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Parliamentary Standing Committee on Public Works

REPORT

relating to the

132kV SUBTRANSMISSION DEVELOPMENT, TUGGERANONG, A.C.T.

(Nineteenth Report of 1984)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1984

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS
(Twenty-Seventh Committee)

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The Honourable Wallace Clyde Fife, M.P. (Vice-Chairman)

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	Eamon John Lindsay, Esq., R.F.D., M.P.
	John Saunderson, Esq., M.P.

EXTRACT FROM THE VOTES AND PROCEEDINGS NO. 88
DATED THURSDAY, 6 SEPTEMBER 1984

12 PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - SUBTRANSMISSION DEVELOPMENT, TUGGERANONG, ACT: Mr Hurford (Minister for Housing and Construction), pursuant to notice, moved - That, in accordance with the provisions of the Public Works Committee Act 1969, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for consideration and report: 132kV subtransmission development, Tuggeranong, ACT.

Mr Hurford presented plans in connected with the proposed work.

Debate ensued.

Question - put and passed.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

132kV SUBTRANSMISSION DEVELOPMENT, TUGGERANONG, AUSTRALIAN CAPITAL TERRITORY

R E P O R T

By resolution on 6 September 1984, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report the proposal for the construction of a zone substation and associated subtransmission system in Tuggeranong, Australian Capital Territory.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal is to extend the existing 132 kilovolt (kV) subtransmission system in the south Tuggeranong Valley, A.C.T., for the Australian Capital Territory Electricity Authority (ACTEA). The project comprises:

- construction of a zone substation consisting of a switchyard and control building on a 1.4 hectare site adjacent to the former Monaro Highway in the A.C.T. suburb of Gilmore;

- erection of 6.2 kilometres of twin 132kV subtransmission line from the existing Wanniassa zone substation to Gilmore, and

- erection of 11 kilometres of single high capacity subtransmission line from the Causeway zone substation to Gilmore.

2. The estimated cost of the proposal when referred to the Committee was $6.92 million at October 1983 prices.

THE COMMITTEE'S INVESTIGATION

3. The Committee received a written submission and supporting plans from the ACTEA. The Authority also provided the Committee with Draft and Supplementary environmental impact statements. Correspondence was also received from the National Capital Development Commission (NCDC).

4. On 6 September 1984, on the motion of Senator Jones, the Committee resolved that pursuant to sub-section 11(1) of the Public Works Committee Act 1969, a Sectional Committee examine the proposal and report to the Committee. The Sectional Committee conducted a public hearing in Canberra on 8 October 1984 at which representatives of the ACTEA gave evidence.

5. On 10 September 1984 the Sectional Committee inspected the City East Zone Substation, the site of the proposed zone substation and the routes of the proposed subtransmission lines.

6. The Committee's proceedings will be printed as Minutes of Evidence and a list of witnesses appears at Appendix A.

BACKGROUND

7. Role of ACTEA The distribution of electricity in the A.C.T. is the responsibility of the ACTEA, a statutory authority constituted under the Australian Capital Territory Electricity Supply Act 1962. Following an amendment to the Public Works Committee Act in 1981, proposed works of certain statutory authorities are now subject to scrutiny by the Parliamentary Standing Committee on Public Works. This is the first instance that a work by the ACTEA has been considered by the Committee.

8. Electricity distribution in the A.C.T. The existing A.C.T. Electricity distribution system is illustrated in Appendix B. Since the Territory has no appreciable power generating capacity of its own electricity for use in the A.C.T. is drawn from the 330kV New South Wales, Snowy Mountains and Victorian interconnected transmission system. This is transformed to 132kV at the Electricity Commission of New South Wales (ECNSW) Canberra bulk supply substation near Holt to supply the ACTEA subtransmission system and surrounding areas of N.S.W. A further transformation to 66kV is carried out by the ECNSW at its Oaks Estate bulk supply substation to supply both the ACTEA and the Southern Tablelands County Council. The ACTEA 66kV system, however, is being phased out.

9. The initial distribution of power throughout the A.C.T. is through a system of high voltage subtransmission lines (at 132kV or 66kV) to zone substations. At these zone substations the voltage is reduced to 11kV for supply to the local area. Overhead and underground distribution feeders carry the power from the zone substation to residential and commercial areas, where the voltage is further reduced by local distribution transformers to supply the low voltage network serving individual consumers, normally at 240 or 415 volts.

10. Zone substations A zone substation receives power at 132kV and reduces the voltage to 11kV for distribution. It comprises the transformers to reduce the voltage, switchgear and busbars for the connection and protection of transmission lines and power transformers, and control buildings containing circuit breaker switchboards for the connection of the 11kV feeders and control equipment for monitoring, operating and protecting the installed plant.

11. The number of zone substations required is determined by the capacity of each substation, and their distribution is dictated primarily by the pattern of urban development. In order to achieve an economic, stable and secure supply, it is necessary for each zone substation to be located as near as practicable to the load centre. It is uneconomical to extend 11kV feeder lines to large remote loads, and voltage fluctuations occur when feeding over long distances. The ACTEA advised that, although all electrical appliances are designed to tolerate minor voltage fluctuations (and in most States there exists legislation to ensure this), in times of peak load damage can occur to appliances with electric motors (e.g., refrigerators, air-conditioners). As a consequence, in the A.C.T., a consumer should generally be no further than 5 km from a zone substation.

12. There are 8 zone substations presently in operation in the A.C.T. Each is normally unmanned, but is visited daily for routine inspection, and for maintenance where necessary.

13. A typical zone substation transformer has a nominal capacity of 70 megawatts (MW). Most zone substations are constructed initially with 2 transformers, but the requirement to be able to shut one down while still being able to supply power with the other means that each 2-transformer substation has a firm capacity of 70MW. The addition of a third transformer, however, theoretically doubles a zone substation's capacity.

14. Subtransmission lines. Linking zone substations are subtransmission lines capable of supplying a high voltage. In the A.C.T. electricity is supplied at 132kV from the bulk supply substation at Holt. The lines are supported on either wooden or concrete poles, or steel lattice towers.

15. For security of supply it is essential that each zone substation be supplied by at least two lines to ensure that the supply does not fail in the event or damage or a technical fault occurring on one line, and to allow one line to be taken out of service for routine maintenance.

THE NEED

16. Development of southern Tuggeranong The Tuggeranong Valley is one of the most rapidly developing areas in Canberra. The National Capital Development Commission is proposing the development and occupation of the southern Tuggeranong suburbs of Gilmore, Theodore, Calwell and Isabella Plains, in the mid to late 1980's. As well, further growth is expected in the established suburbs of Wanniassa, Fadden, Macarthur, Chisholm and Richardson, and in the Hume Industrial Estate. Within 10 years it is anticipated that development will commence in the North Lanyon area.

17. The Authority supplied the Committee with NCDC estimates which indicate that the population of the Tuggeranong Valley will increase from its present 43,000 people to 62,600 by 1988, and possibly peak at 100,000 during the late 1990's. The Authority advised that it would not be feasible to permit any additional increase in population in Tuggeranong beyond 1986 if the proposal did not proceed.

18. The cumulative effect of projected development in Tuggeranong is reflected in the Valley's anticipated power requirements. The ACTEA advised the Committee that, based on the NCDC's current development intentions, the peak power demand for Tuggeranong is estimated to be between 225 and 280MW, about double that which can be provided by the Wanniassa zone substation. Future development of the Lanyon and West Murrumbidgee areas could see the demand rise to between 270 and 330MW.

19. Existing electricity supply to Tuggeranong Presently, all of Tuggeranong is supplied with electricity from a zone substation at Wanniassa. The addition of a third transformer there enabled that zone substation to attain a firm capacity of 120MW, 95 per cent of which was reached during the last two winters.

20. Although some load can be transferred to the Woden zone substation, continuing growth in the area of O'Malley, North Stirling, Isaacs, Swinger Hill and North Tuggeranong will result in limited spare capacity available for further development in southern Tuggeranong.

21. Committee's Conclusion In order for the program of land development and occupation of the Tuggeranong Valley to continue, the additional supply of electrical power is essential. The need for a zone substation and associated subtransmission network is evident.

THE PROPOSAL

22. The proposal is for the construction of a zone substation and associated control facilities in the A.C.T. suburb of Gilmore, and the erection of subtransmission lines linking it to zone substations in Wanniassa and the Causeway. The components of the proposal are examined below.

GILMORE ZONE SUBSTATION

23. The general layout of the Gilmore zone substation is depicted in Appendix C.

24. Location A key determinant in siting a substation is that it should be close to the area it will serve. The current program of development by the NCDC is centred in the

south-eastern area of Tuggeranong. Under current population predictions a zone substation will be required to supply the area by the winter of 1986.

25. Additionally, the Hume Industrial Estate to the east of Gilmore is considered by the NCDC to be one of the few industrial areas within the A.C.T. with potential for expansion and is expected to create a demand for a greater commercial load.

26. The ACTEA also informed the Committee that by connecting the proposed zone substation to the Wanniassa and Causeway zone substations the security of supply to central Canberra would be improved by the creation of a physical ring around Canberra.

27. With the abovementioned factors in mind, and the requirement for a site to be approximately 1.4 hectares in area and on reasonably flat ground, the ACTEA identified 3 locations in the Gilmore-Macarthur area as being suitable sites. These were:

Site A - Immediately west of the Monaro Highway, between the highway and the former route for the highway (i.e., in Gilmore).

Site B - North of Isabella Drive (i.e., in Macarthur).

Site C - East of the Monaro Highway (i.e., near the N.S.W. border).

28. Each site is situated on former grazing land and is visible from the highway. However, the ACTEA considered site A to be the most preferable due to it:

- having the least visual impact from the highways;
- being furthest away from a restaurant development (Rose Cottage Inn);

- being cheaper by at least $250,000 when the cost of 11kV feeders is considered;
- occupying land no longer suitable for grazing, and
- having shorter access from existing roads.

29. Substation building A building is required at the substation to house the control room, switchroom and battery and communication units, and although the substation normally will be unmanned, provision is also required for mess and septic toilet facilities. It will be a single-storey structure approximately 46 metres long, 13 metres wide and 5 metres high, and have a reinforced concrete floor, double skin cavity brick walls, and a pitched metal deck roof to ensure a dry interior in the most severe storm conditions.

30. Finishes are intended to be of low maintenance and subdued in tone. The roof will be a beige colorbond and external walls will be of dull red textured brick. Internally, walls will be unpainted and floor surfaces will be treated concrete, except in the control lobby and mess area, where vinyl floor tiles will be laid.

31. The building will be oriented along the north face of the switchyard so as to mask most of the outdoor transformers, switchgear and busbars.

32. Switchyard The switchyard will contain all the 132kV switchgear and busbars, as well as two 50MW power transformers. It will be capable of augmentation, with provision being made for later subtransmission line connectors and an additional power transformer.

33. For security reasons a 2.4 metre high chain wire fence will enclose the switchyard.

34. Services Since the substation will not be continually manned, many operations will be automatic or be remotely controlled from the ACTEA System Control Room in the city, and therefore only essential services are required.

35. As it is necessary for the substation to have an independent power source to operate all the control and protection gear, and be able to do so in the event or a power failure to the substation, a bank of nickel cadmium batteries capable of supplying 110 volts D.C. will be provided.

36. Electrical heating will be installed in the control and mess rooms and the building pressurised by means of a filtered fan to discourage the entry of dust. An electric hot water service will supply the mess room and toilet facilities.

37. Normal indoor lighting will be provided. Switchyards may be floodlit for night operations or emergency maintenance, but will normally be left unlit to reduce the visual impact of the substation.

38. The switchyard firefighting water supply will be supplemented by two 70kg dry powder fire extinguishers on hand trolleys. Interior equipment will be protected by carbon dioxide extinguishers and a fire detection system with remote alarm installed.

39. Roof and surface drainage will be piped to the creek, and an oil interceptor tank with capacity to hold the oil content of a single power transformer (30,000 litres) will be installed on a separate drainage line from the transformer pads.

40. Access to the substation will be via a short road from the old Monaro highway, and parking spaces for 3 vehicles will be provided.

41. Underground cables The only overhead cables in the immediate vicinity of the substation will be those associated with the 132kV subtransmission lines to the Wanniassa and Causeway zone substations. All 11kV feeder lines leaving the substation will be underground for both landscape and technical reasons. Those running south will be underground until reaching 11kV/415V transformers in the residential areas, and would follow the route of the old highway, which later will be filled in. Lines leading to the north will be underground at least until crossing Isabella Drive.

42. Landscaping The ACTEA acknowledged in its Environmental Impact Statement that the only significant environmental issue associated with the substation site was its visual impact when viewed from the Monaro highway. To a large extent, the present screen planting and stands of pines and eucalypts will reduce its visual impact, and when supplementary planting matures the substation should be well concealed behind apparently natural vegetation.

43. The site's visual impact will be reduced further by the mounding and landscaping of spoil.

44. Construction impacts In general, the substation's construction will not have a great impact on the mainly undeveloped surrounding areas. Completion and occupation of the first homes in the suburb of Gilmore is not expected until mid 1985, and these will be remote from the substation. The closest development, namely, the Rose Cottage Inn, could expect some construction noise, but it is unlikely this would have a significant effect on the operation of the restaurant. The Committee was informed that relative to the ongoing house construction in the area, the construction of the substation would not have a significant impact.

45. Committee's Conclusion The site is well suited for a zone substation to efficiently provide electricity to present and future consumers. It is sufficiently distant from residential areas to render transformer noise levels negligible, and is capable of being effectively landscaped to minimise the visual impact of the substation.

WANNIASSA TO GILMORE SUBTRANSMISSION LINES

46. Proposed route The proposed route of the 132kV Wanniassa to Gilmore subtransmission lines are mapped out at Appendix D. Leaving the Wanniassa substation the lines will follow a low ridge between Mt Taylor and Mt Wanniassa until reaching Erindale Drive. They will cross Erindale Drive through an existing cutting on a high point in the road and then skirt the northern slopes of Mt Wanniassa and the ridge separating Tuggeranong from the Long Gully area until crossing Isabella Drive and entering the Gilmore substation.

47. The total length will be 6.2 kilometres and generally will pass through terrain ranging from open woodland and grassland on the lower slopes to dense woodland and open forest on the hilltops and upper slopes.

48. Impact on current land use With the exception of the Wanniassa end, the lines will have very little impact. Between the Wanniassa substation and Erindale Drive the lines will pass through an area containing few mature trees and will be visible from nearby houses. Although screen planting is proposed, the ACTEA acknowledged that the lines would remain a prominent element in the local landscape.

49. After crossing Erindale Drive the lines are unlikely to have much of an impact as they will pass through land used mainly for low intensity recreational use (e.g., walking, jogging) and

would be out of sight of residential areas and remote from most roads. They would be visible across very open woodland but their visual impact would be softened by a timbered backdrop.

50. Alternative route The proposed route has been sited to reduce the prominence of the lines as much as possible. The lines are routed through mainly non-residential areas, whereas any alternative would be longer and pass through suburban areas. The proposed route could be shortened by straightening it near Erindale Drive, but its visual impact would be greater. The lines would then cross the road obliquely at a lower elevation in a section where motorists would have long views of them when travelling north. Additionally, many trees would have to be removed, which would leave an obvious corridor through the forest.

51. Construction aspects It is expected that the lines will take 6 months to construct, with construction activities occurring intermittently at any section. Noise from boring machines and pneumatic hammers will occur only during normal working hours and would last only a few days at each pole section.

52. The first 4.4 km will be constructed as light capacity (250MW) twin circuits each supported on 20 metre high single concrete poles, spaced at about 150 metre intervals. Such a configuration will require a 45 to 80 metre corridor to be cleared of trees.

53. The last 1.8 km into the Gilmore substation will be common with the Causeway to Gilmore line. It was originally proposed that this section of line be carried on steel lattice towers, however, the Committee was informed that recent overseas developments with insulators indicate that it is now possible to allow high capacity 500MW circuits to be supported on concrete

poles, resulting in a lower profile line. The ACTEA will consider further the use of concrete poles with a view to using them throughout the project.

54. Access tracks along the route will be required during the construction phase and will remain for periodic maintenance and clearing. Since it is not proposed to construct lattice towers, access for heavy vehicles will not be required and will be limited to truck-mounted boring machines and the like. The impact of access tracks, therefore, is likely to be very slight. In poorly drained areas temporary drainage facilities will be employed and will be rehabilitated when no longer needed.

55. Committee's Conclusion The route of the 132kV subtransmission lines from Wanniassa to Gilmore is satisfactory. Care has been taken to minimise their visual impact on the landscape.

CAUSEWAY TO GILMORE SUBTRANSMISSION LINE

56. Proposed route The 11 km route of the Causeway-Gilmore 132kV subtransmission line is constrained by several existing or proposed land uses, particularly in the Fyshwick and Narrabundah areas. Appendix E outlines the proposed and alternative routes.

57. From the Causeway zone substation the subtransmission line will pass through the former Causeway housing area, cross the railway lines and Canberra Avenue, and then follow Jerrabomberra Creek in a southerly direction before crossing Hindmarsh Drive and Jerrabomberra Avenue. From there the line would pass by the Callumbrae homestead and the southern end of the BMG quarry, and cross Mugga Lane before following the footslopes of Isaacs Ridge and joining the Wanniassa-Gilmore lines into the Gilmore zone substation.

58. Impact on current land use Although in the Causeway area the line would traverse land that is below the 100 year flood level and has not yet been redeveloped it would have a significant visual impact. The line would be partly screened by established deciduous trees, however, additional screen planting would be necessary. The positioning of the line could render the land unsuitable for any future housing development.

59. Just south of Canberra Avenue the route is tightly constrained by the Hindmarsh Drive/future Eastern Parkway road reservation, Jerrabomberra Creek and the Mill Creek Oval. Unless an alternative route is adopted the line would have an impact on at least one of the abovementioned land uses. In order to keep its support structures a safe distance from the future Eastern Parkway, the line may encroach upon Mill Creek Oval, which the Committee was informed is one of the more popular ovals in inner Canberra, and would severely limit its use as a football or cricket ground. An option is to remove a stand of rusted poplars currently lying between the oval and the road and route the lines through there. However, apart from the line then being highly visible, this option would create a safety hazard as the oval is sometimes used for kite and model aeroplane flying. An alternative would be to couple this option with relocating the oval and planting a replacement row of poplars.

60. In the Narrabundah Lane area the proposed route would cut across the corner of a lease currently held by a plant nursery. Although the line would not affect operations there, it would preclude the future construction of buildings should the lessee wish to expand. Additionally, the lessee is required by the terms of the lease to plant tall trees around the boundary of the site, and this would not be possible to comply with. The ACTEA advised, however, that the route again is dependent on the final alignment of the Eastern Parkway and the encroachment may not occur.

61. Further south the proposed route would enter the desirable clearance zone for the Bonshaw Naval Receiving Station. Although high voltage powerlines are a particular source of interference to radio reception, the Committee was informed that the extent of interference could not be gauged in absolute terms and the development was only one of an increasing number of activities in Canberra and Queanbeyan which could eventually lead to the station's relocation.

62. Most of the remaining land traversed by the powerlines is used for grazing and would not be affected significantly. Although they would pass close to the Callumbrae homestead, reducing its aesthetic appeal, the ACTEA believes the visual and ecological impact can be minimised through close consultation with the lessee.

63. The route also would bring the powerlines close to the BMG quarry. Concern was expressed that interference could cause premature ignition of electric detonators, a potentially hazardous situation. The ACTEA informed the Committee that less than 25 metres of the route would cross the quarry, and provided proper precautions were taken, powerline induced detonations should not be possible.

64. Alternative routes In an attempt to overcome the constraints imposed by current land use in the northern section of the line, 2 alternative routes were examined. Both bypass the Narrabundah area by adopting a longer route which would take the powerlines around the Fyshwick industrial area before heading south.

65. Alternative A would avoid conflict in the Causeway area by crossing Jerrabomberra Creek near its entrance to Lake Burley Griffin before running along an existing easement towards the northern end of Fyshwick. However, its route probably would result in the loss of a playing field, and would encroach upon

the Jerrabomberra Wetlands, an area regarded as the most significant area of waterbird habitat within the A.C.T., and used by many migratory waterbirds. The alternative also would be highly visible from the National Area and by passing through the Fyshwick sewage treatment works would restrict future development there.

66. A second alternative would avoid the Jerrabomberra Wetlands by following the same route through the Causeway as the proposal (and therefore face the same problems) but then would cut across the Fyshwick Temporary Industrial Area, affecting about 6 leases.

67. Both alternatives would follow the same route around the north and east of Fyshwick, and come into conflict with flight paths from Canberra Airport. Although there would be no encroachment on the main flight path, the line could prove a hazard to aircraft in difficulty. It is standard aviation practice for aircraft experiencing power losses on take-off to turn to the right of the normal flight path. Troubled aircraft leaving Canberra to the south then would have to turn in the direction of the powerlines, an obviously hazardous situation, as they would likely to be flying at low altitudes.

68. Additionally, compared with the proposal, both alternatives would greatly increase the extent of interference experienced at the Bonshaw Naval Receiving Station.

69. All alternative routes in the southern section of the line would pass through relatively open country and would be prominent on the landscape. The Committee notes that any attempt to ameliorate the impact of the proposal on the Callumbrae Homestead by siting the line away to the east may be negated by the need for a future line to link up with a future Mugga zone substation (should it be required) and therefore would have to encroach upon the property.

70. Construction aspects Construction aspects will be similar to the Wanniassa-Gilmore line, except that this line will be of higher capacity (500MW).

71. North of Canberra Avenue the line will be constructed over flood-prone land and will necessitate the construction of flood protection mounds on which to erect support structures.

72. Access tracks over waterlogged ground may require minor filling but are not considered to pose a significant environmental threat. Along Isaacs Ridge in the south, the construction of access tracks may be difficult on steep and poorly drained terrain. The Authority informed the Committee that it would place great emphasis on clearing easements by hand rather than using machinery in order to preserve ground cover and shrubs.

73. Undergrounding It is not intended to route any of the 132kV cables underground, as is the case with three 800 metre low capacity sections or 132kV cable associated with the Causeway zone substation. The ACTEA informed the Committee that for longer, higher capacity circuits such as in the proposal, the selection of an underground cable rather than an overhead line would increase the cost by a factor of up to 20 times. Besides being more unreliable, requiring longer repair time and an additional circuit for security of supply, the easement would have to remain permanently clear of trees and large shrubs to escape root damage. Additionally, heat produced by the cable could cause soil dessication and lead to permanent scarring.

74. Committee's Conclusion Although the proposed Causeway to Gilmore subtransmission line will have an adverse impact on land uses in certain places, it is acceptable. It has been designed to be as minimally intrusive as possible while still being able to cater for present and possible future power requirements. Alternative routes are longer, more costly and less desirable.

CONSULTATION

75. In March 1984 the ACTEA prepared a draft Environmental Impact Statement in accordance with the Environment Protection (Impact of Proposals) Act 1974. The statement was made widely available, with most affected lessees receiving a hand delivered copy. Copies were also supplied to interested conservation and recreation bodies. The Authority received 10 responses, 6 from government authorities, 2 from lessees and the remainder from the public.

76. The ACTEA then prepared a final Environmental Impact Statement, which was submitted to the Department of Home Affairs and Environment and subsequently cleared.

77. Much of the area to be traversed by the power lines is public land managed by the Department of Territories and Local Government. Details of access, clearing and other factors relevant to the management of the area will be determined in consultation with the Department. Similarly, the NCDC, as the body with the statutory responsibility for land use determination, will be consulted before final approval is given.

OTHER OBSERVATIONS

78. Eastern Parkway The Eastern Parkway is proposed to be the major access road to Canberra from the south. It is not expected to be completed for a number of years. The Committee is concerned that it is expected to form a judgment on the merits of the Causeway to Gilmore subtransmission line when its route has not yet been finalised. While the Committee considers this to be unsatisfactory it does acknowledge that the alignments of the Causeway to Gilmore line and the Eastern Parkway will need to complement each other in certain places and therefore cannot be

considered in isolation. The Committee notes that it is intended that the Causeway to Gilmore line will be the last stage of the project to be commenced, and that by then the final alignment of the Eastern Parkway should be known. The Committee requests the NCDC to give due cognizance to the effects any alignment of the Parkway would have on the route of the Causeway to Gilmore subtransmission line.

79. Future zone substations The Committee is aware that the proposal is not intended to fulfil the electricity requirements of the entire Tuggeranong Valley, and that should further southern development continue other zone substations inevitably would be required. The Committee is satisfied that the primary purpose of the Gilmore zone substation is to provide a supply of electricity to consumers in its immediate vicinity and that it will perform this function regardless of whether or not the Tuggeranong Valley is developed further. Although the Gilmore zone substation has been designed and sited so it is able to be connected to future zone substations, the Committee offers no comment on the desirability of further southern development. It considers its terms of reference to restrict it to the merits of the proposal and not to proposals which may or may not eventuate.

80. The Committee observes that responsibility for land use in the A.C.T. rests with the NCDC, and that proposed works of that body are exempt from scrutiny by the Committee unless specifically referred to by the Government.

LIMIT OF COST

81. Limit of cost estimates, based on October 1983 prices, are as follows:

		$m
Gilmore zone substation		
Civil and Structural Work		0.46
Building and Landscaping		0.40
Indoor Electrical Works		1.09
Outdoor Electrical Works		1.95
	Sub-total	3.90
Gilmore-Wanniassa Subtransmission		1.37
Causeway-Gilmore Subtransmission		1.65
	TOTAL	6.92

PROGRAM

82. The Gilmore zone substation is required to be commissioned before winter 1986. Initial connection to either Wanniassa or Causeway give adequate secure capacity in the short term, but connection to both sources is required for load growth expected by winter 1989.

83. It is proposed to link the substation first to the Wanniassa zone substation by a twin circuit line, and connect it to the Causeway at a later date. This staging process would have the advantage of allowing more time for better co-ordination between the Causeway line and the route of the Eastern Parkway proposed by the NCDC.

84. Committee's Recommendation The Committee recommends construction of the work in this reference.

RECOMMENDATIONS AND CONCLUSIONS

85. The recommendations and conclusions of the Committee and the paragraph in the report to which each refers are set out below:

		Paragraph
1.	IN ORDER FOR THE PROGRAM OF LAND DEVELOPMENT AND OCCUPATION OF THE TUGGERANONG VALLEY TO CONTINUE, THE ADDITIONAL SUPPLY OF ELECTRICAL POWER IS ESSENTIAL. THE NEED FOR A ZONE SUBSTATION AND ASSOCIATED SUBTRANSMISSION NETWORK IS EVIDENT.	21
2.	THE SITE IS WELL SUITED FOR A ZONE SUBSTATION TO EFFICIENTLY PROVIDE ELECTRICITY TO PRESENT AND FUTURE CONSUMERS. IT IS SUFFICIENTLY DISTANT FROM RESIDENTIAL AREAS TO RENDER TRANSFORMER NOISE LEVELS NEGLIGIBLE, AND IS CAPABLE OF BEING EFFECTIVELY LANDSCAPED TO MINIMISE THE VISUAL IMPACT OF THE SUBSTATION.	45
3.	THE ROUTE OF THE 132kV SUBTRANSMISSION LINES FROM WANNIASSA TO GILMORE IS SATISFACTORY. CARE HAS BEEN TAKEN TO MINIMISE THEIR VISUAL IMPACT ON THE LANDSCAPE.	55

Paragraph

4. ALTHOUGH THE PROPOSED CAUSEWAY TO GILMORE SUBTRANSMISSION LINE WILL HAVE AN ADVERSE IMPACT ON LAND USES IN CERTAIN PLACES, IT IS ACCEPTABLE. IT HAS BEEN DESIGNED TO BE AS MINIMALLY INTRUSIVE AS POSSIBLE WHILE STILL BEING ABLE TO CATER FOR PRESENT AND POSSIBLE POWER REQUIREMENTS. ALTERNATIVE ROUTES ARE LONGER, MORE COSTLY AND LESS DESIRABLE. 74

5. THE ESTIMATED COST OF THE PROPOSAL WHEN REFERRED TO THE COMMITTEE WAS $6.92 MILLION AT OCTOBER 1983 PRICES. 81

7. THE COMMITTEE RECOMMENDS CONSTRUCTION OF THE WORK IN THIS REFERENCE. 84

D.J. Foreman

(D.J. FOREMAN)
Chairman

Parliamentary Standing Committee
on Public Works
Parliament House
CANBERRA

8 October 1984

APPENDIX A

LIST OF WITNESSES

Bolton, W.E., Esq., Chairman, Australian Capital Territory Electricity Authority, 221 London Circuit, Canberra, Australian Capital Territory

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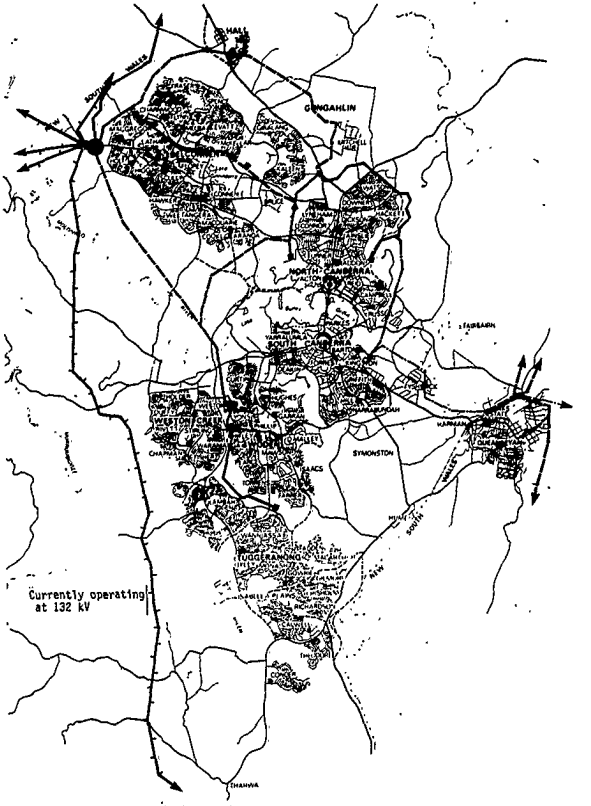
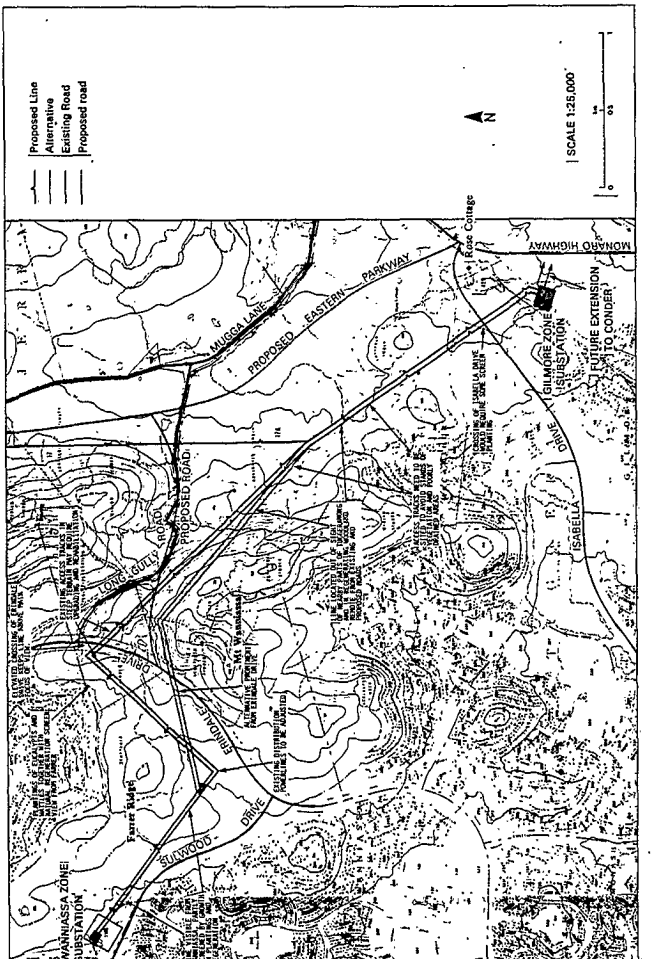


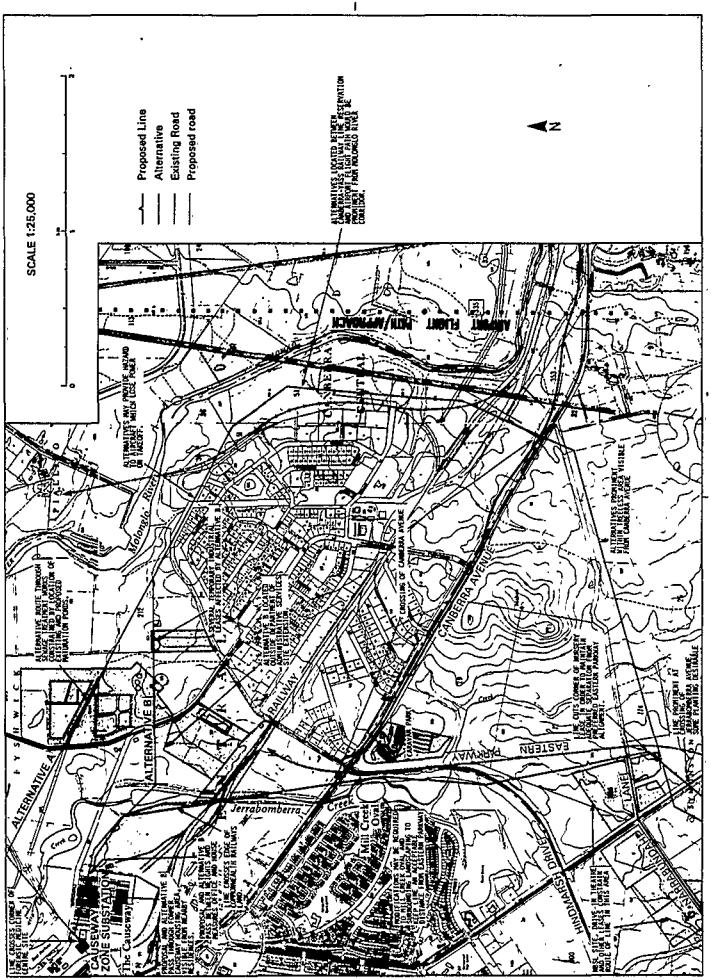
Electricity distribution network in the A.C.T.

APPENDIX C

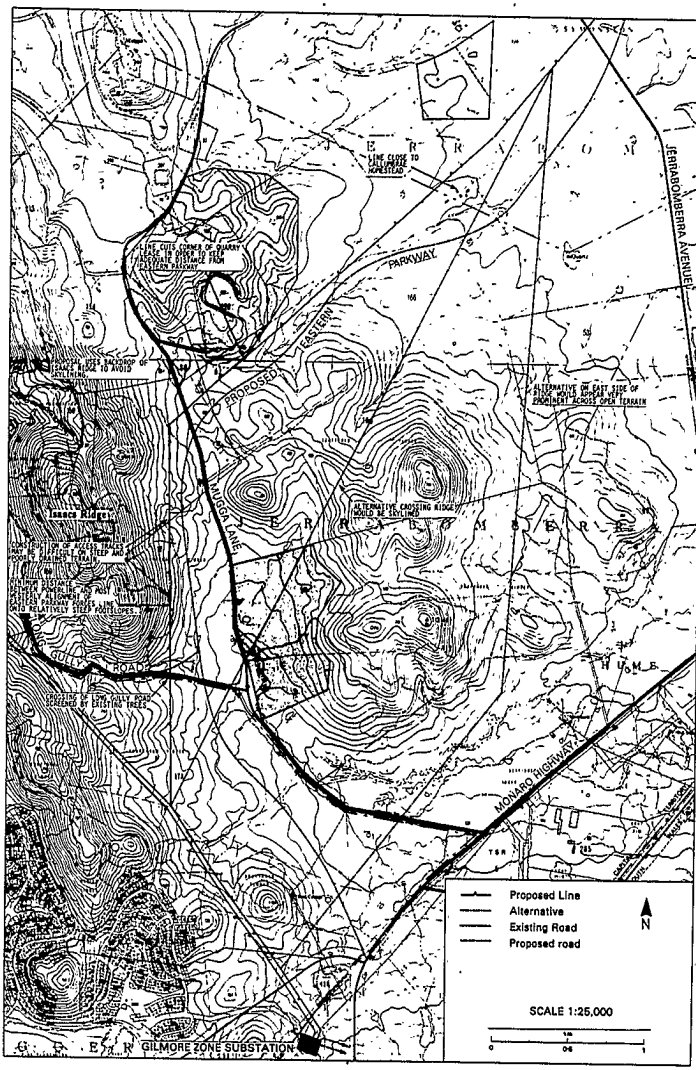
GILMORE ZONE SUBSTATION
GENERAL ARRANGEMENT PLAN



Wanniassa to Gilmore lines. Location in relation to existing and proposed land uses



Causeway to Gilmore line - northern section. Location in relation to existing and proposed land uses



Causeway to Gilmore line - southern section. Location in relation to existing and proposed land uses

(E-2)