverage Packaging legislation
 - Chart G Local Restrictive Beverage Packaging legislation
 - Chart H Initiatives/Referenda on Forced Deposit and Litter/Recycling legislation
 - Chart I Federal Restrictive Beverage Packaging Legislative Activity 1970 - 1982.
-

OVERALL SUMMARY
BEVERAGE PACKAGING LEGISLATION

| <u>State</u> | <u>Litter/Recycling Law</u> | <u>Forced Deposit</u> | <u>Hi-Cone/Contour-Pak Restrictions</u> | <u>Pull-Tab Ban</u> | <u>Other</u> |
|----------------|-----------------------------|-----------------------|---|---------------------|---|
| Alaska | X | | X | X | |
| California | X | | X | X | |
| Colorado | | | | X | |
| Connecticut | | X | | X | |
| Delaware* | | X | X | X | bans non-refillable glass |
| Hawaii | X | | | X | |
| Iowa | | X | | X | |
| Kansas | | | | X | |
| Louisiana | X | | | | |
| Maine | | X | X | X | |
| Massachusetts | | X | X | X | |
| Michigan | | X | | X | |
| Minnesota | | | | X | Packaging Guidelines |
| Montana | | | | X | |
| Nebraska | X | | | X | |
| New Jersey | X | | | | |
| New Mexico | | | | X | |
| New York* | | X | X | X | |
| Ohio | X | | | X | |
| Oklahoma | | | | X | |
| Oregon | | X | X (Hi-Cone Only) | X | |
| South Carolina | X | | | X | |
| South Dakota | | | | | bans sales of non-reusable, non-recyclable/or non-biodegradable beverage containers |
| Tennessee | X | | | X | |
| Vermont | | X | X | X | |
| Virginia | X | | | X | |
| Washington | X | | | | |

* Note: Effective date of Delaware law deposit provisions 11/15/82 for wholesalers; 1/1/83 for retailers and 7/1/83 for the ban on N/R glass. New York law effective 7/1/83.

Owens-Illinois
Public Affairs Department
11/5/82

STATEWIDE FORCED DEPOSIT LEGISLATION

Chart "B-1"

| <u>State</u> | <u>Current Deposit Provisions/ Handling Fee</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|---|---|---|--|
| Connecticut | 5¢ minimum deposit on beer/soft drink containers 1¢ handling fee paid by distributors | bans detachable opening devices on cans | all provisions - 1/1/80 (signed into law 4/12/78) | had contained "Employee Dislocation Fund" to financially assist those losing jobs as a result of the law... this was repealed 4/13/81 due to cost |
| Delaware | 5¢ minimum deposit on beer/soft drink glass & plastic containers only up to 64 oz. minimum 20% handling fee paid by distributors | aluminum cans exempted from deposit until 1/15/84 bans non-refillable glass containers bans detachable opening devices on cans bans non-biodegradable or non-photodegradable "plastic rings or similar devices" (applies to Hi-Cone/Contour-Pak) | deposit provisions: wholesalers 11/15/82; retailers 1/15/83 pull-tab and Hi-Cone/Contour-Pak restrictions 1/15/83 ban on N/R glass 7/14/83 (signed into law 6/30/82) * * * aluminum can exemption signed 7/13/82 | originally signed into law 7/1/78, containing a "contiguous states" provision...this provision repealed; instead section added making law effective when legislature appropriated implementation funds which it did 6/82 |
| Iowa | 5¢ minimum deposit on beer/soft drink/wine/liquor containers 1¢ handling fee paid by distributors | bans detachable opening devices on cans allows retailers to refuse to refund deposits if approved redemption center located nearby | 7/1/79 for deposit on beer/soft drink containers 5/1/79 for deposit on liquor/wine containers 7/1/79 for pull-tab ban (originally signed into law 5/12/78) | \$100,000 from state's unreclaimed deposits is appropriated each year to Dept. of Substance Abuse for alcoholism treatment |
| Maine | 5¢ minimum deposit on beer/soft drink containers 2¢ handling fee paid by distributors | bans detachable opening devices on cans bans non-biodegradable "plastic rings or other device or material" (applies to Hi-Cone/Contour-Pak; allows "thermo" (heat) degradable & "chemo" degradable Hi-Cone Carriers) | all provisions - 1/1/78 (originally passed legislature with provision calling for binding referendum of people; measure was approved in 11/2/76 General Election) | repeal referendum failed 11/4/79 General Election |

Owens-Illinois
Public Affairs Department
11/5/82

Chart "B-1"

| <u>State</u> | <u>Current Deposit Provisions/ Handling Fee</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|---------------|---|--|---|--|
| Massachusetts | 10¢ minimum deposit on beer/soft drink containers over 32 ounces; 5¢ minimum deposit on beer/soft drink containers under 32 ounces 1¢ handling fee paid by distributors | bans non-biodegradable or non-photodegradable "plastic rings or other device or material" (applies to Hi-Cone/Contour-Pak) workers' "readjustment allowance" & retraining to be provided to employees losing jobs as result of bill | all provisions - 1/17/83 (signed into law 11/16/81) | measure had been vetoed by Governor but veto was overridden by legislature attempt to repeal (via initiative) defeated in 11/82 General Election bottler entitled to credit against excise tax liability of .001¢ for each re-useable beverage container sold during first qtr. 1983 |
| Michigan | 10¢ minimum deposit on beer/soft drink containers; 5¢ deposit on certified beer/soft drink containers ("certified"-capable of being reused by more than one manufacturer) <u>no handling fee</u> | bans detachable opening devices on cans | all provisions - 12/3/78 (approved via initiative of the people at 11/2/76 General Election) | Michigan Liquor Control Commission basically administers beer regulations; State Agriculture Department regulates soft drinks |
| New York | 5¢ minimum deposit on beer/soft drink containers minimum 20% handling fee paid by distributor | bans "beverages packaged by means of plastic loop retainers" (applies to Hi-Cone; Contour-Pak questionable) bans detachable opening devices on cans negates any local deposit law (ie, Suffolk County) | all provisions 7/1/83 (signed into law 6/15/82) | creates temporary state commission in 1985 to review bill |

STATEWIDE FORCED DEPOSIT LEGISLATION

Chart "B-3"

| <u>State</u> | <u>Current Deposit Provisions/ Handling Fee</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|--|--|--|---|
| Oregon | 5¢ minimum deposit on beer/soft drink containers; 2¢ deposit on <u>certified</u> beer/soft drink containers ("certified"-capable of being reused by more than one manufacturer) <u>no</u> handling fee | bans detachable opening devices on cans for all beverages in liquid form intended for human consumption (allows pressure-sensitive tape) dealers may refuse for refund contaminated or more than 96 containers at any one time, if a time is posted when large quantities are accepted | all provisions - 10/1/72 (signed into law 7/2/71) | Oregon was first state to pass a forced deposit law; State also has a Hi-Cone law (see Chart "D") |
| Vermont | 5¢ minimum deposit on beer/soft drink containers minimum 40% handling fee paid by distributor | bans detachable opening devices on cans for <u>all</u> drinks in liquid form sold for human consumption (allows pressure-sensitive tape) bans non-biodegradable "plastic rings or similar devices" (applies to Hi-Cone/Contour-Pak) bans sales of glass beer/soft drink containers not certified capable of being refilled 5 times | original bill - 4/7/72; deposit provisions - 7/1/73 Hi-Cone/pull tab - 4/30/75 | as originally passed, called for 4 mill tax on all beverage containers for beer/soft drink/liquor/wine; 4 mill tax on beer/soft drink only then replaced with 5¢ deposit; 4 mill tax on liquor/wine later removed in 1979 |

(Note: Explanations given include amendments which are currently part of each bill's provisions.)

STATEWIDE LITTER/RECYCLING LEGISLATION*

Chart "C-1"

| <u>State</u> | <u>Type of Funding</u> | <u>Programs/Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|--|--|---|---|
| Alaska | <u>no</u> industry funding - state monies used | calls for litter receptacles, litterbags, establishment of youth litter corps authorizes grants for educa- tional programs on littering prohibits littering and calls for penalties bans detachable opening de- vices on cans (<u>but</u> allows pressure-sensitive tape to be used) bans non-degradable "plastic rings or similar devices" (applies to Hi-Cone/ Contour-Pak) | litter controls - 7/1/80 Hi-Cone/Contour-Pak/pull- tab bans - 10/1/81 (signed into law 7/1/80) * * * expires ("sunsets") 7/1/84 | administered by Dept. of Environmental Conservation, Advisory Council created to advise Department (7- member group) this is only litter/recyc- ling law to contain Hi-Cone ban |
| California | currently no industry funding - state monies used (annual appropria- tions) | promotion of resource recovery, recycling, public awareness programs, litter control; prohibits littering etc. | <u>original</u> bill - 1/1/78 (signed into law 9/30/77) * * * (as originally written, was to "sunset" or expire 7/1/83...as amended sunset provision removed) | original funding was assess- ment on wholesalers/manu- facturers based on number of employees; on retailers based on gross sales; funding amended several times (first retailers re- moved; then certain whole- salers/manufacturers; allocation of program funds changed; state budget action in 1981 again cut funding) |

*Note: The states of Arkansas, Colorado, Connecticut and Kentucky no longer have their litter/recycling laws in effect. Both the Arkansas and Connecticut bills were legislatively repealed; the Colorado bill "sunsetting" (expired) on 6/30/82; and the Kentucky bill was ruled unconstitutional (since it did not receive the number of House votes needed to pass financially oriented legislation).

STATEWIDE LITTER/RECYCLING LEGISLATION

Chart "C-2"

| <u>State</u> | <u>Type of Funding</u> | <u>Program/Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|--|---|--|---|
| Hawaii | <u>no</u> industry funding; monies come from private or public sources (\$300,000 originally appropriated from State funds to implement bill) | calls for litter receptacles, encouragement of voluntary antilitter campaigns, educational programs prohibits littering; provides for littering penalties bans detachable opening devices on cans (allows pressure-sensitive tape; includes fruit juices, fruit ades) | litter control - 1/1/79 pull-tab ban - 10/1/79 plastic container ban - 10/1/79 (this plastic container ban ruled unconstitutional 8/22/79 and legislatively removed from bill 5/15/81 (signed into law 6/16/77) | measure had contained a ban on all beverages sold in plastic containers; this ban was ruled <u>unconstitutional</u> in Honolulu Circuit Court administered by Department of Health |
| Louisiana | <u>no</u> industry funding; monies come from state funds or private donations, as well as penalties for litter violations | calls for educational programs, revision of local littering ordinances, cooperation with recycling programs, local grants, etc. calls for "summer employment" for litter cleanup | all provisions - 7/13/81 (signed into law 7/13/81) | administered by Louisiana Litter Control Commission |
| Nebraska | \$150 per million dollars of sales for manufacturers & wholesalers of 10 product categories \$150 per million dollars of sales for retailers of food, beverages, liquor, wine, beer, malt beverages and groceries | calls for litter receptacles, littering surveys, public education programs calls for youth litter patrols; expansion of recycling and source separation programs calls for grants to state and local government units | all provisions - 10/1/79 (signed into law 5/24/79) * * * expires ("sunsets") 6/30/86 | administered by Department of Environmental Control contains "severability clause" keeping other provisions intact should one be found invalid original bill did not assess retailers (added via amendment 5/14/81) |
| New Jersey | tax on sanitary landfill owners & operators, 12¢ per cubic yard for disposed of solid waste (also applies to those in Pennsylvania & New York using New Jersey landfills) tax drops to 6¢ per cubic yard 1/1/86 | allocates low-interest loans to recycling businesses and industries for recycling of paper, glass, metal, other materials first-year grants to be distributed 1983...based on tons of materials recycled within each community during 1982 only municipalities eligible to receive grants | all provisions - 1/1/82 (signed into law 9/9/81) * * * reduction in per cubic yard tax - 1/6/86 | expected to generate \$3 million annually administered by State Office of Recycling (funding administered by Departments of Energy & Environmental Protection jointly) |

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STATEWIDE LITTER/RECYCLING LEGISLATION

Chart "C-3"

| <u>State</u> | <u>Type of Funding</u> | <u>Programs/Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|----------------|---|---|---|---|
| Ohio | two-level surcharge on all who pay Corporate Franchise Tax (first level-applies to all corporations--maximum liability of \$5,000) and manufacturers/retailers of 7 categories of "litter stream" products (second level-only applies when sales are at least \$10 million of litter stream products or 5% of total sales). Maximum liability on second level also \$5,000. | calls for implementation of statewide litter control program; educational programs; recycling centers accepts applications for grants from governmental entities (have non-profit groups as sub-grantees) prohibits littering and calls for penalties may call for baseline litter survey & follow-up surveys bans detachable opening devices on cans of beer, soft drinks or "mixed beverages" (pre-mixed cocktails & "still"-adulterated-drinks, ie, Hi-C; does <u>not</u> include fruit juice) | litter controls - 7/14/80 pull-tab ban - 7/1/82 (signed into law 7/14/80) * * * expires ("sunsets") 6/30/86 | administered by Department of Natural Resources Office of Litter Control before signing in 1980, Governor line-item vetoed a provision calling for a ban of non-photodegradable Hi-Cone Carriers/Contour-Pak |
| South Carolina | <u>no</u> industry funding; monies come from private and public sources (can be augmented by General Assembly through appropriations) | calls for litter receptacles prohibits littering and provides penalties authorizes grants to "litter control organizations" calls for educational programs; youth litter corps allows for use of prison labor in litter pickup allows for training of "Litter Control Officers" bans detachable opening devices on beer/soft drink cans | litter controls - 5/5/78 pull-tab bans - 10/1/80 (signed into law 5/5/78) | administered by Department of Health and Environmental Control |

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STATEWIDE LITTER/RECYCLING LEGISLATION

Chart "C-4"

| <u>State</u> | <u>Type of Funding</u> | <u>Programs/Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|--|--|--|--|
| Tennessee | through increase in beer excise tax from \$3.40 to \$3.90 per barrel & soft drink excise tax from 1.5% to 2.1% per gross receipts of sales. | authorizes grants to counties for litter pickup along roads/highways allows for use of prison labor for litter pickup | all provisions - 5/7/81 (signed into law 5/7/81) * * * increase in beer/soft drink excise taxes 7/1/81 (signed into law 5/13/81) | administered by Commissioner of Transportation |
| Virginia | \$10 annual litter levy on manufacturers/wholesalers/distributors of 15 product categories; additional \$15 annual litter levy on manufacturers/wholesalers/distributors of groceries, soft drinks and beer additional excise tax on beer of \$0.15 per barrel; soft drink excise tax of \$40-\$6,000 depending on gross receipts of soft drink distributors | calls for litter receptacles, litterbags coordination of voluntary antilitter campaigns grants for antilitter programs preempts all counties (except Loudoun and Fairfax) from enacting deposit measures calls for litter surveys | original bill - 5/12/76 (signed into law 5/12/76) | original funding for the bill was a \$5 litter levy for manufacturers/wholesalers/distributors of the 15 product categories (with no second tier) along with beer and soft drink excise taxes administered by Department of Conservation & Economic Development |
| Washington | assessment of \$150 per million dollars of sales for wholesalers/manufacturers/retailers of 13 different product categories | calls for litter receptacles, litterbags prohibits littering and calls for penalties coordination of local anti-litter efforts youth litter patrols allocation of funds/grants for public education programs, litter control, R&D, etc. encouragement of private recycling programs | original bill - 5/21/71 (signed into law 5/21/71) * * * ratified by voters at 11/72 General Election | first state to enact litter/recycling legislation administered by Department of Ecology |

MULTI-PAK CARRIER RESTRICTIONS
(HI-CONE/CONTOUR PAK)

Chart "D-1"

(Both Hi-Cone and Contour-Pak covered unless otherwise indicated)

Bans as Parts of Other Legislation

| State | Effective Date(s) | Comments |
|---------------|-------------------|---|
| Alaska | 10/1/81 | bans non-degradable plastic rings or similar devices |
| Delaware | 1/15/83 | bans non-bio or non-photodegradable plastic rings or similar devices |
| Maine | 1/1/78 | bans non-biodegradable plastic rings or similar devices; allows "thermo" (heat) and "chemo" degradable carriers |
| Massachusetts | 1/17/83 | bans non-bio or non-photodegradable plastic rings or similar devices |

Bans Passed as Separate Measures

| State | Effective Date(s) | Comments |
|------------|--------------------------------------|--|
| California | 11/1/82 (signed into law 9/17/79) | originally banned sale of non-photo, chemo or biodegradable carriers after 7/1/81 or one year after degradable carriers are found to be commercially available; on 10/28/81, it was determined these degradable carriers were available ...now <u>degradable carriers must be on the shelves by 11/1/82</u> ; certain sizes of Contour-Pak are allowed under the law |
| Oregon | 9/1/78 (signed into law 5/25/77) | does <u>not</u> cover Contour-Pak (word "metal" appears in prohibition); bans sale of plastic ring connectors which will not decompose by photobiodegradation, chemical degradation or biodegradation within 120 days of disposal |

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Chart "D-1"

MULTI-PAK CARRIER RESTRICTIONS
(HI-CONE/CONTOUR-PAK)

(Both Hi-Cone and Contour-Pak covered unless otherwise indicated)

Chart "D-2"

Bans as Parts of Other Legislation

Bans Passed as Separate Measures

| <u>State</u> | <u>Effective Date</u> | <u>Comments</u> |
|--------------|-----------------------|---|
| New York | 7/1/83 | bans "beverages packaged by means of plastic loop retainers" (Hi-Cone) use of Contour-Pak questionable) |
| Vermont | 4/30/75 | bans non-biodegradable plastic rings or similar devices |

Chart "D-2"

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PULL-TAB BANS
 (RESTRICTIONS ON DETACHABLE OPENING DEVICES)
 (Beer/soft drink containers only unless otherwise indicated)

Chart "E"

Bans as Parts of Other Legislation

| <u>State</u> | <u>Effective Date</u> | <u>Comments</u> |
|--------------|-----------------------|---|
| Alaska | 10/1/81 | pressure-sensitive tape allowed |
| Connecticut | 1/1/80 | |
| Delaware | 7/1/83 | |
| Hawaii | 10/1/79 | pressure-sensitive tape allowed; includes fruit juices and ades |
| Iowa | 7/1/79 | |
| Maine | 1/1/78 | |
| Michigan | 12/3/78 | |
| New York | 7/1/83 | |
| Ohio | 7/1/82 | also covers "mixed beverages" (pre-mixed cocktails & adulterated fruit drinks, i.e. Hi-C; does <u>not</u> include fruit juices) |
| Oregon | 10/1/72 | pressure-sensitive tape allowed; covers <u>any</u> beverage in liquid form for human consumption |
| S. Carolina | 10/1/80 | |
| Vermont | 4/30/75 | pressure-sensitive tape allowed; covers <u>any</u> beverage in liquid form for human consumption |

Bans Passed as Separate Measures

| <u>State</u> | <u>Effective Date</u> | <u>Comments</u> |
|---------------|-----------------------|---|
| California | 1/1/79 | pressure-sensitive tape allowed |
| Colorado | 1/1/83 | pressure-sensitive tape allowed; includes fruit juices, vegetable juices, non-carbonated soft drinks |
| Kansas | 1/1/82 | |
| Massachusetts | 6/1/79 | |
| Minnesota | 1/1/77 | includes tea |
| Montana | 1/1/82 | includes tea |
| Nebraska | 7/1/82 | |
| New Mexico | 1/1/83 | includes fruit juices, vegetable juices |
| Oklahoma | 1/1/81 | includes fruit juices, fruit ades, non-carbonated drinks |
| Tennessee | 3/1/82 | covers all drinks in liquid form; pressure-sensitive tape allowed for fruit juices, fruit ades and vegetable juices <u>only</u> |
| Virginia | 1/1/79 | includes fruit juices, fruit ades |
| Washington | 7/1/82 | pressure-sensitive tape allowed; includes "...other drinks in liquid form" |

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Chart "E"

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MISCELLANEOUS RESTRICTIVE PACKAGING LEGISLATION

Chart "F"

| <u>State</u> | <u>Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|--------------|---|--|---|
| Minnesota* | called "Minnesota Packaging Guidelines" gives Pollution Control Agency power to "outlaw" any package felt to be environmentally damaging" does <u>not</u> involve changes in an existing package's color, size, shape or printing limited to new or revised packages sold at retail after 5/25/73 "grandfathers in" (precludes from the law) packages sold or in existence prior to 5/25/73 | ruled <u>constitutional</u> 9/7/79 (originally signed into law 5/25/73) | long litigation history involving validity originally ruled valid in 1976, but temporary injunction granted prohibiting implementation ruled constitutional in State Supreme Court in 1979, noting that the regulations should be considered "guidelines" <u>and did not have effect of law</u> |
| South Dakota | bans sale of containers for beer and soft drinks unless they are "reusable," "recyclable," or "biodegradable" calls for litter receptacles; prohibits littering and provides penalties; allows municipalities to regulate litter | litter controls - 3/2/74 container limitations amendment 7/1/78 (signed into law 3/2/74) | original version of bill did not include term "recyclable" |

* Note: Minnesota passed legislation, to be effective 7/1/77, to ban the sale of all milk in plastic containers. However, after a series of court battles, the measure was finally legislatively repealed on 5/8/81.

LOCAL RESTRICTIVE BEVERAGE PACKAGING LEGISLATION

Chart "G-1"

| <u>State</u> | <u>Deposit Provisions</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|----------------------------|--|---|---|--|
| Albuquerque, New Mexico | | prohibits possession, carrying or transporting of glass containers in public parks | effective after 9/82 (signed into law 7/12/82) | |
| Berkeley, California | 5¢ minimum deposit on beer/soft drink containers up to 16 oz; 10¢ minimum deposit on beer/soft drink containers over 16 oz. | | was to be effective 7/25/76 (signed into law 10/22/75) | had been in litigation since passage; ruled valid 4/23/81 in State Supreme Court; Berkeley City Council voted 11/24/81 not to implement pending outcome of statewide forced deposit initiative November, 1982 |
| Boise, Idaho | | prohibits use, carrying, or possession of <u>any</u> glass beverage containers in city parks (language added to existing ordinance) | 3/16/81 (signed into law 3/16/81) | prompted by need to obtain cleanup funds for city |
| Cincinnati, Ohio | | bans use of glass containers in city-owned Riverfront Park areas | 6/9/82 (signed into law 6/9/82) | Riverfront Festival held every September |
| Collier County, Florida | | prohibits possession, carrying or transporting glass containers in parks or county beach access areas | 2/26/81 (signed into law 1/27/81) | purpose to "protect health, welfare, and safety" of persons using parks/beach access areas |

LOCAL RESTRICTIVE BEVERAGE PACKAGING LEGISLATION

| <u>State</u> | <u>Deposit Provisions</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|------------------------|---|---|--|---|
| Columbia, Missouri | 5¢ minimum deposit on beer/soft drink con- tainers 20¢ handling fee paid by distributor | | 11/4/81 (signed into law 4/5/77) | originally passed via initiative petition, 4/5/77, to be effec- tive 7/5/77; had been in litigation attempt to <u>repeal</u> failed on two General Election ballots (11/3/81 and 11/2/82) |
| Cypress, California | | bans possession, carrying or trans- porting of glass containers in parks and recreation areas | 1/13/82 (signed into law 12/14/81) | |

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Chart "G-2"

LOCAL RESTRICTIVE BEVERAGE PACKAGING LEGISLATION

Chart "G-3"

| <u>Locality</u> | <u>Deposit Provisions</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|------------------------------|--|---|---|--|
| Denver, Colorado | | litter control measure; included in provisions is ban of <u>all</u> glass containers in mountain/city parks | 9/4/79 (signed into law 9/4/79) | |
| Highland Park, Illinois | 5¢ minimum deposit on beer/soft drink containers | ban on detachable opening devices on cans | (not in effect); only effective if 8 of 12 North Shore communi- ties pass similar ordinances, including 3 contiguous communi- ties | North Shore communiti include Deerfield, Evanston, Glencoe, Glenview, Highwood, Kennilworth, Lake Forest, Northbrook, Northfield, Wilmette Winnetka, Highland Park |
| Lafayette, Louisiana | | prohibits carrying of an open glass container upon "public streets" or public property including parks | 1/25/78 (signed into law 1/25/78) | |
| Louisville, Colorado | | prohibits "bringing onto or using" in parks any glass or "breakable" container without written consent of Director of Parks | 5/16/80 (signed into law 4/1/80) | measure passed as attempt to control "alcoholic elements" |
| Orange County, California | | bans "dangerous articles" on county beaches, including bottles, glasses, crockery, etc. | 2/10/81 (signed into law 2/10/81) | affects 5 miles of Orange County beaches |
| Montgomery Cty., Maryland | 5¢ minimum deposit on beer/soft drink con- tainers | tax of 2¢ on containers up to 16 oz; tax of 4¢ over 16 oz. ban on detachable opening devices on cans | tax - 1/1/78 deposit - when "suffi- cient number of sur- rounding jurisdictions have enacted substan- tially similar legisla- tion" | effective date of de- posit section had been postponed several times before the "con- tiguous jurisdictions section was put in |

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LOCAL RESTRICTIVE BEVERAGE PACKAGING LEGISLATION

Chart "G-4"

| <u>Locality</u> | <u>Deposit Provisions</u> | <u>Other Provisions</u> | <u>Effective Date(s)</u> | <u>Comments</u> |
|-------------------------------------|---------------------------|--|--|---|
| New Iberia, Louisiana | | prohibits possession of any open glass container on public streets, parks, other public property within city; does <u>not</u> apply to closed containers "mechanically sealed, being transported from place of purchase" | 5/2/78 (signed into law 5/2/78) | |
| Oberlin, Ohio | | bans sale or possession of beer/ soft drinks/fruit ades & ready mixed teas in non-refillable containers (glass, metal, plastic) bans pull tabs on metal containers of 12 ounces or more | originally 1972 (current wording, as amended, signed into law 5/7/79) | amended several times |
| Rhode Island (local communities) | | question appeared on 11/2/82 General Election ballots in 26 communities on whether or not the state should enact deposit legislation: of these 25 communities voted in favor of deposits | | considered a "straw vote" - without the effect of law |
| Syracuse, New York | | prohibits carrying or possession of <u>any</u> glass beverage container in parks and on playgrounds | 8/3/81 (signed into law 8/3/81) | |

*Note: The localities of Fairfax and Loudon Counties, Virginia; Champaign/Urbana, Illinois; Marin County, California, and Suffolk County, N.Y. no longer have effective ordinances. The Fairfax and Loudon County ordinances (forced deposits) were ruled unconstitutional in State Supreme Court in 1980; the Champaign/Urbana forced deposit ordinances were contingent each upon the other...thus, when the Champaign ordinance was repealed 6/81, so was Urbana's. Marin County's ordinance (forced deposit) was conditional upon the adoption of substantially similar ordinances by cities within the county by 7/1/80, which did not happen; and enactment of the statewide New York forced deposit law negated any local forced deposit measures in the state.

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INITIATIVES/REFERENDA ON
FORCED DEPOSIT AND LITTER/RECYCLING LEGISLATION

Chart "H"

Statewide Initiatives

Local/County Initiatives

| <u>State</u> | <u>Year</u> | <u>Issue</u> | <u>Outcome</u> | | <u>Locality</u> | <u>Year</u> | <u>Issue</u> | <u>Outcome</u> |
|---------------|-------------|--|----------------|--------|---------------------------------------|-------------|--------------------------------------|------------------------------|
| Washington | 1970 | forced deposits | DEFEATED | 52-48% | Juneau, Alaska | 1971 | forced deposits | DEFEATED |
| Washington | 1972 | affirmation of legislatively passed litter/ recycling law | PASSED | 65-35% | Bridgeton, Maine | 1973 | forced deposits | DEFEATED |
| Colorado | 1976 | forced deposits | DEFEATED | 67-33% | Coon Rapids, Minn. | 1973 | forced deposits | DEFEATED |
| Massachusetts | 1976 | forced deposits | DEFEATED | 50-49% | Crystal, Minn. | 1973 | forced deposits | DEFEATED |
| Maine | 1976 | forced deposits | PASSED | 58-42% | Dade County/Miami Metro Area, Fla. | 1974 | forced deposits | DEFEATED |
| Michigan | 1976 | forced deposits | PASSED | 64-36% | Eau Claire, Wisc. | 1975 | forced deposits | DEFEATED |
| Alaska | 1978 | forced deposits | DEFEATED | 61-39% | Columbia, Mo. | 1977 | forced deposits | PASSED |
| Nebraska | 1978 | forced deposits | DEFEATED | 57-43% | Howard Cty., Md. | 1978 | forced deposits | DEFEATED |
| Ohio | 1979 | forced deposits | DEFEATED | 72-28% | Stevens Point, Wi. | 1978 | forced deposits | DEFEATED |
| Maine | 1979 | <u>repeal</u> of 1976- passed bill | DEFEATED | 85-15% | Columbia, Mo. | 1981 | <u>repeal</u> of 1977- passed law | DEFEATED |
| Washington | 1979 | forced deposits | DEFEATED | 58-42% | | 1982 | repeal of 1977- passed law | DEFEATED |
| Montana | 1980 | forced deposits | DEFEATED | 72-28% | Rhode Island | 1982 | non-binding re- quest to state | PASSED |
| Arizona | 1982 | forced deposits | DEFEATED | 68-32% | (26 local communities | | to enact deposit legislation | (in 25 of 26 communities) |
| California | 1982 | forced deposits | DEFEATED | 56-44% | | | | |
| Colorado | 1982 | forced deposits | DEFEATED | 75-25% | | | | |
| Washington | 1982 | forced deposits | DEFEATED | 71-29% | | | | |
| Massachusetts | 1982 | <u>repeal</u> of 1981- passed bill | DEFEATED | 59-41% | | | | |

Chart "H"

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Nationwide Forced Deposit
Proposals 1970 - 1982

- forced deposit proposals (in most cases including a ban on pull-tabs) have been introduced in the last 5 Congresses
- none have passed out of Committee
- currently under consideration in 1982 are S 709 by Sen. Mark Hatfield, R-Oregon (plus 6 others) and HR 2498 by Rep. Jim Jeffords, R-Vermont and 44 others

Federal Energy Administration
Study (FEA) - 1976

- study released in 1976 commissioned through Research Triangle Institute
- covered potential energy use/economic effects if Federal forced deposit law were passed on beer/soft drink containers
- claimed equivalent of 81,000 barrels of oil per day could be saved
- major unsupportable assumption upon which findings were based was that the country would go to an all-refillable system
- study overall favored nationwide forced deposit law

Office of Technological Assessment (OTA)
- 1978

- OTA reported to Subcommittee of House Interstate and Foreign Commerce Committee in 1978 that forced deposits:
 - a) may reduce individual pieces of litter but not collection costs
 - b) municipal solid waste would be reduced by only 6%
 - c) container legislation may harm resource recovery
 - d) return rate would have to equal or exceed 83% to make deposit laws effective
- even with these findings, OTA's final position paper favored forced deposits

Environmental Protection Agency
Guidelines (EPA) - 1976

- called for 5 cent forced deposit on beer/soft drink containers sold on all Federal installations
- tested at 10 different military installations in 1977; implemented at all National Parks mid-1977
- results of tests showed total beverage sales drop at 10 military bases of 15.1% - dollar loss of \$1,847,576
- Defense Department recommended Guidelines not be implemented fully or selectively because of potential sales loss (1979)

General Accounting Office (GAO) -
1977 and 1980

- Sen. Robert Packwood released uncompleted (and without approval) a report by GAO in 1977 on the effects of a nationwide forced deposit law
- final copy of report issued late, 1977 favored deposit system (using as basis 1976 FEA report)
- GAO updated its findings and released another report 12/80, still favoring forced deposits
- update done at Packwood's request; based figures on 1974 dollars; did not take into account supplier/retailer impact

Product Disposal Charge Concept - 1977

- concept places weight or unit-based charge on manufacturers of products which end up in municipal solid waste system
- base charge of \$26 per ton for paper and flexible packaging; 1/2 cent per container for rigid containers
- introduced but not acted upon

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FEDERAL RESTRICTIVE BEVERAGE PACKAGING LEGISLATIVE ACTIVITY
1970-1982

Chart "I-2"

Resource Conservation Committee
(RCC) - 1979

- composed of 10 agencies and bureaus; created by 1976-passed Resource Conservation and Recovery Act; called for 2-year study of, among other things, forced deposits
- 12/77, four positions regarding forced deposits adopted:
 - a) forced deposits are an effective way of reducing beverage-related litter
 - b) forced deposits could eliminate up to 2 percent of solid waste
 - c) product disposal charges (see previous page) could reduce solid waste but would not be as effective in reducing beverage-related litter
 - d) further studies needed
- Committee work was extended until 1979, when they met to vote on forced deposits: 4 of the involved agencies on the Committee voted in favor; 4 voted against; 2 voted for further study
- final report issued 1979 took "no consensus position" and also did not recommend adoption of national litter/recycling law

Chart "I-2"

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**THE EFFECTS OF DEPOSIT LEGISLATION
ON BEER AND SOFT DRINK SALES AND PACKAGE MIX
IN SIX STATES OF THE U.S.A.**

This is a chapter extracted from a report by T.G. Langton of Chase Econometrics and S. Senzer of Sabre Associates entitled "Materials Competition in the Beverage Container Industry - The Outlook for Aluminium Glass and Plastics to 1990". The report is dated August 1982 and was prepared for industry as a basis for developing future material requirements. Deposit legislation was reviewed as a factor to be taken into account in predicting these future requirements.

DEPOSIT LEGISLATION

Over the last ten years mandatory deposit legislation (MDL) has been discussed and debated from the halls of Congress to the confines of Smalltown, U.S.A. At times the rhetoric between proponents and opponents of such legislation has become so clouded and distorted as to leave one confused as to the real issues concerning mandatory deposit legislation. It is neither our purpose nor desire to argue the rationale for or against mandatory deposit legislation. However, at the present time nine states have passed mandatory deposit laws with six of those states having already implemented them—mandatory deposit legislation is a fact of life in the beverage industry in the United States. Furthermore, with the possible passage of deposit laws in California and other states in the near future, the specter of national legislation still remains an issue. This chapter addresses the issues concerning deposit legislation and attempts to clarify the impacts of such legislation on the beverage industry. Under Deposit Legislation all containers are technically returnable, hence the distinction in this chapter between returnable and refillable. In all other sections of this report returnable should be interpreted to mean a bottle which can be reused.

Structure of the Soft Drink and Malt Beverage Sectors

When examining the structure of the beverage industry in the U. S., we are actually looking at two distinct entities—the soft drink industry and the malt beverage industry—each with its own distribution system. Because of the dissimilarities between the two distribution systems, the effects of deposit legislation on the container mix have also been dissimilar.

The soft drink industry is best characterized as an industry based on a large number of regional/local bottlers. Generally, they are independent businessmen under franchise agreements with one or more national syrup suppliers and service a limited geographical area. Typically, they also perform the function of

distributor of the soft drink to the retailer. As mentioned above, a bottlers' territory covers a relatively small geographical area. The proximity of the bottler to the retail market offers a relatively short transportation/distribution supply line. This distribution system—close proximity of bottler/distributor to the retail outlet and the short transportation link—greatly enhances the economic viability of the returnable/refillable glass bottle, making it cost competitive with one-way containers. Indeed, refillable glass bottles continue to account for a significant proportion—approximately 33.5 percent—of the total packaged soft drink container mix.

In the malt beverage industry production and distribution begin at a national or regional brewery, servicing a relatively large geographical area which usually encompasses at least several states. Unlike the soft drink industry, the brewers do not deliver their product directly to retail outlets. The distribution chain begins with the brewer shipping product to a local distributor, who then ships the product to the local retail outlet, making the transportation link considerably longer than in the soft drink industry. This typically translates into higher transportation costs for delivering the product to the consumer. This additional transportation cost, along with the increased handling costs, reduces the cost advantage returnable/refillable glass bottles hold over one-way containers. Indeed, returnable bottles only accounted for about 8.5% of the packaged malt beverage container mix in 1981.

Under mandatory deposit legislation the distinctive nature of the two distribution systems generally leads to distinctly different changes in the container mix for the soft drink and malt beverage industries. In the soft drink industry, under MDL, returnable/refillable glass bottles have a definite cost advantage over nonrefillable bottles. Thus, as would be expected, nonrefillable bottles in many cases have been virtually eliminated. In the malt beverage industry, longer transportation lines require not only a larger bottle float but also increase the cost of returning empty bottles to the brewer. (This includes increased transportation, sorting and handling cost.) Much of the cost justification for utilizing refillable bottles under mandatory deposit legislation in

the soft drink industry is lost to brewers. Indeed, in most MDL states, non-refillable beer bottles have continued to command a larger proportion of the container mix than refillable containers.

A simplified schematic of materials flow assuming the existence of a mandatory deposit system is illustrated in the accompanying figure. Specific details may vary somewhat from state to state, particularly in the malt beverage industry, where state laws differ considerably with regards to distribution and retail sales of alcoholic beverages.

Current Status of Mandatory Deposit Laws

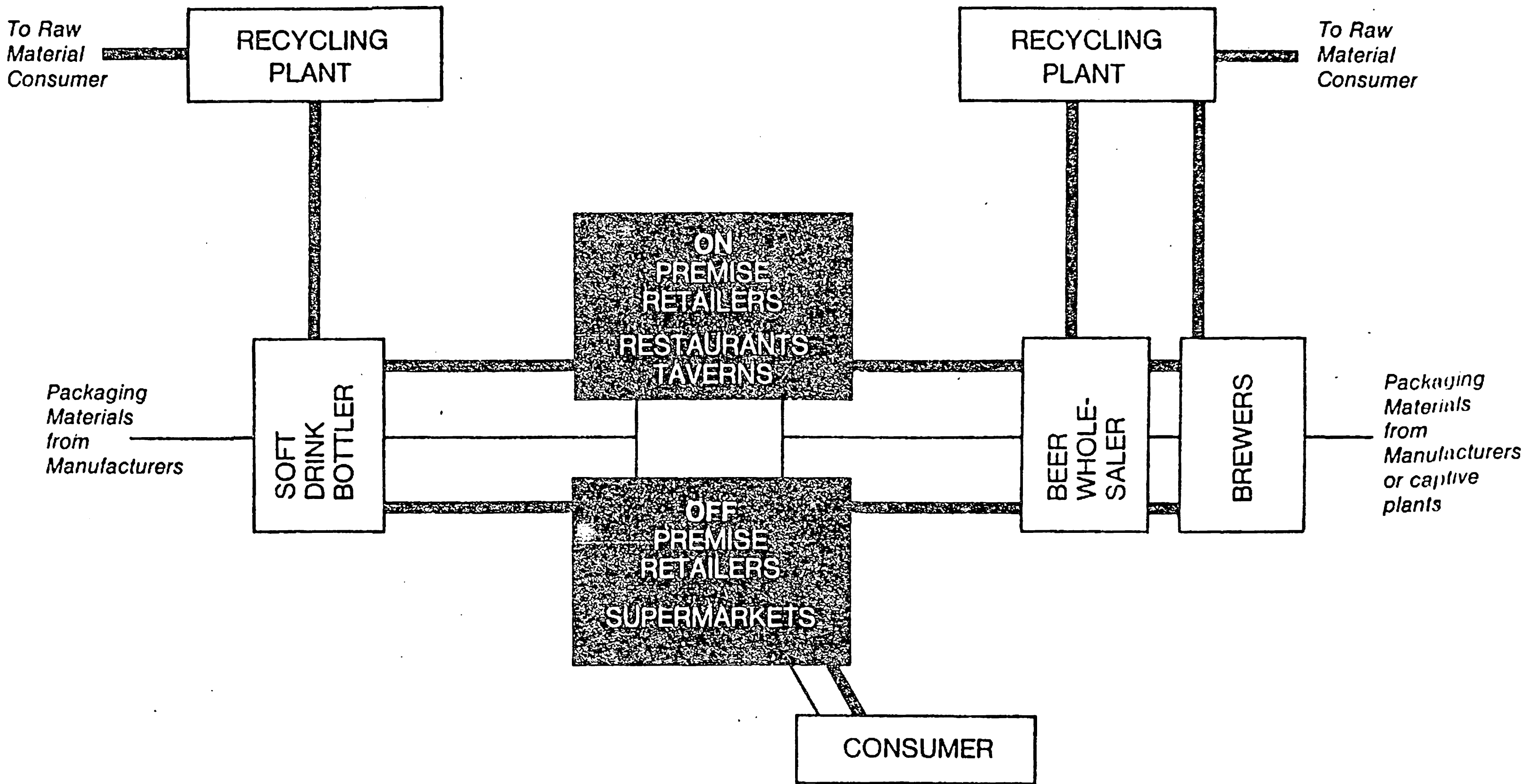
Currently, nine states (Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon and Vermont) have passed mandatory deposit legislation. Oregon and Michigan have a two tier minimum deposit system of 2¢/5¢ and 5¢/10¢ per container, respectively. A two tier system is based on a certified/generic versus a non certified/specialized container system. A container qualifies as a generic unit if it can be used interchangeably by at least two brewers or soft drink bottlers. (The intent of the two tier system is to encourage the use of returnable bottles.) Once a container qualifies as a certified container it is subject to the lower deposit requirement. All other containers, including cans, one-way bottles, (glass and plastic) and brand specific refillable bottles are subject to the higher deposit. The latter may not qualify for certification because the bottler/brewer chooses to retain a brand specific, distinctive bottle for marketing reasons. Indeed, a number of brewers have chosen to continue to market their products in non certified bottles after experiencing a loss of market share when they initially switched to generic containers.

All MDL states provide for the establishment of redemption centers, and bar the use of detachable pull-tabs. Only Oregon experienced any significant

impact on the container mix as a result of the latter stipulation and that was the result of a lack of suitable machinery to produce nondetachable tabs in 1972. Five states provide for a 1¢ per container handling fee for retailers, while two states provide a 2¢ per container handling fee. Various other provisions deal with the banning of certain container connecting devices, labeling requirements, types of beverages covered and the issue of job displacement. Major provisions for each state are shown in the following table.

**SIMPLIFIED MATERIALS FLOW DIAGRAM
IN A DEPOSIT REGIME**

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_____ FORWARD FLOW
 _____ RETURN FLOW

CURRENT STATUS OF MANDATORY DEPOSIT LAWS

| <u>State</u> | <u>Effective Date</u> | <u>Provisions</u> |
|--------------|--|--|
| Conn. | 1/1/80 | <ul style="list-style-type: none">- Minimum 5¢ deposit per container- Minimum 1¢ handling fee per container- Bans sale of beverage containers with detachable pull-tabs- Provides for the establishment of redemption centers- Affected beverages—beer, other malt beverages, mineral waters, soda water and carbonated soft drinks |
| Delaware | 7/14/82, if General Assembly appropriates funds to carry out the laws provisions | <ul style="list-style-type: none">- Minimum 5¢ deposit per container- Minimum 20% handling fee per container- Bans sale of beverage containers with detachable pull tabs- Bans non-biodegradable plastic carriers- Provides for the establishment of redemption centers- Affected beverages—mineral waters (not including any naturally sparkling waters) soda waters or any other carbonated beverages not containing alcohol that are commonly known as a "soft drink" and any beer, ale or other malt beverage containing alcohol. |

| <u>State</u> | <u>Effective Date</u> | <u>Provisisons</u> |
|--------------|--|--|
| Iowa | May 1, 1979, containers sold in liquor stores, July 1, 1979, con- tainers sold in retail stores | <ul style="list-style-type: none"> - Minimum 5¢ deposit per container - Minimum 1¢ handling fee per container - Bans sale of beverage containers with detachable pull-tabs - Provides for the establishment of redemption centers - Affected Beverages -- alcoholic beverages including alcohol, spirits, wine, beer, malt beverages, mineral water, soda water and similar carbonated soft drinks |
| Maine | 1/1/78 (enacted by referendum on 11/2/76) | <ul style="list-style-type: none"> - Minimum 5¢ deposit per container - Minumum 2¢ handling fee per container - Bans sale of beverage containers with detachable pull-tabs - Bans non-biodegradable plastic carriers of material which does not decompose by degradation, chemical degradation, or biodegradation within a reasonable period of time upon exposure to the elements - Provides for the establishment of redemption centers - Affected beverages--beer, ale and other fermented drinks, soda water and non-alcholoic carbonated drinks |

| <u>State</u> | <u>Effective Date</u> | <u>Provisions</u> |
|--------------------|-----------------------|--|
| Mass. ¹ | 1/17/83 | <ul style="list-style-type: none"> - Minimum 5¢ deposit per container—less than 32 ounces; 10¢ deposit per container—32 ounces or more - Minimum 1¢ handling fee per container - Pull-tab ban law effective June 1, 1979 - Bans non-biodegradable plastic carriers - Provides for the establishment of redemption centers - Provides a credit against the excise tax liability of a bottler equal to 1/10 of 1¢ for each refillable beverage container containing a beverage sold by him/her for consumption within the state for the first taxable quarter of the year 1983 - Provides for unemployment dislocation allowance and job retraining for those person whose jobs are lost due to the forced deposit law - Affected beverages: soda water or similar carbonated soft drinks, mineral water, beer and other malt beverages. |

¹ Unemployment/Dislocation Allowance: Provided for under Massachusetts law only. Connecticut removed such a provision from its law by H.B. 7295 which was signed on April 13, 1981.

| <u>State</u> | <u>Effective Date</u> | <u>Provisions</u> |
|---------------------|--|---|
| Mich. ¹ | 12/3/78 (enacted by referendum on 10/2/76) | <ul style="list-style-type: none"> - Minimum 5¢ deposit per container on certified containers; 10¢ deposit per container on all others - Bans sale of beverage containers with detachable pull-tabs - Provides container certification standards - Provides for the establishment of redemption centers - Provides for container certification standards - Affected beverages—soft drinks, carbonated natural or mineral water or other non-alcoholic carbonated drink, beer, ale or other malt drink of whatever alcohol content |
| New York | 7/1/83 | <ul style="list-style-type: none"> - Minimum 5¢ deposit per container - Minimum 20% handling fee per container - Provides for the establishment of redemption centers - Bans sale of beverage containers with detachable pull-tabs - Bans plastic connecting devices - Affected beverages - carbonated soft drinks, mineral water, soda water, beer and other malt beverages |
| Oregon ¹ | 10/1/72 | <ul style="list-style-type: none"> - Minimum 2¢ deposit per container on certified containers; 5¢ deposit per container on all others - Bans sale of beverage containers with detachable pull tabs (the pull-tab exclusion has been extended to include non-carbonated soft drinks, as of March 1, 1979) - Bans connecting devices for beverage containers which will not decompose within 120 days of disposal, either by chemical degradation, biodegradation, or photodegradation |

¹ A certified container typically is defined as a container which is refillable as well as generic—capable of being used interchangeably by two or more breweries or soft drink bottlers.

| <u>State</u> | <u>Effective Date</u> | <u>Provisions</u> |
|---------------|-----------------------|--|
| Oregon (cont) | 10/1/72 | <ul style="list-style-type: none"> - Provides for the establishment of redemption centers, subject to the approval of the Oregon Liquor Control Commission - Provides for container certification standards - Affected beverage--beer or other malt beverages, mineral waters, soda water and similar carbonated soft drinks - |
| Vermont | 7/1/75 | <ul style="list-style-type: none"> - Minimum 5 ¢ deposit per container - Minimum 40% handling fee per container - Bans sale of beverage containers with detachable pull-tabs - Bans non-biodegradable connecting device - Provides for the establishment of redemption centers - Affected Beverages--beer or other malt beverages, mineral waters, soda water and carbonated soft drinks |

Impact of Deposit Legislation: The Role of Decision Units

The problems of solid waste/litter and its impact on the environment were first raised as the justification for mandatory deposit legislation. However, the effects of MDL and the question of who benefits and what segment of the economy must bear the cost, quickly become the dominant issue. Proponents argue for the issues of solid waste, litter control, energy and resource conservation as the overriding concerns, while container manufacturers, bottlers, brewers, retailers and others have stressed dislocation including job losses, increased labor and capital costs, sanitation problems, higher consumer prices, reduced sales and other issues as pertinent to the rejection of deposit legislation. Although all of these familiar issues are important in their own right, we shall focus our discussion on the container packaging mix.

Consumers

Under mandatory deposit legislation consumers have been faced with higher price levels resulting initially in an absolute decline or a reduction in the growth of malt beverage and soft drink consumption per capita. Furthermore, consumers residing in border areas with non deposit states have tended to engage in cross border purchasing.

The impact of mandatory deposit laws on the container mix has proved rather revealing. What seems apparent is that the consumer remains firmly committed to the convenience packaging of beverages. Despite the institution of deposits and the generally high return rates which have been achieved, the consumer, per se, has not been responsible for a massive shift to returnable/refillable bottles. That is, despite the elimination of what has been perceived as a major convenience factor—the ability to avoid the returning of

cans and glass and PET bottles without financial hardship—many individuals continue to prefer these types of packages for their lighter weight, ease of handling, unbreakability, etc. Indeed, the success of PET bottles in MDL states indicates that it is the cost and convenience attributes of a particular package rather than a philosophical preference for returnable/refillable bottles by consumers which will determine the ultimate package.

In most cases, the changes which have occurred seem primarily the result of strategic and cost considerations on the part of soft drink bottlers, syrup manufacturers and brewers (tempered by consumer preferences) rather than deliberate actions by other principals in the beverage packaging/distribution chain. In summary, we see no reason to believe consumer choice of container packaging under MDL will depart significantly from long term trends which have accorded a significant market niche to convenience type packages. Indeed, the issues such as taste, weight and convenience of storage will remain the important factors in choosing a particular container. Moreover, while the bottler/brewer may be able to influence packaging mix in the short run, the consumers will continue to be the most important component in determining container mix when deposit legislation is initiated.

Retailers

Retailers have borne a significant proportion of the cost and inconvenience of deposit legislation and none of the cost reductions possible at the other steps in the distribution system. For example, retailers do not initiate the deposit, they do not experience a gain from unclaimed deposits or hold any deposit float which can be invested. Furthermore, all returned bottles are passed on to distributors, thus they have no opportunity to profit from recyclable materials.

At the same time the retailer faces a number of additional costs and dislocations. Among the most serious are increased handling costs, space

availability (and the concomitant cost of acquiring the necessary space) as well as the health and sanitary problems of storing returned containers.

Modern supermarkets and retail outlets have been predicated upon rapid sales turnover and, more importantly, upon the maximization of display area as a percentage of total building footage. In deposit legislation states this merchandizing formula has been severely strained, with the necessary storage space required to handle returned containers being made available through either the dislocation of other products or the addition of extra storage space through construction, sometimes at significant cost. Labor costs also escalate due to the increased handling and sorting required for returned containers, with further costs incurred for sanitation and pest control. In a number of MDL states, these added costs to the retailer have been recognized by the adoption of a handling fee as part of the deposit legislation.

The retailers' impact on the container mix can be significant in the short run. However, over time, consumer preferences and the various promotion and preferences of the bottler/brewer tend to dominate the packaging mix. There is, we believe, one important caveat to this statement. In most MDL states there has been a tendency, especially in soft drinks, to reduce the number of different packages offered, presumably to economize on shelf space and reduce handling difficulties. This may benefit the more easily stacked can and argue against a large inventory of similar sized packages such as the Plasti-Shield^R pint and PET half liter containers.

Beer Distributors

Beer distributors have little impact on the container mix. As the middlemen, they are performing a transportation, storage and local sales/marketing function. Therefore, they have little preference/control for a container type other than a desire to maximize the number of aluminum cans within their mix. However, since the aluminum can dominates the beer can

market, this preference on the part of distributors will have no impact on the future container mix unless dislocations from glass to cans occur. To be sure, distributors will be sensitive to changes in consumer preferences and will pass such information on to their suppliers. While distributors do incur additional handling and labor costs with deposit legislation, they do initiate the deposit. The gross revenue accruing from such operations can be considerable. Any unclaimed deposits will accrue to the distributor as will revenues from the sale of aluminum scrap (and to a much lesser extent, steel scrap and glass cullet). In addition, interest is accrued from deposits on the container float. These sums can be considerable. For example, if a distributor in a state with a 5¢ minimum deposit sold 300,000 cases of beer packaged in aluminum cans per year, received 90% of these back and was able to sell these cans at an average price of 40¢ per pound, total gross revenue to the distributor would amount to \$36,000 from unclaimed deposits plus about \$110,000 from the sale of crushed aluminum cans. Finally, at an annual interest rate of 12% and assuming a 3 month float, interest income would amount to another \$10,800 annually. In the soft drink sector, a similar function is performed by bottlers. It should be noted that the dollar amount above is a gross figure and does not include charges for handling, storage, etc.

Brewers, Bottlers and Syrup Producers

The packaging choice decision at this level is somewhat paradoxical because the ultimate decision lies with brewers, bottlers and syrup producers. However, the critical question is in evaluating what factors determine the ultimate choice. Certainly, systems cost is a factor but marketing considerations are also important and we would argue they are the most critical factor when cost differences are not large. Moreover, as we move further back in the distribution chain, the ability to unilaterally impose rapid changes in the beverage mix as a result of MDL becomes more limited because the attitudes and preferences of other parties—retailers, bottlers, retailers and consumers—must be considered. Indeed, we would argue that the consumer is critical—market share

must be protected by offering the preferred package.

This is clearly illustrated in Oregon where in the beer industry the trend has been away from a generic/certified container, despite higher deposit costs, to a brand distinctive packaging type. Indeed, Miller continues to supply its bottled beer in their distinctive "flint" bottle in all MDL states. Therefore, the philosophy of many brewers/bottlers is one of satisfying consumer preference and establishing product differentiation rather than one dominated by strict minimization of all costs.

In summary, although all of the participants involved with production, distribution and consumption of beverages have some impact on the packaging mix under MDL, the consumer's preferences for a particular packaging type dominates. Other participants including retailers and bottlers may have cost considerations which argue for a shift in packaging. These can and will be made, but their permanence depends on the willingness of consumers to accept the change. The alternative is a loss of market share, a choice not likely in the highly competitive beer and soft drink industries.

Beverage Mix Changes: Impact on Material Suppliers

Oregon

Oregon's bottle bill became the first modern statewide deposit law in the nation. With the implementation of MDL the container mix changed dramatically, more so than in any other deposit state. One-way glass containers were virtually eliminated, while can usage was drastically reduced. A number of factors led to this dramatic shift, first because of the two tier nature of the Oregon law, there is a disincentive to purchase both one-way bottles and cans. This was further highlighted by the perception of retailers that the intent of the law and the

preference of consumers was for refillable bottles. Second, the ban on detachable pull-tabs left can manufacturers temporarily with no suitable alternative to the easy open lid. Thus, there was a switch to refillable bottles.

The change in product mix was particularly dramatic for beer in that many major national breweries for a time essentially withdrew from the Oregon market. Local and regional breweries were the main beneficiaries in the short term although they subsequently fell prey to the intense competition all regional brewers have faced from the national brands. Since the economics of refillable bottles is decidedly better for regional breweries, this withdrawal virtually guaranteed a surge in refillable beer bottles. Two types of generic bottles emerged from the ensuing switch--the eleven ounce Canadian "stubby" and a thirty two ounce quart bottle. Since the initial implementation, one-way bottles have recovered somewhat in the beer sector while cans have now established themselves with virtually the same volume mix as was typical before the deposit legislation.

As one would expect, prior to legislation, the soft drink sector was dominated by the refillable bottle. This dominance was increased at the expense of a major loss of can market share and the elimination of one-way glass. Cans have slowly made a come back and now are on a par with volume shares typical of the early 1970's. This has been accomplished, despite the recent success of plastic containers. One way glass has failed to reestablish itself as a viable container.

In summary, the initial experience in Oregon was atypical of the experiences which would follow in other MDL states. As the first state to implement deposit legislation in the throw-away age, Oregon entered the unknown. Unfortunately, the merchandisers, both retail and brewers/bottlers, overreacted to the container law, based on a misconception of consumer preference--that deposit legislation is tantamount to a preference for refillable containers. National brewers chose to abandon the market rather than return to a distribution system (the refillable bottle) that was in the process of being abandoned.

A number of important implications can be drawn from the Oregon experience, particularly in recent years. Despite discriminatory deposit requirements, the beverage can has virtually recaptured its pre-MDL market share in both the soft drink and malt beverage sectors. Moreover, PET containers have also captured a significant proportion of the packaged soft drink market at the expense of the glass container. Indeed, the glass container has been losing market share for some time now in both the soft drink and beer sectors. In 1981, the malt beverage container mix changed dramatically, particularly in the glass packaging sector where nonrefillable glass declined from 23% in 1980 to 10% in 1981 while cans rose from 29% to 41%. Meanwhile, in the soft drink sector, two liter PET bottles accounted for nearly 13% of packaged volume. Package mix changes in Oregon are shown in the following table.

Estimated Package Mix—Volume Basis

Oregon

(Legislation Effective 10/72)

Malt Beverages

| | 71 | 74 | 76 | 77 | 78 | 79 | 80 | 81 |
|----------------|----|----|----|----|----|----|----|----|
| Nonrefillables | | | | | | | | |
| Cans | 43 | 4 | 7 | 8 | 13 | 29 | 29 | 41 |
| Glass | 25 | - | 10 | 23 | 29 | 21 | 23 | 10 |
| Refillables | 32 | 96 | 83 | 69 | 58 | 50 | 48 | 49 |

Soft Drinks

| | 72 | 74 | 77 | 79 | 81 |
|----------------|----|----|----|----|----|
| Nonrefillables | | | | | |
| Cans | 30 | 7 | 12 | 15 | 30 |
| Glass | 5 | - | - | - | - |
| Plastic | - | - | - | 7 | 13 |
| Refillables | 65 | 93 | 88 | 78 | 57 |

Vermont and Maine

Vermont and Maine are the two states with the longest standing one tier mandatory deposit laws. Because the deposit requirements of these two states do not discriminate among containers, the distortion caused by a two tier system on the container mix has been eliminated. However, because of the demographics and market peculiarities of these two states, they can be characterized as somewhat unique relative to the nation as a whole. Both states are characterized by relatively few inhabitants who are rurally inclined, markets that are large in area and sparsely populated, a lack of major highways, a severe winter climate and a mobile free spending tourist industry. These markets were ideally suited to a nonreturnable distribution system in that high transportation costs and the convenience factor severely eroded the economics of refillable containers.

Shipments of refillables in both states were nearly non-existent before MDL. After the introduction of deposit legislation the packaging mix shifted significantly. In the Vermont malt beverage sector the market share of cans returned to near pre-law levels shortly after adoption of the law. The glass container mix did shift after MDL with a greater emphasis on refillables. This trend has subsequently been reversed and nonrefillable glass containers continue to dominate the market in much the same manner as before legislation. Overall, cans have lost about 5% of market share while one-way glass a more moderate 3%. Refillables have about doubled their presence. Although 1981 data are not available, it does appear that the package mix has stabilized.

In Maine, refillables also have increased slightly. Cans have lost about 13% of share while one-way bottles have gained 12%. The strength of one-way glass, particularly in Maine, is somewhat of an anomaly. We suspect that this is in large part due to specific marketing strategies of the major brewers. Given that the refillable package remains uneconomic or the least preferable, the choice reduces to one-way glass versus cans. One-way glass gained share nationwide during the mid 1970's as the major breweries emphasized premium and super

premium beers. To some extent, then, Vermont and Maine are a microcosm of the country in general. Moreover, the economics of aluminum recycling would be diminished for the very logistical reasons that argue against a massive shift to refillables.

The experience in soft drinks has been somewhat different. MDL, in conjunction with the smaller marketing areas for soft drink bottlers, has made the refillable container a viable package. In Vermont, refillables now comprise some 80% to 85% of packaged volume. The big loser has been the one-way glass bottle which is now virtually nonexistent. Cans also declined from nearly 40% by volume to 15%. Refillables in Maine grew from virtually zero to nearly two thirds of the market volume. Cans have held their market share, perhaps even gained some share. In both Maine and Vermont, the two liter plastic bottle has made significant inroads despite the swing to the refillable/returnable regime.

Detailed package mix data for Vermont and Maine are summarized in the following tables.

Estimated Package Mix—Volume Basis

Vermont

(Legislation Effective 9/73)

Malt Beverages

| | 72 | 76 | 77 | 78 | 79 | 80 |
|----------------|----|----|----|----|----|----|
| Nonrefillables | | | | | | |
| Cans | 33 | 36 | 33 | 31 | 29 | 28 |
| Glass | 60 | 42 | 48 | 51 | 56 | 57 |
| Refillables | 7 | 22 | 19 | 18 | 15 | 15 |

Soft Drink

| | 72 | 73 | 74 | 75 | 79 | 81 |
|----------------|----|----|----|----|----|----|
| Nonrefillables | | | | | | |
| Cans | 39 | 25 | 19 | 13 | 15 | 15 |
| Glass | 58 | 75 | 17 | 14 | - | - |
| Plastic | - | - | - | - | - | 5 |
| Refillables | 3 | - | 64 | 73 | 85 | 80 |

Estimated Package Mix
Maine
 (Legislation Effective 1/78)

Malt Beverages

| | 77 | 78 | 79 | 80 | 81 |
|-----------------------|----|----|----|----|----|
| Nonrefillables | | | | | |
| Cans | 41 | 36 | 31 | 30 | 28 |
| Glass | 54 | 57 | 61 | 64 | 66 |
| Refillables | 5 | 7 | 8 | 6 | 6 |

Soft Drink

| | 77 | 78 | 79 | 81 |
|-----------------------|----|----|----|----|
| Nonrefillables | | | | |
| Cans | 20 | 20 | 20 | 23 |
| Glass | 80 | 16 | 2 | - |
| Plastic | - | - | 10 | 13 |
| Refillables | - | 64 | 68 | 64 |

Michigan

This state has been touted as an important test case because it is the first large, urban state to adopt a two-tiered MDL system. Moreover, some of the problems and miscalculations which typified the Oregon situation were eliminated. The pull-tab ban was no longer an issue because a suitable alternative had been on the market for a number of years and both bottlers and brewers made a concerted effort to inform and educate retailers as to what they could expect, thus avoiding the massive artificial shift from cans that typified Oregon. This program avoided the worst aspects of Oregon but problems still existed. Some beer distributors initially resisted adopting the "bag-box" approach. Under this system, uncrushed cans are collected in standard size plastic bags which hold an average of 240 twelve ounce cans with an expected error of plus or minus 6 cans. (These bags are essentially a larger and better quality version of the standard household refuse liner). The bag-box system thus eliminates counting at the retail store and simplifies both handling and storage. In any event, retail stores reacted to this delay in adopting a bag-box system by eliminating some can packages or substituting comparable glass packages for them. Thus, cans still suffered an almost 50% diminution of market share in the malt beverage sector during 1979. This shrinkage apparently surprised some major brewers. In light of the concerted informational efforts of the major brewers and the resiliency of the can container in other MDL states, we would not expect cans to suffer additional declines and in fact, a slight share increase was recorded in 1981.

The soft drink mix has also shifted with refillable containers now representing about 66% of the total mix. Since the economics of refillables is generally better in the soft drink sector than is the case with malt beverages, we expect refillables to maintain their share during the next few years. Any growth in returnables should come largely at the expense of the nonrefillable bottle/container. Present can levels seem reasonable and should remain at about this percentage mix during the foreseeable future.

The one-way bottle was all but eliminated as a package in soft drinks by

1979 when it came under double pressure from both refillable bottles and plastic. Present can levels are at about 18% and appear to have stabilized. We do not expect any major changes in share during the foreseeable future. Indeed, current levels of about 18% represent approximately the national average for soft drink dispensed via vending machine and the can continues to dominate this market segment.

Overall, can share in both the malt beverage and soft drink sectors is now some 50%-55% of levels prior to MDL. We believe some rebound for cans may occur, particularly in beer. In this sector, the strength of nonreturnable glass could diminish as the emphasis on premium/super premium beers and product differentiation subside somewhat in the decade.

Estimated Package Mix
Michigan
(Legislation Effective 12/78)
Malt Beverages

| | 77 | 78 | 79 | 80 | 81 |
|-----------------------|----|----|----|----|----|
| Nonrefillables | | | | | |
| Cans | 72 | 63 | 38 | 38 | 40 |
| Glass | 16 | 20 | 30 | 30 | 28 |
| Refillables | 12 | 17 | 32 | 32 | 32 |

Soft Drink

| | 75 | 77 | 78 | 79 | 81 |
|-----------------------|----|----|----|----|----|
| Nonrefillables | | | | | |
| Cans | 34 | 33 | 32 | 18 | 18 |
| Glass | 42 | 50 | 45 | 2 | - |
| Plastic | - | - | 1 | 14 | 16 |
| Refillables | 24 | 17 | 22 | 66 | 66 |

Iowa and Connecticut

Iowa and Connecticut are the two most recent states to adopt mandatory deposit legislation. These two states' container mix has been the least affected by mandatory deposit laws, particularly in the malt beverage sector. In Iowa, cans continued to command over 70% of the malt beverage market in 1981 while the mix between refillables and non-refillable glass bottles stood at 15% and 12%, respectively. This was roughly the same percentage as the pre-law mix except the percentages have been reversed. In the soft drink sector cans relinquished some of the market share enjoyed previous to deposit legislation. The packaging mix of glass bottles has shifted from nonrefillable to refillable containers as would be expected by previous experience. Plastic has also penetrated the Iowa market accounting for 7% of the total container mix.

In Connecticut, the post deposit law packaging mix was also quite similar to the pre-deposit law mix. Again in the soft drink industry the switch to refillables from nonrefillable containers was apparent, with the virtual elimination of the nonrefillable glass package. Cans continue to retain their market share at approximately 25%. More importantly, plastic containers command a surprising 45% of the packaging mix. This is well above the national average, but is even lower when compared to neighboring Rhode Island, where PET containers reportedly maintain a 50% market share of package soft drinks.

In the malt beverage industry cans not only maintained their market share but also managed to expand somewhat from the pre-law mix. The glass nonrefillable to refillable mix has remained fairly stable with a slight shift towards refillables. However, we expect glass refillables to increase significantly in the next year as a major brewer in the Connecticut market switches to an emphasis on the refillable containers. Package mix changes in Iowa and Connecticut are shown in the following tables.

Estimated Package Mix
Iowa
 (Legislation Effective 7/79)

Malt Beverages

| | 79 | 80 | 81 |
|-----------------------|----|----|----|
| Nonrefillables | | | |
| Cans | 76 | 76 | 73 |
| Glass | 15 | 13 | 12 |
| Refillables | 9 | 11 | 15 |

Soft Drink

| | 79 | 81 |
|----------------------|----|----|
| Nonrefillable | | |
| Cans | 30 | 26 |
| Glass | 28 | 7 |
| Plastic | 2 | 7 |
| Refillables | 40 | 60 |

Estimated Package Mix
Connecticut
 (Legislation Effective 1/80)

Malt Beverages

| | 78 | 79 | 80 | 81 |
|-----------------------|----|----|----|----|
| Nonrefillables | | | | |
| Cans | 46 | 38 | 39 | 42 |
| Glass | 48 | 54 | 50 | 45 |
| Refillables | 6 | 8 | 11 | 13 |

Soft Drink

| | 77 | 81 |
|-----------------------|----|----|
| Nonrefillables | | |
| Cans | 25 | 25 |
| Glass | 75 | - |
| Plastic | - | 45 |
| Refillables | - | 30 |

Prospects For Additional Legislation

With the conservative bent of the nation at the present time, and the public reluctance to initiate further environmental legislation, one would expect mandatory deposit legislation to become a moot issue. However, this issue is alive and well in numerous states throughout the nation. Two states which were involved in MDL discussions earlier this year were thought to be key states. California remains undecided concerning MDL but New York has recently enacted this legislation. Although the nation has become more cautious in supporting environmental causes at the cost of economic growth, the impetus for mandatory deposit legislation is more than the environmental issue it once was. Over recent years mandatory deposit legislation has become an issue of resource management with the perception that nonrefillable containers are an inefficient use of the nations resources.

Over the last ten years, hundreds of attempts to pass deposit legislation have been defeated. However, for each initiative which is rejected, a new initiative soon replaces the rejected proposal. Moreover, once deposit legislation is adopted there is little broad based support for repeal. Indeed, numerous public opinion polls have shown strong support for desposit laws once they are adopted, while industry attitudes towards deposit laws are tempered considerably once investments have been made to deal with the problems associated with mandatory deposits. Two critical facts are readily apparent from this; First, proponents of deposit legislation are persistant at the very least, and second, once MDL is adopted there is little liklihood of repeal. As noted above, two large states-- California and New York were considering MDL during the early months of 1982. More recently, New York has passed a deposit law which will become effective in mid 1983. There are a number of ramifications of passage. First, it is significant in and of itself because New York represents approximately 8 percent of the nations' population and a major package shift in this state could have a noticeable impact on national totals. In addition, New York will join most New England

states as a MDL state. Rhode Island and New Hampshire may then find it virtually impossible to avoid deposit legislation. Finally, passage in New York enhances the "critical mass" argument—a core of support could lead to a snowball effect with more states giving into the momentum. A national law also enters the picture at this time. In California, public support for the upcoming referendum is rather strong, however, the expected media blitz has not begun and the outcome is far from certain.

The critical question to be asked at this point is whether opposition to mandatory deposit legislation is a defensible position in the long-run. Looking at the historical realities in mandatory deposit states, and the persistence with which proponents continue their effort, one quickly perceives a situation where opponents of deposit legislation are winning nearly all the battles and slowly losing the war. Indeed, if mandatory deposit legislation is passed in California, which is certainly a possibility, passage in other states becomes increasingly more likely—at that time nearly 30% of the population would be living under MDL. The question of timing thus becomes the critical component for state mandatory deposit law implementation. The probability of a large number of states adopting MDL within the next several years appears slight at this time. However, we do expect a slow, gradual succession of new state mandatory deposit laws and this assumption underlies our container shipments forecast in the next chapter.

With the possibility of several large states adopting legislation in the near future, a national deposit law would prove less disruptive than continued piecemeal state legislation. However, the philosophy of the Administration in Washington, with its emphasis on states rights would strongly suggest that action on a national basis would be an unlikely occurrence at least during this Administration's term. Moreover, the legislative history of MDL indicates a poor track record. Only once has such a bill even been considered by the appropriate committee and then it was soundly defeated.

Summary and Conclusions

Mandatory deposit legislation has resulted in a draconian restructuring of the beverage container mix initially expected by observers only if one views the situation of one-way glass in soft drinks. Indeed, when the most recent two states to adopt MDL are examined, Iowa and Connecticut, the container mix on a pre and post deposit law basis, shows only minor legislation orientated shifts occurring other than a switch from nonrefillable to refillable bottles, in the soft drink sector. The experience of the various deposit states suggest a continued preference by the consumer for convenience packaging particularly for cans and plastic. This is obvious in Oregon where after being virtually eliminated as a container package the can has rebounded strongly. Michigan does present some problems for cans but we believe it likely that the can share will rebound somewhat in the next few years.

Generally, in states with deposit legislation, cans and plastic (two liter) continue to command a significant share of the container packaging mix. In the soft drink sector, refillable bottles typically dominate the packaging mix, due to the local nature of the industry. However, the nonrefillable bottle continues to command a significant proportion of the container mix in the malt beverage sector, principally a function of the national nature of the distribution system and marketing considerations by brewers.

We believe that MDL will have the following effects on container mix, at the state level: In the malt beverage industry, the market share of cans would likely decline initially to between 40%-90% of pre-law levels. The lower end (40%) of this initial range would be experienced under a high two tier deposit system similar to that in Michigan and serviced by a number of regional breweries which can take advantage of the cost savings of returnable packages associated with local markets. In the longer run, under this scenario, cans could recover to 50% - 80% of pre law levels. The upper end of this initial range (90%) could be expected under a one tier system in the short term while in the the long run, cans

could recover to near pre law levels. Refillable bottles could easily double their share particularly in a two tier state or in regions where breweries are in close proximity to population centers, thus minimizing transportation costs. However, it must be remembered that current market share for refillables is rather small and the bottles are, by definition, reusable, hence the long run demand for bottles is not that large. Nonrefillable beer bottles do not appear to have suffered particularly harshly after the introduction of deposit legislation. This is somewhat of an anomaly and probably attributable to the marketing efforts of the major breweries. In the future, we would expect nonrefillable bottles to come under pressure from refillables—as has been the case in soft drinks.

In the soft drink industry, refillable containers command a favorable cost advantage over competing nonrefillable containers, with nonrefillable glass virtually disappearing from the product mix. The market share of cans could decline to 30% - 70% of levels prior to MDL. Again, we expect the lower 30% range under a high two tier system similar to Michigan. We would expect cans to recover some of their lost share over time. This recovery would probably be less noticeable than in malt beverages. The market share of the two liter PET bottle, although difficult to gauge at this time, should prove rather resilient under MDL. Indeed, recent experience suggests little or no effect on PET market penetration under MDL. (The half liter PET bottle would probably be more susceptible to dislocation under deposit legislation than the two liter. Indeed, its reaction to MDL would probably more closely parallel nonreturnable glass.)

Current data indicate that refillable packages could double or triple their share under MDL to between 60%-70% of total package volume. The remainder would be split between plastics and the aluminum can. It is quite interesting to note the strong showing of the plastic bottle in the MDL states. This suggests that all involved recognize the convenience of this package and its appeal to consumers. Indeed, multi-drink plastics and the aluminum can may eventually be viewed as the preferred convenience packaging with refillable glass as the cost minimizing alternative. Under this scenario, the future of the nonrefillable glass soft drink bottle is in serious doubt in MDL states.

In summary, package mix changes appear less likely in malt beverages than for soft drinks and in both sectors nonrefillable glass appears more vulnerable than the aluminum can. An analysis of PET is not strictly comparable because plastics were not a factor in most states before MDL adoption. The following table attempts to gauge in a qualitative manner the impact of MDL on aluminum cans and nonrefillable glass. The urban definition cannot be used to classify an entire state, but a rather high population density subregion. In this region, mobile life and lack of space for storage in groceries should militate against severe dislocation, at least for cans. The suburban/exurban life style seems the most conducive to major shifts. There the environment is most suited to refillables and the economics favorable—people are inclined by life style (environmental concerns, etc.) towards refillables, and the transportation costs of establishing this system are not prohibitive. The rural category is modeled after the experiences in Vermont and Maine and is the most volatile. Given national breweries, cans are virtually unaffected while glass suffers declines. In soft drinks, the nonrefillable glass bottle is virtually eliminated. We should raise a cautionary note and state that this classification system is by no means complete and, is subject to caveats. Although it is based on an admittedly small sample, we believe it can serve as a demarcation point for further analysis.

**Relative Impact of Mandatory Deposit
Legislation on Post Law Package Mix**

| | <u>Urban</u> | <u>Suburban/Exurban</u> | <u>Rural</u> |
|-----------------------|--------------|-------------------------|--------------|
| <u>Malt Beverages</u> | | | |
| Nonrefillable Glass | 2 | 2 | 2 |
| Cans | 1 | 2 | 0-1 |
| <u>Soft Drinks</u> | | | |
| Nonrefillable Glass | 2 | 2-3 | 3 |
| Cans | 1-2 | 2 | 1 |

- 0 - Little or no long term shift in package mix.
- 1 - Minor changes.
- 2 - Moderate Shift.
- 3 - Virtual elimination of package type.

SYNOPSIS FROM
SUBMISSION (NUMBER 2) TO THE
NATURAL RESOURCES AND ENVIRONMENT COMMITTEE
INQUIRY INTO DEPOSIT LEGISLATION

BY THE
DEPARTMENT OF INDUSTRY, COMMERCE AND TECHNOLOGY

Policy and Planning Division

February 1984

SYNOPSIS

It is a very difficult task to evaluate and weigh up all the issues that must be examined when considering introducing mandatory deposits for beverage containers. This is principally due to the complexity of the issues that arise and the confusion which is created when some proponents and opponents of deposit legislation present their case.

The beverage and related container manufacturing industry has been associated with a number of external costs including litter, waste collection and disposal, pollution, road congestion and health and hygiene. Detailed studies in this field have been conducted in the United States and the United Kingdom and two such reports available to the Department conclude that such costs, in aggregate, are lower for a returnable container system than a non-returnable container system. There are differing opinions as to whether these costs are significant in total.

The Department considers that the key issue in the debate on beverage containers is recycling. The reusing and recycling of containers creates less pollution than extracting and processing virgin raw materials to manufacture new containers. Furthermore a beverage container system which is characterised by high return rates (a feature of an effective recycling system) has a direct impact on the external costs of waste disposal and may also reduce the level of beverage container litter.

In Victoria the beverage and associated container manufacturing industry is engaged in recycling activity. Industry recognizes the considerable economic benefits to be gained by recycling beverage containers and is aware of the conservation/environmental benefits of recycling.

Despite these benefits, beverage container recycling activity in Victoria is considerably lower than that in South Australia. We need to gain more understanding of the factors which are inhibiting recycling activity in Victoria and implement programs to significantly increase the recycling rate of all beverage container types in Victoria.

In South Australia, mandatory deposit legislation (MDL) has been effective in maintaining and in the case of cans achieving, high recycling rates. However, this approach is only one of many that could be used to encourage improved

recycling activity in Victoria. What is needed is a program designed to significantly improve beverage container recycling rates whilst minimizing the economic impact on industry.

The Department's submission examines in detail the likely price effect of mandatory deposit legislation. The discussion highlights the range and complexity of the variables which will be affected by such legislation. The exercise also gives an indication of the uncertainties that exist if mandatory deposit legislation is introduced. There is little agreement on the consumer price effect, either in studies based on analytical price/cost models or retail price surveys.

Accordingly the Department considers that a phased approach to the question should be adopted. As a first step more emphasis should be placed on devising incentives and programs to directly improve recycling activity in Victoria's beverage container industry.

The Department suggests the establishment of a Recycling Unit within the EPA and proposes a number of activities for such a Unit. The Unit should work closely with industry, local councils and other interested parties and report to Parliament annually. A high level of funding from industry combined with grants from the State Government and local councils should be made available to implement the Unit's programs.

As a first task, the Unit could examine one sector of the packaging industry, namely the beverage container industry. It could be responsible for:

- . establishing and publishing statistics on recycling;
- . setting target recycling rates, for example, comparable to those achieved in South Australia;
- . investigating the problems in attaining higher recycling rates (including economic feasibility) and suggesting and implementing programs to overcome these problems;
- . improving community awareness of the location and operating times of council recycling depots, industry collection centres and other organizations involved in recycling;

- investigating the efficiency of these and other services and developing programs to encourage efficient and effective recycling systems;
- encouraging industry to maintain an active media campaign to increase container returns;
- encouraging industry to make consumers more aware of where they can buy returnable beverage containers;
- encouraging industry to clearly mark on containers whether they are refillable or can be recycled and making recommendations on the most appropriate markings; and
- encouraging industry to clearly mark the deposit amount on containers.

If such a program fails to significantly improve beverage container recycling rates (for example, to a rate comparable to that in South Australia) or can only do so at great cost, alternative measures, including mandatory deposit legislation should then be considered.

PART OF SUBMISSION
TO THE
PARLIAMENT OF VICTORIA
NATURAL RESOURCES AND ENVIRONMENT COMMITTEE
INQUIRY INTO CONTAINER DEPOSIT LEGISLATION

FROM

THE RECYCLING CAMPAIGN,
FRIENDS OF THE EARTH (COLLINGWOOD)

MARCH 1983

SECTION VI: RECOMMENDATIONS

PREAMBLE

The aims of the following recommendations are to

- (i) encourage the use of refillable containers by means of deposits
- (ii) encourage return and recycling of non-refillable containers, again by means of deposits
- (iii) discourage the use of containers which are neither refillable nor recyclable, by imposition of a "pollution tax".

The pollution tax on non-recyclable containers would need to be set at a level high enough to act as a disincentive for the manufacture and use of such containers. Such a tax would pay for the costs such containers incur to society. The legislation could determine where to spend the revenue gathered from the pollution tax. Some suggestions are that it be spent on:

- publicity aimed at creating an awareness of the benefits of a "conserving society"
- subsidies to local councils for litter clean-up costs
- rebates to fillers to encourage purchase of standardised returnable bottles.

As the aim of the pollution tax is to reduce production of non-recyclable containers, the revenue would decrease over a period of time as more containers become refillable or recyclable.

DEFINITION OF BEVERAGE CONTAINER

Any container for holding soft drink, mineral water, fruit juice, milk, beer, wine, spirits or other beverages for human consumption, including new beverages unforeseen at present, should be included in the definition of "beverage container".

As far as we can ascertain, there is no justification for excluding non-carbonated drinks from the definition of "beverage".

To prevent discrimination against deposit-bearing containers, all drinks must be included under the terms of the legislation. (In South Australia, tetra pak, milk cartons, one-way glass and plastic fruit juice containers, and non-deposit-bearing beer bottles are exempted from the legislation, creating positive discrimination towards these products.)

The unnecessary development of non-recyclable or non-refillable containers for products which can be readily packaged in re-useable containers is simply not justifiable with the catch-cry of "consumer convenience".

The environmental and social costs of such "throw-away" beverage packages should be borne by the producers and consumers of the product. The "polluter pays" approach is the only system which ensures that polluters are aware and accountable for the consequences of their actions, and the best incentive for changeover to less polluting habits is the sensible application of this approach.

The reduction in domestic waste, litter and wasted resources will be greater in Victoria than it was in the case of South Australia, because of the high proportion of one-way non-biodegradable beverage containers (83%) already dominating the Victorian beverage market.

Beer and other alcoholic beverages should not be exempt. The present amount paid for beer bottles returned by the public in Victoria, 1½ cents, is insufficient to prevent littering. The amount paid to collectors and handlers is insufficient to provide an adequate return for their labour. A refundable deposit would ensure brewers a higher return rate for their containers than they can achieve at present. This would result in a cost saving to their operations and prevent discrimination against deposit-bearing containers such as cans.

The recommendations to ban detachable metal ring-pull tops and plastic six-pack ring holders aim at ensuring safety of people, animals and natural systems. One wonders why such simple measures have not already been implemented.

Although beverage containers are the most common non-biodegradable packaging material in the waste stream, equally environmentally unsound packaging materials abound in other product areas. Certain questions must be answered by the packaging industry before it is permitted to unleash further new packaging forms on the marketplace.

The establishment of EIS procedures, requiring packaging manufacturers to prove the desirability of new packaging forms is necessary.

RECOMMENDATIONS:

1. Deposits to be placed on all refillable or recyclable beverage containers. This deposit should be redeemable at point of purchase or at licenced buy-back agencies.
2. Handling fee to be set for returnable deposit containers.
 - (a) Fee must be high enough to compensate collectors and handlers for their time at a reasonable hourly rate (agents in South Australia still receive only 1.3 cents per can, a fee set six years ago when legislation was implemented).

We suggest that licensed can agents, marine dealers and council-operated collection schemes receive a 2 cent handling fee for cans and a 4 cent handling fee for bottles. Milk bars, supermarkets, other retail outlets and charities should receive a 2 cent handling fee per bottle.

Two-litre PET plastic bottles, if deemed recyclable, should attract a 4 cent handling fee as for other bottles.
 - (b) Deposit and handling fee to be adjusted periodically in line with inflation.
 - (c) Fillers to agree on a system whereby cans need not be sorted, and may be crushed by collector. (In South Australia fillers require cans to be whole and sorted for return to individual companies.) A central buy-back agency operating on behalf of all fillers would make this unnecessary.
 - (d) Legislation may also be necessary to ensure that there is reasonable access for the small entrepreneur or local council seeking a franchise to become a local can collection agent.
3. A "Pollution Tax" to be placed on all non-recyclable containers.
 - (a) This tax could amount to 10-20% of container price, or be set at a level high enough to act as a disincentive to manufacturing of such products and to encourage recycling of the materials if possible.
 - (b) Tax to be payable at point of manufacture in Victoria, or if container is imported, by filler.
4. Responsibility for setting of handling fees and deposits to remain with the Victorian Government.
5. Fillers should be encouraged to use standardized refillable containers to facilitate handling, sorting and re-use. This could be achieved by:

- (a) investment rebate or similar allowance to fillers introducing standardized refillable containers
- (b) reduction or elimination of sales tax on new refillable standard containers.

This rebate could be phased out over time as standardized containers become established in the market-place.

- 6. Legislation should outlaw such dangerous and unnecessary packaging features as the detachable ring-pull top on cans and bottles and the plastic six-pack ring holder.
- 7. Legislation should ban all messages such as "Do Not Refill" from containers which are in fact quite refillable. Such messages are on many non-deposit bottles; these messages are hampering efforts to wash and re-use them.
- 8. Enactment of Environment Impact Legislation enabling full public participation and thorough investigation of the environmental impact of all new packaging forms before they are allowed to be marketed.
- 9. Warranty provisions covering all beverage containers to be the responsibility of the container manufacturer. Warranty must extend for the container's entire lifetime, not just the first filling. Restrictive practices aimed at preventing re-sale of second-hand bottles must be discontinued.

PART OF THE VICTORIAN INDUSTRY GROUP PROPOSAL

TO THE

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO CONTAINER DEPOSIT LEGISLATION

ENTITLED

POSITIVE LITTER CONTROL

A Total Alternative to Deposit Legislation

THE "VICTORIAN INDUSTRY GROUP" CONSISTS OF

Australian Consolidated Industries Limited

Beecham Australia Pty. Ltd.

Cadbury Schweppes Pty. Limited

Carlton and United Breweries Limited

Coca-Cola Bottlers, Melbourne

Comalco Limited

Containers Limited

J. Gadsden Australia Limited

Glass Containers Limited.

STATEMENT OF OBJECTIVES

THE GROUP's Proposal addresses the following objectives:

1. To initiate an on-going, effective litter reduction campaign throughout Victoria designed to:
 - . increase public awareness of the anti-social aspects of littering and thereby reduce the inevitable cost burden imposed upon Government and the community at large by irresponsible acts of littering.
 - . influence community attitudes and behaviour against indiscriminate acts of littering.
2. To further develop and promote effective recycling campaigns for glass, metal and plastic beverage containers in co-operation with State, Municipal and local authorities.
3. To encourage the development of technology designed to improve litter collection, disposal and recycling, and solid waste management.
4. To implement these proposals in such a way as to contribute to the industrial development of the State without adversely affecting consumers in Victorian industry.
5. To continue to provide a positive climate for the development of new technologies in beverage and beverage container manufacture.
6. To achieve the above measures without risk of job loss to over 1,200 employees of THE GROUP and the domino job loss of approximately 3,600 employees within other supporting Victorian industries.

SUMMARY OF THE GROUP'S PROPOSAL

It is THE GROUP's belief that in the light of the comments on the preceding pages, the objectives set out on page 2 of this document can only be achieved through the implementation of:

1. LITTER ABATEMENT

- . An extensive, State-wide, media-based, anti-litter campaign designed to emphasise the anti-social aspects of littering and engender a more responsible attitude by all sections of the community to the problems of littering.
- . An educational programme for school children designed to foster the behavioural patterns referred to in the preceding paragraph.
- . Field programmes at Local Government/Local Council level to supplement the effectiveness of a State-wide, anti-litter campaign.
- . Voluntary support programmes - such as Keep Australia Beautiful's Tidy Towns Competitions - to extend throughout the community the impact of the chosen anti-litter campaign.

2. RECYCLING AND RESOURCE RECOVERY

- . A co-ordinated programme extending present industry recycling and resource recovery schemes.

3. SOLID WASTE MANAGEMENT

- . The latest, most cost-efficient methods of solid waste management.

SUMMARY OF THE GROUP'S PROPOSAL (cont'd)

THE PROPOSAL

To assist in the achievement of the objectives stated, THE GROUP:

- (i) is prepared to fund a POSITIVE LITTER CONTROL programme which addresses ALL litter, along lines similar to those successfully employed in other Australian States and overseas.
- (ii) will co-ordinate, and where economically viable, extend its present recycling and resource recovery programmes, and
- (iii) recommends that part of the moneys provided under (i) above be used to fund research into the latest techniques of solid waste management.

FUNDING

Will be the responsibility of THE GROUP whose commitment is that the programme will be fully funded to the extent of \$2,500,000 over a three year period.

IMPLEMENTATION

THE GROUP is convinced that Government must take the initiative in the implementation of such a programme if:

- . it is to be successful, and
- . is to receive wholehearted support from Local Government, industry and consumers.

The suggested programme contained in the following pages outlines three alternative administrative approaches which have been used successfully to implement similar proposals in other States or Territories in Australia.

It is emphasised, however, that each of the three alternative administrative approaches is based on the Gilson POSITIVE LITTER CONTROL model and does not differ in substance. Variations are purely in administrative detail. All three approaches have been used successfully in different environments.

Implementation recommendations for:

1. Litter Abatement
2. Recycling and Resource Recovery
3. Solid Waste Management

are set out on the following pages.

THE GROUP'S PROPOSAL IN DETAIL

1. LITTER ABATEMENT

A. Programme Definition

The recommended litter abatement programme will be based on the Gilson model which postulates that if litter is to be reduced substantially in any location, habits and practices responsible for it must change. In order to bring about this change, four things are necessary:-

- * adequate LAWS
- * modern EQUIPMENT
- * continuous EDUCATION
- * back-up ENFORCEMENT

This particular approach is known as POSITIVE LITTER CONTROL. It identifies the ways in which litter is generated, the places at which it occurs and the method by which this problem can be controlled and minimised.

The programme recommended has a significant media content and utilises the campaign theme and slogan, "Do the Right Thing". The theme and slogan have already proved highly successful in other Australian States and are being recommended for this reason, as well as the fact that their adoption would significantly reduce media production costs.

A substantial amount of supportive material would also be made available to metropolitan and country councils, companies, voluntary groups, sporting bodies etc.

It should be recognised that while litter can be reduced, NO programme will eliminate ALL litter. Effective clean-up activities by State and Local Government authorities must continue during any litter abatement campaign, reducing in scale as the campaign becomes more successful.

A clean environment brings substantial economic benefits to Local Government whose cleaning activities are greatly reduced and whose refuse collection and solid waste disposal centres become potential profit centres - not cost centres. Health hazards posed by the existence of excessive litter are also reduced.

B. Funding

The Group is prepared to enter into a formal agreement with the Victorian Government to fund the programme proposed in this document for a period of three years on the basis that during this time, the Government will undertake to pursue a POSITIVE LITTER CONTROL programme, rather than legislate for container deposits or impose some comparable cost impost on packaging.

The areas of expenditure are envisaged as:-

| | <u>Year 1</u> | <u>Year 2</u> | <u>Year 3</u> |
|--------------------|--------------------|------------------|------------------|
| 1. Administration | 122,000 | 83,000 | 83,000 |
| 2. Communication: | | | |
| - Media | 560,000 | 381,000 | 381,000 |
| - Promotion | 69,000 | 47,000 | 47,000 |
| 3. Education | 63,000 | 43,000 | 43,000 |
| 4. Hardware | 85,000 | 58,000 | 58,000 |
| 5. Grants | 130,000 | 88,000 | 88,000 |
| 6. Research | 20,000 | 14,000 | 14,000 |
| 7. General Reserve | 9,000 | 7,000 | 7,000 |
| Total - | <u>\$1,058,000</u> | <u>\$721,000</u> | <u>\$721,000</u> |

Attachment A provides a more detailed breakdown of suggested expenditure levels in Year 1, recognising that costs in the start-up year will inevitably be somewhat higher than in subsequent years.

The expenditure levels for the various activities proposed are estimates at this stage and are intended merely to be suggestions derived from experience gained in similar activities in other States and overseas. Obviously the implementing body chosen by the Government will be responsible for more specifically allocating the funds provided by the Group to the requisite areas of expense at the appropriate time.

It is envisaged that approximately six months before the expiration of the proposed three year contractual period the arrangement would be reviewed by Government and Industry in the light of the success of the programme. Following this assessment, appropriate action would be considered by both parties.

C. Implementation

Implementation of a POSITIVE LITTER CONTROL programme should be carried out by the most effective management mechanism available. In considering the best mechanism, it is worth looking at current Australian experience.

THE GROUP believes that any of three alternative implementation mechanisms could be appropriate, each of which is currently operating successfully either in the Northern Territory, New South Wales or Western Australia.

Each alternative involves industry funding and Government/Industry co-operation in the direction of the programme. However, each differs in the composition of the bodies responsible for the programme's initiation, policy and execution.

Each of the areas also has a slightly different set of circumstances than Victoria. For this reason, THE GROUP recommends that the Government discusses further with it which approach is most appropriate to Victoria.

Results achieved by the Northern Territory, New South Wales and Western Australia include:

- significant reduction in total litter,
- significant improvement in recycling levels,
- better social attitudes and behaviour of individuals towards resource recovery,
- involvement of numerous voluntary community groups in projects such as recycling, special clean-ups etc.
- the engendering of a high degree of co-operation and understanding between industry and Government in the execution of the programme,
- active support provided by voluntary industry collection and recycling schemes.

D. Implementation – Administrative Alternatives

The three administrative alternatives proposed to implement the programme are as follows. It should be emphasised, however, that the sequence in which each is listed does not represent THE GROUP's view as to which alternative is most desirable for the Victorian circumstance. It is recognised that this is purely a matter for decision by the Victorian Government.

ALTERNATIVE 1. – A JOINT GOVERNMENT/INDUSTRY COMMITTEE

In the Northern Territory a joint Government/Industry Committee administers its POSITIVE LITTER CONTROL programme based on the theme, "Do the Right Thing".

The Committee is an independent entity, although it follows broad policy guidelines established by a nominated Minister in the Government.

The Committee is accountable to the Minister for determining the policy guideline details as well as being responsible for implementation of an effective litter reduction programme.

If this approach was favoured for Victoria, the Committee's composition is recommended as:

- 4 Government representatives
- 4 Industry representatives nominated by the Industry Group
- 1 Keep Australia Beautiful Council (Victoria) representative

ALTERNATIVE 1. (cont'd)

The Chairman of this Committee should be one of the Government representatives, preferably the Permanent Head of the Ministry for Conservation.

The importance of such a Chairman in this alternative is that inter-departmental problems are likely to be more readily resolved at senior level.

It is further recommended that senior officers from the Department of Education, Environment and Local Government be co-opted as required, as these portfolios play an important role in the implementation of a successful litter reduction programme.

Implementation of the programme would be carried out through a Chief Executive who would be recruited for this purpose.

Once the Chief Executive has become familiar with the problems and their solutions, he would recommend policy to the Committee.

This approach would need the establishment of an independent organisational and administrative structure.

ALTERNATIVE 2. - A STATE GOVERNMENT DEPARTMENT

In New South Wales, the State Pollution Control Commission (SPCC), aided by industry funding and participation, has, since 1978, been conducting a successful POSITIVE LITTER CONTROL programme based on the theme, "Do the Right Thing".

The policy, strategy and implementation of the "Do the Right Thing" campaign in New South Wales is determined by the SPCC. However, to take advantage of the commercial experience and co-operation of the industry group funding the campaign (the Litter Research Association), the New South Wales Government established a Litter Reduction Campaign Liaison Committee. This Committee comprises:

- 4 representatives from the Commission, and
- 4 representatives from Industry.

The Committee meets monthly to discuss the effectiveness of the campaign, review budgeted and actual expenditure by category and offer advice and assistance to the Litter Project Co-ordinator of the programme.

The Co-ordinator and his small staff are part of the SPCC and utilise its premises and facilities. Overheads of the group are thus kept to a minimum.

The role and co-operation of the KABC (NSW) has been an important adjunct to the SPCC's campaign. The KABC's administrative costs are funded by the SPCC by an annual grant of \$50,000.

ALTERNATIVE 2. (cont'd)

The New South Wales Minister for Planning and Environment, who is also the Ministerial Head of the State Pollution Control Commission, is also, under KABC (NSW's) Constitution, the Honorary President of this voluntary body.

If the New South Wales approach was implemented in Victoria, THE GROUP recommends the following mechanisms:

- . A nominated State Government Department would be responsible for formulating policy and the allocation, expenditure and control of the funds.
- . A Chief Executive with a high level of management and marketing expertise, a flair for public relations and a keen interest in resource conservation, should be recruited to administer the campaign on a full-time basis. This person should preferably be directly accountable to the head of the nominated Government department.
- . To assist in the implementation of the programme, a Litter Reduction Programme Advisory Committee should be established comprising:
 - 4 representatives from Government, and
 - 4 representatives nominated by Industry, one each from the glass manufacturers, the can manufacturers, the brewing industry and the soft drink industry.
- . Financial support by the nominated State Government department should be provided to the KABC (VIC) out of moneys provided by THE GROUP to the extent necessary to maintain a high level of voluntary support throughout all sections of the community for the Government's anti-litter programme.

ALTERNATIVE 3. - A STATUTORILY INCORPORATED KABC

This Alternative is based on the administrative mechanism adopted by Western Australia.

The Western Australian POSITIVE LITTER CONTROL programme is administered by a statutorily incorporated Keep Australia Beautiful Council and based on the theme, "Do the Right Thing".

The Western Australian Act makes the KABC Statutory Board of 12 persons accountable to the Minister for Local Government. Of the Board members, six are nominated by Industry and six by Government.

The Government nominees include one person (the Chairman) who is not a public servant. He is a paid member (\$3,000 per annum) who is recognised within the community as interested in litter and recycling programmes. The five other members nominated by the Government are drawn from:

- Local Government (1 metropolitan and 1 country);
- Under Secretary to Local Government (1);
- Department of Education (1) and
- Department of Tourism (1).

ALTERNATIVE 3. (cont'd)

Policy is recommended to the Minister for Local Government by the Board and following his approval is implemented by a salaried Executive Director with six salaried support staff.

All salaried staff are employed under the same terms and conditions as State public servants. The Board and its officers are housed in the Local Government Department building (rental for space used is charged) and the Board benefits by purchasing vehicles through the Government Car pool (no sales tax) and from other advantages of a similar nature.

Five Sub-Committees, each chaired by a member of the Statutory Board, operate to increase the effectiveness of the Board and its Executive Director. The Sub-Committees, which meet monthly, and are staffed by voluntary, unpaid members, are:

- . Finance and Membership
- . Education
- . Enforcement
- . Publicity
- . Special Projects

In total, about 40 bodies and about 70 additional people co-operate with the Board in implementing its programme.

DETAILED BREAKDOWN OF
PROPOSED VICTORIAN LITTER REDUCTION CAMPAIGN
FOR YEAR ONE

ADMINISTRATION

| | | |
|-----------------------|---------------|---------|
| Salaries | 110,000 | |
| Travel, Miscellaneous | <u>12,000</u> | 122,000 |

COMMUNICATION

| | | | |
|-------------------|--------------------------------------|---------------|---------|
| <u>Media:</u> | Advertising | 500,000 | |
| <u>Promotion:</u> | TV/Radio Commercial Production | 60,000 | |
| | Brochures (Local Government, public) | 8,000 | |
| | - Litter reduction | 8,000 | |
| | - Recycling | 8,000 | |
| | Tidy Scheme - Royal Melbourne Show | 13,000 | |
| | Public Relations (on project basis) | 15,000 | |
| | Posters | <u>25,000</u> | 629,000 |

EDUCATION

| | | |
|--|---------------|--------|
| Education Officer | 23,000 | |
| In-service programme - Teachers | 15,000 | |
| Net (of sales tax) cost of curriculum materials | 5,000 | |
| School film on litter, recycling (assume 3/4 of cost subsidised by private sector) | <u>20,000</u> | 63,000 |

HARDWARE

| | | |
|-----------------------------|------------|--------|
| Litterbags, (cars etc.) | 50,000 | |
| Picnic, show litter bags | 1,500 | |
| Stickers, Signs | 30,000 | |
| Litter bag dispenser stands | 3,000 | |
| Large litter clean-up bags | <u>500</u> | 85,000 |

GRANTS

| | | |
|--|---------------|---------|
| Local Council competition for litter/solid waste/resource recovery innovation - prizes | 10,000 | |
| Pilot Local Council schemes implementing prize-winning suggestions | 60,000 | |
| KABC (Vic) Administration and programmes | <u>60,000</u> | 130,000 |

RESEARCH

| | | |
|---|--------------|--------|
| Litter Index | 5,000 | |
| Attitude/Awareness study to monitor public attitude to litter and littering behaviour | 10,000 | |
| Garbage Analysis Study | <u>5,000</u> | 20,000 |

GENERAL RESERVE

| | | |
|--|--------------|-------|
| | <u>9,000</u> | 9,000 |
|--|--------------|-------|

| | | |
|--|--|--------------------|
| | | <u>\$1,058,000</u> |
|--|--|--------------------|

PART OF A PROPOSAL

TO THE

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO CONTAINER DEPOSIT LEGISLATION

FROM THE

KEEP AUSTRALIA BEAUTIFUL COUNCIL (VICTORIA)

EXECUTIVE SUMMARY

The litter problem in Victoria requires a total approach involving more direct Government leadership and community participation.

The KABC (Vic) recommends that a positive litter control system is the best method of reducing the total litter stream in this State.

The KABC's past experience shows that the best long term results in litter reduction are achieved by the development of civic pride. This requires the participation of the entire community - State and local Government, the education system and the general public.

The KABC recommends the following program which has these principal features:

Strategy

By the establishment of KABC as a statutory body in Victoria, State and local Government, industry and the community would be drawn together to work co-operatively and more effectively than ever before towards common goals in litter reduction, recycling and solid waste management.

Activities

Litter Control and Development of Civic Pride

Achieved through:

- o enlarging current KABC positive litter control program;
- o extending its Tidy Town program;
- o increasing its media public awareness program;
- o updating and continuing its schools' program;
- o further promoting beach and roadside clean-ups;
- o co-operating with organisers and promoters of "crowd functions" to minimise and control litter at public functions;
- o increasing local Government/council support;
- o continuing to co-operate with service clubs and groups;

- o co-operating with all State Government departments;
- o working nationally with all other States and Territories to achieve and protect a beautiful Australia; and
- o establishing targets for litter reduction with progress towards their achievement being reported regularly to a Government supervisory body.

Recycling

Achieved through:

- o active participation in co-ordinated State and local Government and industry efforts to establish targets for improved performance in recycling;
- o utilising KABC's established credibility and support from the media to gain widespread public participation in statewide recycling programs;
- o promoting the community benefits of recycling as an adjunct to litter reduction education and promotion programs;
- o developing, in co-operation with councils and industry, more attractive and convenient facilities for recycling and providing centralised advisory services to the public, community groups and municipalities; and
- o giving grants to specialist bodies to further develop recycling technology. The KABC is represented on the Environment Protection Authority's Recycling Advisory Committee and would use the expertise of this Committee to recommend projects to be undertaken.

Solid Waste Management and Resource Recovery

Achieved through:

- o giving grants to specialist bodies to establish more efficient and effective methods of solid waste disposal and recovery of reusable resources.

Funding

The Victorian Industry Group's proposal would raise funds from member companies in the packaging and beverage industries to meet the cost of the KABC program, estimated to be \$1,320,000 in the first year (Attachment 1) and more than \$2 million over the first three years.

The KABC Board of Directors would act as a policy body to establish objectives and policies, and to review progress. Its Directors would comprise State and local Government, industry representatives and KABC members.

Implementation

Responsibility for implementation of the program on a Statewide basis would be placed with the KABC which would assist and co-ordinate the activities of various Government departments and authorities, local government, industry and community action groups.

It is recommended that authority be given to the KABC by forming it into a statutory body, similar to the KABC in Western Australia which operates successfully in that State. This submission and the attached budget are based upon this assumption.

KABC EXPERIENCE IN VICTORIA

Victoria has successfully tackled and reduced its litter problem including beverage containers, through a pioneering program of positive litter control introduced by the KABC in 1979.

Program Objectives

The program's objectives are:

- o to promote civic pride through an appreciation of a clean environment;
- o to develop efficient proven methods of litter reduction, and apply these by widespread community involvement;
- o to monitor results of litter reduction programs;
- o to encourage a responsible community attitude towards recycling and re-use; and
- o to advise and assist State and local Government and commercial and voluntary bodies on environmental matters.

Operational Strategy and Activities

The program uses the 5E approach:

1. Education

The KABC views educational activities as its prime tool. They are directed at the general public, students, commerce and industry and authorities who are reached through the distribution of literature and films, displays, seminars, workshops and advertising and media campaigns.

Close contact is maintained with schools where the KABC's program is supported by the Education Department.

Media support through donated community announcements and production gives annual campaigns with a value of \$2.5 million on TV, radio and press, in addition to widespread editorial coverage.

2. Example

Activities which encourage community participation in decreasing litter include:

a. Tidy Town Program

An annual competition conducted in conjunction with the State Government to acknowledge Victoria's tidiest town. Last year 123 city and country towns participated.

The program is conducted throughout Australia and bonds together more than 16,000 organisations including Government instrumentalities, local Government, community service groups, commerce and industry, sporting and community interest groups and schools.

These organisations participate in litter control, tree plantings, development of parks and gardens, and restoration of heritage sites, all of which boost community pride and morale.

b. Tidy Beach Program

An annual program during the summer months which concentrates on reducing litter on beaches.

c. Mobile Litter Control Vehicle

Tidiness on beaches and in other public areas is promoted through a number of mobile litter control vehicles which are equipped with custom-built trailers and specially designed bins. People are encouraged to sort litter into the respective bins for different recyclable articles, eg, steel and aluminium cans, bottles, paper etc. The vehicles are proving a great success with organisations to whom they are available for loan, eg, the Port Phillip Authority for beach patrols and service clubs. A public address system is installed in one of the vehicles.

d. KAB Week

A KAB Week is held each year with a variety of educational activities and special events throughout Victoria.

Last year comic characters were used to deliver recycling messages to the public, more than 40,000 Australian native trees were distributed and more than 3,600 schools received special kits.

e. Demonstration Projects for Industry and Commerce

The KABC sets up litter control programs for organisations whose staff are instructed in techniques for decreasing litter and given materials for distribution to employees.

3. Equipment

The KABC supplies physical resources to support community participation in litter reduction, eg, promotional items, literature, posters and litter bags. These are often distributed through councils.

The KABC is also active in the development of better designed litter bins and more effective litter equipment at wayside stops, loading bays and dumps.

4. Enforcement

The KABC believes enforcement of penalties is vital in deterring the inveterate litterer. It supports penalty levels set at a level to discourage littering in the first instance and to deter further offences.

The KABC is anxious to see the recommendations for amendments to The Litter Act come about. These were submitted to the Premier by the Interdepartmental Committee on Litter Control in 1981. Although it was the Premier's intention to deal with them in the spring session of 1981, owing to the pressure of other parliamentary matters, these have not come before the House as yet. These have been re-submitted to the Premier in 1984.

The KABC advocates more active and consistent enforcement of existing legislation, as well as publicity about litter penalties.

The KABC would also like to see the reinstatement of the intra and interdepartmental activities which were previously conducted by the Interdepartmental Committee on Litter Control prior to its disbandment in 1981.

5. Economic Re-use of Resources

A responsible community attitude towards recycling and re-use is encouraged, and sorting household garbage at the source of its generation is advocated and stimulated by community education.

Strong support is given to local and State Government efforts to establish schemes enabling public participation in recovery and re-use of valuable materials.

Support is also given to voluntary industry recycling schemes for glass, aluminium and paper which the KABC believes should be an established part of the Australian community.

The KABC gives telephone advice about recycling and provides lists of recoverable materials.

While the KABC recognises limitations in the economic viability of recycling schemes, it believes that these can be reduced by research and development.

Other KABC activities include maintaining a regular information flow from within Australia and from overseas on all aspects of litter control. The KABC also conducts surveys and research on litter, littering habits, litter control equipment, the litter problems of specific communities and public attitudes to littering and its control.

National Nature

The KABC is part of the national KABC organisation, which has a uniform approach to litter control in all States. While the Victorian Council is autonomous, it derives many benefits from belonging to a national body. These include high public recognition and cost savings through the sharing of research results, information, promotional materials and equipment.

Funding

The KABC has been funded mainly by the Victorian Industry Group. Other sources of funds are a \$50,000 State Government grant, individual and community membership fees, sponsorships and public fund-raising.

While the financial support of industry, Government and many others has been appreciated (without it, Victoria would be a much dirtier State today), the KABC has always been frustrated by the knowledge that so much more could be done

for the Victorian community with more funding. It is heartened to learn that adequate funding can be secured by the adoption of the proposal of the Victorian Industry Group.

It is apparent that industry, particularly the beverage packaging industry, has accepted a long-term responsibility for reducing littering and improving waste disposal and recycling. In Australian States where industry has been given an opportunity to do so, it has voluntarily provided funds to finance effective programs, in preference to having restrictions and impositions placed upon its products. It can be safely assumed that funds would continue to be provided on this basis.

Organisation Structure for Proposed Victorian Litter Program

POLICY COMMITTEE
BOARD OF KABC
(STATE GOVT / LOCAL GOVT /
INDUSTRY / KABC)

IMPLEMENTING BODY
KABC

FUNDING
VICTORIAN
INDUSTRY GROUP
THROUGH STATE
TREASURY

FUND-RAISING
COMMUNITY

EDUCATION
EDUCATION
DEPARTMENT

MEMBERSHIP

RESEARCH
LITTERING
RECYCLING
WASTE MANAGEMENT
ATTITODINAL

ACTION GROUPS
(LOCAL GOVT, SERVICE CLUBS,
STUDENTS, STATE GOVT.)

SCHOOL
PROGRAMS

TIDY
TOWNS

TIDY
BEACHES

KAB
WEEK

PLANTING OF
NATIVE TREES

CARE
AWARDS

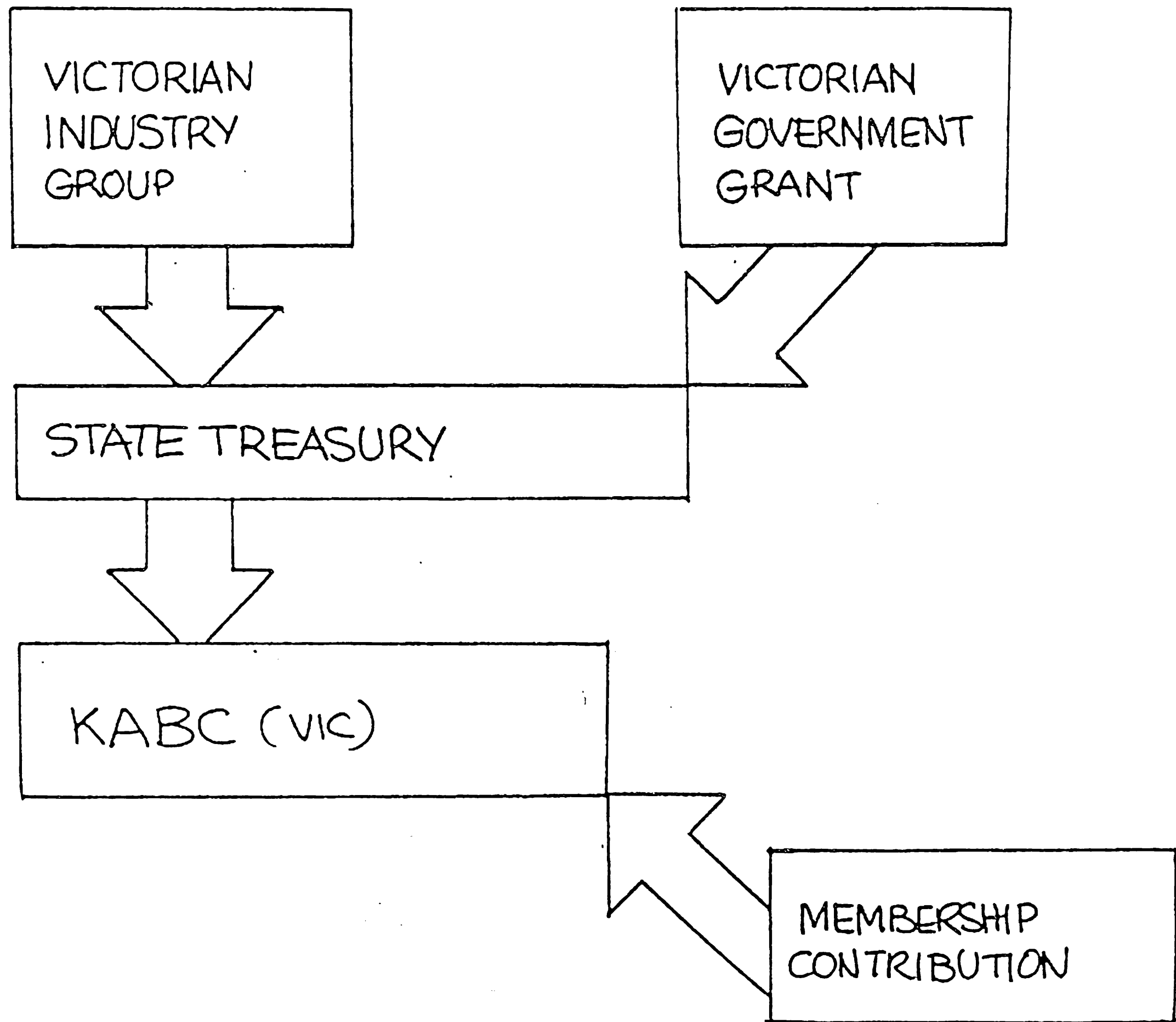
SPECIAL
EVENTS

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FUNCTIONS

ACTIVITIES

Funding for Proposed Victorian Litter Program



KEEP AUSTRALIA BEAUTIFUL COUNCIL (VICTORIA)
BUDGET ESTIMATE - PUBLIC EDUCATION PROGRAMME - YEAR ONE

Attachment 3

| | | | |
|--|---|----------------|------------------|
| <u>1. ADMINISTRATION</u> | | \$ | |
| | Salaries | | 110,000 |
| | Travel, Miscellaneous | | 12,000 |
| | | | <u>122,000</u> |
| <u>2. DIRECT PUBLIC EDUCATION - MEDIA</u> | | | <u>\$122,000</u> |
| | aimed at educating all sectors of the community | | |
| | - <u>Litter Laws</u> : Awareness to penalties and enforcement | | |
| | - <u>Do the Right Thing</u> : Television Campaign Production | 500,000 | |
| | - <u>Sporting Events</u> : Clean sports areas | 60,000 | |
| | - <u>Tidy Towns Contest</u> : | 200,000 | |
| | - <u>Tidy Beaches Contest</u> | 50,000 | |
| | - KAB Week: (National Week) | | |
| | - Public Relations | 24,000 | |
| | - Civic pride events promotion | 20,000 | |
| | | <u>854,000</u> | <u>\$854,000</u> |
| <u>3. EDUCATION - SCHOOLS</u> | | | |
| | Education Officer | 25,000 | |
| | In Service programmes | 15,000 | |
| | Curriculum materials | 5,000 | |
| | Audio-Visual materials on litter and recycling | 20,000 | |
| | Development Activity | 5,000 | |
| | | <u>70,000</u> | <u>\$ 70,000</u> |
| <u>4. PUBLICATIONS/DISPLAYS/PROMOTIONS</u> | | | |
| | Maintain and reprint existing publications | 8,000 | |
| | Brochures (Local Govt/Public) | | |
| | Litter Reduction | 8,000 | |
| | Recycling | 8,000 | |
| | Litter Bags, | 50,000 | |
| | Picnic/Show, litterbags | 1,500 | |
| | Sticker/Signs | 30,000 | |
| | Litter bag dispenser stands | 3,000 | |
| | Large litter clean-up bags | 500 | |
| | Posters | 25,000 | |
| | | <u>109,000</u> | <u>\$109,000</u> |

KEEP AUSTRALIA BEAUTIFUL COUNCIL (VICTORIA)

BUDGET ESTIMATE - SPECIAL PROJECTS PROGRAMMES - YEAR ONE

1. LITTER BINS:

Investigate, liaise and establish minimum requirements for litter control at:-

| | | |
|----------------------------|----------------|----------------|
| Football grounds | | |
| Racecourses | | |
| Cricket grounds | | |
| Trotting events | | |
| Raceways | | |
| Greyhound tracks | | |
| and other sporting venues. | <u>\$5,000</u> | <u>\$5,000</u> |

2. PENALTY WARNING SIGNS (DO NOT LITTER)

| | | |
|----------------------------------|--------------|----------------|
| Provision of 1,000 Warning Signs | <u>2,000</u> | <u>\$2,000</u> |
|----------------------------------|--------------|----------------|

3. LITTER RESEARCH & EVALUATION

| | | |
|---|--------------|-----------------|
| Surveys - | 5,000 | |
| Public Awareness survey. Repeat of previous survey to establish changing public attitudes | 10,000 | |
| Garbage analysis study | <u>5,000</u> | <u>\$20,000</u> |

4. GRANTS

| | | |
|---|-------|--|
| To ascertain what recycling is taking place in Victoria | 5,000 | |
|---|-------|--|

| | | |
|---|--------|--|
| Development of recycling technology for plastics/paper/tinplate | 50,000 | |
|---|--------|--|

| | | |
|---|---------------|--|
| Support funding to Local Govt. for development of litter reduction/solid waste treatment and resource recovery. | <u>50,000</u> | |
|---|---------------|--|

| | | |
|--|------------------|------------------|
| | <u>\$105,000</u> | <u>\$105,000</u> |
|--|------------------|------------------|

KEEP AUSTRALIA BEAUTIFUL COUNCIL (VICTORIA)

BUDGET ESTIMATE - ENFORCEMENT PROGRAMMES - YEAR ONE

1. TRAINING OF AUTHORISED OFFICERS

Full day instructional classes will be held at KABC office for groups of 8 or 9 persons duly authorised to enforce Litter Act and Regulations. Teaching by Staff Officer Enforcement Training Workshops to be conducted in major country centres.

\$

5,000

2. LECTURES FOR JUVENILES

1,000

Evening lectures of 1 hour duration as an alternative to payment of fine or appearance in Children's Court offer to municipal councils.

3. REPORTING OFFENDERS

1,500

Motor vehicle reports
Boat and watercraft reporting

4. BLITZ PROGRAMMES

15,000

Offer of blitz enforcement assistance to municipal councils for special events, eradication of bad litter areas.

5. LEGISLATIVE REQUIREMENTS

500

Infringement Notices in pads
Badge and identification

23,000

\$23,000

GENERAL RESERVE

10,000

\$10,000

GRAND TOTAL

\$1,320,000

KEEP AUSTRALIA BEAUTIFUL COUNCIL (VICTORIA)

INCOME

| <u>Subscriptions -</u> | <u>\$</u> |
|---|--------------------|
| Cities and Shires | 12,000 |
| Companies and Organisations | 18,000 |
| Individuals | 1,000 |
| | <hr/> |
| | 31,000 |
| | |
| State Government Grants | 55,000 |
| Victorian Industry Group - Tidy Towns (KABC) | 135,000 |
| Victorian Industry Group - Positive Litter Control | 1,058,000 |
| Interest | 10,000 |
| Donations | 1,000 |
| Sale of Promotional Material | 30,000 |
| | <hr/> |
| | <u>\$1,320,000</u> |

PART OF PAPER SUBMITTED BY

MR. K. N. McLENNAN

Chief Health Surveyor

City of Knox

"The influence of changes in Lifestyle on
Waste Disposal Problems in Australia"

ESTABLISHMENT OF RECYCLING DEPOT

- 5.1 The conferences with industry, during 1974, resulted in a decision to establish a Recycling programme in the City of Knox. It was resolved that the depot for the reception of resource materials - paper, cardboard, glass, bottles and scrap metal should be established adjacent to the landfill disposal site at Scoresby.
- 5.2 Planning the construction of the necessary facilities to house the operation began in December 1974. Construction works on the site were completed in time for the opening on Saturday, 29th March, 1975.

From the outset there was a steady stream of materials delivered to the resource recovery depot. There were many in the community interested in the separation of resource materials. Their interest and that of many others was stimulated by the considerable amount of publicity given to the Recycling operation. A special issue of the "Knox Newsletter*" was almost entirely devoted to the project.

*Council publication distributed to household three times per year.

DEVELOPMENT

- 5.3 Initially, the programme was almost entirely dependent for its survival upon materials source separated and delivered to the depot by residents. It soon became apparent that if the venture was to be successful more material would have to be extracted from the waste stream. Despite the loss of \$A8000, in its first year of operation, the City fathers were happy, as that loss was compensated for by the saving of space at the landfill. Constant publicity was given to the project in an endeavour to induce residents to maximise their efforts toward the source separation of resource materials. However, despite some small improvement it was obvious the operation required considerable change if it was to survive, prosper and deliver the desired results. It was also probably unreasonable to expect residents to carry recyclables up to 18 km to the Resource recovery depot. This would be even more so today with the high and seemingly ever escalating cost of energy.
- 6.3 An examination of the material being collected as household refuse revealed a very high bottle and glass content. The EPA Garbage Analysis programme of 1977/78 subsequently confirmed these observations. At that time, it was found that about 40% of Melbourne's garbage was made up of resource materials.

SOURCE SEPARATION

- 7.1 The owners of certain refillable bottles were continually expressing their concern about the continuing high level of loss of their containers in the waste stream. These bottles comprised at that time some 16.3% of the glass component in the packaging content of domestic garbage. In cases where a voluntary manufacturer's deposit of \$A0.20 applies there is still a high level of discards.
- 7.2 As part of our endeavour to increase the volume of materials passing through the recycling depot and at the same time reduce the glass content of the domestic garbage, we commenced collecting source separated glass containers early in 1977. The community was requested to leave bottles adjacent to bins of refuse matter on days of garbage collection. An intensive advertising campaign was mounted to induce residents to accept and participate in the revised arrangement. The garbage collectors delivered cards, advising of the service, to each tenement in the municipality. Press releases on the subject were produced and published. The result for the first month was a total of 1253 potato sacks* mixed bottles. Today, we are averaging about 1800 sacks of mixed bottles by this means each week.

*Potato sacks - each manufactured to hold 50 kg of potatoes will carry, on average, 3.5 dozen 750 ml bottles.

- 7.3 Every opportunity continues to be taken to advertise the availability of this service to residents. It has been effective in significantly reducing the glass content of the waste stream.

NEIGHBOURHOOD DEPOTS

- 8.1 Throughout Australia Boy Scout Groups have for many years collected bottles as a means of producing much needed funding. In recent times, they have established "Bottle Depots" in many areas. During 1977, the Council expressed concern about the untidy neglected state of many of these depots which might have been more aptly described as "bottle dumps". The Council directive was that they be either cleaned up or closed.
- 8.2 Prior to this direction, consideration was being given to the concept for establishing Neighbourhood depots for the reception of resource materials, paper, cardboard and bottles. It was believed that the provision of such depots adjacent to shopping centres would be beneficial and have the desired effect of enabling residents to increase their contribution toward effectively reducing the recyclable content of the waste stream. Thus, the opportunity was taken of evolving a programme based upon the untidy depots.

- 8.3 The proposition put to the various Scout Groups was readily accepted and the Co-operative programme of Neighbourhood depots commenced operation on 1st October, 1978. Again, publicity in the form of press release and leaflets were produced and disseminated to the Knox Community.
- 8.4 At this time there are 11 depots in the Neighbourhood programme. Most are satisfactorily located being either adjacent to a shopping centre or a main road.
- 8.5 The Boy Scout Groups regularly distribute leaflets in their area and various Council publications have publicised the location thus creating awareness of the presence of these depots.
- 8.6 In taking over the collection of the materials from the neighbourhood depots, the Council undertook to clear produce at least once a week. Facilities for the reception of paper and cardboard were provided immediately. Lately provision has been made for the collection of clean steel cans. The response from the community has been remarkable. They have accepted their presence. From the outset the volume of material being handled showed a steady increase. The volume of recyclables deposited has been beyond all expectations.
- 8.7 The community now has three outlets for resource materials - Garbage Service, Neighbourhood depots and the Central depot.
- 8.8 The Neighbourhood depots now present a much improved appearance. They do not now attract vandals nor illicit deposits of offensive waste matter. With their acceptance by the community, I envisage that in the future there will be many more, particularly with the continued growth and development of the municipality.

GROWTH OF PROGRAMME

- 9.1 The growth of the resource recovery programme of source separated recyclable paper, cardboard, bottles and scrap metal can be demonstrated in many ways.
- 9.2 Receipts are one indication of the value of materials recovered and sold through this now viable undertaking.

| | |
|---------|-----------------------|
| 1976-77 | \$A 32,400 |
| 1977-78 | \$A 58,000 |
| 1978-79 | \$A 130,000 |
| 1979-80 | \$A 175,000 |
| 1980-81 | \$A 200,000 estimated |

9.3 Alternatively, volumes of materials recovered, handled and passed through the central depot amply demonstrate the growth by that means (12 months ended 31st March).

| | 1978 | 1979 | 1980 | 1981 |
|--|--------|---------|---------|---------|
| (a) Bag of bottles from garbage collection | 36 000 | 54 000 | 91 180 | 85 102* |
| (b) Refillable bottles - dozens | 90 000 | 160 000 | 186 000 | 202 546 |
| (c) Cullet glass - tonnes | 338 | 664 | 942 | 1 147 |
| (d) Paper & cardboard - tonnes | 361 | 480 | 764 | 798 |
| (e) Scrap metal - mainly ferrous tonnes | 503 | 875 | 1 050 | 1 200 |

* Stoppage - Industrial problems affected collection.

9.4 At the Central depot bottles are sorted (by hand) into saleable refillable and non-refillable. The non-refillables together with some refillables for which we have been unable to develop a market are broken up according to colour.

At the outset there was a market for mixed cullet. During April of 1978 we were able to negotiate an attractive price for colour separated cullet glass. The necessary bins were constructed and since the end of May, 1978, we have been selling cullet glass according to colour - Clear, Amber, Green.

9.5 The clear glass component forms approximately 53% of the total of cullet glass. The green and amber portions being approximately equal.

9.6 Refillable bottles are sorted, crated and stacked awaiting period return to their respective owners.

EXTRACT FROM THE PROCEEDINGS

The Minutes of the Proceedings of the Committee show the following Division which took place during consideration of the draft report:

Tuesday, 14 August 1984.

The Committee divided on the question, That the Report be adopted:

The result of the Division was:

Ayes, 6

The Hon. W. R. Baxter
Mr. C. W. Burgin
The Hon. D. E. Henshaw
Mr. G. R. Ihlein
The Hon. R. I. Knowles
Mr. D. K. McKellar

Noes, 5

Mr. M. J. McDonald
The Hon. B. T. Pullen

And so it was resolved in the affirmative.

* * * * *

MINORITY REPORT

by

The Honourable B. T. Pullen, M.L.C.

and

Mr. M. J. McDonald, M.P.

Pursuant to S4N(4)

of the

Parliamentary Committees Act 1968

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* * *

CHAPTER ONE

INTRODUCTION

1.1 This report is required for two reasons. First, despite the large amount of evidence taken and the inspections made, we believe the majority report has not directly addressed the terms of reference set for the inquiry. Second, although the conclusions reached in the majority report recognise in part the problems in the current situation and acknowledge that some Government action is required, the form of action recommended is too indefinite to materially change the current trend to increased levels of littering and waste of resources.

1.2 The investigations carried out by the Committee clearly show that there is a littering and waste problem of some magnitude. For instance, on the best estimates, some 1096 million beverage containers were disposed to waste in Victoria in the year 1982-83. This equals a rate of over three million containers a day or more than 2000 per minute entering the litter and waste streams.

It is clear that this wastage would be even greater but for the fact that 397 million glass containers were refilled and the material equivalent of 71 million glass and 86 million aluminium containers were recycled.

1.3 The overall situation is shown schematically in Figure 1. Whether this improves or deteriorates depends on the kind of containers produced and used by the industry and the amount of effort exercised by Government, industry and the community in the collection of those containers capable of being refilled or recycled.

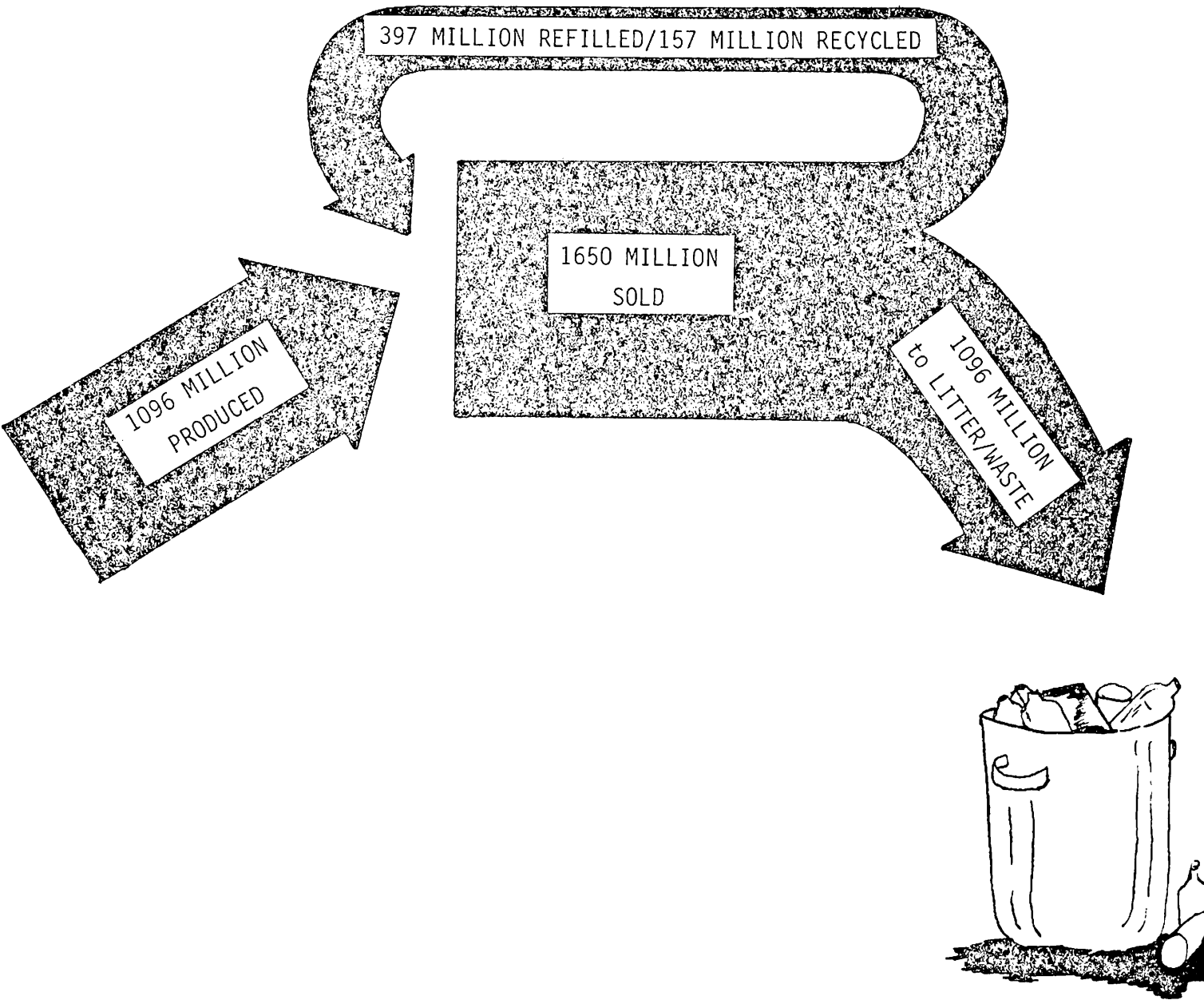


FIGURE 1. THE LITTER/WASTE STREAM

Units: Beverage Containers per annum, Victoria 1982-83.

This is illustrated by Table 1 which shows that the maximum potential refillable and recycling percentage achievable in 1982-83 was 64 per cent, whilst the actual result fell far short of this at 34 per cent.

TABLE 1

COMPARISON BETWEEN POTENTIAL AND ACTUAL PERFORMANCE

| Beverage Containers | Millions per annum | (%) | Beverage Containers | Millions per annum | (%) |
|-----------------------------------|--------------------|-----|---------------------|--------------------|-----|
| Potentially refillable | 552 | 33 | Actually refilled | 397 | 24 |
| Potentially recyclable | 511 | 31 | Actually recycled | 157 | 10 |
| POTENTIAL | 1063 | 64 | ACTUAL | 554 | 34 |
| Non-refillable/ non-recyclable | 587 | 36 | To waste | 1096 | 66 |
| TOTAL | 1650 | 100 | | 1650 | 100 |

If the community and Government want to tackle the problem of beverage container litter and waste in an effective way, and the inquiry received ample evidence demonstrating that the community is deeply concerned about the issue, then it is clear that we must address the source of the problem, that is the growing proportion of containers that are neither recyclable nor re-usable, and develop processes and incentives to maximise the return rate.

- 1.4 The recommendations in this minority report are developed on this premise and with regard to the terms of reference, basic to the inquiry, namely:

To investigate, make recommendations and report to Parliament by 1 November 1983 in relation to beverage and drink container deposit legislation with particular regard to the following:*

- (1) Future prices, sales and investment in the drink, beverage and related packaging industry;*
- (2) Employment;*
- (3) Conservation and allocation of natural resources and energy;*
- (4) Littering and aesthetics;*
- (5) Waste collection and disposal or recycling; and*
- (6) Alternative waste control methods.*

Form of report

- 1.5 Thus, Chapter Two, Impacts of Container Deposit Legislation, examines the expected impact that the introduction of container deposit legislation in Victoria would have in the areas of concern identified in the terms of reference.
- 1.6 Chapter Three, Variations and Alternatives, discusses variations of container deposit legislation applicable in Victoria and other possible alternatives, including the concept suggested in the majority report.
- 1.7 Finally, Chapter Four summarises the conclusions and provides a set of recommendations.

* Report deadline extended to 1 April 1984.

CHAPTER TWO

IMPACTS OF CONTAINER DEPOSIT LEGISLATION

- 2.1 This chapter focuses on the introduction of a form of container deposit legislation as a means of reducing litter and wastage of resource and evaluates its likely impacts, with particular reference to the areas indicated in the terms of reference for this inquiry.
- 2.2 As there is some variation in the forms of container deposit legislation already introduced in South Australia and overseas, the evaluations except where otherwise stated relate to a basic format similar to the South Australian legislation, namely where:
- (1) Manufacturers using refillable bottles are exempted from the provisions of the legislation provided they maintain their returnable refillable bottle system.
 - (2) Non-refillable containers must bear a minimum refund amount of five cents.
 - (3) Refunds on non-refillable glass containers of any brand are obtainable from retail outlets which normally sell that brand, and refunds on non-refillable non-glass containers (e.g. cans, Polyethelene Terephthalate (PET) bottles) are obtainable from licensed collection depots located in metropolitan and country areas.

EMPLOYMENT IMPACT

- 2.3 The impact of the introduction of any form of deposit legislation on employment both in the short term and long term is clearly a key matter to be considered.

Our conclusion, based on evidence available to the Committee indicates that there should be substantial net employment gains following the introduction of deposit legislation.

Areas of work where an increase in employment could be expected include can and bottle depots, transportation, can processing, refilling, and supermarkets and other retail outlets (if used as points of return for containers).

Summary of evidence and findings re employment

2.4 South Australian survey

A survey conducted in South Australia of bottle and can collection depots by the Conservation Council of South Australia and Friends of the Earth in June 1982 and February 1983 indicated that, as a result of deposit legislation, the following jobs had been created:

TABLE 2
JOBS CREATED BY BEVERAGE CONTAINER ACT
(SOUTH AUSTRALIA)

| Area of Work | Full Time Jobs | Part Time Jobs | Total |
|-----------------------|----------------|----------------|-------|
| Supermarkets | 170 | 200 | 370 |
| Transport | 32 (approx) | 50 (approx) | 82 |
| Can and bottle depots | 102 | 131 | 133 |
| Can processing | 15 | - | 15 |
| | 319 | 381 | 700 |

The part-time jobs created are permanent and do not include seasonal workers.

2.5 Comptroller General's Report

A report by the Comptroller General of the United States on States' experience with beverage container deposit laws (December 1980) showed a similar increase in employment.

In Maine, with a population of 1.079 million (June 1979) there was an estimated increase of 626 jobs. Distributors reported an increase in jobs in distribution and warehousing of 10 to 40 per cent.

In Michigan, with a population of 9.207 million (June 1979) there was a net gain of 4648 jobs. This was comprised of 4888 jobs created and 240 jobs lost. The report questions whether the 240 jobs lost were directly attributable to the deposit law but assumes the losses were directly caused by the changed law for the purposes of the report.

2.6 Although it is not possible to make direct comparisons between the situation in other jurisdictions and Victoria, the introduction of deposit legislation could be expected to have proportionately similar effects.

2.7 Consultants' report to Natural Resources and Environment Committee

Such a conclusion is borne out in a report prepared for the Natural Resources and Environment Committee by Peat, Marwick, Mitchell Services which indicated that a net 150 to 200 jobs would be created overall should a litter tax of similar levels to a deposit be introduced.

2.8 Deposit legislation may also work to protect existing jobs in various sectors of the industry.

The report of the Conservation Council of South Australia/Friends of the Earth survey shows the existence of 80 marine stores in South Australia, 113 including can redemption centres, employing, at a conservative estimate, 360 people.

Victoria, a State with approximately three times the population of South Australia, has only around 40 marine stores employing approximately 200 people.

In the course of the survey comments were received from several South Australian merchants to the effect that they would not be in business without deposit legislation.

- 2.9 The submission by the South Australian Minister for Environment and Planning, presented at the request of the Committee, suggests that the result of one-way bottles without deposit on the South Australian market would result in the closure of the refillable bottle lines at the Payneham (Adelaide) factory. This factory currently employs 100 people.

It was also submitted by the South Australian Minister for Environment and Planning that the competitive situation of small family bottlers in country towns would be seriously jeopardised by the South Australian market becoming a predominately can or one-way bottle market.

A similar concern has been expressed for the future of Victorian country bottlers. Twelve Victorian country bottlers have written to the Committee urging that steps be taken to ensure a supply of standardised returnable bottles to all bottlers and stating that they are not opposed to deposit legislation providing that it does not discriminate against soft drinks.

Details of United States experience re employment

- 2.10 In Vermont and Maine, where estimates of jobs created by deposit legislation are 350 and 626 respectively, no job losses as a result of the introduction of deposit legislation were reported.

2.11 In Connecticut, studies of the effect of deposit legislation show a net increase of nearly 700 jobs. Two separate studies, by the New York Public Interest Research Group (PIRG) and the City of New York, show respectively that 139 and 145 jobs lost permanently. Both studies show higher levels of temporary job loss, the New York PIRG study indicating most temporary job losses were for less than a week and the City of New York study indicating that the losses were due to the seasonal nature of demand for beverages.

2.12 In Michigan, the Comptroller General of the United States reported that 4888 jobs were created and 240 lost following the introduction of deposit legislation. As earlier stated, the Comptroller General questioned whether the job losses were, in fact, attributable to the introduction of deposit legislation. The 240 jobs lost were comprised of 73 employees of the National Can Company and 163 employees at the Owens - Illinois Bottle Manufacturing Plant.

A report by New York PIRG points out that the National Can Company simultaneously opened a new plant in Ohio following a business plan which had been developed prior to the introduction of the legislation and that the Owen - Illinois Glass Plant also opened a modernised plant in Illinois.

2.13 Oregon probably represents the worst case of job loss as a result of deposit legislation; yet, overall, there was a net gain in employment. A 1974 study cites 576 new jobs created in warehousing and handling and 140 in transportation. Three hundred and fifty jobs were cited as lost in the can and glass industries. However, peculiarities of the Oregon legislation were the earliness of its introduction (October 1972) and the introduction of a ban on ring-pull tops prior to the development of a marketable substitute. Many brands were therefore unavailable in cans until the pop top was introduced. Can sales have since recovered and continue to grow. Prior to the passage of the law, cans accounted for approximately 20 per cent of the market for beer. Following an initial dip as a result of the legislation, 50 per cent of beer sales are now in cans.

South Australia in detail

- 2.14 In South Australia, job losses claimed as a result of the *Beverage Container Act* are 39 jobs at the Schweppes' Mt. Gambier plant and 50 jobs at Gadsden's three-piece steel can plant.

In his submission to the Committee, the South Australian Minister for Environment and Planning submitted that the losses at the Schweppes plant are directly related to the company's loss of market in South Australia following a 'price war' between Schweppes, Pub Squash and Coca Cola in the two years immediately prior to the introduction of the Act.

J. Gadsden Australia Ltd. was the only beverage can manufacturer in South Australia. The only user of Gadsden's three-piece steel can was Diverse Products (Coca Cola Bottlers).

- 2.15 The South Australian Minister for Environment and Planning commented that Gadsden's investment was based on "overly optimistic sales projections" which "would have required average growth rates of an order which is simply not achievable in the current market".

Following the introduction of the *Beverage Container Act* Coca Cola Bottlers shifted from steel cans to aluminium cans. Evidence presented to the Committee indicates that this shift to aluminium cans could not be simply attributed to the effects of the *Beverage Container Act*.

The South Australian Minister for Environment and Planning, for instance, has given the following reasons for the change-over by Coca Cola to aluminium cans and the subsequent closure of the Gadsden plant:

- (1) Ninety percent of soft drink cans being sold in South Australia are being returned via the deposit system. The value of scrap therefore becomes an important factor in a choice between steel and aluminium cans. At the time of the switch, aluminium scrap was worth 58 cents a kilo and steel scrap was worth 2 cents a kilo.

- (2) Coca Cola's marketing and media promotion is determined nationally and this would have been a significant factor in Coca Cola's South Australian marketing being brought into line with their operations in other states.
- (3) Nationally, the steel can has been forced out of the market by the competitiveness of the aluminium can. The loss of the South Australian market for steel cans would have occurred without deposit legislation, as it has in Victoria and New South Wales. Predictions to this effect had been made in a report of the Commercial Banking Corporation in May 1977, prior to the introduction of deposit legislation.

Gadsden's has since bought ACI's Pacific Can plant which manufactures aluminium cans and now supplies aluminium cans to the South Australian market.

Victoria

2.16 In Victoria, the area most likely to suffer job losses as a result of deposit legislation is the glass industry.

ACI, the dominant glass manufacturer, has submitted to the Committee that 183 jobs would be lost at its AGM Spotswood plant by 1985 if container deposit legislation was introduced.

In considering this claim in context, it is necessary to look at the employment structure in the industry and the impact of the introduction of competing packaging materials.

Employment structure in the glass industry

- 2.17 ACI has provided statistics and graphs relating to their employment and productivity profiles in the glass industry in Victoria and South Australia. Graphs of their employment and sales per employee in South Australia and Victoria from 1972 projected to 1985 are reproduced as Figures 2 and 3.

The picture that emerges of AGM (the ACI subsidiary) operations in Victoria is one of rising productivity, sales in tonnes per employee increasing from under 100 tonnes in 1972 to over 200 tonnes in 1983, accompanied by falling employment, accelerating from 1980.

Without any impact from deposit legislation, employment has fallen from 1290 in 1972 to 1134 in 1980 and 919 in 1983, a 28.8 per cent loss in employment since 1972. AGM predicts a further steep fall in employment without deposit legislation to 781 by 1985, representing a 39.5 per cent loss in employment since 1972.

The same period in South Australia has seen a slower increase in productivity, from a higher base of around 120 tonnes per employee in 1972 to around 180 tonnes per employee in 1983. Employment in the same period fell by 21 per cent, compared to 28.8 per cent in Victoria, and AGM does not expect employment in its South Australian operations to experience the projected steep decline to 1985 as is expected for its Victorian operations.

Although it is speculative to place the sole responsibility for the stabilization of employment in AGM's South Australian operations on the introduction of deposit legislation, the fact that the rapid decline in employment in Victoria from 1980 is not mirrored in South Australia is highly suggestive. An assumption that deposit legislation has played a major role in stabilising employment in glass manufacture in South Australia is borne out by other sources.

NUMBER OF AGM EMPLOYEES IN VICTORIA AND SOUTH AUSTRALIA
1972 - 1985



FIGURE 2.

SALES PER EMPLOYEE

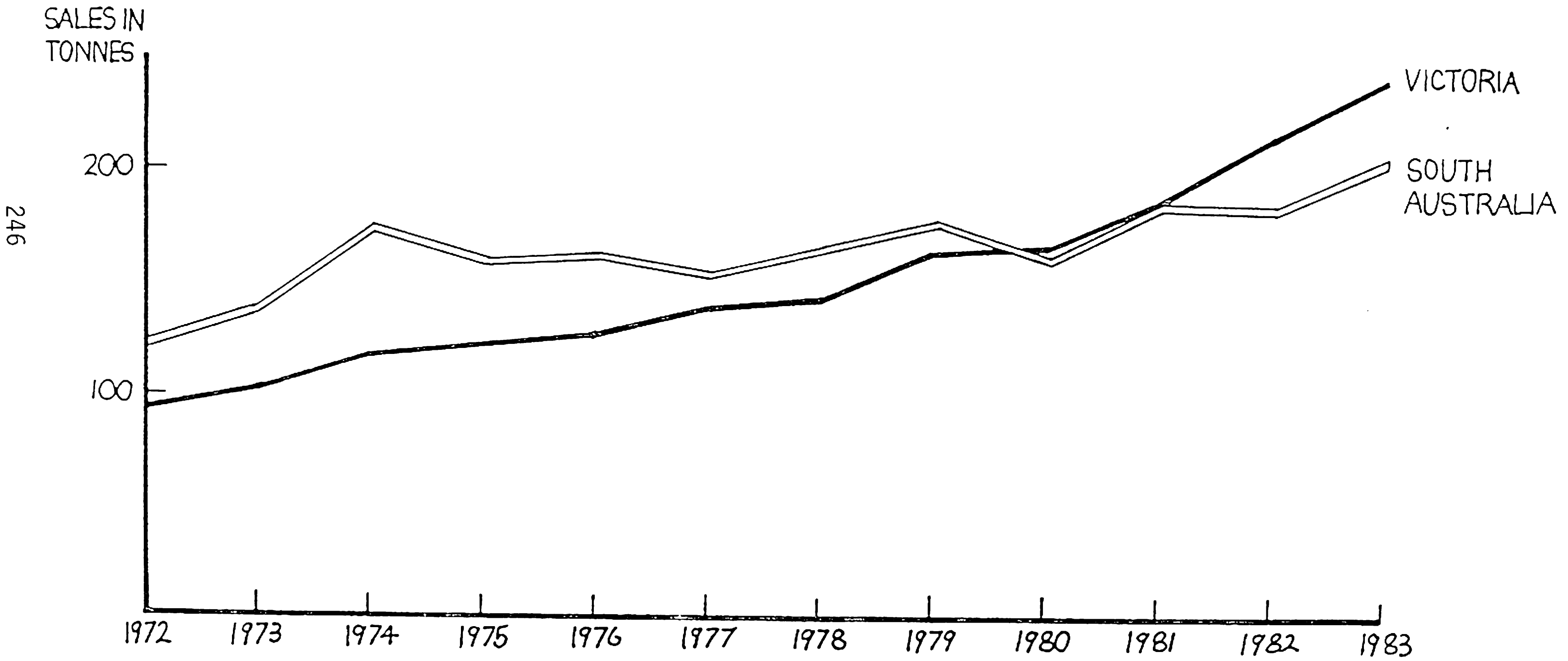


FIGURE 3.

The South Australian Minister for Environment and Planning points to an increase in the share of packaged beer marketed in glass in South Australia of 14 per cent and, in addition to this increase, a permanent level of sales to replace 375 ml "echo" bottles of approximately 3.2 per cent.

The Minister goes on to state that the Glass Workers Union (S.A. Branch) has confirmed that there has not been a loss of employment at the bottle factory.

The report of the Comptroller General of the United States indicates that similar gains in the market share enjoyed by refillable glass bottles was experienced in Maine and Michigan following the introduction of deposit legislation.

Competing packaging materials

2.18 The container which has made the most recent substantial inroads into the beverage container market is the Polyethylene Terephthalate (PET) bottle. A two litre container was introduced in Victoria in 1979-80 for soft drinks. By 1982-83 fifteen per cent, by volume, of all soft drinks sold in Victoria was packaged in the two litre PET container.

A 1250 ml PET container has been in use in New South Wales since 1982-83 but has not yet been introduced in Victoria. If introduced, it would directly compete with the present 1250 ml one-way glass container.

ACI has provided statistics to the Committee showing that the labour content of glass bottles was 41.0 per cent compared to a labour content of 13.5 per cent for PET bottles.

Thus, in addition to the employment impact on the glass industry, the substitution of PET containers would generally bring about a net loss of employment.

In Conclusion

2.19 The evidence presented to the Committee shows that the introduction of container deposit legislation has historically resulted in a net increase in employment.

Evidence suggests that job losses as a result of deposit legislation have been minimal and, where there has been a loss in employment subsequent to the introduction of deposit legislation, market forces or other factors can often be shown to have played a significant role.

On the basis of experience, in particular that of South Australia and the States of Maine and Michigan, the introduction of deposit legislation in Victoria could be expected to result in the creation of at least 1000 to 1500 jobs in can and bottle depots, transportation, can processing, refilling and retail outlets.

Job losses could occur at the AGM Spotswood plant but evidence suggests that this would be ameliorated by, in the first instance, a greater market share for refillable bottles and, secondly, the stabilisation of employment in the glass industry with a guaranteed on-going market share for glass bottles in comparison to a continued decline in employment in the industry under current trends.

IMPACT ON ENERGY AND RESOURCE USE

Summary of evidence and findings

2.20 If containers are recycled or refilled, the energy and resources that would have been used to manufacture new containers is saved. Against this must be set the energy and resources required to transport the containers from retail collection points to recycling points and to wash them. Studies indicate that the net result is a reduction in energy requirements.

In a study prepared on behalf of the beverage industry, W. D. Scott estimates that soft drink and beer container systems in Australia consume about 1.5 per cent of primary energy demand in Australia.

The study predicts the following reductions in Energy requirements for soft drink and beer containers as a result of a five cent deposit. Figures are in Petajoules (10^{15} joules).

TABLE 3

AUSTRALIAN ENERGY REQUIREMENTS FOR SOFT DRINK AND BEER

| | BEER | SOFT DRINK | |
|--|--------|------------|-------|
| | | | |
| Present | 21.8 | 26.6 | 26.6 |
| Difference from present with 5c. deposit | 8.1 | 5.0 | 2.6* |
| Percentage reduction | 37.2 % | 18.8 % | 9.8 % |
| Less difference due to volume loss | 6.7 | 4.5 | 2.3 |
| Percentage reduction | 30.7 % | 16.9 % | 8.6 % |

* Including exemptions.

2.21 Comptroller General's report

The 1980 report of the Comptroller General of the United States on State's experience with Beverage Container Deposit Laws shows similar results for the United States. The report estimated that the enactment of container deposit legislation throughout the United States would result in a 33 per cent reduction in energy use in the beverage container industry (including transportation) or 0.2 per cent of total United States energy usage.

2.22 We consider that the argument advanced in the study by W. D. Scott, that to achieve a substantial reduction in total energy use a total industry policy would have to be pursued, to be basically correct.

However, the energy savings which can be attributed to deposit legislation are a worthwhile contribution. For instance:

- (1) The resultant cost savings to the industry and the consumer of a reduction in energy use of the magnitude of 22.1 per cent to 27 per cent (on W. D. Scott's figures, dependent on whether deposit exemptions exist).
- (2) The fact that the small percentage of 0.4 per cent of total Australian energy use represents the large energy saving of between 10.7 and 13.1 petajoules (based on W. D. Scott's figures and dependent on whether deposit exemptions exist).
- (3) The value in beginning to tackle large problems, such as total energy consumption, in any area which allows improvement as a step towards the development of a comprehensive approach.

2.23 The predicted reduction in energy use is a function of the lower energy requirements required for refillable bottles compared to single trip bottles and the reduced energy requirement of only 5 per cent to recycle aluminium cans compared to the energy cost of producing new aluminium cans.

A compilation of three studies of energy requirements for differing containers, prepared by W. D. Scott, is shown in Figure 4.

- 2.24 All studies indicate reductions in the use of mineral resources as a result of deposit legislation.

The Comptroller General of the United States estimates a reduction in Iron Ore consumption for the United States of 1.4 million tons if deposit legislation was introduced by the United States and a reduction of 2.3 million tons in the consumption of bauxite.

W. D. Scott predicts an increase in the recycling of aluminium cans from the present Australian total of 14.8 thousand tonnes to 24.1 thousand tonnes with a uniform 5c deposit or 22.4 thousand tonnes with a 5c deposit with exemptions and an increase in the recycling of steel cans from 2.5 thousand tonnes to 9.0 thousand tonnes or 8.3 thousand tonnes on the same assumptions.

This increase in recycling may be slightly understated as W. D. Scott has assumed a redemption rate of only 80 per cent with a 5c deposit whereas redemption rates in Maine, Michigan, Vermont and South Australia are between 90 and 95 per cent and the return rate in Oregon is over 80 per cent.

Pausacker, Hutton and Nankin study

- 2.25 The study by Pausacker, Hutton and Nankin estimates considerable savings in resources in the event of the introduction of deposit legislation in Victoria. Results are given under two scenarios. The first "limited deposit" scenario is based on the South Australian and United States model of deposits being placed on beer and soft drink containers. The "total deposit" scenario assumes a deposit or equivalent "pollution tax" on all beverage containers.

FIGURE 4

Estimates of Energy Requirements by Container System*

| CONTAINER SYSTEM | | | | ENERGY REQUIREMENTS AND STUDY | | | | |
|------------------|-----------|-------------------|---------------|-------------------------------|------------------|----------------------------|------------|------|
| Beverage | Material | Size (ml) | Refillability | Number of Trips | EPA | Estimated Boustead Hancock | Beder Hunt | |
| | | | | | | MJ/litre | | |
| Soft Drink | Glass | 185 | Multi-trip | 15 | | 29.4 | | |
| | | 200 | " | 15 | | 27.8 | | |
| | | 250 | " | 15 | | 22.4 | | |
| | | 285 | " | 15 | | 18.6 | | |
| | | 375 | " | 15 | 3.3 (45+ml) | 17.6 | | |
| | | 750 | " | 10 | | 13.0 | | |
| | | 900 | " | " | | 10.8 | | |
| | | 1000 | " | 10 | | 9.4 | | |
| | | 1000 | " | 4 | | 12.1 | | |
| | | 250 | Single trip | 1 | | 37.9 | | |
| | 285 | " | " | 19.7 (340ml) | 36.4 | | | |
| | 500 | " | " | | 27.0 | | | |
| | 750 e | " | " | | 23.3 | 11.5 | | |
| | 1000 e | " | " | | 23.1 | | | |
| | 1250 e | " | " | | 23.0 | | | |
| | 1500 e | " | " | | 22.8 | | | |
| | 2000 e | " | " | | 22.5 | 11.1 | | |
| | | All Al. Steel/Al. | 375 | " | 1 | 20.8 (340ml) (2) | 26.8 | 13.9 |
| | | | 250 | " | " | | 32.2 | 11.0 |
| | | | 375 | " | " | 14.8 (340ml) | 24.5 | |
| | PET | 1000 | " | " | | | 8.4 | |
| | | 1250 | " | " | | 17.5 | 7.9 | |
| | | 1500 | " | " | | 16.5 | 7.4 | |
| | | 2000 | " | 1 | | 14.4 | 6.5 | |
| Beer | Glass | 750 | Multi-trip | 4 | | 13.8 | | |
| | | 375 | " | 3 | 12.0 (340ml) (1) | 22.7 | | |
| | " | 250 | Single trip | 1 | | 35.0 | | |
| | " | 375 | " | 1 | 17.9 (340ml) | 30.8 | | |
| | All Al. | 375 | " | | 20.9 (340ml) (2) | 27.5 | | |
| | | 750 | " | | | 15.8 | | |
| | Steel/Al. | 375 | " | | 15.0 (340ml) | 25.3 | | |
| | | | 500 | " | | 21.4 | | |
| | | 750 | " | | 18.3 | | | |
| Beer | Glass | 750 | Multi-trip | 7 | | 12.1 | | |
| | | 750 | " | 5 | | 13.0 | | |
| | | 375 | " | 4 | | 20.9 | | |
| | | 375 | " | 5 | | 19.9 | | |

e - estimated (1) - 5 trips (2) - Al recycled

* Report by W.D. Scott. Study of the Economic Impact of Beverage Container Deposit Legislation. August 1983.

Both scenarios assume a 95 per cent recycling rate for aluminium cans and beer and carbonated drink bottles. The "limited deposit" scenario assumes a 14 per cent return rate for other bottles and the "total deposit" scenario assumes a 95 per cent return rate for all bottles.

Under both scenarios there would be a saving of 2991 tonnes of aluminium valued, at current scrap prices, of more than \$2 million.

Under the limited deposit scenario 117 000 tonnes of glass would be saved each year representing, at \$60/tonne cullet value, a saving of \$7 million. Under the total deposit scenario 138 700 tonnes of glass with a value of \$8.3 million would be saved each year.

The Pausacker/Hutton/Nankin study may be optimistic in the return rates envisaged but it does serve to indicate the magnitude of the savings that are possible.

- 2.26 Whilst none of the mineral resources saved as a result of deposit legislation are scarce in the sense of their being subject to imminent shortages, there are identifiable and potentially significant cost savings to be made by the industry through increased recycling and subsequent reduction in materials use.

In Conclusion

- 2.27 A side effect of the introduction of deposit legislation would be a reduction in both energy and material resource use. This reduction is of a substantial level within the industry and should eventually translate into lower production costs.

In summary, the impact on total levels of energy and resources use of deposit legislation is arguably relatively small but the effect itself is positive and of significance within the industry.

IMPACT ON LITTER, COSTS AND AESTHETICS

Social costs

2.28 The questions of litter and waste disposal embrace economic, social and aesthetic effects of importance to the general community. In assessing these impacts, it is not readily possible to quantify all the social costs of litter such as personal injuries, damage to health and the reduction of amenity of recreation areas. However, to a certain extent, the economic costs can be quantified.

Economic costs

2.29 An estimate by the Keep Australia Beautiful Council (KABC), and accepted by the Australian Environment Council, indicated that litter costs the Australian community \$50 million per annum, or \$3.50 per head. On this basis, litter costs the Victorian community approximately \$14 million each year.

The estimated cost to Victorian local government in 1982-83 in disposing of beverage container waste and litter was \$4 300 000.

Department of Crown Lands and Survey

2.30 Both the Department of Crown Lands and Survey and the National Parks Service made submissions to the Committee that commented on litter.

The Department of Crown Lands and Survey, while not opposing the introduction of deposit legislation, supported in its submission an alternative, or an adjunct to, deposit legislation based on a general tax on packaging materials.

Although the Department does not maintain figures on the costs of litter collection and removal as it is regarded as part of general management, it

submitted to the Committee that litter was a management problem of some magnitude. The Department estimates that beverage containers make up 30 per cent of total refuse in "day use" areas. It submitted to the Committee that the existing system of deposits in Victoria and is partially effective in the reduction of particular beverage containers. Containers such as plastic and wax covered cartons are not affected by the present deposit system.

National Parks Service

- 2.31 The National Parks Service supports the introduction of deposit legislation as part of a package designed to reduce littering.

The cost to the National Parks Service of removal of rubbish is approximately \$200 000 per year, or 10 per cent of its total park maintenance budget. The Service budgetted for rubbish removal costs, not including tipping fees, of \$43 000 at Tidal River and \$16 000 at Mt. Buffalo in the 1982-83 financial year. The service also utilises volunteer labour in rubbish removal.

Most of the rubbish collected by the National Parks Service in its regular rubbish collections is drink containers. The Service submits that any reduction in the number of "throw away" drink containers would reduce the Service's costs accordingly.

Roadside litter and solid waste

- 2.32 The experience in the United States and South Australia indicates that the introduction of deposit legislation has had a direct impact on the reduction of litter, particularly roadside litter, and on the amount of solid waste.

While the reduction of litter has been concentrated in a reduction in the littering of cans and bottles, there has also been a related reduction in other forms of litter as a result of complementary anti-litter laws and/or an increased public awareness.

Evidence presented to the Committee indicates that littering of cans and bottles has decreased substantially, and at a greater rate than general litter, in jurisdictions which have introduced deposit legislation.

Particular experience

2.33 In Maine, the Department of Conservation reported a reduction in beverage container litter of 69 per cent to 77 per cent and a reduction in total litter by item count of between 34 per cent and 64 per cent. Litter of containers subject to deposit dropped by 96 per cent.

The Maine Department of Transportation reported that its roadside litter cleaning costs dropped from over \$250 000 to approximately \$104 000 annually from 1977 to 1979.

The Maine bottle bill is estimated to have reduced solid waste by at least 6 per cent. The CalPIRG study shows an 84 per cent reduction in the beverage container proportion of solid waste.

2.34 In Michigan, beer and soft drink container litter was reduced by 87.4 per cent following the introduction of deposit legislation. However, total litter increased by 5.6 per cent, underlining the importance of complementary legislation and/or programmes to beverage container deposit legislation for a comprehensive anti-litter programme.

A reduction in total highway roadside litter has, however, occurred following the introduction of deposit legislation. The Maintenance Division of the Michigan Department of Transportation reported a 41 per cent reduction in total litter during the 30 day August/September survey period in 1979 over the same period 1978. In the same period there was an 84 per cent reduction in beverage container litter. The report of the Department of Transportation commented:

The data also confirms that the beverage container legislation was a primary factor responsible for the litter decrease.

Similar results to those in Maine were achieved in solid waste reduction, several cities reporting reductions of 6 per cent by volume since the implementation of legislation.

- 2.35 In Oregon, within two years of the introduction of deposit legislation in 1972, beverage container in the litter stream dropped by 83 per cent. The total litter stream was reduced by 11 per cent to 26 per cent by count or 35 per cent to 40 per cent by volume. Litter control costs have been stabilised at a rate of increase of 1.5 per cent, per year, (1980 figures). Figures are not available as to the costs of administering the Bill. However, no State or local government agency have reported additional employment of staff or significant expenses in administering the law.

The reduction in solid waste generation as a consequence of deposit legislation is estimated at 4 per cent.

- 2.36 In Vermont, early surveys of the effects of deposit legislation showed a reduction in beverage container litter of 76 per cent and a reduction in total litter volume of 35 per cent.

The Vermont State Highways Department reported a reduction in labour hours spent on litter pick-up from 57 439 hours in 1973 to 24 983 hours in 1977, a reduction of 56.5 per cent.

- 2.37 In 1972, the State of Washington introduced the Model Litter Control Act. The Act makes littering a misdemeanour (minimum fine \$US 10), requires all public places to have litter receptacles and cars and boats to carry litter bags, and imposes a tax on all businesses and industries whose products are reasonably related to the litter stream of 0.015 per cent of sales.

A consulting firm made an estimate of 100 000 tons of litter per year in the litter stream prior to the MLCA. Subsequent surveys found an annual rate of litter of 40 000 tons. A reduction in litter of 60 per cent is therefore claimed for the Act.

The consultants estimate has since been found to be doubtful and the author of a comparative study of the Washington and Oregon legislation, P. Spendelow, states that much of the evidence which purports to show the effective reduction of litter in Washington has been withdrawn by the Washington Department of Ecology.

Report No. 8 of the Australian Environment Council quotes the finding of Spendelow's study (1979, University of Washington and Washington PIRG) as that:

The (Washington Legislation) may have reduced litter from pre MLCA levels, but apparently it has had no more of an effect than Oregon's deposit legislation has had on the littering of non-beverage items. For beverage items, however, the difference between the States was large, with the littering rate for beverage containers nearly four times higher in Washington than in Oregon.

In his report of July 1981 (See appendix 1), the Chairman of the Victorian Environment Protection Authority commented on the "remarkable absence of litter" he observed along the highways of Maine, Vermont and Oregon, the three U.S. States with deposit legislation that he visited. He goes on to state that this was not the case in other states he visited, including Washington and California.

The Washington legislation has no impact on levels of resources used, and no claims have been made of a reduction in the level of solid waste as a result of the Model Litter Control Act.

South Australia

2.38 In his submission to the Committee, the South Australian Minister for Environment and Planning states that:

.... the very high return rate of cans and the decreased sales of beer in cans has all but eliminated cans from the litter and waste stream.

Figures quoted in the submission of the Keep South Australia Beautiful surveys of average litter composition by type show that bottles and cans now represent a very small part of the litter stream. The figures are as follows:

TABLE 4

**GLASS AND METAL COMPONENT OF SOUTH AUSTRALIAN
LITTER STREAM**

| | 1978 % | 1979 % | 1980 % | 1981 % | 1982 % |
|---------------------------|-----------|-----------|-----------|-----------|-----------|
| Glass (including bottles) | 2.5 | 2.3 | 3.8 | 3.8 | 7.9 |
| Metal (including cans) | 2.2 | 1.4 | 1.4 | 1.7 | 3.2 |

This compares very favourably with figures for earlier years in South Australia. If 1973 is used as a base figure, beverage litter was reduced by 54.7 per cent in the first year of the Act's introduction. However, there was a significant reduction in litter in 1976, the year before the introduction of the Act. The South Australian Minister for Environment and Planning considers that a substantial part of this reduction was due to the educative effect of the debate surrounding the Act. Using 1976 as a base, there was a reduction of 44 per cent in beverage container litter in the first year of the Act.

SOLID WASTE

2.39 Experience in the United States indicates a reduction in solid waste as a result of deposit legislation of between 4 per cent and 6 per cent.

In a study prepared on behalf of the beverage industry, W. D. Scott has estimated a reduction in solid waste from beverage materials of the following proportions:

TABLE 5

SOLID WASTE FROM BEVERAGE MATERIALS

| | Present | 5c Uniform Deposit | % Reduction | 5c Deposit with Exemptions | % Reduction |
|----------------------------|---------|--------------------|-------------|----------------------------|-------------|
| Glass (in '000 tonnes) | 352.5 | 178.8 | 49.3 | 281.0 | 20.3 |
| Aluminium (in '000 tonnes) | 14.8 | 6.0 | 59.5 | 5.6 | 62.2 |
| Steel | 39.6 | 2.4 | 93.9 | 2.3 | 94.2 |
| PET | 7.1 | 8.2 | (15.5) | 8.2 | (15.5) |
| TOTAL | 414.0 | 195.4 | 52.8 | 297.1 | 28.2 |

In Conclusion

2.40 It seems beyond dispute that the enactment of deposit legislation will have a considerable effect on the reduction of beverage container litter. This would appear to be in the range of a 70 per cent to 90 per cent reduction, with a probably higher reduction in roadside beverage container litter.

Deposit legislation is also likely to have an effect on total litter of around 30 per cent to 50 per cent reduction. This is dependent on variables such as the proportion of total litter made up of beverage container items, the educative effect of deposit legislation, and any complementary legislation or programmes put in place.

The reduction in total litter could be expected to be of a similar extent as that which would be achieved through legislation similar to that adopted in Washington.

Solid waste could be reduced by a minimum of 4 per cent up to more than 6 per cent.

IMPACT ON CONSUMER PRICES

- 2.41 Changes in price to the consumer as a result of deposit legislation would, after the initial fluctuations following introduction, appear to be marginal, with effects ranging from a slight decrease in price, through no change, to a slight increase in price.
- 2.42 A table prepared by the Department of Industry, Commerce and Technology of various U.S. estimates of percentage changes in shelf prices as a result of deposit legislation achieved the following results:

TABLE 6

PERCENTAGE CHANGE IN SHELF PRICES
AS A RESULT OF DEPOSIT LEGISLATION

| | Bottles | | Cans | |
|---|-----------------|---------------------|----------------|--------------|
| | Refillable % | Non-refillable % | Aluminium % | Steel % |
| Department of Commerce | Increase | - | - | - |
| Research Triangle Institute | -0.8 +0.7 | - - | -2.0 -4.0 | +1.6 -0.8 |
| Resource Conservation Committee | 0.0 0.0 | -0.9 +0.4 | -3.2 -2.0 | +0.8 +0.8 |
| Wharton School (including cost of unredeemed deposits) | +3.1 | - | - | - |
| Wharton School (adjusted) | +0.5 | - | - | - |

2.43 South Australian beer prices appear to be among the lowest in Australia. The South Australian Brewing Company promotes its returnable "echo" bottles as leading to lower beer prices.

The South Australian Minister for Environment and Planning states in his submission that retail and wholesale prices have not risen above the prevailing inflation rate since the inception of deposit legislation in South Australia. Data provided by Coca Cola Bottlers Adelaide to the Minister indicate wholesale price increases were lower than the prevailing inflation rate.

Comparisons of prices between South Australia and Australia indicate that the South Australian consumer pays no more for soft drink than consumers in other states.

- 2.44 A consultants report commissioned by the Litter Control Committee of the Australia Environment Council estimated increased prices to Australian consumers of \$23.9 million as a result of deposit legislation.

This estimate was rejected by the Litter Control Committee on the basis that South Australian and overseas experience with deposit legislation indicate lower net prices to consumers.

However, assuming this "worst case" figure of higher prices, the proportional increase in prices to the Victorian consumers would be \$6.7 million or, on the basis of 1650 million beverage containers filled and used in Victoria in 1982-83, a price increase of 0.41 cents per container.

Assuming that white milk was excluded from the ambit of the legislation, 294 million milk cartons used in 1982 would have to be subtracted from the total number of beverage containers, resulting in a price increase of 0.49 cents per container.

- 2.45 Deposit legislation has the effect of encouraging the use of refillable bottles over other beverage containers. Studies show that the retail price per litre is cheaper in refillable bottles than other containers.

- 2.46 A study commissioned by the Natural Resources and Environment Committee shows the following comparison of retail prices of soft drinks in larger size bottles, as of 30 June 1983:

TABLE 7

RETAIL PRICES OF SOFT DRINKS IN LARGER
SIZE BOTTLES 30 JUNE 1983

| Container Type and Size | Recommended Retail Price (cents per litre) | Retail Margin % |
|--------------------------------|---|-----------------|
| Brand A 1250 ml non-refillable | 87.20 | 33 |
| Brand A one litre refillable | 83.00 | 50 |
| Brand B 750 ml non-refillable | 112.00 | 34 |
| Brand B 900 ml refillable | 93.32 | 50 |

2.47 A table prepared by the Department of Industry, Commerce and Technology of Recommended Retail Prices of Coca Cola Bottlers in Melbourne for May 1983 reveals the following information:

TABLE 8

RECOMMENDED RETAIL PRICES (COCA COLA) PER LITRE - MAY 1983

| Container Type and Size | Recommended Retail Price per litre (net of deposit) |
|-------------------------------|---|
| 185 ml returnable bottle | \$1.60 |
| 285 ml returnable bottle | \$1.10 |
| 1000 ml returnable bottle | \$0.80 |
| 375 ml can | \$1.40 |
| 285 ml non-returnable bottle | \$1.60 |
| 1250 ml non-returnable bottle | \$0.90 |
| 2000 ml non-returnable bottle | \$0.80 |

Price per litre decreases as the size of the container increases. Drinks in returnable bottles can be seen, however, to be significantly cheaper than drinks in comparable sized non-returnable containers, the 1000 ml returnable bottle costing 80c per litre, being 10c per litre cheaper than the 1250 ml non-returnable bottle.

Only the 285 ml bottle was marketed in both returnable and non-returnable varieties. Drink in the returnable bottle was 50c per litre cheaper than in the non-returnable bottle.

2.48 The U.S. Government Office of Technology Assessment found a consistent pattern in actual price differentials between returnable and non-returnable bottles.

They concluded that prices of beverages in refillable bottles were lower than in non-returnable bottles, generally by between 10 per cent and 30 per cent.

2.49 The U.K. Waste Management Advisory Council came to similar conclusions, finding that returnables net of deposit were cheaper per unit of volume by between 10 per cent and 20 per cent than non-returnable bottles sold from the same outlet.

In Conclusion

2.50 Container deposit legislation appears to have only marginal price effects for beverages which continue to be sold in the same size and type of container. Refillable bottles generally provide cheaper prices per litre than non-refillable containers.

IMPACTS ON INDUSTRY

2.51 The costs and benefits to industry of government action such as new legislation is dependent on a number of factors including the rate and manner of the introduction of such action and interaction with other changes stemming from market forces or technological pressures.

Hence aggregate results which try and list costs and benefits in dollar terms need to be treated with some caution because of the assumptions that any investigation would have to make and the possible sensitivity of the results to incorrect assumptions.

2.52 In this context a study commissioned by the Litter Control Committee of the Australian Environment Council which estimated the value of effects on selected industries of the introduction of beverage container deposit legislation throughout Australia can be used to deduce the following:

Retailing

2.53 The estimated effect for the retailing sector was \$14.4 million, made up of \$9.2 million in the retrieval of bottles and \$5.2 million in extra handling, transport and storage costs. The proportional cost for Victorian retailers would be \$4 million.

The Litter Control Committee speculated that some of this cost may be offset by a proportion of refunds being spent in the shop of refund.

A greater off-setting factor would be the continuation of the higher margins that currently exist for refundable bottles. The retail mark-up for present deposit bottles is around 50 per cent compared to 33 per cent to 34 per cent for non-returnable bottles. The study by W. D. Scott confirms this assumption (see Scott 4.5.1).

Soft Drink Manufacturers

2.54 The consultants estimated a net benefit to Australian soft drink manufacturers of \$14.2 million. This was comprised of \$33.6 million in additional costs and \$47.8 million in benefits. The Litter Control Committee increased the estimated net benefit by \$3 million, adding \$1.5 million to the consultants' estimate of resource value of cullet and including a benefit of \$1.5 million for interest not estimated by the consultants on unrefunded deposits.

Brewers

2.55 The consultants estimated a negligible impact on breweries with benefits of \$82.8 million being almost exactly balanced by costs of \$82.7 million. The study by W. D. Scott also shows a marginal increase in profit contribution for breweries as a result of deposit legislation similar to that in South Australia.

Distributors

2.56 The consultants estimated costs to distributors to increase Australia-wide by between \$15.0 and \$17.5 million (Victorian proportion \$4.2 to \$4.9 million) made up of \$3 to \$5.5 million in increased distribution costs (\$0.84 to \$1.5 million for Victoria) and \$12 million in retrieval costs.

The retrieval costs component estimated by the consultants were excluded by the Litter Control Committee as these figures are double counting estimates included under soft drink manufacturers and brewers.

Marine Dealers (bottle and can deposits)

2.57 The consultants estimated Australia-wide benefits to Marine Dealers of \$27.7 to \$31.7 million from increased turnover in bottles and cans. The Litter Control Committee added \$0.2 million to this estimate for an increased turnover in one-way soft drink bottles.

Container Manufacturers

2.58 Costs to container manufacturers were not estimated by the consultants or the Litter Control Committee.

However, in the study prepared by W. D. Scott on behalf of the industry, a reduction in profit contribution Australia-wide of \$20.356 million was estimated for container manufacturers. (\$5.5 million estimated for Victoria)

In conclusion

2.59 As indicated, it is difficult to draw firm conclusions from aggregate results taken in isolation. However, it would seem that the effects calculated can be assigned to sectors as follows:

TABLE 9

SUMMARY OF COSTS AND BENEFITS BY SECTOR

| Victorian Sector | Cost | Benefit |
|--------------------------|-----------------------------|--------------|
| Retailing sector | \$ 4 million ¹ | |
| Soft drink manufacturers | | \$ 4 million |
| Brewers | No change ² | |
| Distributors | \$ 1.5 million ³ | |
| Marine dealers | | \$ 8 million |
| Container manufacturers | \$ 5.5 million | |
| TOTAL | \$11 million | \$12 million |

1. Effects of greater profit margins for returnables could affect this figure.
2. Could be a marginal benefit.
3. Retrieval costs not included.

2.60 Given that approximately 1650 million beverage containers were sold in Victoria in 1982-83, it can be noted that a cost or a benefit in the order of \$5 million represents an impact of about 0.3 cents per container.

CHAPTER THREE

VARIATIONS AND ALTERNATIVES

THE SOUTH AUSTRALIAN BEVERAGE CONTAINER ACT

3.1 The South Australian Act has been successful in encouraging recycling and a reduction in waste and littering in the containers covered by the legislation.

The major provisions of the Act are:

- (1) Manufacturers using refillable bottles are exempted from the provisions of the Act provided they maintain their returnable refillable bottle system;
- (2) Non-refillable containers must bear a minimum refund amount of five cents;
- (3) Refunds on non-refillable glass containers of any brand are obtainable from retail outlets which normally sell that brand, and refunds on non-refillable non-glass containers (e.g. cans, PET bottles) are obtainable from licensed collection depots located in metropolitan and country areas; and
- (4) Ring-pull can tops are banned.

3.2 As outlined in Chapter Two of this report, the legislation has had beneficial effects. Employment has been increased; the Conservation Council of South Australia/Friends of the Earth survey estimates that 700 jobs have been created. Beverage container litter was reduced by 44 per cent in the first year of the Act. In his submission to the Committee, the South Australian Minister for Environment and Planning stated that cans have been all but eliminated from the litter and waste streams. Prices of beverages have not increased as a result of the legislation; in fact, South Australian beer prices

remain the lowest in Australia. The system is also simple and appears to be well understood and popular with the South Australian community.

- 3.3 The *Beverage Container Act* does not, however, provide a total answer to beverage litter control in South Australia. Nor would an identical scheme in Victoria provide a total answer to the control of Victoria's beverage container litter.

The *Beverage Container Act*, for instance, does not cover containers other than cans and beer and carbonated soft drink bottles. Non-deposit beverage container litter remains a substantial problem.

There have also been some problems with the obtaining of refunds on some bottles classified as "exempt" as the method of obtaining refunds is not set out in the Act.

- 3.4 Given these problems and the increasing penetration of paper and plastic containers into the Victorian market, legislation in Victoria would have to be of a more extensive nature than that in South Australia. Exemptions and procedures for the administration of the legislation would need to be related to each of the types of beverage container. Where the nature of the containers renders it impractical for them to be returned or recycled, a similar incentive to that created by the imposition of a deposit would be required to avoid a continuation of the problems that have not been addressed by the South Australian *Beverage Container Act*. The Jenkins Committee report indicates a possible approach.

THE JENKINS COMMITTEE REPORT

- 3.5 In 1974, the Federal House of Representatives Standing Committee on Environment and Conservation reported on "Deposits on Beverage Containers" (The Jenkins Committee Report).

Major recommendations of the Jenkins Committee were that:

- All beverage containers which do not carry a refundable deposit of at least five cents should incur a tax of three cents payable once only at the point of manufacture or import of the container; and
- That the funds raised by the proposed tax on non-deposit containers should be made available for the following purposes:
 - (a) to enable local government and other authorities responsible for litter prevention and collection and waste disposal to carry out their responsibilities more effectively;
 - (b) to fund the establishment and continued operation of a unit within the CSIRO to investigate in co-operation with State Governments, local authorities and industry, the recovery of resources from waste and the recycling of waste materials;
 - (c) to provide financial assistance to voluntary organisations involved in combatting litter and encouraging the re-use of resources.

3.6 As with the South Australian Act, the recommendations only covered some beverages and beverage containers, specifically beer, mineral water and carbonated soft drinks in glass or metal containers.

The recommendations do, however, contain a mechanism for an incentive for non-recyclable containers to be removed from the litter stream through the imposition of a "pollution tax".

This could be extended to cover paperboard and plastic containers, which have established themselves in the marketplace since the Jenkins Committee Report.

The recommendations of the Jenkins Committee have the further advantage over the South Australian Act of removing incentives for a shift from recyclable containers to paper and plastic containers, at the same time providing funds for the clean-up and disposal of such containers and for research and development on the whole question of litter, waste management and recycling.

OTHER ALTERNATIVES TO CONTAINER DEPOSIT LEGISLATION

The Victorian Industry Group's "Positive Litter Control" approach

3.7 The Victorian Industry Group, a body representing the nine major companies in the beverage and beverage container industry, presented a "Positive Litter Control" proposal to the Committee.

Major elements of the proposal are:

- A State-wide, media based, anti-litter campaign, emphasising the anti-social aspects of littering;
- an educational programme for school children;
- Field programmes at local government level to support the State-wide campaign; and
- voluntary support programmes, such as the Keep Australia Beautiful Council's Tidy Towns competition.

The Industry Group has stated that it is prepared to enter into a formal agreement with the Government to fund this programme for three years, up to a level of \$2.5 million over that period, if the Government undertakes not to introduce either a deposit system for containers or a "litter tax" of similar proportions on packaging in general.

- 3.8 While this proposal represents a recognition by the beverage and beverage container industries of their responsibility towards the disposal of beverage container litter, it has several major limitations on its effectiveness.
- 3.9 First, the proposal really only addresses the question of littering. Even if effective, there would be no impact on energy and resource use or in the reduction of solid waste.
- 3.10 Second, performance targets in particular, and other areas of the proposal in general, are very open-ended. No targets are set as to what would be a satisfactory reduction in the level of litter and no commitments are included in the proposal as to return rates expected for recyclable and refillable containers.
- 3.11 Third, there are no incentives within the proposal which would work to ensure a significant reduction in the amount of beverage container litter. The proposal revolves essentially around a commitment from industry, in return for guarantees from Government, for increased funding to existing educative programmes such as those conducted by the Keep Australia Beautiful Council and government at various levels, and expanding the type and number of these programmes.
- 3.12 Fourth, no mechanism is proposed for dealing with industry sectors whose performance results are below the standard for other sectors. Nor is there any mechanism for dealing with individual companies which are not meeting the same standards as others in any particular industry. No framework is set out for the implementation of required specific actions. Improvements to the programme, or merely the maintenance of required standards, could only be achieved through encouragement. Given that there are no financial incentives to implement the scheme, and no sanctions for failing to do so, something greater than encouragement may be required for the effective implementation of the stated goals of the proposal.

- 3.13 Fifth, the proposal only covers a period of three years. No consideration is given to the situation after the first three years other than assessment of the success or otherwise of the programme and the consideration of "appropriate action" by Government and industry.
- 3.14 Sixth, the proposal does nothing to provide incentives for the use of recyclable or refillable containers rather than non-recyclable non-refillable containers.
- 3.15 Seventh, the level of funding proposed of \$2.5 million over three years, or approximately \$800 000 per annum, does not appear to be based on any costing of the proposed programmes and may result in limitations on both the extent and effectiveness of the proposed media and education sub-programmes..
- 3.16 Eighth, the experience of the New South Wales programme indicates that the positive litter control approach, whilst of some benefit, has not provided a solution to the problems of beverage container litter and waste disposal. Beverage containers and related items remain a significant component of litter in New South Wales.

The Majority Report's recommendations

- 3.17 The recommendations contained in the majority report have drawn substantially upon the concepts in the proposal of the Victorian Industry Group.

Some of the problems identified with the Victorian Industry Group's proposal would be ameliorated by modifications in the majority report's recommendations but substantial problems would remain unresolved.

3.18 The majority report essentially recommends the negotiation of a five-year agreement with the relevant industries with the objective of achieving significant improvements in litter reduction. The report comments that aspects of the proposed Victorian Industry Group programme and funding appear to be inadequate and recommends that funds should be negotiated on the basis of an agreed thorough on-going programme and should be indexed for inflation.

The majority report recommends the setting of definite recycling targets for each type of recyclable container and performance measures which relate to both recyclable and non-recyclable containers.

3.19 However, the achievement of these percentage targets on a shrinking number of recyclable or refillable containers would seem totally unrealistic in the context of the current rapid trend in Victoria towards one-trip bottles, PET and paperboard containers.

3.20 Thus, the majority report's proposal, if adopted, would have most impact on the clean-up of beverage container litter and not substantially address the questions of energy and resource use or the reduction of solid waste.

3.21 There is no incentive embodied in the recommendation to ensure the effective implementation of the suggested programme by industry and the only sanction provided is the explicit stating of the alternative position, in the event that agreement cannot be negotiated, a form of container deposit legislation will be introduced.

3.22 The recommendation covers a period of five years and as a strategy it has many difficulties.

First, costs borne by industry in administering the negotiated programme may, assuming the programme is successful in its stated objectives, be transferred to Government after the five-year period.

Second, given the changes occurring in the industry at present, especially the quite rapid move towards the use of non-recyclable/non-refillable containers, the introduction of the foreshadowed deposit legislation at the end of five years, in the event that the recommended programme does not successfully meet its aims, would create costly and greater difficulties in adjustment than at present.

Third, the very possibility of the replacement of the recommended programme with the recommended alternative of deposit legislation at a later stage, if treated seriously, will create great uncertainty within the industry and could cause problems in relation to long term planning and investment decisions.

3.23 As with the Victorian Industry Group proposal, the majority report's recommendations do nothing to provide incentives for the use of refillable and recyclable containers rather than non-recyclable or refillable containers.

3.24 Underpinning all these individual problems is the emphasis on cleaning-up litter created by beverage containers rather than addressing means of reducing the amount of beverage container litter entering the litter and waste streams.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

We believe that society has a right and an obligation to demand a degree of responsibility to be exercised in relation to the fate of used drink containers. The failure to re-use a drink container is likely first to increase the likelihood that the container will be littered and, second, to lead to an unnecessary use of resources in its replacement. We are of the view that both of these aspects are socially undesirable, and that society, through the means of the legislature, has an obligation to seek their improvement.

Another way of putting this is to make the point that the various individuals involved in the provision and consumption of the contents of a container should not then have the right to impose the cost of managing the empty container (and conserving its resource value) on society as a whole.

Evidence suggests that this is a position supported by the general community and that the general community supports, or at the very least is not opposed to, container deposit legislation.

Evidence is comprised of, first, submissions to the Committee and, secondly, attitudes of community bodies expressed elsewhere and surveys or other indications of public opinion where deposit legislation is in place.

Some probable factors behind this general community attitude include:

- objection to litter for aesthetic/health reasons;
- a perception of deposits as a no cost alternative to a litter tax or publicly funded clean-up operations;
- recognition of litter disposal costs as a general cost to be borne - particularly at local government level; and
- a generalised objection to waste.

Fifty-two Victorian municipalities made submissions to the Committee in support of deposit legislation. One opposed deposit legislation. Eight community health groups, three conservation groups and four other community groups also supported deposit legislation as did many individuals either in submissions or in letters to the Committee and its members.

With the exception of the one municipality, one W.A. State authority and four Unions and the Victorian Trades Hall Council, all submissions opposing deposit legislation came from companies or industry groups involved in various areas of the packaging or beverage industries.

The Australian Council of Local Government Associations and all State Local Government Associations support the introduction of a container deposit system.

In jurisdictions where deposit legislation exists there is strong public support for the system.

In South Australia, a survey of the Centre for Applied Social and Survey Research at Flinders University revealed the following:

16 per cent strongly approved and 56 per cent approved the effectiveness of the *Beverage Container Act* in reducing litter;

44 per cent disagreed and 33 per cent strongly disagreed that disposable container were better than returnables.

In Maine, the deposit legislation was passed at referendum by 84 per cent of the voters when a repeal proposition was put to the vote. In Vermont, a 1977 public opinion poll showed 93 per cent support for deposit legislation (introduced in 1973) with 7 per cent opposed, undecided or without an opinion. In Michigan, the deposit law was passed at referendum in November 1976 by 64 per cent to 36 per cent. Only three of 83 Counties in Michigan disapproved of the proposal. In Oregon there appears to be similar public support of their deposit legislation.

Mr. J. C. Fraser, after visiting the USA as Chairman of the Victorian Environment Protection Authority, stated in July 1981:

The States visited having beverage deposit legislation (Maine, Vermont and Oregon) seem to be extremely pleased with the results in terms of public acceptance and support, reduction of beverage container litter, reduction of all litter, and stimulation for recycling and resource recovery. A similar conclusion can be said for Michigan based on information obtained from that State.

Submissions from Victorian local government and community groups mentioned above would suggest that a similar level of public support to that evidenced in South Australia and the American States would be achieved.

Also during the course of this inquiry, there have been commendable expressions from the various parts of the drink industry that it does have some social responsibility in the cost of managing used containers. As previously discussed, consumers, in the form of the community at large, also accept this responsibility of the industry and the consumer. However, it is clear that the industry as a whole is extremely unlikely to implement a self-regulatory role which will achieve significant change.

In simple terms, this is because industry can more readily operate profitably if this responsibility is, in major part, taken up by the larger community. (It should be noted that a broadly imposed responsibility would tend not to affect profitability and, in many cases, would lead to savings through resource conservation.)

While we are of the view that legislative guidelines have to be set to ensure responsible handling of empty containers, we are very conscious of the magnitude of the problems facing the industry in taking up its responsibilities in terms of profitability, capital investment and employment problems. Careful thought needs to be given to facilitating a slow transition by a set of phase-in provisions. Consideration should also be given to providing assistance or relief to an industry if a situation arises where even with staged introduction problems arises in any necessary restructuring.

This situation, however, is not unique and has been faced by Government, industry and management successfully, most notably in the phased introduction of design rules related to the reduction of air pollution by motor vehicles.

It should also be noted that there is a large measure of goodwill towards these objectives within the industry, and every endeavour should be made to build constructively upon this goodwill.

Another important issue is that of coverage. A case in point is that of milk. A significant portion of the container market is held by milk. After careful consideration, we came to the view that white unflavoured milk should be exempted from the recommendations on the basis that it is a vital household foodstuff rather than a recreation drink and that it is largely consumed in the home where it is not readily littered.

RECOMMENDATIONS

Legislation for beverage containers

- (1) All drink containers, except as exempted under, shall be subject to a minimum five-cent deposit.
- (2) Retailers of beverages subject to a container deposit shall be bound to refund deposits on return of the containers, subject to dispensation due to the proximity of licensed retrieval depots or, in other circumstances, as determined by the responsible Minister.
- (3) Exemptions from the deposit requirement may be granted by the responsible Minister for:
 - (a) White unflavoured milk;
 - (b) Classes of containers where a filler or container manufacturer can satisfy the Minister that the industry will implement an acceptable and effective container return system;
 - (c) Containers not capable of being refilled or recycled for which a container manufacturer and/or filler and/or retailer have paid an appropriate fee or contribution in lieu of the deposit requirement.
- (4) (a) In determining whether a return system is acceptable under section 3(b), it is recommended that the Minister accept as a guideline a return rate of 80 per cent, this being phased in commencing at 60 per cent and increasing at 5 per cent, per year. Acceptable return systems would include direct replacement home delivery systems and alternative systems instituted by industry to achieve the desired performance standard.

- (b) In respect of containers for which a fee or contribution would apply, the Government should negotiate with the relevant sections of the beverage industry on a suitable method of payment. It would be desirable if annual payments could be agreed on an industry basis to reduce administrative costs and complexity. Failing such an agreement, the fee could be collected, for example, by a business franchise fee in respect of these containers. The fee should be based on a minimum of two cents per container increasing by one cent per year to reach parity with the mandatory container deposit. If an industry contribution can be negotiated, the saving of administrative costs could be taken into account.
- (5) The responsible Minister should have discretion to implement these recommendations with a reasonable degree of flexibility so as to achieve the maximum practicality consistent with achieving desirable re-usage rates for containers which can be sensibly re-used and with the imposition of a pollution tax on containers which cannot be sensibly re-used.

Funds to be directed to a comprehensive programme

- (6) All funds generated under Section 3(c) should not be seen or used as a general revenue-raising measure but should be made available to:
- (i) fund a comprehensive programme directed at achieving overall improvement in reducing litter, managing waste, and conserving resources. The programme should include:
 - (a) the promotion of public awareness programmes aimed at the prevention and collection of litter and improved container recycling;
 - (b) assistance to municipalities and others in establishing and developing recycling initiatives;

- (c) research into, and promotion of, matters associated with litter, beverage container recycling and management;
- (ii) Administration costs associated with container deposit legislation.

Advisory Committee

- (7) The Government should establish an advisory committee consisting of twelve members. The membership should comprise:
 - Three members appointed from the Government from areas of Government concerned with environment management and waste control, community development and recreation/tourism, and economic and industry management;
 - Three members from local government (of whom at least one should be from a rural municipality);
 - Two members from the beverage and container industry;
 - Two members from the unions in the above industries; and
 - Two members from community organisations concerned with litter, waste and resource management and conservation.
- (8) The advisory committee should advise the Minister for Planning and Environment on matters associated with the programme and any other matters referred to it by the Minister.

Unit in EPA and appointment of independent auditor

- (9) (a) The Government should establish a unit in the Environment Protection Authority to administer matters referred to in these recommendations.

(b) This unit would assist in the preparation of an annual report to be presented to Parliament by the Minister for Planning and Environment setting out:

(i) the recycling targets for past years and the year ahead;

(ii) the recycling rates actually achieved and the number of the various types of beverage containers manufactured, sold, refilled and recycled in Victoria during the year covered by the report;

(iii) reasons for differences between the target and achieved rates of recycling;

(iv) a report on the overall programme carried out during the previous year; and

(v) the programme proposed for the year ahead.

(c) Establish the office of an independent auditor to collect comprehensive data annually about beverage containers in Victoria so that progress can be monitored. This would necessitate the collection of data from major companies and organisations but would not require the collection of data from smaller businesses.

Priority matters

- (10) The following matters should be accorded priority within the comprehensive programme:
- (a) Research and organisation efforts to increase the standardisation of containers and to increase the practical recyclability of containers not currently recycled (particularly PET bottles).
 - (b) Independent technical research to determine, adjust and enforce objective safe standards for bottles to be refilled.
 - (c) The prohibition of detachable can tops.
 - (d) Research to overcome problems leading to the littering of bottle tops and to investigate beverage straws and pack connectors, and other littered items, with a view to having them manufactured from decomposable material so as to reduce their long-term impact when littered.

Co-operation with other States

- (11) Although the South Australian and overseas experience has shown that it is possible to implement container deposit legislation with some success within one State's jurisdiction, it is strongly recommended that co-operative efforts be made to establish comparable legislation and practices with other States, particularly the bordering States of South Australia and New South Wales, to minimise distribution problems and to obtain the maximum benefits.

Some Information and Impressions on Litter Control Programs in Five States in the United States of America



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SOME INFORMATION AND IMPRESSIONS ON
LITTER CONTROL PROGRAMS IN FIVE STATES
IN THE UNITED STATES OF AMERICA

by

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ENVIRONMENT PROTECTION AUTHORITY

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INTRODUCTION

During a visit to the United States in October and November 1980 I visited five States having special anti-litter legislation. Two of these States, Washington and California, have legislation establishing a fund through taxation. It is used to finance litter pick-up and anti-litter education and information programs. The other three States, Oregon, Maine and Vermont have beverage container deposit legislation aimed at removing beverage containers from the litter stream.

Litter control, in particular beverage container legislation, has become a highly emotive and controversial subject in Australia. The beverage industry is strongly opposed to container deposit legislation and supports the "systems" approach involving programs of litter pick-up, public education, enforcement, etc. Public interest groups tend to favour container deposit legislation.

In reviewing the situation in the five States visited, I talked with the administrators of the program in an effort to assess effectiveness of the legislation. We are often subjected to interpretations of what is happening in the United States on litter control and as a result of my contacts I found many of these interpretations to be incorrect.

The following report is a collection of information gained with respect to the litter control programs in the States of California, Oregon, Maine, Vermont and Washington preceded by a summary of impressions gained. It is not intended to be an exhaustive treatment of litter control programs in the U.S. but hopefully it will provide useful background for evaluating these programs.

IMPRESSIONS GAINED

1. The States visited having beverage deposit legislation (Maine, Vermont and Oregon) seem to be extremely pleased with the results in terms of public acceptance and support, reduction of beverage container litter, reduction of all litter, and stimulation for recycling and resource recovery. A similar conclusion can be said for Michigan based on information obtained from that State.
2. The States of Washington and California have adopted so-called model litter laws involving a tax on industry to finance litter pick-up and anti-litter public information programs. In these States extensive programs are either operated or encouraged by the States to reduce litter through prevention and pick-up as contrasted to the beverage container deposit legislation. The programs in these States are impressive public relations exercises and are undoubtedly beneficial but their effectiveness in actually reducing litter along the roadside and in recreation areas is being questioned.
3. The flip top opening for beverage cans has been banned in many States. Acceptable substitutes have been developed and are in common use in most States of the U.S. The clear impression is that the flip top can is a thing of the past in the U.S.
4. As of the end of 1980 six States in the U.S. have adopted beverage can deposit legislation. Nine States have adopted so-called model litter laws which were, in most cases, sponsored or supported by the beverage industry as an alternative to beverage can deposit legislation.
5. The administrators of the beverage deposit States visited (Oregon, Maine and Vermont) were unreserved and outspoken in their support of the results achieved at very little or no cost to the taxpayer. The administrators of the model litter law States of Washington and California, although enthusiastic about their programs, were more reserved about their effectiveness and there were indications of problems with public acceptance.
6. Most administrators and people I contacted anticipated national beverage container deposit legislation in the U.S. within a few years despite strong opposition from the beverage industry.
7. Public enthusiasm for beverage container deposit legislation in the States of Maine, Vermont and Oregon is impressive.
8. In travelling along the highways of Maine, Vermont and Oregon I observed a remarkable absence of litter. This was not the case in other States visited.

STATUS OF LITTER LAWS IN THE U.S.A. (1980)

States with Deposit Legislation

| | |
|-------------|--------|
| Oregon | 1972 |
| Vermont | 1975 |
| Maine | 1978** |
| Michigan | 1978 |
| Iowa | 1979 |
| Connecticut | 1980 |

States with a Litter Law

Washington*
California
Colorado
Nebraska
Virginia
South Carolina
Hawaii
Alaska*
Ohio*

States considering Deposit Legislation

Maryland
Rhode Island

States considering Legislation for Litter Law

North Dakota
Kansas
Missouri
Indiana
Maryland
Massachusetts
Illinois
Louisiana

Note: Massachusetts passed a container deposit bill but it was vetoed by the Governor.

* Deposit legislation defeated.

** Attempted repeal failed.

CALIFORNIA

California's Litter Control, Resources Recovery and Recycling Act was passed in 1977 and is administered by the State Solid Waste Management Board.

The Act authorises the Board to accept grants, gifts and donations to carry out its purposes and it imposes an annual assessment on persons holding a seller's permit under the State's Sales and Use Tax Law.

In the 1980-81 fiscal year the Board will spend about \$3½ million on litter clean-up and enforcement and another \$1 million on education and public participation. These activities relate to recycling and resource recovery as well as litter control.

Much of the money expended is in the form of grants to the counties and municipalities of the State for cleaning beaches, parks and roadsides; enforcement of anti-litter laws and purchase of equipment and litter receptacles. Grants may also be given for implementation of informational programs aimed at educating the public not to litter.

The Act requires that 30% of the fund shall be expended on clean-up of recreational land and public roads with one per cent going to the State Department of Parks and Recreation for clean-up of its areas; two per cent to the California Conservation Corps for clean-up on federal lands used for recreation purposes; two per cent to the Department of Transportation for clean-up of State highways and twenty-five per cent to cities and counties for clean-up on recreational lands and public roadways.

Basically the program is one of taxing the manufacturers and wholesalers of products in the retail sales stream and using the revenue for grants to local government entities for litter pick-up, enforcement and education programs and in statewide education and information programs.

The Act has provided a stimulus to local governments to engage in litter pick-up and enforcement programs. It has also facilitated development of rather sophisticated information programs including school education "packages" with cassette tapes, film clips and printed course material for teachers to use. In addition, the Board has sponsored statewide television and billboard advertising campaigns and is encouraging grassroots public awareness committees at local government levels.

In talking with administrators and a legislative consultant I gained the impression that doubts have been raised about the effectiveness of the program and that changes may be needed. The general view is that deposit legislation has been set aside temporarily in California but will very likely be introduced in the next few years.

It is difficult to assess the effectiveness of the California program but an interesting aspect of the legislation is that it calls for the Legislative Analyst to analyse the effectiveness of the Act in

(1) reducing litter, (2) increasing the volumes of materials recycled, (3) reducing energy use, and (4) reducing the disposal of solid waste onto land, into the atmosphere or into waters of the State. The Act remains in effect only until July 1, 1983 and is automatically repealed on that date unless the legislature before that time enacts a statute deleting or extending that date. Therefore it can be said that the program is on trial and will be subject to annual assessments by the Legislative Analyst.

MAINE

Maine's beer and carbonated drinks deposit legislation was enacted through referendum in 1978. It passed by a vote of approximately 60% in favour and 40% opposed. After some 22 months in operation a referendum was sponsored by industry to repeal the Act but the voters rejected the proposal by an overwhelming 5-1 margin (84% to 16%) in November 1979. Newspaper accounts of the election results showed that the law and its program had become very popular with Maine's people. It was interesting to note that the repeal effort gained fewer votes than the number of signatures on the petitions leading to placement of the referendum on the election ballot.

The legislation requires a retail store owner to accept for redemption any beer or carbonated drink (including sparkling waters) containers which he sells (by brand and size). Every beverage container must have a refund value of at least 5¢ but the manufacturer can impose a higher refund value if it wishes. Distributors are generally placing a 5¢ deposit on small containers, 10¢ on large cans and 20¢ on 2 litre glass containers but 5¢ on 2 litre plastic containers. The law exempts containers over 1 gallon in size. The refund value must be shown on the top in the case of cans, and on the sides or top for bottles.

The law also provides for the voluntary establishment of privately operated redemption centres where containers of brands and sizes handled by nearby participating stores (usually located not more than three miles from the redemption centre) are redeemed. Most redemption centres are organised by several stores in a local area whose proprietors do not wish to handle the returned containers. In the first year about 90 redemption centres were operated but this dropped to 20 in the second year and then increased to 40 in the third year. Many store owners including several of the large supermarket chains such as Safeway decided that it was good policy to redeem the containers in their stores rather than at redemption centres because it brought the customer back into the store and increased sales. (Note that in Oregon the large supermarket chains favour the redemption centre approach). Most redemption centres are now in rural areas.

Under the Act stores (but not redemption centres) may limit the maximum number of containers redeemed at any one time to 240. Also, they can, within certain minimum times, limit the hours when they will redeem containers.

The legislation banned flip tops on cans.

The Act also requires the distributor to pick up empty redeemed containers from the store or redemption centre at the time he delivers and he must pay the deposit fee plus 2¢ per container within 10 days of the pick-up. Thus the store owner or redemption centre gains a handling fee from his redemption. Many of the privately operated redemption centres are operating very profitably on the 2¢ per container revenue. The distributor takes the redeemed containers to a collection point and then sells the cans and plastic containers to a recycling centre and most of the bottles go back into the system for refilling.

The distributor makes a profit on the sale of cans (mostly aluminium which in 1980 brought \$560/ton from the recyclers). He also saves money because he purchases fewer glass bottles due to a higher percentage of refilling. He makes money also because of a 10% loss in the containers originally distributed (containers not returned but for which the retailer has paid the deposit fee to the distributor).

The beverage industry is now making more money on the refillable bottles than they did previously on the one-way bottle. The soft drink industry has largely converted from throwaway bottles to refillable containers. The mix of bottles vs. cans has remained about the same since enactment of the legislation.

The Act is administered by the Division of Food Regulations of the State Department of Agriculture. Seven food inspectors enforce the Act state-wide on a part time basis but only one position was added and charged to the program. In talking with the administrators of the program they made the following comments:

1. The program has been effective - cans and bottles cannot be found along roads. (Also at events, picnic areas, parks, etc.).
2. It has greatly reduced the problem of broken glass on beach areas.
3. It seems to have made people litter-conscious. People are littering less than before and this relates to paper as well as cans and bottles.
4. The legislation produced more jobs but they tend to be minimum wage jobs instead of higher paid positions. Labour supported the program.
5. At first the price of beer was raised by about 35¢ per six pack to cover increased costs but this was found to be excessive. The price of soft drinks remained about the same. However, most breweries chose to continue one-way containers which increased in price to offset the additional cost of handling. For breweries choosing to use a refillable bottle, prices have actually decreased from the previous one-way container.
6. Some stores near borders with States that do not have a deposit law (e.g. New Hampshire) lost some trade because nearby residents will go across the line to purchase at a lower price. This was also influenced by the fact that New Hampshire does not have a sales tax but Maine does.
7. There has been very little complaint from store owners or distributors.
8. There has been a great saving to the State in reduced roadside and park clean-up costs.
9. Thought is now being given to expanding the legislation to cover fruit juice, non carbonated lemonade and wine containers.

10. Very few problems exist in administering the Act. Present problems involve minor infractions by retailers and distributors. Occasional loads of unmarked containers come into a retailer by mistake.
11. They have noted that refillable bottles contain a little more foreign material than in the past but this has not been serious. It has caused some fillers to put in additional equipment and inspectors to catch it.
12. It has stimulated establishment of recycling centres, many of which are now expanding into paper and other products.
13. The deposit program has created a recycling program in the State. Practically all one-way containers are now recycled and recycling centres are beginning to recycle other products, including paper.
14. The program has worked far in excess of expectations. Municipal solid waste and therefore municipal waste handling costs have decreased.

A five-year litter study conducted by the Maine Department of Conservation showed that beverage container litter along Maine roadsides decreased by more than 75% after the deposit legislation went into effect in February 1978. The study also revealed that all litter, including paper, decreased by 32%.

The Maine Department of Transportation reported that its roadside litter cleaning costs dropped from over \$250,000 to about \$104,000 annually from 1977 to 1979. Reduction in bottle glass damage to tyres and their possible contribution to accidents was not estimated. The survey found that bottle litter had been reduced by 55% and can litter by 56%.

In driving around the Augusta-Portland area of Maine I could not help but notice and be impressed by the lack of litter along the roadside. Driving from Augusta, Maine to Montpelier, Vermont I paid particular notice to roadside litter. I saw no cans or bottles and only about five pieces of paper or plastic in Maine. Upon crossing the border into New Hampshire I immediately observed large numbers of cans, and bottles, and also paper and plastics in volume along the roadside. This prevailed as I drove across the State. New Hampshire does not have deposit legislation. Upon entering Vermont and as I drove to Montpelier, the capital, I again observed a marked scarcity of litter along the roadside. The comparative roadside cleanliness in Maine and Vermont was very impressive.

While in Maine I visited several redemption centres, stores and a recycling centre, the Maine Beverage Container Services Inc., which buys cans, plastic bottles, cardboard and glass containers from beverage distributors. The plant cost \$350,000 and this investment was paid off in two years through the sale of baled products. It is owned by a group of beer distributors.

The plant processes 10 tons/day of cardboard; 120 tons glass/day in the summer and 80 tons per day in winter; 160,000 lbs. per week of bimetal cans in the summer and 80,000 lbs./week in winter; 45 tons of aluminium cans per week in summer and 30 tons/week in winter; 60,000 lbs. per week of plastic bottles in the summer and 30,000 lbs. in winter; 8,000 lbs. of paper cups per month; and 1,500 lbs. of plastic bags per week.

The operator of the plant told me that the beverage companies he deals with are pleased with the deposit legislation because they are making money as a result of it. The plant sells the glass to glass companies, and the plastic bottles are sold to a company that shreds it for fibre-fill material used in clothing and insulation. He also indicated they had plans to expand their recycling activities into other types of waste products.

My contact with the operators or owners of stores and redemption centres indicated a general enthusiasm for the deposit legislation. One store owner indicated it was a "bit of bother" but he was still in favour of it.

OREGON

The Act

Oregon's so-called "Bottle Bill" enacted in 1971 and implemented on October 1, 1972 requires that all beverage containers shall be marked with a minimum refund value and that this value shall be paid by the distributor to the dealers, and by dealer to consumer. "Beverage" is defined as including beer, malt beverage, mineral water, soda water and carbonated soft drinks.

Dealers and distributors must accept for deposit refund empty beverage containers of the kind, size and brand they sell. The Act also provides for a "certified" beverage container which is re-usable by more than one manufacturer and its capacity and shape may be designated by the State Liquor Control Commission. Minimum refund value of each container is set at 5¢ and for "certified" containers is 2¢. Redemption centres can also be established.

The Act also prohibits the "flip top" opening on metal beverage containers, and requires that the plastic ring holders for six packs of beverage cans be made of material which will decompose within 120 days of disposal.

Discussion with Administrators of the Act

The following points were gleaned from discussion with the State administrators of Oregon's "Bottle Bill".

Problems during the initial implementation of the Act were the logistics of storing refunded containers and the setting up of accounting systems at the retail level. These problems were soon solved and are no longer a factor.

The program basically administers itself. The State spends very little time and money on enforcement.

For the first five years there was no identifiable budget item for administration of the Act. The small costs have been absorbed by other programs. Only five legal actions have been taken to date and those were prosecuted by the Liquor Control Commission. The administrator of the Act spends only about 5% of his time on it.

The public supports the program and does most of the enforcement by reporting infractions. People do not view it as an inconvenience.

Only one redemption centre has been formed. Most retailers realise the value of having the customer come back to their stores.

Some complaints still come from the large chain stores because they have tight controls on personnel time and they dislike assigning personnel time to handling refunded containers. They may agitate for redemption through centres only.

The return rate on cans is now estimated at 80%; on plastic and glass bottles 80% and 90% on identified refillable bottles. With the advent of deposit legislation in several States many brewers adopted a common beer bottle but two major brewers have retained a distinctive bottle (Miller's and Budweiser). Budweiser, however, has a national bottle which it buys back for refilling. Miller's does not take back its bottle and therefore its bottles are processed into cullet.

As with other States there was an initial decline in the sale of cans for about eight or nine months and then they came back.

In 1977 the State estimated the distributors profited by approximately two million dollars on non-redeemed beverage containers. It was noted that the Iowa legislation calls for unclaimed deposit funds to go to the State for use in a rehabilitation program for alcoholics.

There is recognition that the Act does not bring in funds for education purposes as does the Washington and California laws. Although the administrators seem to be thoroughly happy with the Oregon "Bottle Bill" they suggest that a tax on other items in the litter stream such as paper and plastic products could provide funds for an education program which would help.

Arrangements between recyclers, distributors and retailers was a concern at the time the Act went into operation and it was feared that some unco-operative individuals could disrupt the machinery. In practice these matters resolved themselves quickly. The recyclers providing the best and quickest service won the distributors' business and the retailers directed their business to the distributors who gave them service. Thus the unco-operative recycler or distributor soon discovered he was losing business and corrected his approach. Similarly, retailers found that their customers were happy with the program so a positive approach became good business.

The Oregon administrators believe a national beverage container bill will be introduced in two or three years and it stands a good chance of passage. It would receive strong opposition from the beverage and can industries and some unions would probably oppose it because of the fear of a short-term drop in can consumption and thus loss of jobs in the can making industry.

Oregon has not made a detailed study of the effects of the Act. They feel it is so successful and this is so obvious that an evaluation is not needed.

However, they provided me with a report issued by the State entitled, "Oregon's Bottle Bill - the 1979 Report". Some points of interest from this report are listed below:

1. Employment has increased as a result of this legislation.
2. Litter has been reduced.
3. After an initial slowing in sales, beverage cans are again claiming their share of the market.

4. Aluminium cans are being returned at a rate of over 80%.
5. There is enthusiastic public support of the Bottle Bill.
6. The public does not demand a throwaway economy; it has merely responded to aggressive advertising and marketing techniques which promote waste of natural resources.
7. The Bill has facilitated recycling and resource recovery operations.
8. 380 million fewer beverage containers are disposed of in Oregon each year because of the Bottle Bill.
9. Beverages sold in returnable containers cost less, as they always have, not only in Oregon but all through the nation.
10. Claims of beverage price increases as the result of the Bottle Bill are misleading. Post-Bottle Bill beverage price increases, associated with runaway sugar prices and general inflation, occurred in Washington and California (non-deposit legislation States) as well as in Oregon.
11. Sales have increased.
12. A survey conducted by an Oregon newspaper found 7.5 times more bottle and can litter along Washington highways.
13. A survey conducted by the Oregon State Highway Division along 30 randomly selected one-mile sites for one year before and two years after the law went into effect showed a reduction of 72% in beverage container litter after one year and 83% after two years.
14. Cans and bottles are the most visible sort of litter and the least biodegradable. Natural conditions can recycle a tin can to dust in 100 years, an aluminium can in 500 years and a glass bottle in one million years.
15. An estimated net energy saving of 1.4 trillion BTU's per year has been realised in Oregon as a result of the Bill. In Oregon returnable soft drink bottles are re-used about 24 times and beer bottles about 20 times. At this rate, the returnable bottle system uses one third of the energy consumed in the throwaway system. The manufacture of aluminium from virgin materials requires 20 times the energy needed for recycled aluminium.
16. No health or sanitation problems related to the Bottle Bill have been reported.
17. The Bottle Bill has helped to keep beaches, parks, campgrounds and wilderness areas free of sharp metal and broken glass which are hazards to health and safety of people and animals.

18. Recycling centres, both commercial and non-profit, have continued to flourish since the law went into effect, despite predictions to the contrary by the beverage industry.
19. No attempt has been made to repeal this legislation. The fact that the Bottle Bill has not increased the costs of government nor expanded the bureaucracy enhances its popularity.

During my visit to Oregon I had an interview with the owner of a large (over 100 stores - the largest in Oregon) retail grocery business operating in Oregon and Southern Washington. Some of his observations are noted below:

- He is solidly for beverage deposit legislation.
- Beverages are 29% of his business.
- The beverage industry has put out much misleading information on Oregon's Bottle Bill and its effects. The truth is that it has not hurt anybody and it has cleaned up the State.
- Total sales of beverages in his stores were not affected.
- When the law first went into effect it banned the flip top can and the industry did not have a substitute ready and therefore had to go back to the solid top. This caused a drop off in can sales but increased bottle sales kept total store sales about the same.
- At the present time the mix of cans vs. bottles is about the same as before the Bottle Bill went into effect.
- Distributors are making more money with the Bottle Bill than they were making before it went into effect.
- Retailers experienced some inconvenience. He had to make additions to some of his stores to accommodate return and storage of beverage containers but otherwise very little was needed to comply with the legislation.
- A recent article in the magazine "The American Grocer" condemned the Bottle Bill. He stated the magazine is owned by the American Can Company. The article (in his view) contained misleading information and was exceptionally biased.

I also visited a commercial recycling operation in Portland, Oregon which was processing 12 million pounds of aluminium cans per year; 500 tons of glass (cullet) per month; 2,000 lbs. of cardboard/month and 60 tons of plastic bottles per month. The owners are pleased with the Bottle Bill but the District Manager of the company said the Bill should be extended to cover all containers including wine bottles, fruit juices, etc. Steel cans are separated magnetically and are sent to a landfill garbage site as valueless. Aluminium cans are crushed, baled and sent to Reynolds Aluminium Company. Bottles are sold directly to glass plants. Plastic bottles are crushed, baled and sent to clothing and insulation manufacturers.

VERMONT

Vermont was the first State in the U.S. to adopt a deposit system. The 1953 Act which simply prohibited the sale of beer or ale in non-returnable glass containers was allowed to expire in 1957 after an intensive campaign against it by the beverage industry.

A new Bill requiring a deposit on beer and soda containers was enacted in 1972 and implemented in 1973. The new Act called for a deposit of at least five cents on each beer and soda container sold in the State. The deposit was to be refunded when the container was returned to the store. Stores were required to accept containers of the size and type they sold. They could limit the hours in which they redeemed the containers and they could refuse to accept dirty or damaged containers.

The Act was amended in 1975 to ban non-refillable bottles, cans with removable tabs, and non-biodegradable plastic rings for six packs. It does not require that containers be refilled.

Vermont has now had seven years of experience with its deposit legislation. The State estimates the return rate on containers was 76% in 1974 and is now (1980) 97% and that total litter (including paper, plastics, etc.) has been reduced about one-third.

Retail grocers were originally opponents of the legislation but, according to State officials, are now strong supporters because they not only recognise the litter control effect but also the business advantages. Consumers return to the neighbourhood grocer and make further purchases when redeeming containers.

Distributors now reimburse retailers with a minimum of two cents per container. Thus the retailer recovers most of his handling costs. Distributors have use of the deposit money for 30 to 60 days which is a significant benefit.

Approximately 150 private redemption centres have been set up around the State. Most of them sell beverages but little else. Most of the centres are making good profits.

Under the Act a group of retailers can also petition to set up a certified redemption centre where the brands and types of containers they handle can be redeemed. Eight such centres have been established but surprisingly the participating retailers continue to redeem containers at their individual stores because they consider it good business. They have found that it increases the volume of sales.

According to the State officials and retailers to whom I spoke public response to the legislation is overwhelmingly favourable. It is no longer a political issue. A 1977 public opinion poll showed 93% support with 7% opposed, undecided or without an opinion. The brewers and National Beverage Association have discontinued their opposition in Vermont.

Asked if they would recommend a different approach if they were starting anew the State officials said generally no. They suggested deposit legislation should have an implementation lead time of 9 to 12 months to give manufacturers and retailers time to prepare. They

suggested a two-phase approach to bottles. First, impose a deposit requirement and then one year later require all glass containers be refilled or be capable of being refilled by two or more manufacturers. This tends to move manufacturers towards a standard bottle.

Several changes occurred in the mix of cans and bottles. Before the law 37% of the beverage market involved cans and was evenly split between aluminium and steel (or bimetal). In the first year of the legislation supermarkets decided to handle bottles only. Cans dropped to 14% of the market but within two to three years they were back to 33%. Because of increased sales the 33% represented more cans than the 37%. Also, almost all cans are now fully aluminium because they have more recycling value and with a recovery system afforded by deposit legislation it pays to recover aluminium cans over bimetal cans.

Non carbonated drinks are not covered by the law but it is anticipated that eventually the law will be amended to cover them as well.

Almost all soft drink glass containers are refilled now. About 14% of glass beer containers are refilled with the remainder being recycled as broken glass and then made into new bottles or other glass products. Mechanisms are being set up to recycle plastic containers.

Most of the original problems and frictions have dissolved. With protection to the retailer to reject unclean containers the fear of health problems has disappeared. No health problems have developed. Initial friction between retailers and consumers was resolved when retailers found that the redemption process enticed the customers back into their stores more often and the consumers decided the inconvenience to them was really minimal and they liked the end result.

As noted under the section of this report dealing with the State of Maine, my travels in Vermont revealed remarkably litter free roadsides. This was not the case in the adjoining State of New Hampshire.

The following benefits are quoted from the conclusions and summary of a 1977 report by James M. Jeffords (Congressman from Vermont) and Donald W. Webster (Director of Environmental Protection for Vermont). The Vermont State officials referred me to these conclusions as reflective of the benefits derived from the State program:

"Virtual elimination of roadside litter, with a 56.5 per cent reduction in state effort for litter pickup.

"Substantial savings to consumers who purchase beverages in refillable containers, which have been made available as a result of the deposit law. These savings may be conservatively estimated at \$60 per year for the typical family using refillables. The savings are not offset by raised prices for non-refillables.

"Substantial conservation of energy, material resources, and space in sanitary landfills. The energy savings potential can be conservatively estimated as the equivalent of the home heating needs of Vermont's third largest city.

"The opportunity to re-direct voluntary beautification efforts to tree planting and other projects with long term benefit, rather than the Sisyphean task of litter pickup.

"Sizeable increases in beverage sales, with positive impact on state revenue and the economy. While the increases may not be directly attributable to the deposit law, the figures clearly show that the law has not had a negative impact.

"Spinoff benefits including raised environmental consciousness resulting from pervasive citizen participation, as well as fund raising opportunities for worthwhile causes through 'bottle drives' and operation of container redemption centers.

"Greater consumer choice; approximately 20 more brands of beer are available in Vermont now than before the law. As with the figures on increased sales, this may not be directly attributable to the legislation, but serves as proof that the law has not discouraged the distribution of minor brands.

"Consistently high, and growing, levels of approval for the legislation expressed in every public opinion survey taken on the issue, with the latest survey showing that 93 per cent of Vermonters like the law well enough to believe it should be implemented nationally.

"A complete turnaround in the positions of most retail grocers. Initially unified in strong opposition, the vast majority of Vermont grocers now support the legislation. Among others whose livelihoods are affected by the law: soda distributors have made it clear they are not unhappy with the legislation; while beer distributors constitute the major remaining open opponents. It should be emphasized that there is no evidence that the legislation has economically damaged the beer distributors, but that they tend to reflect the positions of the national brewers with whom they are affiliated.

"Rapidly rising beverage sales in Vermont, with no indication that Vermonters are crossing easily accessible state borders to purchase beer or soda in neighboring jurisdictions.

"A return rate of better than 95 per cent of all beverage containers sold in Vermont; an extremely high percentage considering that Vermont has a substantial tourist industry, thus many short term visitors."

WASHINGTON

Washington was one of the first States to try deposit legislation but it failed. In 1971 an industry group took initiatives to the legislature. The legislation was approved by the voters in 1972. It was called the Model Litter Control Act.

Basically the Washington Model Litter Control Act is a tax of .015% (\$150 per \$1 million gross sales) on industry sales of materials likely to be littered. The principal sources of revenue from the tax on industry are the food and beverage manufacturers (15.9%); wholesale food stores (15.6%); retail food stores (33.3%) and eating and drinking establishments (6.9%).

The money goes into a fund which at first was to be used for an education program to prevent littering. Later the State organised a youth corps program to pick up litter and still later a recycling program was added. The tax generates about \$1.5 million per year. At the present time the Washington State Department of Ecology, the administrator of the program, spends 20% to 30% of this revenue on education and trash bins; 40%-50% on the youth corps (litter pick-up) and 20% to 30% on encouragements to recycling.

The Act also directs the Department of Ecology to seek statewide uniformity of litter receptacles and requires that receptacles be placed throughout public places. Under this part of the Act the owner or operator of any public place is required to provide receptacles of acceptable design, colour and markings. They must be placed along all specified roads, in parks, campgrounds, in parking lots open to the public, where boating activities take place, at all outdoor sporting and recreation activities and in schoolgrounds and playgrounds.

1979 amendments to the Act added recycling programs as a major purpose of the Act and this involved recovery and recycling of waste materials related to litter, a fostering of private recycling and increased public awareness of the need for recycling and litter control.

The Act provides for a fine of not less than ten dollars for each offence of littering. The court may also direct the litterer to pick up and remove all litter from the area of violation in addition to the fine.

The owners of vehicles and watercraft are required to keep and use a litter bag. A violation is subject to a maximum fine of ten dollars.

Recently the Department initiated a recycling hotline to increase public awareness of the availability of recycling as an alternative to solid waste disposal. Through this telephone service the Department attempts to connect those who wish to recycle with those who collect and process recyclable goods. The hotline handled over 2,500 calls in 1979. There were about 600 recycling centres in Washington as of January 1980. They range from charity operated newspaper drops to large commercial operations. A 1979 survey of 135 recyclers showed that they had recycled 395,260 tons of materials including 9,747,861 cases of refillable beer bottles, 13,108 tons of container glass and 81,809 tons of newsprint.

Unfortunately Washington does not have good data on litter volumes before and after enactment of the Model Litter Control Act. A consulting firm made an estimate of the annual rate of litter (100,000 tons) before the Act. After-enactment surveys showed a reduction of approximately 60%. However, the consulting firm's estimate was later found to be doubtful so the estimate of reduction was believed incorrect. In 1975 surveys by another consulting firm indicated litter generation in Washington was at the rate of 39,200 tons per year. Subsequent surveys have shown a steady decline to a figure of 30,670 tons in 1979.

The major activity in the Washington program is litter pick-up under the youth corps. This program costs about \$500,000 per year. It is intended to draw public attention to the litter problem as well as removing litter from public places.

Under the program the Washington Department of Ecology employs teenagers each year to pick up litter and trash in public places, usually along highways. Some (2½%) of the materials picked up are recycled and the youths employed keep the proceeds as an added incentive. Each youth is paid \$3.10 per hour (1980) and supervisors are paid \$5.33 per hour.

In 1980 the State had 50 crews totalling 280 employees engaged in litter pick-up each month. Each employee is hired on a monthly basis so there is a constant turnover and greater involvement.

The administrators of the youth corps program believe it has a high education value. Exit interviews with those hired into the program show that the youths now think about conservation of resources and are strong advocates of anti-litter programs.

Litter collected by the youths was placed in large clear plastic bags and left beside the highways for considerable periods of time purposely to advertise the pick-up program.

Program administrators concede that it has come under some public criticism because of a belief that litterers are more prone to litter because they know it will eventually be picked up by the State. The administrators state that litter in urban areas seems to be increasing in contrast to rural areas. They claim this reflects the success of their program because most of the urban problem comes from transportation of wastes in uncovered trucks and inadequate placement of litter receptacles. Retired policemen were engaged to police the placement of receptacles.

The program is now moving into a number of public relations exercises such as organised bicycle trips, brochures, advertising, TV programs teacher materials, packaged audio-visual programs, and a series of activities using a frontier character called "Cascade Jack" who is dressed in deerskin clothes and carries a long barrelled musket. They work very closely with industry in these programs and call on industry for help such as recycling message on Safeway stores' grocery bags.

The administrators cite three important factors in the Washington program:

1. The program is strong because there is dedication of significant funding (now \$1.5 million per year). Without this funding the program would fail.
2. It allows the government to be the leader and catalyst in litter control. It stimulates good relations with industry because the regulatory aspects are minimal.
3. It is a behavioural modification program designed to help people do what is right.

On the legislative front I was informed that further attempts will be made to introduce deposit legislation in Washington in 1982. Legislation to ban the flip top on beverage cans was introduced but it failed to pass by a narrow margin.

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MINORITY REPORT

by

Dr. G. M. Vaughan, M.P.

Pursuant to S4N(4)

of the

Parliamentary Committees Act 1968

CHAPTER ONE

IN THE ACT

1.1 The Order in Council referring beverage and drink container deposit legislation to the Committee directs the Committee to have regard, amongst other things, to:

- (1) *Future prices, sales and investment in the drink, beverage and related packaging industry;*
- (2) *Employment.*

1.2 It may be the case that those matters are not relevant to the functions of the Committee as set out in Section 4C of the *Parliamentary Committees Act* 1968. Under Section 4F(1)(a) of that Act, the Committee may only be required to inquire into, consider and report to the Parliament on any proposal, matter or thing relevant to the functions of that Committee. It could be argued that the Committee should not have concerned itself with the two matters listed above which are not in themselves relevant to either the natural resources of the State or the environment.

1.3 If it is the wish of the Parliament that the Natural Resources and Environment Committee shall be required to inquire into, consider and report to the Parliament on the economic and social aspects of any particular proposal, matter or thing concerned with the natural resources of the State or with the environment, then it would seem to be desirable that this be specifically stated in Section 4C of the *Parliamentary Committees Act* 1968.

CHAPTER TWO

A MATTER OF INTERPRETATION

2.1 The Order in Council of 26 October 1982 directed the Committee as follows:

To investigate, make recommendations and report to Parliament by 1 November 1983 in relation to beverage and drink container deposit legislation with particular regard to the following:

- (1) *Future prices, sales and investment in the drink, beverage and related packaging industry;*
- (2) *Employment;*
- (3) *Conservation and allocation of natural resources and energy;*
- (4) *Littering and aesthetics;*
- (5) *Waste collection and disposal or recycling; and*
- (6) *Alternative waste control methods.*

2.2 The majority report is based upon a particular interpretation of that Order in Council:

1.14 The Committee interpreted its terms of reference widely to include all matters related to waste and litter control, including especially - but not exclusively - beverage and drink containers and including especially - but not exclusively - container deposit legislation.

2.3 This dilution of the purpose of the inquiry has led to a failure to adequately address its specific task, that is to investigate, make recommendations and report to Parliament on the matter of beverage and drink container deposit legislation.

CHAPTER THREE

BUT IN THE MULTITUDE OF COUNSELLORS

- 3.1 The majority report adopts an Augustinian approach to beverage and drink container deposit legislation. It desires ecological chastity, but not now.
- 3.2 While this approach may have merit, it is not derived from an objective assessment of the evidence before the Committee.
- 3.3 In a political environment where deregulation has become a popular catch-phrase and an ideological test of purity, consideration of beverage and drink container deposit legislation on its merits by a Parliamentary Committee is made more difficult.
- 3.4 The majority report can be considered in this light.

CHAPTER FOUR

A MODEST ACHIEVEMENT

- 4.1 The majority report makes only modest efforts to resolve the points of contention raised during the inquiry.
- 4.2 As a result, it is likely that the community debate in Victoria on the virtues or otherwise of beverage and drink container deposit legislation will continue.
- 4.3 The majority report can be considered to be a useful contribution to that continuing debate.
- 4.4 It is a pity that it isn't more.
- 4.5 If a further examination of the impact in Victoria of the introduction of beverage and drink container deposit legislation is required, another form of inquiry is suggested.

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