SOUTHERN BROADACRE PLANNING STUDY

PREPARATION, REVIEW AND AUTHORISATION

FINAL REPORT
Southern Broadacre Planning Study

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1. Introduction & Objectives

1.1. Background

The study area is located on the eastern edge of Canberra, adjacent to the border with NSW and Queanbeyan and the major roads of Hindmarsh Drive, and Mugga Lane.

The study area is shown on Figure 1.1 and is approximately 3,000 hectares in area.

The subject site is covered by a Broadacre Land Use Policy under the Territory Plan (Refer Figure 1.2)

The original planning intentions of the site were for its development as the next town for the ACT. The draft Jerrabomberra Scoping Study (2000) identified that the development of the valley was constrained by a combination of ecological, cultural and physical factors.

The study has been overseen by a joint steering committee consisting of representatives from ACTPLA (Structure Planning), the Land Development Agency and Environment ACT (Wildlife Research and Monitoring). Due to the size of the study area and the complex issues to be addressed, other sections of ACTPLA (including Transport Planning, Rural leasing, Spatial Planning and Urban Design and Projects), Environment ACT (Heritage) and the National Capital Authority have also provided guidance regarding the key elements of the study.

1.2. Objective

The main objective of this study is to develop the environmental, planning and engineering requirements for the land-use structure of the area.

The outputs of this report include:

- A land use plan, identifying proposed land uses that address site constraints and opportunities
- An Outline Plan
- A Plan indicating proposed Variations to the Territory Plan

The outputs are underpinned by detailed environmental, planning and engineering assessments.

The outputs have also been tested through extensive consultation with several government agencies, lessees and other relevant stakeholders.

The findings of this report will form the basis for further, more detailed work associated with the ultimate development of the subject site.
2. Planning Context

2.1. Review of Previous Planning Work

In 1989, the Interim Territory Planning Authority (ITPA) undertook a planning study of the Jerrabomberra Valley. This work resulted in the report *Jerrabomberra Valley Planning Options. Metropolitan Policy Plan Review*, which considered existing land use and landscape character and identified environmental and engineering constraints on development. The study also identified a range of planning options for urban development in the Jerrabomberra Valley.

In 1989, existing land uses identified as constraints to development included the Navy’s HMAS Harman facility, the two quarries, Mugga landfill, the National Biological Standards Laboratory (now the Therapeutic Goods Administration) and the flight paths for the Canberra airport.

The report concluded that, “once the HMAS Harman facility is relocated it is possible to develop Jerrabomberra Valley as a subdistrict of South Canberra for a population of about 25,000. The planning of Jerrabomberra would need to be closely integrated with the adjoining South Queanbeyan area which is currently being planned for a population of more than 15,000.”

2.2. Jerrabomberra - National Ideas Competition

In 1994, a national ideas competition was held for the planning of the Jerrabomberra future urban area. Although at that time there was no decision to proceed with development, the competition was in response to the OECD’s call for case studies that illustrate methods, processes and outcomes for achieving ecological sustainable development. The sponsoring agencies for the competition were the National Capital Authority (Commonwealth Government), the Department of Environment, Land and Planning, ACT Electricity and Water (ACT Government) and the Queanbeyan City Council (Department of Urban Services, NSW).

The thirty-two entries provided a wide variety of responses with some common underlying themes:

- the need to return to pedestrian urban villages linked by transport routes
- that change would be gradual
- that sustainability need not imply more expensive or less effective approaches to urban development.

The report, *Jerrabomberra Valley: A case study for ecologically sustainable urban development* (1994), prepared by Foulsham and Munday Pty Ltd, to the OECD and Australian governments following the competition stated that “the judges believed that the competition met the expectations of the organisers in that many people in..."
Australia are willing to try to put the ideas of ESD into practice. They concluded that many of the submissions included ideas worth further consideration and wider diffusion. These ideas cover the following topics:

- technical and planning responses to such issues as water catchment, public and private transport, energy use, nurturing biodiversity, climate change, waste as a resource and building materials; and
- processes which allow community involvement and self-government, on-going evaluation and change in response to unforeseen development and new or better information.

These topics have provided an overview of current and innovative ideas for further development and possible testing.

As an input to the Jerrabomberra Valley National Ideas Competition, the National Capital Planning Authority (NCPA), commissioned a Jerrabomberra planning study undertaken by the consultant firm, Spiller, Gibbins and Swan Pty Ltd. Their report, Jerrabomberra Impact Study, (1994), investigated the area potentially available for development, including land in NSW and provided a preliminary assessment of the potential external impacts of development on adjacent areas and on the National Capital Plan. Specific issues explored were:

- employment and population levels
- travel implications and traffic impacts, particularly in the Central National Area
- choices between main infrastructure systems;
- catchment management and other environmental impacts
- implications for urban design intentions in the Central National Area.

In 1996, the NCPA further explored the development of the Jerrabomberra Valley and commissioned the consultants, Synectics to prepare the report, A Role for the Australian Government in the Ecologically Sustainable Urban Development of the Jerrabomberra Valley (1996). This report identified the potential benefits of implementing ecologically sustainable development in the Jerrabomberra Valley and defined the appropriate role of the Commonwealth Government in capturing these benefits.

In 1997, the planning for sustainable development in the Jerrabomberra Valley was again considered by the NCPA, who engaged Focus Pty Ltd to build on earlier proposals arising from the design competition. The consultant’s report, Practical Proposals fro the Jerrabomberra Valley as a Demonstration Area for Canberra, (1997), provided:

- an update for the framework for sustainable development
- detailed examples of some international best practice case studies
- the local application of sustainable development
the planning process for development of the Jerrabomberra Valley.

2.3. Jerrabomberra / Symonston Scoping Study 2000
The scoping study was undertaken by the ACT Planning Authority to provide a background to this current, more detailed study. The scoping study identified the presence of substantial areas of high ecological value, and these together with the constraints imposed by the HMAS Harman radio facilities led to the conclusion that development of the area for broad scale residential use as was had been previously envisaged would not be possible. A range of alternative development potentials were identified.

2.4. ACT and Sub-region Planning Strategy
The ACT and Sub-region Planning Strategy, adopted by Commonwealth, NSW, ACT and regional local governments in 1998, identified indicative areas with potential for long term future urban development. In particular, the Strategy recommends the following actions in relation to future urban areas to:

- identify Lower Jerrabomberra and Gooromon-Jeir as indicative areas with potential for future urban development in the longer term
- review the metropolitan structure of Canberra-Queanbeyan, including further analysis of all growth options by appropriate environmental and planning studies, assessment of social impacts in terms of community linkages and cultural identities, assessments of economic impacts and possible cross-border institutional arrangements
- apply the findings for establishing an appropriate planning and institutional framework for cross-border coordination of urban development, as developed under the joint Queanbeyan City Council and ACT Government project (under the Commonwealth’s Integrated Local Area Planning (ILAP) program)
- undertake a complete and timely ecological inventory of the region, including indicative areas, as essential and early component of the planning and development process
- undertake environmental studies and metropolitan structure evaluation prior to determining Lower Jerrabomberra as the next major urban development area.
2.5. The Canberra Spatial Plan

In March 2004 the ACT Government launched the Canberra Spatial Plan. This document outlines a strategic direction that will help manage change and provide for growth to achieve the social, environmental and economic sustainability of Canberra. The Southern Broadacre area (the subject of this report) is a large parcel of land with potential for development. This potential was identified in general terms in a scoping study conducted in 2000 and is also recognised in the Spatial Plan, which identifies the area as part of a strategic employment corridor linking the Majura Valley through to Symonston and the Hume Industrial area. This corridor is identified for the growth of industrial, broadacre commercial, tourism, recreation and transport related activities and it includes links to the Canberra International Airport. In this context, any substantial development of the southern broadacre area would be of metropolitan and possibly also of regional significance and consequently this study is being prepared to refine and update the findings of the scoping study and to reflect its strategic importance as identified in the Canberra Spatial Plan”.

2.6. Rural Policy Task Force

In 1996, the Rural Policy Task Force was formed to review rural land policies in the ACT. The Task Force’s report, released in June 1997, stated in relation to rural leases in short lease term areas that:

“3.2.2. Short term leases under current planning policies have been characterised as having terms up to 20 years, but in the areas of Symonston, Jerrabomberra, Hume and Majura, the terms are generally up to 2005. The most recent advice from the Metropolitan Planners is that rural leases in these areas may now be extended to 2020.”

The Task Force recommended that “lease terms to 2020 be granted in areas of Majura, Symonston, Hume and Jerrabomberra designated for rural purposes”.

(Recommendation 2).

The Government Response to the Rural Policy Task Force Report, issued in December 1997, generally agreed with this recommendation, with exceptions stating that “the Jerrabomberra Valley is identified as the next major area for urban development in the National Capital Plan and Territory Plan”. However, “current planning work has identified constraints likely to limit the nature and scale of development which can occur (particularly in catering for an upgraded Canberra airport and protecting threatened ecological communities and species under the Nature Conservation Act 1980).”

In February 2000, the ACT Government released “Farming in the ACT” which outlines the implementation of the ACT Government’s rural policy. This paper states that “long-term rural leases can best provide security for rural enterprises. However, the future needs of the community and need to protect environmental areas mean that
Gungahlin, Majura, Symonston and Jerrabomberra is subject to further investigation.” Figure 2.1 shows the current pattern of rural leases over the study area.

2.7. Statutory Responsibilities for protecting Biological assets

The ACT Government has statutory responsibilities under the *Land (Planning and Environment) Act 1991* and the *Nature Conservation Act 1980* to protect and conserve biological resources.

The *Territory Plan*, an instrument empowered by the *Land Act*, requires that biological resources be considered in the planning process. Specific goals in the *Territory Plan* in relation to biological resources are;

- to promote the conservation of natural resources;
- to conserve and enhance valued features of the Territory's natural, built, social and cultural environment; and
- to promote ecologically sustainable development, protect biodiversity, and provide for high standards of environmental amenity, urban design and landscape.

These specific requirements reflect the growing emphasis in planning to consider ecological issues, and in particular the explicit adoption in the Territory Plan of the principle of ecological sustainability.

The *Nature Conservation Act 1980* makes provision for the protection and conservation of native flora and fauna. The Act was strengthened in 1994 by an amendment which empowered the Minister to declare threatened species and communities in the ACT, and established the Flora and Fauna Committee to assist the Minister in this process.

A number of the “Action Plans” that have been prepared under this legislation to protect threatened species and communities are relevant to the study area. These species and ecological communities are summarised in section 3.2, with further detail provided in Appendix A.

New Commonwealth legislation also strengthens the protection of natural resources in the ACT. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* gives the Commonwealth a role in assessing and approving all actions which impact significantly on threatened species or communities. This is a marked change from the Commonwealth’s previous role in which they were only involved if the proposal were on Commonwealth land, or required a decision by another Commonwealth agency. Some of the species found in the study area come within the scope of this Commonwealth legislation. These are discussed in section 9.3.
2.8. Planning Framework for Natural Ecosystems in the ACT and Southern Tablelands

The planning framework for natural ecosystems of the ACT and NSW Southern Tablelands was prepared as a collaborative project by Environment ACT, NSW Department of Environment and Conservation (NSW National Parks and Wildlife), the Housing Industry Association (ACT) with the assistance of local councils and presents information on species and ecological communities of conservation importance at the regional scale. It is not a statutory document, but provides guidance for strategic planning and a regional context for assessing development proposals.

It reinforces the ACT Action Plans prepared under the Nature Conservation Act by providing additional information to assist in interpreting these in a regional context. In particular, it confirms the importance of parts of the ACT, including the present study area, as being of particularly high priority in the conservation of some threatened species and ecological communities.

2.9. Statutory Responsibilities for protecting Heritage

The ACT Government has statutory responsibilities under the Land (Planning and Environment Act 1991) to conserve and enhance valued features of the Territory’s natural, built, social and cultural environment.

The Territory Plan requires that cultural heritage be considered in the planning process. The Heritage Unit has advised that the study area contains a significant number of Aboriginal and historic heritage sites, both registered and unregistered, including areas of high Aboriginal archaeological potential (PAD’s) which will require further detailed assessment of heritage significance.

2.10. Changing Development Pressures

Various factors including environmental and planning studies and recent development pressures within the Jerrabomberra/Symonston area have emphasised the need for the review of this area for future urban use. These include:

- ecological survey and the preparation of Action Plans (including a recent review of the Yellow Box – Red Gum Grassy Woodland Action plan) for the protection of threatened species and ecological communities resulting in large parcels of land recommended for protection in nature reserves. In particular, the Native Temperate Grassland and the Grassland Earless Dragon are now nationally recognised as endangered and their protection in the ACT must be in accordance with both ACT and Commonwealth legislation.

- more certainty about the timing for the relocation of HMAS Harman receiving station (currently estimated between 2004-2005). These facilities have been a major constraint to urban development in the Jerrabomberra Valley in the past.
the 2000 review of industrial land in the ACT which makes recommendations for the expansion of the Hume industrial area and other industrial uses which have implications for the study area. Territory Plan Variation No. 175, finalised in 2003 confirms the findings of the earlier study.

individual developments and pressures for further development in the study area without a planning framework to make integrated planning decisions.

Pressure from rural lessees for more certainty of land tenure to enable them to invest in longer term solutions to resolve farm and environmental management issues.

A rapid increase in residential land prices in Canberra and the region in the last few years, reflecting high levels of demand for land, has had effect of making all development opportunities more financially attractive.

Agreement reached between the Canberra Airport and the ACT Government regarding restrictions on residential development in parts of the Jerrabomberra, Symonston area.

A feasibility study carried out by RA Young & Associates investigating a possible Aquatic Park on Lake Jerrabomberra, incorporating a rowing course and other related uses.

2.11. Existing Land Use Policy

2.11.1. National Capital Plan

The Jerrabomberra Valley lies within one of the Broadacre Areas under the National Capital Plan. The Plan lists a range of uses permitted in these Broadacre Areas which “may act a buffers between towns, provide sites for uses which require large land areas or may benefit from or be best located within a non-urban setting, and in some cases provide a land bank for future urban areas”. The National Capital Plan also identifies the Jerrabomberra Valley as an “Area Under Investigation for Urban Use” and pending completion of planning studies, uses should remain rural in nature, or be of short duration and involve minimal improvements.

Two major roads within the study area, the Monaro Highway and Canberra Avenue, are Designated Areas identified as “Approach Routes” in the National Capital Plan. This plan states that “It is in the interests of the National Capital that development flanking Approach Routes is of a type and quality complementary to the role and status of the city.” Special requirements, which are outlined in approved Development Control Plans, apply to development on land adjacent to Approach Routes. Other controls in the National Capital Plan (Part 5.2) and the Territory Plan (Part C4 1.1) which relate to the Jerrabomberra Valley are that:
all proposals for development within the 25 ANEF contour (see Figure 2.2) shall be referred to the Department of Defence for examination and comment and such comment shall be taken into account when arriving at a decision

all proposals for development within 2km of the radio station shall be referred to the Department of Defence for examination and comment and such comment shall be taken into account in arriving at a decision. (see Figure 2.3)

a buffer zone of 1km will be maintained around the quarry sites in order to ensure protection of adjacent areas from noise, air blast overpressure and ground vibration nuisance. Within this protection zone, only development free of constraints on quarry operations is to be permitted (see Figure 2.3)

development around landfill areas needs to be restricted to prevent the environmental impacts of these existing land uses, such as the spread of odours and wind-blown particles, conflicting with more sensitive land uses. No new residential use or community use will be permitted within 500 m of the boundaries of these areas (see Figure 2.3).

2.11.2. National Land
Within the Jerrabomberra Valley and Symonston area there are several existing facilities on National Land (see Figure 2.2). These are the Navy facilities including, HMAS Harman adjacent to Canberra Avenue and the Bonshaw radio station between Canberra Avenue and the Monaro Highway

2.11.3. Territory Plan
The Territory Plan indicates the area within the Jerrabomberra Valley as subject to review (shown on the Territory Plan map as a red line within which the code ‘R’ appears) and Part A of the Territory Plan (Planning Principles and Policies) section 2.8 states that “a possible new urban district at Jerrabomberra-Symonston will be investigated.” (See Figure 1.2).

The majority of the study area is identified in the Territory Plan as Broadacre Land Use Policy with one area of Industrial Land Use opposite Hume industrial estate to the south.

The objectives of the Broadacre Land Use Policies are:
a) to make provision in a predominantly rural landscape setting for a range of uses which require larger sites and/or a location outside urban areas
b) to make provision for activities requiring clearance zones or protection from conflicting development
c) to ensure that development does not adversely impact on the environmental quality of the locality
d) to ensure, where appropriate, that development and the use of land does not undermine the future use of land which may be required for urban and other purposes.

The Broadacre Land Use Policies provide for a range of uses including agriculture, caravan park, corrections facility, defence installation, health facility, outdoor recreation facility, scientific research establishment, tourist facility and transport depot. Schedule 1 of the Broadacre Land Use Policies, Part B10 of the Territory Plan Written Statement lists all the purposes for which Broadacre land may be used.

Within the Broadacre Land Use Policy area there are several sites which have area specific policies. These include:

- **Area 10D** - Small agriculture enterprises, Symonston. This area (Section 103) adjoins Hindmarsh Drive and the uses permitted are generally small area agriculture and agriculture-related activities.

- **Area 10E** - Mobile home park, Symonston and Sundown Village. This policy allows for the mobile home parks which occupy these two sites.

- **Area 10G** - Existing Quarry, Jerrabomberra. This is to make provision for quarrying and other compatible uses during the life of the quarry.

- **Area 10H** - Mugga Landfill Site, Jerrabomberra. This is to make provision for land for the disposal of non-recyclable wastes and for managing recyclable materials.
3. Constraints and Opportunities

3.1. Existing Land Use

The majority of the study area is currently used for rural purposes either as grazing, horse agistment or for small scale agriculture purposes. Other major uses are, the Mugga landfill and the quarry along Mugga Lane (see Figure 2.2).

Three large institutions, HMAS Harman receiving station and naval base, the Therapeutic Goods Administration (TGA) and the Australian Geological Survey Organisation (AGSO) are also located in the study area on National Land.

Quamby Remand Centre and the Juvenile Justice Residential Centre are adjacent to the study area along Mugga Lane. Trotting and dog racing facilities are located on Jerrabomberra Avenue and the Southcare helicopter operates from a site on the Monaro Highway north of Hume.

A detailed list of current businesses and institutions within the study area is provided in Appendix B.

3.1.1. Rural uses

Of the 16 rural properties shown on Figure 2.1, there are eight large properties located within the study area, ranging from 80 to 350 hectares (Properties numbered 1 to 8). These eight rural properties are leased for grazing and agricultural purposes. All but two of these rural properties have leases which expire in 2005, the remainder have quarterly leases.

There are a further six smaller rural properties between Hindmarsh Drive and Narrabundah Lane on Section 103 and Section 97 Symonston ranging in size from 7.5 to 35 hectares. These include the Lowline Stud on Block 5 Section 103 Symonston and the historical Mugga Mugga Homestead on Block 6 Section 103 Symonston. These leases expire in 2020, except for the Mugga Mugga lease which expires in 2007. The “Callum Brae” and “Woden” homesteads are important cultural heritage places that are entered onto the ACT Heritage Places Register.

“The former Mugga zoo site at Block 1 Section 3 is leased with a term that expires in 2029.

There are also two rural homesteads within the industrial area opposite Hume.

In relation to rural leases where endangered or vulnerable animal species and ecological communities have been found, the Action Plans state that:

“Some of the core sites of high conservation value are within rural leases. Preliminary investigations indicate that these leases currently contain withdrawal clauses allowing for the use of land for public purposes. The Rural Policy Task Force has recently reviewed all aspects of rural leases including the recommendation of...
appropriate lease terms. Two recommendations of the Task Force that affect the Action Plans are that:

- the lease term of the Jerrabomberra Valley to be the year 2020 and
- there are no withdrawal clauses over any part of the rural lease unless it has been clearly defined for an imminent public work.

This will mean that the Territory would have to withdraw any area of land having conservation significance at the time of an application for a new lease, or acquire it subsequently under the provisions of the Land Acquisition Act 1994.

Environment ACT will need to identify areas requiring special conservation measures before applications for extended lease terms are received. In the event that large areas of a lease are to be withdrawn for conservation purposes, consideration must be given to the viability of the remainder of the lease. Grazing may be undertaken where it is considered that it will be consistent with the maintenance of the natural temperate grassland conservation values.”

3.1.2. Agistment

Almost all of the major rural lessees within the Jerrabomberra/Symonston area have agistment licences over adjoining land (see Figure 2.1). The licence agreements to graze stock are administered by Environment ACT, ACT Parks and Conservation Service.

Recommendation 9 of the Rural Policy Task Force Report recommends that “the current policy of encouraging the consolidation of smaller rural holdings be continued and actively promoted and that:

- where farmers have continuously held land under agistment for not less than 15 years they be directly offered a lease over it; or
- where agistment has been for a period less than 15 years adjoining lessees be given the opportunity of tendering for its incorporation under their existing lease.”

The Government Response to the Rural Task Force Report agreed with this Recommendation subject to conditions that:

- where land has been held under agistment by the same person for 15 or more years, and that person has an adjoining lease, they would be offered a direct grant over the agisted land.
- if the land is of a size or could be consolidated with adjoining agistment to make the block viable, then the government may consolidate and sell the land on the open market.
- where land has been held under agistment by the same person for less than 15 years, current policy would be maintained, which is to give the first right to the last lessee provided present land adjoins the agisted parcel and the lessee has
maintained good land management practices. However, if none of these situations are present tendering by adjoining lessees is acceptable.

Public land will NOT be available for inclusion in a lease on this basis. Agistment on public land generally involves a long term requirement where grazing serves a purpose other than primary production (e.g., conservation) and may need to be altered or removed on an ad hoc basis. Leases would not be appropriated in these cases."

Longer term agistment in the Jerrabomberra Valley will need to be assessed against the Action Plan recommendations and development pressures on a site by site basis.

3.1.3. Industrial Areas

Hume industrial area

The Hume industrial area is located adjacent to the study area along the Monaro Highway adjacent to the NSW border. A large parcel of undeveloped land identified for Industrial Use in the Territory Plan on the north western side of the Monaro Highway is effectively part of the Hume Industrial Estate although it is located in Symonston.

In February 1998, there were 154 hectares of vacant industrial land within the Hume Industrial Land Use Policy Area. The majority of this land is unserviced, including the approximately 65 hectares on the west side of the Monaro Highway. Only 3.8 hectares is fully serviced.

A Native Title Claim for a large area (17 hectares) on Section 8 Hume imposes some constraints on the release of this land for development in the short term.

The ACT Industrial Land Study (June 1998) concluded that generally there is an adequate supply of existing industrial land for new industrial use in the ACT. If demand for land in Hume remains steady, supply was considered to be adequate for 8-10 years, but one large demand could create a shortage in the area. A discussion paper prepared by the Planning Authority in 2000 generally confirmed this position and provided background to a review of Territory Plan Industrial Land Use policies. The subsequent Territory Plan Variation did not seek to “reserve” any substantial areas to industrial use. We are now approaching the end of the 8-10 year period and the identification of further industrial land opportunities is warranted.

Advanced Technology Manufacturing Estate (AMTECH) - Canberra Avenue, Symonston

In 1993, the ACT Government developed the advanced technology estate (AMTECH) on Section 4 Symonston after an approach from Canberra Region Advanced Technology Manufacturer’s Association seeking suitable sites for their members to
co-locate. The estate is immediately to the north of the study area and opposite Fyshwick on the north side of Canberra Avenue.

The estate is approximately 25-30 hectares with 18 blocks available in Stage 1 and approximately 34 blocks available in Stage 2. To date, 5 of the Stage 1 blocks have been leased. Of these, 3 sites have been developed.

The endangered Grassland Earless Dragon has been found within Stage 2 of the AMTECH estate but 40% of the site will be available for development.

Quarry sites
The only remaining hard rock quarry in the ACT is located within the study area on Block 2031 Jerrabomberra. Boral Resources currently operates the quarry located on Mugga Lane and known as the Mugga #1 quarry. The site is approximately 106 hectares and contains reserves of hard rock used for the building and construction industry in Canberra and surrounding region. In addition to quarrying, the site is also used for concrete batching, bituminous asphalt production and truck maintenance and refuelling.

The current lease for the quarry has been renewed recently to the year 2020 (see Figure 2.3). In the Preliminary Assessment (PA) submitted with the application for the new lease, Boral have stated that the Mugga 1 quarry currently produces 150,000 to 350,000 tonnes of crushed rock products per year and that “the quarry has reserves of 18 million tonnes of mixed grades, which at current and projected production rates will last approximately 100 years.”

Mugga #2 quarry, adjacent to the study area in the Designated Area Canberra Nature Park along Mugga Lane ceased operation in 1997 and has been returned to the ACT Government following rehabilitation and landscaping.

Mugga Lane landfill
The Mugga Lane landfill site, an area of approximately 123 hectares is located in the study area adjacent to Mugga Lane. (refer to Figure 2.2). In the 1994 Master Planning for the ACT landfills it was recommended that the Mugga Lane landfill be upgraded by restricting access for the public and, upgrading environmental controls and capacity. The Master Plan also recommended the development of a Resource Recovery Estate to enhance resource recovery industries and provide modern recycling and transfer facilities adjacent to the Mugga Lane landfill.

Development around landfill areas needs to be restricted to prevent the environmental impacts of these existing land uses, such as the spread of odours and wind-blown particles, conflicting with more sensitive land uses. No new residential use or community use will be permitted within 500 m of the boundaries of these areas (see Figure 2.3).

### 3.1.4. Contaminated Sites

The ACT Government’s “Strategic Plan for Contaminated Sites Management 1995” requires that potentially contaminated land will be investigated at the earliest stages of the planning process to ensure a site is suitable for the proposed development. This will be necessary for much of the land included in this study, as part of the detailed planning phase.

Contaminated sites are unlikely to be of large extent and will typically consist of abandoned sheep dip sites and residue from minor farm-based industrial activities, such as diesel and chemical fertilisers.

### 3.2. Ecological Characteristics

The study area contains a large number of features of ecological interest including endangered woodland and grassland communities, threatened plant and animal species, a wetland used by migratory birds subject to international treaties, and wildlife movement corridors. The ACT Government has determined that some of the woodland areas will be protected as native reserves, but the precise boundaries and the official names of these areas have still to be resolved. There are other grassland areas which are also proposed as nature reserves, and which interface with a nature reserve on the New South Wales side of the border, adjoining the study area.

A detailed ecological assessment of the study area is presented in Appendix A. The main points arising from this assessment are as follows:

#### 3.2.1. Woodland

The woodland is located in the hills and lower slopes of the western part of the study area (refer Figure 3.1). This includes some Yellow Box – Red Gum grassy woodland, which is an endangered ecological community. The ACT Government has announced its intention to protect most of the better quality woodland in nature reserves west of the Monaro Highway. The precise boundaries of these reserves have still to be finalised, and the areas currently have no formal conservation status.

It is important to maintain ecological connectivity between woodland areas to facilitate wildlife movement. This could be achieved by retaining an area of lower quality woodland.
It is also desirable to maintain ecological connectivity to the south, linking with remnant woodland along the Monaro Highway and in New South Wales. The best opportunity for such a corridor is likely to be via the high quality woodland west of Mugga Lane and south of Long Gully Road, through the ‘Rose Cottage’ area.

3.2.2. Natural temperate grassland

There are two main areas of natural temperate grassland within the study area, one immediately west of the Monaro Highway and Jerrabomberra Avenue, and the other east of Jerrabomberra Creek. Some other smaller areas are also present. Natural temperate grassland is an endangered ecological community in the ACT, and also under the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act).

Most of the better quality grassland west of the highway would be conserved within the proposed ‘Callum Brae South’ Nature Reserve (or ‘Woden Grassland Reserve’ as described in the present text). The ACT Government has also announced its intention to establish a nature reserve for grassland conservation east of Jerrabomberra Creek in the Mike’s Hill, East Woden and HMAS Harman sites. The Mike’s Hill and East Woden sites would be separated only by the railway line from the recently declared Letchworth Nature Reserve in New South Wales. These grassland reserves are important conservation opportunities and should be regarded as significant planning constraints, although their precise boundaries have yet to be resolved. Formal establishment of the reserves would follow on from a Territory Plan Variation and gazetted process.

The land associated with the Bonshaw Naval Receiving Station is constrained by its existing use, which is beneficial in protecting the grassland habitat for two threatened species (see below), which is probably the main consideration from a long term conservation viewpoint.

Other natural temperate grassland areas of lower botanical significance are located further north on the ‘Callum Brae’ property and within the ‘Mugga Mugga’ property (see Appendix A for further details). There may be future potential for linking the major grassland areas located respectively west of the Monaro Highway and east of Jerrabomberra Creek by rehabilitating to a more native condition some of the pasture between the creek and the highway and utilising this for a purpose which is consistent with grassland conservation.

3.2.3. Grassland Earless Dragon

The most significant ecological factor influencing planning in the Jerrabomberra Valley is the distribution of the Grassland Earless Dragon (Tympanocryptis pinguicolla), which is listed as endangered under both the EPBC Act and the Nature Conservation Act (NC Act). The Grassland Earless Dragon has received particular
attention as a threatened species in the ACT, not only because of its endangered status but also because its entire population may be confined to a limited area of grassland habitat within the Jerrabomberra and Majura Valleys. There are currently no formally gazetted reserve areas for the Grassland Earless Dragon in the ACT.

The Grassland Earless Dragon (GED) is present in five ACT grassland areas within or adjacent to the study area (refer figure 3.2). Following previous scientific assessment of its status in 1998, it was recommended that all five areas be protected from development, pending further investigation of whether the species in the ACT is the same as that found in a separate population in the Cooma area. Such investigation has indicated that the species are distinct but recent investigations have also confirmed the presence of populations in the New South Wales part of the Jerrabomberra Valley immediately south of the study area in the Letchworth Nature Reserve and the ‘Poplars’ estate. The most important habitat for the GED within the study area will be protected within the proposed grassland reserves recently foreshadowed by the ACT Government.

The ACT Flora and Fauna Committee has recently reviewed the current and potential situation with respect to the GED and has recommended the following conservation principles to guide the decision-making in relation to development of urban areas and the protection of areas of nature conservation significance:

- The protection of all existing known habitat of the GED is of primary importance. Preliminary genetic studies suggest that the Cooma animals (GED) are a different species from those in the ACT, hence the ACT populations are likely to represent the entire distribution of this species. Consequently, destruction of any known habitat is likely to significantly impact on the potential for the survival of this species.

- The need for corridors facilitating movement of the GED between different habitat areas is an important consideration in design of reserves or other protected areas.

- Areas which buffer the habitat of the GED from the impacts of urban or industrial development need to be appropriately sited and managed for maximum effectiveness for this purpose.

- Areas with multiple conservation values (for example the presence of more than one threatened species) should be considered for priority protection, ahead of areas supporting single threatened species. On the other hand, it is important to recognise that the preferred habitat of the GED is not necessarily the best quality natural temperate grassland.

- Priority should be given to protecting larger areas of conservation value, particularly those with potential for connectivity with other such areas.

- The translocation of threatened reptiles (for example, the GED) should not be considered as a viable alternative to the protection of the species and its habitat in-situ.
The GED is known to utilise arthropod burrows as shelter, and it is likely that these, along with an association with low native tussock grasses, are an important habitat feature for the species.

Further information on these principles and the history of investigation into the GED in this area is contained in Appendix C – GED Chronology.

Two broad strategy options have been identified for the long term conservation of GED in the Jerrabomberra Valley.

**Option 1** – Establish a reserve system based on some or all of the known habitat areas, with any habitat areas not included in the reserve system being managed in a way sympathetic to GED conservation and corridors connecting these habitat areas maintained within future development.

**Option 2** – Establish a reserve system based primarily on the higher quality habitat areas and augment this through the rehabilitation of other potential habitat areas. In this option the smaller, less secure habitat areas could still be retained in sympathetic land uses in the short term but may cease to be viable in the long term.

These options are described further and evaluated in Appendix A.

In summary, both options have potential to enhance GED conservation in the Jerrabomberra Valley. Option 1 is likely to be more effective in the short term, while Option 2 has the potential to provide a superior long term solution. Both options, however, are subject to some measure of uncertainty as to their effectiveness in those parts of the area where existing habitat is not formally conserved or where future habitat is depended on rehabilitation or natural regeneration.

In determining land use options, this study has followed an approach which aims to maintain the above principles recommended by the Flora and Fauna Committee over the long term. This includes protecting core GED habitat in reserves, together with other grassland and woodland habitat, and maintaining surrounding or connecting areas in a land use which is consistent with habitat conservation (e.g. rural conservation leasehold, institutional or urban development subject to certain criteria). This approach is discussed in relation to specific areas in Chapter 4, and is consistent in principle with maintaining both of the strategy options for GED conservation, at least in the short term while a better understanding of factors affecting GED viability is developed.

**3.2.4. Other threatened species.**

Other species listed as threatened under the *NC Act* and/or the *EPBC Act* which are known to be present within or close to the study area are listed in the Table 3.1.
### Table 3.1 Threatened Species

<table>
<thead>
<tr>
<th>Species</th>
<th>Status NC Act</th>
<th>Status EPBC Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Striped Legless Lizard (Delma impar)</td>
<td>Vulnerable</td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Pink-tailed Worm Lizard (Aprasia parapulchella)</td>
<td>–</td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Perunga Grasshopper (Perunga ochracea)</td>
<td>Vulnerable</td>
<td>–</td>
</tr>
<tr>
<td>Golden Sun Moth (Synemon plana)</td>
<td>Endangered</td>
<td>Critically endangered</td>
</tr>
<tr>
<td>Button Wrinklewort (Rutidosis leptorrhynchoides)</td>
<td>Endangered</td>
<td>Endangered</td>
</tr>
<tr>
<td>Small Purple Pea (Swainsona recta)</td>
<td>Endangered</td>
<td>Endangered</td>
</tr>
</tbody>
</table>

Site-specific records from targeted surveys within the study area have been compiled by Environment ACT for all of these species. Surveys have also been undertaken in some nearby areas of New South Wales.

There are also several threatened woodland bird species which have been recorded in the Callum Brae woodland area (e.g. Hooded Robin, Brown Treecreeper, Swift Parrot).

Where the above species occur within the study area, they would generally be protected as a result of the existing or proposed nature reserves and/or other measures to conserve Grassland Earless Dragon habitat. The one exception is *Rutidosis* which is present in small numbers in a rural road reserve on the ACT border and within the HMAS Harman site, although this may have the potential to spread to adjacent land under more sympathetic management. It is present in large numbers in Queanbeyan Nature Reserve which adjoins the study area.

### 3.2.5. Wetlands and Latham’s Snipe

There is a wetland south of Canberra Avenue adjacent to HMAS Harman which has been found to be used as habitat by Latham’s Snipe (*Gallinago hardwickii*), a migratory bird which is subject to international treaties with Japan and China. Protection of snipe habitat is subject to the provisions of the Commonwealth *EPBC Act*. This is one of several wetlands in the Canberra area used by the snipe during its annual migration between Japan and Australia. It is desirable to protect the wetland and its catchment, although this need not preclude development a short distance from the wetland, provided that an adequate buffer is provided.
3.2.6. Creative conservation opportunities

The main opportunities for creative conservation to enhance the ecological qualities of the study area while achieving acceptable land use outcomes in a wider context are as follows:

- Enhancement of potential GED habitat between existing grassland habitat and the New South Wales border/ Letchworth Nature Reserve. Figure 3.2 shows the recently created ‘Letchworth Grassland’ conservation area in NSW. This is contiguous with the proposed reserve in the ACT, the two areas being divided only by an unsealed road and railway line, both of which are rarely used. Opportunities will exist for cooperative management and the investigation of techniques to facilitate movement of animals across these barriers.

- Rehabilitation of a native grassland corridor between Jerrabomberra Creek and the Monaro Highway in the south of the study area. Figure 3.2 shows that a grassland corridor is intended to link the Woden and East Jerrabomberra reserves. Design options for the proposed prison will incorporate this corridor and an existing large culvert under the Monaro Highway may be able to be utilised. This is consistent with the outcomes of the Prison Preliminary Assessment.

- Creation of diverse aquatic habitat if a lake is constructed on Jerrabomberra Creek, having regard to the need to minimise the risk of bird hazards to aircraft. The creek corridor is shown in figure 4.2. The boundaries of this zone are defined by the 1:100 year flood line, within which development will not be possible. This provides an opportunity for the introduction of substantial aquatic environments including wetlands and lakes.

3.2.7. Conservation Options

The study area is exceptional in terms of the diversity and quality of ecological attributes that it displays for an area that has experienced a century and a half of environmental change. It is likely that the reduced land use pressures over recent decades have allowed a recovery process which has the potential to continue, possibly at an accelerating rate, in the absence of new development pressures. From a purely ecological perspective, it would not be difficult to make a case for protecting the whole of the area, or at least a majority of it, as a woodland and grassland reserve.

This, however, is unlikely to be feasible in social and economic terms. A more realistic outcome is one which conserves the most valuable ecological features of the area and, as a trade-off, allow other areas to be developed or used for other low intensity activities (e.g. light grazing), despite having some ecological values.

Based on the assessment in Appendix A, the following conservation options have been recommended for consideration from a wider planning perspective:
Protection of Callum Brae Nature Reserve areas from any significant new development, subject to fine-tuning of boundaries.

Retention through appropriate land uses, if not as additional reserve areas, of a broad woodland corridor between these two nature reserve areas and to connect with the woodland west of Mugga Lane and south to the Monaro Highway at Isabella Drive.

Protection of a grassland reserve based on Mike’s Hill which is contiguous with the Letchworth Grasslands, apart from the presence of the railway.

Protection of natural temperate grassland within the HMAS Harman of the Bonshaw Hill area as GED habitat with a view to this ultimately becoming an extension to the nature reserve in the Mike’s Hill area.

Retention of other existing GED habitat subject to development criteria or in the interim under low intensity uses while viable populations of GED remain in these areas, as demonstrated by periodic monitoring, together with retention of linkages to major habitat areas.

Retention of the grassland between the HMAS Harman – Bonshaw site and the New South Wales border, either under a low intensity use or potentially as an extension to the nature reserve encompassing Mike’s Hill and Bonshaw Hill, with a view to promoting the regeneration of GED habitat within this area.

Retention of a grassland corridor linking the Callum Brae South Nature Reserve and the proposed Mike’s Hill Nature Reserve in a form of land use which may allow its long-term rehabilitation to native grassland.

Retention of the existing wetland that is utilised by Latham’s Snipe south of Canberra Avenue.

If a water feature is created on Jerrabomberra Creek, design of at least part of this with a view to enhancing waterbird habitat, consistent with aircraft safety considerations.

These options have been used as the basis to inform the planning for the area. They reflect a precautionary approach towards GED conservation and are intended to offer the flexibility of certain types of development or land use within secondary habitat areas for GED, as discussed further in Chapter 4.

3.3. Cultural Characteristics

Within the Jerrabomberra/Symonston study area, there are eight sites listed as ACT Heritage Places (refer to Figure 3.4), in addition to the Canberra Nature Park adjacent to Mugga Lane which has been nominated to the interim Heritage Places Register. Of these, only two sites, “Mugga Mugga” and “Rose Cottage”, have been included in the Heritage Places Register at Appendix V of the Territory Plan. The Callum Brae property and Woden Homestead are proposed for inclusion and draft citations have been prepared. The remaining sites have been nominated to the interim Heritage...
Places Register and these places are being assessed according to priorities established by the ACT Heritage Council.

“Mugga Mugga” and “Woden” Homestead are also listed on the Register of the National Estate. In addition to “Mugga Mugga” and “Rose Cottage” sites mentioned above, other sites within the Jerrabomberra Valley, Hume and Symonston areas have been surveyed and assessed for their cultural significance. This has been, however, on an ad hoc basis and usually in relation to individual development pressures. These include:

- cultural resource survey of the Jerrabomberra Creek trunk sewer (1992) which is located adjacent to the Jerrabomberra Creek
- survey of the Aboriginal quarry on Block 1 Section 8 Symonston
- draft report on the Travelling Stock Reserve in the ACT, including the Hume site (1994)
- preliminary cultural resource survey of various sites in the Hume industrial estate.

Further detailed assessment and surveys and recommendations for the nominated sites, particularly Woden homestead are required. Surveys for heritage significance are required for the majority of the study area. A range of relevant studies and investigations have been completed in the past as follows:

- Proposed Fyshwick Effluent Rising Main Replacement Cultural Heritage Assessment, Navin Officer (2002).
- A Cultural Heritage Assessment of the Proposed SouthCare Aero Medical Facility, Hughes P.J. (2000).
Although not considered a constraint to future development, known Aboriginal sites within the study areas will need to be considered prior to any changes in land use policy. Special conservation measures protecting the Aboriginal sites from disturbance may also need to be included in some future leases, especially where Aboriginal sites are located within areas designated for industrial and urban land use policy.

3.4. Defence Requirements

Discussions with the Department of Defence have indicated that the intention is to relocate the HMAS Harman radio facilities. The extensive buffer zone that currently applies will not be required. This will have the effect of, subject to other constraints, freeing up a substantial area of land for development and other purposes including conservation. Defence have indicated that the relocation is imminent, scheduled to take place within two years. The locations of the existing facilities and their buffer zones are shown on Figures 2.2 and 2.3.

A meeting was held with Defence staff (Brigadier Hutchinson and others) on 19 June 2003 to confirm all of the above. The intention to relocate the equipment and the reduced buffer requirement was confirmed. A precise date was not able to be given as this has not yet been decided. Advise from Defence (by letter 25 June 2004 to Mr John Paget ACT Prison Project) was that:

1. **HMAS Harman is a key Defence communications centre and is currently undergoing modernisation as part of the High Frequency Modernisation Project (HFMOD). The impact of this on the Prison Project is one of timing.**

2. **HFMOD has experienced a number of delays and completion is now expected in early to mid 2005, however this date may be subject to delays for defect rectification.**

3.5. Canberra Airport Issues

The Canberra Airport is located to the north of the eastern sector of the study area. The construction of residential dwellings in areas subject to aircraft noise is not advisable as it results in unacceptable levels of amenity for residents and complaints against airport operations. Planning agencies throughout Australia have adopted Australian Standard AS2021 as a basis for determining the location limits for residential developments in the vicinity of airport approach and departure corridors. AS2021 defines the Australian Noise Exposure Forecast (ANEF) system. The ANEF system calculates “noise contours” along flight paths based on projected aircraft movements, types of aircraft, distance from the airport (and hence height of aircraft) and topography. For residential development the Australian Standard shows that two contour lines are significant as follows:
Unrestricted residential development is considered to be appropriate outside the ANEF 20 line.

Between ANEF 20 and ANEF 25 residential development is considered to be acceptable subject to the inclusion of special noise amelioration measures in residential building construction.

Land within the ANEF 25 contour is considered to be unsuitable for residential development.

It is noted that some residential development currently exist within these bounds at HMAS Harman and various rural properties.

The areas of land within the Aircraft Noise Protection Zone but outside the 20 ANEF contour are currently zoned for purposes which do not permit residential or associated development. Should there ever be any proposals to permit noise-sensitive land uses in these areas; special consideration will need to be given to their suitability and to noise attenuation requirements to ensure that internal noise levels meet standards (notably AS2107).

The Canberra Spatial Plan recognises the economic importance of the Canberra International Airport. Ensuring that airport operations continue within a robust, transparent and well established legislative and policy framework is important. As part of the implementation of the Spatial Plan it is proposed to initiate a variation to the Territory Plan to include the 20 ANEF as a clearance zone within which residential (suburban or rural) development will not be allowed.

In addition, the Spatial Plan recognises an Aircraft Noise Protection Corridor. This identifies areas in the ACT that may be affected significantly by aircraft noise. Management of the sale of land located outside the 20 ANEF contour but within the Aircraft Noise Protection Corridor should include advice to potential residents about possible noise effects and the application of appropriate design criteria including noise attention requirements.

The long term (Year 2050) ANEF 20 and 25 contours and the Aircraft Noise Protection Corridor are shown on Figure 2.2. Comparison of these with Figure 4.2 indicates that there are areas deemed to be urban capable within the ANEF 20 contour. Much of this is very suitable for non-noise sensitive developments/land uses.

AS2021 outlines the Australian Noise Exposure Forecast (ANEF) system. Forecast noise levels are shown using a series of contours representing points of equal noise exposure. These contours are derived from information on existing and future flight paths, aircraft types, forecasts of aircraft movements and height of aircraft above the ground surface. (Generally, the further from the airport, the higher an aircraft will be and the lower the noise experienced on the ground will be to an exposed observer. From a planning perspective, two ANEF contours are some significance in relation to locating noise-sensitive land uses in the environs of airports. Noise-sensitive land uses include houses, home units, flats and caravan parks, but also schools and aged
persons facilities like nursing homes and hostels (essentially any such use which is of long-term character). AS2021 provides, with very limited exceptions, that such land uses should not be permitted in areas within the 25 ANEF contour. They may be permitted in areas between the 20 ANEF and 25 ANEF contours, generally with conditions requiring noise insulation to ensure that internal noise levels meet relevant standards.

In relation to Canberra International Airport, the Canberra Spatial Plan makes special provision for planning for appropriate land uses in areas affected by aircraft noise. The Plan incorporates boundaries of the airport’s High Noise Corridor in its Airport Noise Protection Zone, identifying areas which are potentially significantly affected by aircraft noise over the long term (based on the airport’s Year 2050 ANEF). It also clearly indicates that residential (and by inference, other noise sensitive) development will not be permitted within the long-term 20 ANEF contour.

3.6. Major Existing Services

Major existing services are shown on Figure 3.5.

3.6.1. Sewer

Existing sewer mains in the vicinity include a gravity trunk sewer connecting Hume to the Canberra trunk sewer network. Sewerage is currently pumped from this main from the pumping station located on Block 15 Section 111 Symonston. A Territory Land easement is required for this trunk sewer.

A report has been prepared by Consulting Environmental Engineers Pty Ltd (CEE), investigating the odour impacts that may be caused by the presence of the sewer pump station. The report (refer Appendix E) concludes that a buffer zone of 50m from the pump station will be satisfactory to prevent any odour nuisance to surrounding development. This conclusion has been based on the possibility of residential land use in the vicinity of the pump station, which is a worst case scenario. Reference to residential development in the report contained in Appendix E does not imply that residential development is recommended for this area.

Other minor sewer mains service some of the structures built within the subject site, but do not represent significant constraints or opportunities to land use determination for the site.

3.6.2. Stormwater

The Jerrabomberra Creek is the main water feature running through the subject site. The 1 in 100 year flood extent for Jerrabomberra Creek was modelled using RAFTS-XP to determine flows and HEC-RAS for flood levels. Although the catchment includes a significant area of land located in New South Wales that is proposed for
residential development, the model only considers these flows in their current state, as attenuation of 100 year flows to pre-development levels will most likely be the future development requirement.

The 1 in 100 year flood extent for Jerrabomberra Creek is shown on Figure 3.5. A smaller creek which runs parallel to the Monaro Highway through the Stonyhurst property drains into the Jerrabomberra Creek and has been affected by soil erosion. The 1 in 100 year flood levels for this creek have been used by consultants documenting the Resource Recovery Centre located south of this creek, adjacent to the Monaro Highway.

Figures in this report depicting the Land Use Plan, Outline Plan and Draft Variation to the Territory Plan show the extent of no development due to flooding criteria. The flooding extent that has been used to show the ‘flood zone’ in each of these drawings has been determined by modelling the 1 in 100 year flood extents with the potential rowing course included in the modelling. Where the boundaries of the wet part of the potential rowing course is located past the extents of the 1 in 100 year flood, the greater land take has been adopted to illustrate the worst case scenario in terms of flood extents.

3.6.3. Water

Water supply to the Jerrabomberra Valley has been established with several trunk mains traversing the area including the Googong trunk water main along the Jerrabomberra Creek and the Mugga to Queanbeyan water main.

As these mains are located adjacent the 1 in 100 year Jerrabomberra Creek extents and the Monaro Highway road reserve, the location of these trunk water mains do not constrain the site’s development potential.

However, these trunk mains are unable to be used for water supply for individual sites. Therefore, any development within the subject site will require augmentation of the water supply network.

Establishing a larger water supply network is not a significant issue, however, there are impacts on the capacity of the existing reservoirs, which is discussed further in Section 8 of this report.

3.6.4. Electricity

Existing electrical services within the study area include:

- The Causeway to Gilmore 132kv transmission line passes through the study area along the Monaro Highway and then west through the ‘Callum Brae’ property.
- There are four 11kv feeders in the study area. Two enter the site from the south end and two enter from the north end.
There are two feeders running in parallel with Monaro Hwy, about 1000m away from the road and 5km in length.

Overhead HV lines also cross Monaro Highway in two locations.

ACTEW has identified that a future zone substation of 132kV transmission line may need to be located near the study area. A location north of Hindmarsh Drive, just beyond the study area limits, has been identified at the time of writing this report. Therefore, the future substation will not form a constraint on the land use options for the study area.

The 132 kV line along the Monaro Highway may need to convert to double circuits in the future. The impact of this would be that the line easement would be increased from the current 40m to 70m wide.

3.6.5. Telecommunications & Gas

Telstra distribution cables are currently located along the study area boundary, Monaro Highway and few connections into the Mugga landfill, Mugga Quarry and HMAS Harman.

Optus and AAPT assets are located on the boundary of the study area on Canberra Avenue and into the study area vicinity into HMAS Harman area.

ICON optic fibre cables are located along the North western edge to eastern edge along Narrabundah Lane, Jerrabomberra Avenue, Monaro highway and mid crossing to north eastern end of the study area boundary.

There is currently no TransACT optic fibre cables located within the study area.

Natural gas is supplied to the Jerrabomberra Valley with mains along the Monaro Highway and Canberra Avenue.

3.7. Water Quality

Any future development within the areas identified as urban capable will need to consider water quality issues including any potential impacts on the Jerrabomberra Creek system including the wetlands and Lake Burley Griffin. Development in the catchment areas will be undertaken in accordance with the principles contained in the ‘Think Water Act Water Strategy’ and the ‘Guidelines for water sensitive urban design’ which are under preparation. The application of these principles in the Southern Broadacre area will improve water quality in receiving waters, enhance ecological values and amenity, reduce potable water demand, and potentially provide long term cost savings whilst integrating the management of the total water cycle into the urban development process.

The Think water, act water strategy includes the following targets that apply to development in the Southern Broadacre area:
A 12 percent reduction in mains water use per capita by 2013 and a 25 percent reduction by 2023 (compared with 2003), achieved through water efficiency, sustainable water recycling and use of stormwater and rainwater.

By 2013, increase the use of treated wastewater (reclaimed water) from 5 percent to 20 percent.

The level of nutrients and sediments entering ACT waterway is not greater than from a well-managed rural landscape.

Reduce the intensity and volume of urban stormwater flows so that the runoff event that occurs once every 3 months is no more than if the site were in an undeveloped rural state.

In addition to the application of these broad principles, planning in the area identified under the Commercial E land use policy, which is likely to consist of a mix of commercial and residential uses will incorporate specific measures. This will include, for example, the control of runoff into the proposed nature reserves and the creation of water quality control ponds/ wetlands that also provides amenity for future residents/users of the area. The opportunity also exists to explore options for the reuse of wastewater and stormwater, possibly associated with recreation facilities and innovative design solutions that recognise the relationship that this area has with the surrounding environment.

As part of the detailed planning process for this area further work is to be undertaken on the catchment characteristics of this area and the specific design and water management measures/options to be applied. This will include consideration of water quality issues and recognition of important values of the downstream area.
4. Regional Development Options

4.1. Regional Land Demand

This planning study has examined all of the land within the study area with respect to its development potential. Substantial areas have been found to be unavailable for development:

- Some existing uses are expected to continue into the long term
- Areas have been proposed to be reserved for conservation purposes
- Some rural lease areas are necessary to provide wildlife corridors and buffer zones and support functions for the conservation reserves
- Road and waterway reserves are required
- The future use of some areas are already committed

The balance of the land in the study area is available for development and has been classified as “urban capable”. The nature of the urban development that could occur will be subject to economic and social considerations and the constraints and opportunities presented by individual sites. Some areas within the study area are relatively “under developed” and may become available for redevelopment.

The discussion below canvasses the level of demand for different types of land use activities that may be attracted to the urban capable land and redevelopment sites in the study area. The discussion focuses on broad land use categories with the assumption that within each there will be opportunities for local commercial and community service sites and the like.

4.1.1. Urban Capable Land

Some areas of the study area have been identified as being “urban capable” or “urban capable subject to criteria”. These precincts are considered to be suitable for a range of development options including residential, commercial/office or light industrial. They have the potential to form part of a significant employment corridor. The precincts designated as being “subject to criteria” have conservation values that must be retained but it is considered that this can be achieved in the context of some development. The conservation values relate to grassland species and communities and the planning criteria for these areas will specify development that has a relatively small building footprint impact on larger sites, retaining substantial areas of undisturbed ground.

4.1.2. Residential

Areas within the study area may prove to be suitable for residential development however such development must be considered in a regional context. The study area is recognised in the Spatial Plan as part of an employment corridor and is constrained to a small extent by the ANEF 20 contour and the Aircraft Noise Protection Corridor as adopted by the ACT government in the Spatial Plan. Part of
the site is considered suitable for residential development subject to resolution of environmental issues and airport noise considerations. While the area marked urban capable on Figure 4.2 is considered residential capable, no further work has been undertaken. Such further work will need to be undertaken prior to any land releases in the area.

4.1.3. Commercial – Retail

The study area is not appropriate for any significant level of retail development although local facilities to support other land uses in the area may be appropriate. The retail hierarchy in the ACT is well established and reflects a socially, environmentally and economically efficient approach to the delivery of retail services. The recent expansion of bulky goods retailing opportunities in Fyshwick caters for an emerging need in this area.

4.1.4. Commercial – Office

Examples exist in Australia and elsewhere of “office park” developments consisting of office buildings often with a technology or research component, placed within a large high quality landscaped estate. This concept has been attempted at Fern Hill and at AMTECH and has met with limited success due to slow take up rate of sites for these specific purposes. The Canberra Airport appears to be having considerably more success with the establishment of “Brindabella Park” at the airport. The synergies offered by the airport location and capital infrastructure are the reason for this success. There does not appear to be demand for another such facility and the study area offers no particular advantages for office development.

4.1.5. Institutional

Institutional activities such as universities and correction facilities play important social and economic roles in the city economy. There is a need to ensure that they can be accommodated with future planning, if and when demand for new facilities arises. Such facilities typically require a large land area and demand levels are not easily predictable. It would be considered judicious for a planning agency to reserve some land in appropriate locations for these types of purposes. Such facilities can be compatible with some conservation outcomes where substantial site area is developed.

4.1.6. Tourism and Recreation

The Monaro highway provides the main access route to the Australian Alps, including the ski resorts, from Sydney and much of the more heavily populated areas of New South Wales. Consequently large volumes of tourist traffic pass through the study area. Canberra itself, including the various National attractions, is a significant tourist destination in its own right. There is limited demand and
sufficient other tourist attractions elsewhere in the Territory to meet existing
demand.

The opportunity exists for the installation of a substantial water body on
Jerrabomberra Creek. This has the potential to provide water based activities
including an international standard rowing course which has the support of the
Australian Sports Commission and the Australian Institute of Sport. A velodrome,
triathlon facilities and similar ventures may also be considered.

Potential exists for part of the study area to be developed as a commercial
accommodation/water sports/tourism node. Accommodation facilities alone aimed
at attracting the “snow traffic” are unlikely to be viable as Thredbo and Perisher
Blue resorts are only 2.5 hours drive away. A larger theme park concept including
a lake with water sports and associated residential accommodation uses may
attain sufficient critical mass to be financially sustainable.

A large integrated complex would also avoid the poor aesthetics that might result
from piecemeal of development of accommodation facilities along the highway.

This concept would also be suitable to accommodate one of the major
international theme parks (Disneyland, Movie World etc.) typically found in major
tourist destinations such as the Gold Coast in Queensland. Such facilities depend
on both high resident and high tourist population numbers, not currently available
in Canberra. They are also more typically identified with places that are already
accepted as holiday destinations (the Gold Coast) which Canberra is not.

Nevertheless proposals for such facilities have been seriously suggested for
Canberra in the past and if the opportunity does arise in the future it would be
advantageous to have a suitable site available.

4.1.7. Rural Land Uses

Much of the study area is currently occupied by rural leases at present. It would be
feasible for this land use to continue into the long term in the absence of any other
more preferable uses for the land. Where land has been identified as capable of
development then it is recommended that it remain under rural use on a short term
or agistment basis pending future development. Land that has been identified as
being suitable for conservation reserve use may be periodically available for
grazing on an agistment basis where this is compatible with or a necessary part of
management arrangements of the reserve. Some parts of the study area have
been found to be suitable for “rural conservation lease”. These areas are proposed
for long term use as grazing farmland but with a strongly conservation oriented
management plan regime. These areas have significant conservation values and
are seen as providing support and buffer functions to the main conservation
reserve areas. Agricultural pursuits such as grazing are compatible with this.

4.1.8. Industrial

The 1998 Industrial Land Study conducted for the ACT Planning Authority (now
actpla) found a low but steady level of demand for industrial land. That study and
subsequent investigations by the Planning Authority did not identify a need for the
creation of additional industrial land opportunities. The occasional need for large
land – take activities and the possible shortage of such sites in existing areas was referred to. This, together with the objective of this study to look to the long term has led to consideration of the option of reserving some of the study area for industrial purposes.

4.1.9. Employment Corridor

The Monaro highway is one of two major north – south transport corridors (the other being Tuggeranong Parkway – Gungahlin Drive) that serve metropolitan Canberra. The study area is strategically located at the approximate “centre of gravity” of the Monaro Highway as it passes the Metropolitan Area. The study area provides large areas of urban capable land between two existing employment nodes at Fyshwick and Hume. Together with the airport which is also becoming a major employment node the opportunity exists for the creation of an employment corridor including the airport, Fyshwick, Symonston and Hume. Such a corridor would allow efficiencies with the development of infrastructure services and public transport routing. It would relate closely to residential areas in inner South Canberra, East Tuggeranong, Jerrabomberra and South Queanbeyan and potential future residential estates in the Jerrabomberra Valley and at Googong in NSW.

The Canberra Spatial Plan has confirmed this and identifies the study area as part of a second north-south employment corridor in addition to the primary Gungahlin – Civic – Tuggeranong corridor.

Research by ACT Planning & Land Authority that led to the formulation of Draft Variation to the Territory Plan No. 175 (a major review of industrial land use policies) indicated that there is a low level of demand for future industrial land in the ACT. This use should be treated as a long term option.

4.2. Potential Land Use

Following consideration of the material in all of the preceding section of this report an assessment has been made of potential land use options across the study area. The outcomes of this assessment are shown of Figure 4.1, summarised on Table 4.1 and discussed below. It is convenient to divide the discussion into two principal components – east and west of the Monaro Highway and also into sub areas within each of these two sectors.

In order to facilitate the implementation of the findings of this study it has been necessary to assess all future land use proposals against the current patterns of land tenure. Much of the study area is currently managed under rural lease or agistment arrangements. It is important to ensure that as land use change occurs over time land management arrangements keep ‘in step’ with the changes. A key to this is to ensure that rural parcels are maintained as manageable units and with tenure arrangements and lease terms that are appropriate for the long term intended use of the land in question.

The land use boundaries are generally based on tenure as these reflect different environmental values based on changes in land management. It is also a
common management practice to retain existing fence lines as far as practicable in these situations. The location of these boundaries has been determined through extensive consultation as part of the preparation of the study.

Figure 4.2 shows proposed future land uses as well as existing tenure boundaries. The diagram also shows boundaries of land parcels that are subject to various types of conservation interest and the aircraft noise protection corridor boundary. Figure 8.1 shows proposed infrastructure servicing arrangements that will support these land uses.

An important proposed use that has not previously been applied in the Territory is the ‘Rural Conservation Lease.’ These leases will cover land that has nature conservation and also possibly heritage significance but which is best managed by being under private leasehold rather than being placed in a reserve. The Rural conservation leases provide a buffer zone to the core conservation reserves, they will be wildlife corridors between areas with the valley and to areas outside the valley and they will provide a source for stock that are needed for grazing within the reserve areas form time to time. Management plans for these leases will reflect these requirements.

A number of reserves are recommended for creation. These are related to the preservation of woodland and grassland ecological communities and a number of threatened and endangered species. Management of these reserves will be based on recommendations made by the Flora and Fauna committee.
### Table 4.1 Future Land Use Precincts (Ref Fig. 4.2)

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4.2.1. Potential Land Use West of Monaro Highway

Mugga Homestead (17.3ha)

The homestead and its curtilage (Block 6, Section 103) have local and National Heritage significance and protection status.

The Heritage Places Register in the Territory Plan states the following requirements to implement conservation policy for the place:

*Mugga Mugga is to be conserved as a cultural and natural landscape of heritage significance in accordance with approved Conservation, Management and Interpretation Policies and Programs. In particular, it should be noted that the property is included in Public Land and subject to a Plan of Management.*

i) All features intrinsic to the significance of the place, including in situ objects and records associated with the Curley family, are to be conserved and appropriately maintained.

ii) New building or landscape elements shall only be permitted where they do not adversely affect the heritage significance of the place.

iii) Public access shall be in accordance with the Interpretation and Management Policy and Program.

The current use should be continued into the future.

Recommended future land use policy: Broadacre

TGA/AGSO (185.2ha)

Possible use of this area for residential development was considered and rejected. It is clearly separated from the Red Hill suburban area by the golf course and Hindmarsh Drive. A residential development here would not be seen as part of Red Hill or Narrabundah, it would be an isolated enclave that would erode the clear definition between suburban and outer areas that has been a feature of Canberra planning to date. Any development would also suffer from being disaggregated by the existing uses that will not change including the Mugga Homestead site and the AGSO and TGA sites.

The existing rural/rural residential and accommodation (caravan parks) uses are compatible with the broadacre land use policy and likely to continue in the short and medium term. The caravan parks currently serve an important social function providing for the lower end accommodation market. Redevelopment of these and other sites in this precinct for more intensive use (eg. Similar to the TGA or AGSO) may occur in future and they provide an important (privately owned) “land bank” for such uses which can be difficult to accommodate within urban areas. Market forces will determine when and if redevelopment occurs.

Sites to the south of Narrabundah Lane and to the east of the TGA building are Territory owned and could be made available for sale reasonably quickly in response to demand. Development with high levels of tree retention is recommended, recognising the existing stands of high quality woodland that warrant protection.
Recommended future land use policy: Broadacre

Callum Brae North (79ha)

This precinct provides a Territory owned “land bank” for future uses similar in nature to the TGA/AGSO facilities. The land should be managed by way of an Agistment Arrangement with the adjoining Rural Lease (Callum Brae) and withdrawn as required. Agistment arrangement should include provision for rural management practices compatible with long term environmental and weed and pest control outcomes. These should be specified in a land management plan to cover the site noting that development of the land may be over a twenty (or more) year period. Implementation of the management plan may involve a subsidy payment noting that financial investment in long term land management will not be viable for a short term agistee.

The Callum Brae North precinct contains Site 6 of the Grassland Earless Dragon habitat, and was identified at scientific and planning workshops held in 1998 as warranting conservation “until the taxonomic status of the Cooma population is established, and if they are of the same subspecies their habitat secured”. The ACT Flora and Fauna Committee noted in December 2003 that preliminary genetic studies suggest that the Cooma population is a different species from the Canberra population. The Committee did not make a specific recommendation with respect to Site 6, but recommended a series of conservation principles to guide decision-making (see Section 3.2.3). The interpretation of these principles indicates that, while Site 6 is not one of the highest priority sites in terms of size or diversity, it is still desirable to protect its GED habitat values. This site also contains heritage values in accordance with the Callum Brae Homestead citation. The requirements of the citation will need to be considered in the detailed design and siting of any proposals in this area.

Recommended future land use policy: Broadacre

Callum Brae Woodland (148.5 ha)

This area has been identified as being of high conservation status in the ACT Lowland Woodland Conservation Strategy (See Section 3.2 above) and the ACT Government has announced it will protect in a new nature reserve. It is recommended that the “broadacre” land use policy be varied to “hills, ridges and buffers” and that the area is designated as “public land”. Cadastral boundaries should be realigned (as per figure 4.2) with ownership and management being the responsibility of Environment ACT.

It is envisaged that requirements for retaining stock in the area for land management reasons will be met via a licensing agreement with the adjoining rural lessees.

Recommended future land use policy: Hills Ridges and Buffers with Public Land overlay
Callum Brae Homestead (4ha)
The Callum Brae Homestead and its curtilage including farm sheds and animal pens has heritage significance and should be preserved. The heritage aspects of the site are illustrated on Figure 3.4. A 99 year single dwelling residential lease is recommended and should include rights of access over adjoining land to provide for a driveway to a nearby public road (Jerrabomberra Avenue in the short term, Jerrabomberra land in the long term when the Monaro Highway interchange is constructed.) New cadastral boundaries will be required.

Noting the heritage outcomes that are required it is recommended that these be reflected in the lease. A simplistic purpose clause such as “residential” is not considered to be appropriate. A lease purpose clause similar to the following is recommended.

“To use the land for a single dwelling managed so as to achieve the following;

- Heritage conservation as specified in the citation at Appendix V of the Territory Plan (include details when heritage process is finalised) and
- Environmental conservation objectives that are established for the adjoining leased land and nearby reserves noting particularly the need for an ecological corridor linking the two reserves.
- Further subdivision should not be permitted

Callum Brae Rural Conservation Lease (55.4ha)
The site has conservation significance providing connectivity between two proposed reserve areas. (Woden grassland and Callum Brae woodland) It also has heritage significance as it provides a protected viewshed for the Callum Brae homestead. A 99 year lease (without dwelling rights) is appropriate. Cadastral boundaries should be adjusted to create a single land parcel. It is noted that the property is unlikely to be a viable agricultural enterprise in its own right, farming activities are likely to be a second source of income to the lessee, supplementing “off farm” income.

Noting the heritage and conservation outcomes that are required it is recommended that these be reflected in the lease. A simplistic purpose clause such as “agriculture” is not considered to be appropriate. A lease purpose clause similar to the following is recommended.

“To use the land for agricultural uses that are managed so as to achieve the following;

- Heritage conservation as specified in the citation at Appendix V of the Territory Plan (include details when heritage process is finalised) and
- Environmental conservation objectives that are established for the adjoining land noting particularly the need for an ecological corridor linking the two reserves.
The land will be managed in accordance with an approved management plan. A management plan will be approved by the Conservator of Flora and Fauna prior to commencement of the lease and will be subject to review and may be required to be revised and submitted for approval at the discretion of the Territory at five yearly intervals. Agriculture will be limited to grazing. Further subdivision should not be permitted.

**Woden Homestead (8.8ha)**

The Woden Homestead has heritage status and is located within an area proposed to be defined as a conservation reserve.

It is recommended that a single dwelling 99 year lease expressed in similar terms to the Callum Brae homestead lease recommended above and with appropriately reconfigured cadastral boundaries be prepared. The lease area includes the Woden homestead and its immediate curtilage including the existing access road to the Monaro Highway.

**Woden Rural Conservation Lease (16.8ha + 28.5ha)**

(Includes Woden Lease area and heritage view area)

The future management of the conservation reserve will be assisted by the retention of rural leases on adjoining land to enable stock to be easily moved on to the reserve as required. The heritage status of the homestead will be improved by the retention of an agricultural function and the viewshed to the south west. It is not considered that agricultural pursuits will be viable in their own right on this property and it is anticipated that the lessee may have a second “off farm” income source.

A 99 year lease without dwelling rights written in similar terms to the Callum Brae Rural Conservation lease (see above) is recommended. Further subdivision should not be permitted.

**Stonyhurst Rural Conservation Lease (192.9ha)**

This land is relatively steep and without road frontage. It contributes to the rural landscape setting for the Monaro Highway National Approach Route. The proximity of the land fill area and industrial uses make it unsuitable for residential development.

The future management of the conservation reserve will be assisted by the retention of rural leases on adjoining land to enable stock to be easily moved on to the reserve as required. It is not considered that agricultural pursuits will be viable in their own right on this property and it is anticipated that the lessee may have a second “off farm” income source.

A 99 year lease with provision for a single dwelling (to replace the existing Stonyhurst homestead that will be overtaken by industrial development) written in similar terms to the Callum Brae Rural Conservation lease (see above) is
recommended. Further subdivision should not be permitted. Access should be provided via the resource recovery estate.

Mugga Rural Conservation Lease (283.5ha)

The proximity of the land fill area and the quarry make this site unsuitable for residential development. The land is heavily treed and the vegetation provides an important wildlife corridor. Retention of the trees is considered to be essential and this precludes non agricultural land uses.

The future management of the conservation reserve will be assisted by the retention of rural leases on adjoining land to enable stock to be easily moved on to the reserve as required. It is not considered that agricultural pursuits will be viable in their own right on this property and it is anticipated that the lessee may have a second “off farm” income source.

The Mugga property is recommended for retention as a rural lease and for confirmation of a 99-year term. The lease boundaries should be appropriately reconfigured as per figure 4.2. The terms of the lease should permit two dwellings (currently there are two dwellings on site, a property of this size would warrant an owners and managers residence) and otherwise be the same as recommended above for Callum Brae, without the reference to heritage conservation which is not necessary in this case. Further subdivision would not be permitted.

Mugga Quarry and Quarry Woodland (48.3 + 60.8ha)

This site includes two components, the quarry itself and an area of woodland within the lease that is not anticipated to be needed for quarry purposes. This substantial area is undisturbed woodland that is of high quality and contiguous with the proposed Mugga woodland reserve.

The lease for the quarry site specifically provides for the protection of this area by stating ‘Native trees on the lease should be protected from damage, save those identified … for removal’.

It is recommended that this area be managed to maintain the woodland values and be subject to an environmental management plan agreed between the lessee and the Conservator of Flora and Fauna. It is recommended that the quarry operation continue, as it is an important regional resource. Continuation beyond the current lease term should be anticipated.

Mugga Lane Land Fill (122.5ha)

It is understood that ACT No Waste proposes to use this site for its current purpose and for related waste management and recycling activities into the future.
Resource Recovery Estate (44ha)
A master plan has been prepared for this site and stage 1 is under construction. An area at the north of the land zoned for industrial purposes falls within the fields of view from Woden Homestead and is considered to have heritage interest. This is recommended for excision from the industrial area and inclusion in the proposed Woden rural conservation lease.

Stonyhurst homestead is within the industrial area. It is not included in the area under development for the stage 1 resource recovery estate but it should be anticipated that it will be required for development in the future. Continuance of the current short term Tenure arrangements for this land is recommended.

Woden Grassland Reserve (296.5ha)
This site is recognised as highly significant for the conservation of its natural temperate grassland community and adjacent areas of high quality woodland. It was recognised as a “core” area in Action Plan No.1 and also recommended for conservation at the 1998 GED workshops, to protect grassland values and three endangered species (see figure 3.2, Site 3 West Jerrabomberra). It is recommended for conversion to reserve status by the same means as for the proposed Callum Brae Woodland Reserve above.

The reserve will have a need for carefully managed stock grazing and it is recommend that this be managed under licensing arrangements with the adjoining Woden, Mugga, Stonyhurst and Callum Brae leases.

Model Aircraft Site
Model aircraft (radio controlled) enthusiasts currently operate from block 2088 Symonston on the Barton Highway. This block will be surrounded by the proposed reserve. It is considered that this use is compatible with the reserve and should continue. A portion of this site may be required for road purposes in the future. In this event it is recommended that the model aircraft facility be relocated a short distance to the south.

Mugga Lane East (83.7 ha)
This site is relatively unconstrained and could be made available for development. Its proximity to the Mugga land fill and resource recovery estate and industrial uses at Hume, and its relative isolation make it unsuitable for residential development.

It is recommend that it be reserved as a “land bank” site for future use for industrial, broadacre or institutional purposes.

Land use policy should remain as broadacre, subject to regular review. Ongoing management should be by way of agistment.
Mugga Lane West (58.7 ha)
This site has the same characteristics as a Mugga Lane East (above) except that it forms part of a wildlife corridor that connects the Mugga Woodlands with areas to the south in NSW. It should be reserved for future development but on the basis that no trees are removed and substantial areas of the site remain undisturbed.

Land use policy should remain as broadacre subject to regular review. Ongoing management should be by way of agistment.

Other Areas (58.5 ha)
Two areas to the west of Mugga Lane and north of Long Gully Road were included in the study areas as they are subject to a broadacre landuse policy in the Territory Plan. They are contiguous with the Mugga open space area and have very high woodland conservation value. The future use of these sites should be as existing, i.e. rural or agistment leases. They have not been considered further.

4.2.2. Potential Land Use East of Monaro Highway
Substantial portions of the land east of the Monaro Highway were identified by the 1998 GED workshops as being of conservation interest (see figure 3.2)

Site 4 – East Jerrabomberra was recommended for conservation.
Site 7 – Cookanalla was recommended for conservation on the same basis as for site 6 Callum Brae North discussed in section 4.2.1 above.

The proposed future land uses for the eastern study area are shown on figure 4.2

Monaro Corridor South (117.9ha)
Land to the east of the highway and west of Jerrabomberra Creek is considered to be capable of urban development. It would be suitable for residential, industrial, commercial, tourism, community, office or institutional uses subject to market demand and socio economic considerations. The eastern boundary of this precinct is fixed by the Jerrabomberra Creek 100 year flood line.

The Southcare Helicopter currently operates from a base on Block 13 Section 18, Hume.

The ACT Government has determined that a correctional facility be built on this site. The PA for this project is complete in accordance with the requirements of the Land (Planning and Environment) Act 1991. Given this, then the appropriate land use policy for this area should be ‘Broadacre’ (as it is currently). Other similar large scale uses such as emergency services facilities would also be appropriate and compatible with this land use policy. A draft PA for an emergency services facility is currently under consideration.

All future uses should recognise the ecological benefits of establishing a grassland corridor for wildlife movement through this area linking the proposed Woden and
Jerrabomberra East reserves. This link could also possibly utilise and existing culvert under the Monaro Highway.

Proposed Future Land Use Policy: Broadacre
Proposed Interim Management: Agistment and helicopter facility lease.

Monaro Corridor North (102ha)

This site is capable of urban development and could be suited to residential, industrial, commercial, tourist, community, office or institutional uses subject to market and socio-economic consideration.

Development of the site could not proceed until:
iv) The HMAS Harman radio facilities are relocated.
v) Access is provided via the proposed new interchange on the Monaro Highway. (possibly an at grade signalised intersection in the initial stage).

The location and prominence of this site and its proximity to the proposed water body make it potentially well suited for development as a an employment node with associated accommodation and residential uses. The Spatial Plan released by the ACT Government in March 2004 shows this area as an employment corridor. Piecemeal development is not recommended as this will:

- Occur over a long period of time, say 10 – 20 years
- Not justify the cost of the Monaro Highway intersection, and probably result in it remaining at-grade for an unacceptably long period (Monaro Highway should operate to parkway standard)
- Present an unattractive appearance from the Highway as tourism uses would seek highway exposure.
- Would preclude a future integrated development that may provide an opportunity for funding the water sports facility.

Interim land management is suggested on the following basis, with the principal objective being to ensure competent management of the land at minimum public sector cost pending ultimate development.

- Existing leases should be reconfigured to include agisted areas
- Leases should be issued on twenty year terms
- Leases or part there of to be renewed for twenty year periods at ten yearly intervals (i.e. the minimum confirmed tenure at any time will be ten years)
- Provision to be included in the leases such that resumption of all or part may be initiated by the Territory if the land is required for development. Such resumption to be on terms as set out in the land Acquisition Act.
- No new dwellings to be constructed
Investment on properties to be limited to farm infrastructure and management items in line with an agreed management plan.

Land use Policy should be amended to reflect its “urban capable” status to allow the mix of activities discussed above. The proposed land use is Commercial E.

**Cookanalla, Cookanalla East (93.6ha + 92.2ha)**

Much of this site has been identified as being of conservation interest as GED habitat. The Cookanalla precinct was identified as Site 7 by the 1998 GED workshops (refer figure 3.2) and Cookanalla East provides connectivity between the Cookanalla habitat and the habitat with conservation significance on the naval site to the south-east.

Interpreting the GED principles recommended by the Flora and Fauna Committee, Site 7 does not have such high conservation priority as Site 4, being smaller, more isolated and less diverse, but is nevertheless desirable for conservation as GED habitat. If it is conserved, however, its long term value as habitat may depend on a habitat corridor connecting it with the more extensive habitat in Site 4 on Bonshaw Hill.

Any further development within the Cookanalla – Cookanalla East area should embrace conditions aimed at protecting those parts of the area which serve as GED habitat, including a corridor linking this habitat with the more extensive habitat on Bonshaw Hill – Mikes Hill (Site 4).

The combination of the Cookanalla site with the Monaro Corridor North site results in a large (272.7ha) area of land that is available for some development. The range of uses suggested above for Monaro Corridor North could be extended over the Cookanalla land except that residential accommodation on Cookanalla East should proceed on the basis that this land is located in an area designated in the Spatial Plan as an ‘Aircraft Noise Protection Corridor’. This may result in measures such as advice to future residents on noise issues being adopted as part of the land development process. With this proviso similar land use policy would be appropriate.

Land management arrangements as for Monaro Corridor North (Commercial E land use policy)

**Roseglen West and Naval Radio Masts (141.9 ha)**

Roseglen west is a part of “Site 4” identified as being of conservation interest by the 1998 GED workshops. Site 4 was recommended for conservation by these workshops. Conservation of the site in the long term is considered to be necessary as it contains a large number of trap sites where GED has been discovered.

The Naval Radio Masts site has conservation value, which is retained under its current use. When the navy relocates these facilities it is recommended that this land be merged with the Roseglen West conservation area to become part of an extended reserve that connects with East Jerrabomberra.
Management and tenure arrangements for these would be based on those for Callum Brae property and reserve discussed above.

**East Jerrabomberra Grassland Reserve (125.4 ha)**

This land has been recommended by the 1998 GED workshops for conservation (Site 4 – East Jerrabomberra, August 1998). This recommendation was made at a time of substantial uncertainty with respect to the conservation status of grassland reserve at Callum Brae, supported by “rural conservation” leases to the north, south and west. Establishment of the Letchworth reserve, contiguous with East Jerrabomberra in NSW is now confirmed. In this context it is considered that the conservation objectives for East Jerrabomberra can be met by the creation of a reserve and rural conservation leases as shown on figure 4.2. Management and tenure arrangements for these would be based on those for Callum Brae property and reserve discussed above.

**Woden East Lease (12.9 ha)**

This site is recommended to be retained as rural/conservation 99 year leases with similar terms as for the Mugga lease discussed above. It provides a support function for the East Jerrabomberra and Letchworth reserves.

**Bonshaw and Roseglen Leases (85.6 + 94.4 ha)**

These sites are recommended to be retained as rural/conservation 99 year leases with similar terms as for the Mugga lease discussed above. They provide a buffer and support function for the East Jerrabomberra and Letchworth reserves and serve also as a wildlife corridor linking to the Molonglo River. A small wetland within the Bonshaw site is also of some value as Latham’s Snipe habitat and will be preserved.

**HMAS Harman (51 ha)**

The HMAS Harman naval base is expected to remain in place into the long term.

**Jerrabomberra Creek Corridor (156.8 ha)**

There is a minimum requirement for a water quality control pond to be installed immediately south of Hindmarsh Drive and the opportunity also exists for this to become a substantial recreational water body. Rowing to international standard and other water sports could be accommodated. Such a facility would add value to the area, and could also become important as waterbird habitat. In this respect, it would be important to design the water body with a view to minimising potential conflicts between large soaring birds and aircraft, given the proximity of the airport flight path.

This corridor is proposed for classification as ‘Commercial E’ and ‘Broadacre’ to facilitate its integration with surrounding areas but it will have a primary function of providing for flood detention, water quality control, aquatic environmental values.
and water based recreation. Final land use decisions in the corridor will be based on more detailed planning assessments.

Management of the creek area adjacent to the proposed East Jerrabomberra reserve should be focused on enhancement of the conservation values of the reserve. Both the grassland reserve and the creek corridor should be restored to enhance the overall value of the reserve. The definition of the western boundary of the creek corridor will be subject to detailed planning in the adjacent land.

4.3. Potential Land Use NSW

The area to the south east of the study area in NSW lies within the municipality of Queanbeyan and is subject to development pressure. This area (Tralee/Environa) is the only land within the Queanbeyan municipal boundary that is likely to be suitable to accommodate residential growth. Queanbeyan City Council is currently progressing rezoning proposals that collectively have the potential to accommodate 10,000 to 20,000 residential sites.

Should development proceed at this scale then it has implications for the future use of land within the study area, particularly with regard to transport connections and employment opportunities. The proposed road network (see section 5) has been designed to accommodate this potential growth if required.

The potential for the Monaro Highway corridor to develop as employment zones could be greatly strengthened.

4.4. Ecological Evaluation

The proposed land uses would substantially enhance the level of protection provided to threatened species and ecological communities within the Jerrabomberra Valley and offer a high level of connectivity between protected areas within the ACT and nearby areas in New South Wales. In particular, the proposed grassland reserves and other areas managed with a view to protecting the grassland habitat provide a significant advance in the conservation of the endangered Grassland Earless Dragon.

A more detailed review of the implications of the specific land use proposals against the conservation principles identified by the Flora and Fauna Committee for the GED is presented in Table 4.2 overleaf (over two pages). This table also compares the proposed land use strategy against the existing situation with respect to GED conservation.
Table 4.2: Review of Proposals Against Conservation Principles For Grassland Earless Dragon (GED)

Key to GED sites on the Jerrabomberra Valley

**ACT:**
Site 3. West Jerrabomberra – within proposed Callum Brae Nature Reserve
Site 4. East Jerrabomberra – includes proposed Mike’s Hill Nature Reserve and HMAS Harman land
Site 5. Amtech – north of Hindmarsh Drive
Site 6. Callum Brae North – corner of Jerrabomberra Avenue and Narrabundah Lane
Site 7. Cookanalla – south of Hindmarsh Drive.

**New South Wales:**
Letchworth – between ACT border (railway line) and Lanyon Drive
Poplars North – north of Tompsitt Drive
Poplars South – south of Tompsitt Drive

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<tr>
<th>Principle</th>
<th>Existing situation</th>
<th>Proposed land use strategy</th>
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<tr>
<td>The protection of all existing known habitat of the GED is of primary importance. Preliminary genetic studies suggest that the Cooma animals (GED) are a different species from those in the ACT, hence the ACT populations are likely to represent the entire distribution of this species. Consequently, destruction of any known habitat is likely to significantly impact on the potential for the survival of this species.</td>
<td>There are currently no reserve areas for the GED in the ACT or Australia. The study area currently has a broadacre land use policy under the Territory Plan. A number of land uses including quarry, large institutional buildings and helicopter flight centre have been established under this land use. GED habitat is currently maintained through a system of land management agreements under short term rural leases.</td>
<td>Sites 3 and 4 are recommended for protection in nature reserves. Sites 6 and 7 are to include appropriate development/land management conditions, as would rural conservation leases between Bonshaw and NSW border. Site 5 and NSW sites are outside study area. Overall, while some existing habitat (Site 6 and 7) could be developed with conditions, there is an increase in habitat area that is formally subject to appropriate development controls, land management agreements and reservation.</td>
</tr>
<tr>
<td>The need for corridors facilitating movement of the GED between different habitat areas is an important consideration in design of reserves and other protected areas.</td>
<td>There has been limited development to date in the study area but the nature of this has tended to be on a site by site basis, which has fragmented habitat. The current broadacre land use policy does not contain any formal provision for ecological linkages and it could be expected that incremental development would continue with limited co-ordination regarding GED habitat. The existing habitat between Sites 3 and 4 is not conducive to movement with Hindmarsh Drive and Monaro Highway, as well as roads in NSW, also potential barriers.</td>
<td>Specific provision for habitat linkages could enhance connectivity, particularly if the land use within corridors enables improvement of habitat. Connectivity between Sites 3 and 4 will be enhanced through the nature of proposed land uses in the developable area between the two proposed reserves (eg large footprint, small building such as proposed prison and ESB HQ and Training Facility). The roads will still remain as potential barriers. Development conditions and land management requirements will facilitate connectivity between Site 4, Site 7 and NSW.</td>
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continued overleaf
**Principle**

Areas which buffer the habitat of the GED from the impacts of urban or industrial development need to be appropriately sited and managed for maximum effectiveness for this purpose.

**Existing situation**

Whilst the current rural leases provide informal buffers between GED habitat and existing development there are no existing formal buffers in the study area. Under the existing broadacre land use policy a variety of forms of development are permitted in the study area. These have the potential to impact on the existing habitat.

**Proposed land use strategy**

The nature of the area will be altered as a result of future development, particularly in relation to the western edge of Site 4. However, the nature of proposed developments in the area adjacent to the southeast end of the Monaro Highway (large area : small footprint) will regulate the land use intensity. Development and land management conditions adjacent to Site 4 and Site 7 and areas adjacent to NSW respectively will assist the development area retaining a buffer function. The buffer/secondary corridor function can be located within proposed development sites where appropriately managed for conservation purposes. The implementation of rural conservation leases adjacent to the proposed reserves (Sites 3 and 4) will assist in the management of the values of these sites whilst maintaining a buffer function.

**Principle**

Areas with multiple conservation values (for example the presence of more than one threatened species) should be considered for priority protection ahead of areas supporting single threatened species. On the other hand, it is important to recognise that the preferred habitat of the GED is not necessarily the best quality natural temperate grassland.

**Existing situation**

The most diverse areas are Sites 3 and 4. Sites 5, 6 and 7, are important primarily as GED sites, although Sites 5 and 6 also contain natural temperate grassland.

**Proposed land use strategy**

The most diverse sites (3 and 4) are proposed as nature reserves. In addition, development conditions and land management requirements will facilitate protection of grassland values in other sites.

**Principle**

Priority should be given to protecting larger areas of conservation value, particularly those with potential for connectivity with other such areas.

**Existing situation**

At present, only Letchworth in NSW is protected.

**Proposed land use strategy**

Site 4, is a large area (287ha) well connected with Letchworth (55ha) and with potential to be connected with Site 3 (297ha) in the future. Apart from the potential barriers caused by roads, there is potential for connecting all of the larger and more diverse grassland habitat areas within the Jerrabomberra Valley in both the ACT and NSW.

**Principle**

The translocation of threatened reptiles (for example, the GED) should not be considered as a viable alternative to the protection of the species and its habitat in situ.

**Existing situation**

None proposed.

**Proposed land use strategy**

No translocation is proposed. However, depending on the future use and management of rural conservation leases, it is possible that existing populations may spread into new territory, while being reduced in numbers in other locations. This process could occur naturally even if it is not promoted through deliberate management or secondary environmental corridors on development sites.

**Principle**

The GED is known to utilise arthropod burrows as shelter, and it is likely that these, along with an association with low native tussock grasses, are an important habitat feature for the species.

**Existing situation**

This appears to be reflected in the current GED distribution, or at least in the past trapping pattern.

**Proposed land use strategy**

Noted for consideration in any Land Management Agreements for the area.
5. Transport Planning

Investigation of transportation planning issues has been carried out as part of this study. The outputs are contained in two Appendices:

- Appendix F – Transport Infrastructure Plan
- Appendix G – Traffic Analyses

This section summarises the key planning inputs that these transportation planning studies have provided to the overall study.

These studies examine scenarios under which the potential New South Wales developments of Tralee/Environa and Googong are substantially developed. If, as foreshadowed in the draft Spatial Plan, the number of dwellings likely to be built in this area is restricted, the forecast traffic volumes will not eventuate and the pattern of development will also be different. Therefore, the traffic figures contained within the reports are a worst case scenario.

5.1. Transport Infrastructure Plan

The Transport Infrastructure Plan explains the broader issues that impact on the transport planning for this area.

The Monaro Highway (formerly the Eastern Parkway) is one of two north-south peripheral parkways established to service inter-town and inter-regional traffic movements. As the Monaro Highway is located close to the southern suburbs of Queanbeyan, it potentially provides good accessibility from possible future development in Tralee and other parts of NSW to Central Canberra.

Planning of Jerrabomberra Valley development must therefore recognise the pivotal role of the Monaro Highway in the road hierarchy, and any new arterial roads must be compatible with the future freeway and the location of future interchanges.

The report also identifies a possible Very High Speed Train Route, in order to assess the impacts that this may have on the development of the study area. This route is also shown on Figure 2.2.

After consideration of various options, the preferred road network within the study area contains the following features, which are shown in Figure 4.5A of Appendix F and also on the Outline Plan in Section 6 of this report:

- A new interchange on the Monaro Highway located midway along the north-south section of that part of the Highway within the study area
- Extension of Jerrabomberra Avenue to the new interchange
- Sub-arterial connections from the interchange to Canberra Avenue and Hindmarsh Drive
5.2. Traffic Analyses
The Traffic Analyses report analyses the traffic volumes generated by development options within the study area. A range of traffic volumes have been considered for the area designated Urban Capable.

The traffic modelling is for broader planning purposes and more detailed traffic analysis will be required for any detailed design.

5.2.1. Road Capacity
The capacity analysis results indicate that Monaro Highway will ultimately need to be widened to six lanes, which is consistent with its original design. The major new roads in Southern Broadacre would need to be 4-lane roads. Long Gully Road-Mugga Lane will need to be duplicated at about the time that an interchange is constructed at Mugga lane/Isabella Drive/Monaro Highway.

5.2.2. Intersections
Preliminary SIDRA analyses have been undertaken for all newly proposed intersections as well as some key existing intersections. The focus of the analyses has been on 2016 conditions. An outline of the outcomes of these analyses for key intersections follows.

New Access on Hindmarsh Drive
There is an opportunity for creating a new signalised access to the east of the Hindmarsh Drive/ Monaro Highway interchange. The critical movement is the westbound through movement on Hindmarsh Drive in the PM peak. Linking the traffic signals along Hindmarsh Drive should ensure reasonable operation, without the need for additional through capacity in the westbound direction.

New Access on Canberra Avenue
It is assumed that a new access to Canberra Avenue would not be required until the long-term. It would be difficult to provide a suitable intersection arrangement here under signalised control. Analyses indicate that at full development the right-turn access into Southern Broadacre would have to be grade-separated to overcome morning peak traffic congestion here. The need for grade-separation will depend on the nature and intensity of development that actually occurs.

Lanyon Drive and Sheppard Street
This intersection would be signalised when Lanyon Drive is duplicated. It would operate satisfactorily as a T-junction in 2016, but not as a cross intersection.
Monaro Highway and Lanyon Drive
This intersection is already highly congested in the PM peak. SIDRA analyses indicate that it requires grade-separation in the medium-term. It is likely that this intersection will be grade-separated.

Monaro Highway and Mugga Lane
This intersection is already highly congested in the AM peak. SIDRA analyses indicate that it requires grade-separation in the medium-term.

Hindmarsh Drive and Canberra Avenue
This is already a busy intersection during peak periods. SIDRA analyses of 2016 traffic flows indicates that additional through capacity would be required on Canberra Avenue to ensure satisfactory operation in peak periods.

Hindmarsh Drive, Mugga Lane and Dalrymple Street
There is already some peak hour congestion at this intersection and there has been a policy to restrict the capacity of Dalrymple Street to minimise through traffic intrusion into Red Hill. There is very little scope for increasing the capacity of this intersection. Traffic delays and queues will continue to grow at this intersection with increased development in Southern Broadacre. Extension of Jerrabomberra Avenue would take some pressure off this intersection, as less traffic would use Mugga Lane.
6. Outline Plan

An outline plan has been produced for the study area. The outline plan overleaf is recommended for adoption by the Territory to provide a basis for the future development of the area.

Key aspects of the outline plan include edge roads to the proposed water quality feature and to the conservation reserve adjacent to the urban capable area.

The road network includes connections to Hindmarsh Drive, Canberra Avenue and the Monaro Highway interchange, in accordance with the recommendations of the traffic analysis.

Recreation cycling facilities have been integrated with the proposed water quality feature, with recreational cycle links proposed to the existing cyclepath network to the north and south of the study area.

The Outline plan also identifies secondary movement corridors for endangered species such as the Grassland Earless Dragon.
7. Financial Analysis

7.1. Commentary on Land Uses

The potential land uses within the Southern Broadacre Land Use area, range from minimal development (i.e. rural, forestry, and conservation uses) to various forms of urban capable including Industrial, Entertainment Accommodation and Leisure, Residential or Institutional uses.

The latter uses would involve significant development costs but would also produce direct return to the Territory, whether financial or as assets returned to the Territory as a condition of developing the land.

There is also the requirement for a water quality control pond which has been incorporated into the precinct as a substantial recreational water body that has the support of the Australian Institute of Sport and the Australian Sports Commission.

The land on the northern area surrounding the Jerrabomberra Creek corridor is the ‘financial life blood’ of any significant infrastructure costs for the development which includes the construction of the water quality control pond / recreational water body. Traditionally the value of Recreational water facilities do not support the costs to construct such a facility, which was acknowledged in the 1997 study by RA Young’s for the subject precinct.

The rural, forestry, and conservation land uses require much lower costs but the direct financial returns would also be nominal. In some circumstances these uses have ‘grazing value’ but in the most part have ‘community’ value. The basis for assessing this value in financial terms is somewhat arbitrary as the land then requires ongoing maintenance costs.

7.2. Approximate Value Rates

The preliminary level of planning and assessment in the present study does not contain sufficient detail to prepare a detailed feasibility assessment incorporating a discounted cash flow. As an alternative approach a direct value rate per hectare has been adopted to assess the englobo value of the land under the range of land use options set out in the report.

We note that some of the land designated as Urban Capable ranges from Residential to Industrial and the value of these types of land in the locality range from $2,000,000 per Ha for Residential (subject to land servicing costs) to $50,000 per Ha for industrial uses.

For the purpose of our assessment we have taken a conservative approach for the urban capable land at $200,000 per Ha. In doing so, we have assumed that some of the land, particularly around the water quality control pond could be utilised as residential.
The value of the rezoned land held by the Territory totals in the order of $70,000,000 but does not take into account the construction cost of the water quality control pond / recreational water body or other significant engineering infrastructure such as major roads or wastewater treatment facilities.

We also note ACT government research into demand for Industrial Land uses in the Territory, prepared as background to Variation 175 to the Territory Plan, which indicates that there is sufficient Industrial land in the existing suburbs of Fyshwick, Hume and Mitchell for the foreseeable future.

In determining the value of the lands we have not derived any value of those lands that are leased for in excess of 20 years. These leases, in the most part, have rights to extension/renewal under existing legislation.

### 7.3. Factors Affecting Value of Urban Capable Land

In terms of its potential urban capable value there are special considerations in assessing the value of developable land in the locality. These include:

- being immediately adjacent to the south Canberra urban area;
- Access to existing transport infrastructure (roads) with major thoroughfares including Hindmarsh Drive, Monaro Highway, Canberra Avenue, Lanyon Drive and Jerrabomberra Avenue servicing the area.
- Topographic features including, timbered ridge through the Callum Brae and Mugga precinct,
- Jerrabomberra Creek corridor which is proposed to include a water quality control pond which may be incorporated into the precinct as a substantial recreational water body.
- Existing Industrial uses to the north in Fyshwick and to the south in Hume
- Existing and proposed waste management at the southern end of the study area
- Existing mixed use Broadacre commercial at the northern end of the study area including the AGSO Therapeutics Goods Administration buildings; and
- Significant tracts of environmentally sensitive land predominantly in the western precinct but also in the eastern areas adjacent to Cookanalla
- Proximity to the flight paths for the Canberra Airport

There is no comparable style of development in the ACT as that proposed for the land.
If the Southern Broadacre area is developed with urban development elements of residential land use, there are a number of factors that will be taken into consideration by the market. These include:

- the proximity to the existing residential and industrial land use areas of South Canberra;
- potential ‘waterside’ residential development of conventional housing, not available elsewhere in the inner south Canberra area (the strength of high density waterside development in the Kingston Foreshore precinct has been acknowledged in preparing our advice); and
- reliance on existing infrastructure of south Canberra for schools, shops and other community services.

7.4. Assumptions and Considerations

All of the above factors have been considered in determining the financial value of development within the Southern Broadacre Area on the basis of other recent values for urban or rural residential land in the ACT and surrounding NSW area. In addition, financial values have been assessed for undeveloped land on the basis of its use for rural, forestry, or conservation purposes.

Sales of these ‘broader’ land uses are more difficult to quantify however there have been sales of properties in surrounding NSW with restrictions, both environmental and developmental, restricting the construction of improvements. The assessments of these values are documented in a detailed valuation report, which has been provided to ACT Planning & Land Authority ‘commercial-in-confidence’.
8. Urban Infrastructure

As much of the study area is recommended to be Nature Reserve, Rural Conservation Lease or a continuation of its current land use, the need for additional infrastructure is confined to the Urban Capable areas east of the Monaro Highway.

This section therefore addresses the infrastructure required within these Urban capable areas to a degree where the major infrastructure requirements are identified.

Future studies incorporating more detailed work will be required to assess the additional infrastructure requirements, as development options become more refined.

One possible development option is a recreational water body for several different water sports, including a rowing course. The feasibility of such a water body has already been investigated in detail in a previous report (Lake Jerrabomberra Aquatic Park Feasibility Study (1997) - RA Young & Associates). Further investigation of the recreational water body should be undertaken as part of the next stage of planning for the Urban Capable Areas, as it is integral to the more detailed aspects of the hydraulic servicing of the Urban Capable Land.

8.1. Road Design & Traffic Engineering

A sub-arterial road network for the Urban Capable Land has been established in the Outline Plan, embracing the main road connectivity recommendations of the traffic analyses.

Other recommendations of the traffic analyses include major roads that cater for possible future development in New South Wales. The need for, and timing of, these roads is a complex issue involving liaison across several governments over cross-border issues. Therefore, these additional major roads have not been included in the plans that form the main body of this report.

8.2. Stormwater

A major water pollution control/retardation pond on Jerrabomberra Creek was provided during the construction of the Hindmarsh Drive extension, with the new road forming the future dam wall for this pond. The pond will need to be sized to achieve containment of pollutants from existing and proposed developments including the upper reaches of the Jerrabomberra Creek in NSW.

There may be an opportunity to combine the water quality function of the pond with recreational uses such as a rowing course, noting that the size requirements for a recreational water body may lead to the creation of a larger water quality pond than may otherwise be required.
8.3. Water Supply

Existing reservoirs are constrained with respect to quantity of flows and pressure levels that may be serviced. Servicing options may require an additional reservoir to be constructed on the hill located west of Woden Homestead.

Duplication of an existing main may also be required to service the proposed industrial area south of Mugga Lane.

These works are shown on figure 8.1

8.4. Sewer

The existing sewer pipe currently carries flows near its full capacity.

Servicing options are as follows:

- A revised sewerage strategy for the Jerrabomberra Valley will need to be determined prior to any major development in the area. This may involve construction of new sewer networks but this is not preferred due to capital constraint.
- For a minor development in the area (for example industrial or rural development), spare capacity may be available, provided the limited spare capacity is not taken by any other future development.
- Alternatively, this site presents an excellent opportunity to implement new policies and technologies with respect to wastewater minimisation and re-use maximisation.

Appendix H includes a letter from ACTEW to the consultants investigating the feasibility of an aquatic facility on Jerrabomberra Creek (dated 1997) which discusses the merits of several options for servicing the land adjacent to Jerrabomberra Creek.

In considering the servicing of the Urban Capable Land, the third option listed above should be investigated, especially in the context of ecologically sustainable development.

8.5. Electricity

ACTEW has identified that a future zone substation of 132kv transmission line may need to be located near the study area. A location north of Hindmarsh Drive has been identified at the time of writing this report.

There will need to be close liaison between ACTEW and the ACT Planning Authority in the early planning phases of the future substation and any urban development to occur within the study area.

The current preliminary proposal for the location of the future zone substation is predicated on the scale of development in the study area being of ‘limited scale’ – as
reflected in this report. Any proposals to increase the scale of development within the study area will require assessment of the capacity of the zone substation planned nearby and may even lead to the requirement for major electricity infrastructure within the urban capable land, such as a zone substation and routes for sub-transmission and distribution lines to and from the substation.
9. Planning Documents

9.1. Draft Variation to the Territory Plan

The existing Territory Plan land use policies for the study area are shown on Figure 1.2. The implementation of the recommendations of this report will require that the Territory Plan map be varied. Figure 9.1 shows a proposed draft variation that will create large areas of Nature Conservation (Hills, Ridges and Buffer), Heritage Precincts (Broadacre), whilst providing development opportunities along the Monaro Highway (Commercial E and Broadacre).

These land use policies and supporting principles for development and conservation will be addressed in detail as part of the variation, which will provide a long term framework for the use of the area. It is intended that the draft Variation will be progressed following the satisfactory completion of this report.

9.2. National Capital Plan

The Monaro Highway is an “Approach Route” in the National Capital Plan. Development along the highway frontage (within 200m of the centreline) is subject to a Development Control Plan to be approved by the National Capital Authority. A DCP would set parameters such as building setbacks, bulk and scale controls, landscaping requirements and intersection and driveway (if any) locations. Insufficient information is available with respect to detail of proposed landuses along the frontage (especially on the eastern side) to embark on the preparation of a DCP at this time except with respect to the proposed prison project for which a draft drawing has been prepared and submitted to the NCA. As part of the planning study a detailed traffic assessment has been undertaken that demonstrates the impact of the proposed development on the surrounding area.

An amendment to the National Capital Plan to remove the ‘subject to review’ status of the valley will be necessary prior to the implementation of the proposed Territory Plan variations. This report provides the necessary technical analysis to demonstrate that the bulk of the study area is not suitable for urban development. Words to this effect and the reasoning behind the proposed planning direction for the area will be included in the principles and policies in the draft Variation to be prepared. The proposed future landuses on Figure 4.2 will provide a basis for an amendment to the National Capital Plan with ‘urban’ and ‘broadacre’ land uses being applied as appropriate.

The areas identified as ‘urban’ will provide significant development opportunities. In particular the area identified as Commercial E on Figure 9.1 will provide substantial scope for commercial mixed used including residential accommodation. The proposed land use variation will also enable the implementation of one of the key aspects of the Canberra Spatial Plan, which identifies this area as an employment corridor linking Hume, Fyshwick and the airport. The feasibility of the nature of
development in this area will be tested as part of the future detailed planning to establish the most appropriate forms of development.

In relation to the areas identified for Broadacre uses the planning study has determined that this is the most appropriate land use for the areas adjacent to Hindmarsh Drive and Narrabundah Lane, the southern Monaro Highway and the areas adjacent to the Mugga Tip on the south side of Mugga Lane. The study concluded that the area adjacent to Hindmarsh Drive and Narrabundah Lane was most suited for large institutional uses such as AGSO and that residential development was not feasible in this area due to its size and the nature of existing uses. In relation to the other two areas, Broadacre was seen as the most appropriate land use policy due to their relationship to existing industrial areas and other environmental constraints. These issues are discussed in more detail in the relevant parts of the report. Words are to be included in the statutory documentation demonstrating the appropriateness of the proposed land uses and identifying principles and policies to be applied in the detailed planning of these areas.

As per the requirements of the National Capital Plan for this area a comprehensive traffic analysis was undertaken. The findings of this analysis is outlined in Section 5 and Appendix F and G of the report and reflect the worst case scenario based on possible development in the study area and NSW. These management principles are to be reflected in any relevant statutory documentation prepared to implement the study findings as appropriate.

9.3. Items to Refer to Environment Australia

The study area contains an unusually high number of species and ecological communities listed under the EPBC Act. These include:

<table>
<thead>
<tr>
<th>Natural temperate grassland</th>
<th>Endangered ecological community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grassland Earless Dragon</td>
<td>Endangered</td>
</tr>
<tr>
<td><em>(Tympanocryptis pinguicolla)</em></td>
<td></td>
</tr>
<tr>
<td>Golden Sun Moth <em>(Synemon plana)</em></td>
<td>Critically endangered</td>
</tr>
<tr>
<td>Button Wrinklewort <em>(Rutidosis leptorrhynchoides)</em></td>
<td>Endangered</td>
</tr>
<tr>
<td>Striped Legless Lizard <em>(Delma impar)</em></td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Pink-tailed Worm Lizard <em>(Aprasia parapulchella)</em></td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Latham’s Snipe <em>(Gallinago hardwickii)</em></td>
<td>Migratory</td>
</tr>
</tbody>
</table>

In addition the land within the HMAS Harman precinct is Commonwealth land, and is subject to the Act if development of this land is likely to have a significant impact on the environment or if development outside that land is likely to have a significant impact on the environment of that land.
Any extensive development within the study area is considered to have sufficient potential impact on one or more of the above factors to warrant the submission of a referral under the *EPBC Act*. Whether such impact would be considered significant, and hence whether the development would be determined to be a controlled action, would depend on the nature of the proposed development in the context of the total area, including the extent to which other actions are planned for protecting or enhancing those environmental values which are recognised under the *EPBC Act*.

The most significant issue in the context of the *EPBC Act* is likely to be the impact on the GED because it is an endangered species of limited distribution which is concentrated particularly in the Jerrabomberra Valley.

While the *EPBC Act* is relatively recent legislation and has been in force only since July 2000, its current application still reflects the 1970s approach of treating individual projects on a reactive basis, rather than encouraging holistic and proactive environmental planning.

In the Jerrabomberra Valley, any extensive development is likely to impact adversely, at least to a small extent, on many factors which are covered by the Act. There is also the opportunity; however, to take other actions which will have benefits that could more than outweigh the adverse effects, for example, through the establishment of secure conservation reserves or other measures for habitat protection and enhancement.

It is recommended that the opportunity be explored with Environment Australia for establishing a holistic approach to any development within the study area, which can either serve as a global referral or alternatively provide a context against which subsequent referrals for individual proposals can be assessed.
10. Consultation

Throughout the preparation of this report, there has been consultation with a variety of stakeholders. A summary of the outcomes of this consultation is contained below:

10.1. HMAS Harman

Defence have indicated that the relocation of the two communication facilities located to the west and south of HMAS Harman is imminent, scheduled to take place within two years. The locations of the existing facilities and their buffer zones are shown on Figures 2.2 and 2.3.

A meeting was held with the Director General Asset Development Infrastructure, Corporate Services Infrastructure Group in the Department of Defence on 19 June 2003 to confirm all of the above. The intention to relocate the equipment and the reduced buffer requirement was confirmed. A precise date was not able to be given as this has not yet been decided.

10.2. Flora and Fauna Committee

A presentation was made to the Flora and Fauna Committee in December 2003, regarding the conservation issues to be addressed in determining appropriate land use policies in the study area. The Committee noted the nature conservation areas being proposed, and generally commended the approach that had been taken in relation to protection of threatened species and ecological communities during this planning exercise.

From this presentation, the Flora and Fauna Committee responded with a series of conservation principles to guide decision making in relation to development of urban areas and the protection of areas of nature conservation significance within the study area. These principles are discussed and addressed in detail in Section 4.4 of this report.

10.3. National Capital Authority

A number of meetings were held with the National Capital Authority to inform it of the study outcomes and the proposed next steps in terms of progressing the findings of the study as part of a Draft Variation to the Territory Plan and amendment to the National Capital Plan.

These meetings included discussions regarding residential opportunities, the inclusions of details regarding discussions with the Department of Defence and the assessment of traffic options and impacts associated with the Central National Area. These issues are to be further investigated as part of the detailed planning work for the urban capable area involving the ACT Planning and Land Authority and the
National Capital Authority in support of a Draft amendment to the National Capital Plan.

10.4. Rural Lessees
The rural lessee of each property impacted by the proposed land changes were invited to one of two presentations held in June 2004. One presentation focussed on the lessees east of the Monaro Highway and the other presentation dealt with lessees located west of the Monaro Highway.

The majority of affected lessees attended these presentations and acquired an understanding of the background and outcomes of the study and implications for their leases.

The implementation of the study recommendations will be administered by actpla’s leasing section, as the leases periodically come up for renewal.

10.5. Mugga Zoo Lessees
A separate meeting was held with the lessees of the former zoo site, who expressed an interest in how the study outcomes may impact on their proposal for an aged person’s development on the site.

Whilst detailed assessment of such a proposal is beyond the scope of this study, it was noted that the proposed land uses do not dramatically change the situation with respect to this land for either the lessee or the Planning Authority.

10.6. Other ACT Government Agencies & Service Providers
In addition, to the regular involvement of the project steering committee consultation was undertaken with other relevant ACT Government Agencies. Specifically, this included the following:

- Environment ACT (Wildlife Research and Monitoring) – A number of discussions have been held to determine indicative boundaries of proposed grassland and woodland nature reserves and associated land management arrangements. This has included discussions regarding the criteria to be applied to development in adjacent areas.

- Environment ACT (Heritage Unit) - Discussions regarding the heritage significance of Callum Brae and Woden Homesteads. Both homesteads are to be protected in heritage precincts with associated land management leases that reflect their historical values.

- ACT Prison Project - Draft findings of the study have assisted in identifying a possible site for the proposed prison.
• Emergency Services Authority - Draft findings of the study have assisted in identifying a possible site for the proposed new authority headquarters and training centre.

• ACT No Waste - Discussions regarding future expansion of Hume Resource Recovery Estate, the future of the Mugga Tip and long term access arrangements for the Stonyhurst property.

• Service providers including ACTEW, Telstra to discuss infrastructure requirements.