EPBC Act 1999

Referral of Proposed Action

EAST LAKE ELECTRICAL 132kV INFRASTRUCTURE RELOCATION & UPGRADE

Fyshwick and Kingston, ACT

For

ActewAGL
and
ACT Planning and Land Authority

December 2009

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Project title:

East Lake Electrical Infrastructure Relocation and Upgrade, ACT

1 Summary of proposed action

1.1 Short description

The proposed action is the East Lake Electrical Infrastructure Relocation and Upgrade project. It will involve the demolition of existing electrical infrastructure (switching yard and overhead subtransmission lines and poles) and the construction of a new co-located substation/switchyard and associated overhead/underground 132kV transmission lines around and across parts of the Jerrabomberra Wetlands, Fyshwick, Kingston and Causeway.

Refer Figure 1 - 3.

The proposed development has an approx construction cost of $37million in 2008 values.

The need for a new co-located electrical infrastructure facility and associated subtransmission line/cable connections arises from two separate considerations:

- The need by ActewAGL for a new zone substation in the study area to meet existing and expected growth in demand from Fyshwick, Canberra Airport and South Canberra, as well as the need to connect the new substation to the ActewAGL Canberra 132kV transmission network; and
- An objective by the ACT Planning and Land Authority (ACTPLA) and the Land Development Agency (LDA) to improve the urban amenity and land value associated with new urban development in East Lake and Kingston Foreshore by relocation of the existing switching station at Causeway and associated overhead subtransmission lines through East Lake and the Jerrabomberra Wetlands Nature Reserve.

ActewAGL and ACTPLA have recognised the economies of scale and management arising from a co-located facility. ActewAGL will retain ownership of all infrastructure.

The project is currently subject to a draft EIS lodged in accordance with the *Planning and Development Act 2007* for public notification with the ACT Planning and Land Authority on 7 December 2009

1.2 **Latitude and longitude**

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
South East Corner	35	19	51	149	10	31
South West Corner	35	19	51	149	08	47
North West Corner	35	18	01	149	08	47
North East Corner	35	18	01	149	10	24

1.3 **Locality**

The project is located in central Canberra. The area of works covers an area from Canberra Avenue in the south to Morshead Drive in the north, and Monaro Highway in the east to Lake Burley Griffin in the west. Refer Figure 1.

1.4 **Size of the development footprint or work area (hectares)**

The proposed development has several elements with different footprint specifications: A new substation and switching station facility will have a footprint of approx 5,000sqm. The project will require the construction of approx 20-25 new power poles to support overhead 132kV subtransmission lines. Each pole has a diameter at ground of approx 4m (total 100sqm). Total easement area for overhead subtransmission lines and underground cables is approx 13ha.

Total combined project footprint (including easements for above and below ground 132kV lines is approx 13.5ha

The new infrastructure will substantially reduce the combined footprint of existing electrical infrastructure in the study area by reducing the number of overhead subtransmission poles and lines, as well as the total easement requirements in the study area including substantial reductions within the Jerrabomberra Nature Reserve.

1.5 **Street address of the site**

The new substation/switching station which is the main element of the proposed development will be located in Dairy Road Fyshwick, ACT. Connecting infrastructure including underground cables and overhead subtransmission lines will traverse a number of Sections and Blocks in the study area. Refer Table 1.

1.6 **Lot description**

The main site facility is proposed for Block 10 Section 59 Fyshwick. Refer Table 1 for block and section descriptors of all elements of the project.

1.7 **Local Government Area and Council contact (if known)**

Australian Capital Territory; ACT Planning and Land Authority(ACTPLA)

1.8 **Timeframe**

2010 - 2013

1.9 **Alternatives**

	No
YES	Yes, you must also complete section 2.2

1.10 **State assessment**

	No

		YES	Yes, you must also complete Section 2.4
1.11	**Component of larger action**	NO	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals**	NO	No
			Yes, provide details:
1.13	**Australian Government funding**	NO	No
			Yes, provide details:

2 Detailed description of proposed action

2.1 Description of proposed action

An executive summary of the draft EIS for proposed development associated with the East Lake Electrical Infrastructure Relocation and Upgrade is provides at Attachment A to this EPBC referral. A full copy of the document including technical papers is available on the ACTPLA website.

The proposed development comprises the following main elements:

Substation/switching station	A site (E4) on Dairy Road Block 10 Section 59 Fyshwick for a combined substation/switching station with an approximate area of 0.5ha to include 132kV GIS switchgear.
Associated 132kV connections	An underground cable route from Causeway switching station to E4 through Jerrabomberra Wetlands via Route 3.
	A northern underground cable from E4 through the Wetlands to connect the new facility with the existing electrical network near Molonglo Reach via Route 11 (R11).
	A southern overhead subtransmission line connection from the existing 132kV line from Gilmore at Canberra Avenue to the new site facility at E4 via Routes 6, 8 and 10.
Removal of existing (redundant) infrastructure and remediation of land	Causeway switching station
	Northern and southern overhead connections to the Causeway switching station (R13, R15 & #14).

2.2 Alternative locations, time frames or activities that form part of the referred action

The proposed development will occur within the bounding location points specified above.

Alternatives to the *Proposed Development* of a combined substation/switching station and associated line connections as outlined above were considered by the Project Team at several levels:

- **Do nothing** – this option would mean retention of the Causeway switching station overhead 132kV power lines and no new substation. The implications of this option are:
    - no provision for greater electricity capacity and reliability of service to satisfy forecast growth in electricity demand in the area
    - no improvements to electricity supply, reliability and security
    - increased prospect of brown-outs and black-outs
    - no opportunity for enhanced land sales and revenue for the Territory
    - no improvement to residential amenity in the Kingston Foreshore area or new East Lake urban development area
    - no improvement to Jerrabomberra Wetlands by removal of overhead power lines.
- **Alternative energy sources** – while no alternative energy sources of sufficiently large scale to meet the network capacity shortfall have been identified, most alternative energy sources would still need to be distributed to consumers and, as such, infrastructure such as substations/switching stations plus line/cable connections would still be required.

- **Alternative sites and routes** – the site selection process undertaken in 2008/09 prior to this draft EIS identified a number of potential sites and routes for the new electrical infrastructure. Three site options and associated route options were further assessed as part of studies for the draft EIS before selection of the *Proposed Development*. Details of the environmental impact of these options and associated mitigation measures are provided in Attachment C to the main draft EIS (Volume 2).

- **Split site for substation and switching station** – A split site solution to the project including retention of the existing Causeway switching station and construction of a separate new substation is technically possible. However, this solution adds substantial costs to the overall project, creates inefficiencies in operation and maintenance of the two facilities, and results in a larger electrical infrastructure footprint in the study area thus reducing flexibility for other land uses. Notwithstanding the above, the Project Brief required a co-located facility.

From the analysis of all site options and routes, it was concluded that the electrical infrastructure solution that best met the combined project objectives was the *Proposed Development* (E4 and associated 132kV connections).

2.3 Context, planning framework and state/local government requirements

Under Part 7.1 and Part 7.2.4 of the *Planning and Development Act 2007* that became effective on the 16 September 2008 (referred hereafter as the Act), all impact track Development Applications (DA) are considered against the Territory Plan and an Environmental Impact Assessment (EIS) unless exempt by the Minister.
The proposed development has been classified as an impact track assessment project by ACTPLA.

Under the Act, the current project of East Lake Electrical Infrastructure relocation and upgrade requires an EIS as stipulated in *Schedule 4, part 4.2, item 2 (a)* "transmission line corridor construction, or realignment works, outside an existing corridor that are intended to carry transmission lines with a voltage of 132kV or more".

The following policies, plans and legislation provide the framework for the project:

- Planning and Development Act 2007
- Planning and Development Regulation 2008
- Environment Protection and Biodiversity Conservation Act 1999
- Environment Protection Act 1997
- Environment Protection Regulation 2005
- Utilities Act 2000
- Tree Protection Act 2005
- Heritage Act 2004
- Water Resource Act 2007
- Water Resources Regulation 2007
- ACT Water Policy 2003
- Think Water, Act Water – A Strategy for Sustainable Water Resource Management 2004
- ACT Territory Plan
- ACT Waste Minimisation Act 2001
- Development Control Code for Best Practice Waste Management in the ACT 1999
- ACT Environmental Standards: Assessment & Classification of Liquid & Non-Liquid Wastes 2000
- Dangerous Substances Act 2004 and Dangerous Substances (General) Regulation 2004
- Land (Planning and Environment) Act 1991
- Nature Conservation Act 1980
- National Environment Protection Council Act 1994
- Air Environment Protection Policy for the ACT
- Contaminated Sites Environment Protection Policy (EPP)
- WorkCover Dangerous Goods Act 1975
- ACT National Capital Plan
- Canberra Spatial plan
- Jerrabomberra Wetlands Management Plan (draft 2006)

2.4 Environmental impact assessments under Commonwealth, State or Territory legislation

A draft EIS has been prepared for the project by Purdon Associates and AECOM for ACTPLA and ActewAGL. The full draft EIA is available on ACTPLA's website. The non-Technical summary of the draft EIS is at Attachment A to this EPBC submission.

A detailed scoping document was prepared by ACTPLA in February 2009 for the project and has been addressed in the draft EIS. A copy of this scoping document is also available as part of the draft EIS papers on the ACTPLA website.

The EIS was prepared in accordance with the Planning and Development Act 2007. The scoping document was prepared by ACTPLA, and covers the following:

- A description of the EIS process
- A description of the individual components of the project
- Assessment of impacts on infrastructure, land, water resources, climate and air, biodiversity and nature conservation, heritage, social values, health and economic values. Each section of the assessment describes the existing situation, potential impacts and mitigation measures.
- A summary of how unavoidable impacts will be managed
- Conclusions regarding the nature and extent of environmental impact caused by the proposed development
- Recommendations for implementation of the electrical infrastructure plan for East Lake.

A number of consultations were completed during preparation of the draft EIS. Consultation was broken into three categories.

Category One Stakeholders

As per section 26 of the *Planning and Development Regulation 2008*, the following organisations/stakeholders were consulted:

(a) ACTEW Corporation Limited;
(b) ActewAGL Distribution;
(c) the Conservator of Flora and Fauna;
(d) the Emergency Services Commissioner;
(e) the Environment Protection Authority;
(f) the ACT Heritage Council;
(g) the Chief Executive of the administrative units responsible for the following matters:
  (i) health policy;
  (ii) municipal services;
(h) unleased land or public land custodians.

Category Two Stakeholders

Custodians of unleased or Territory-owned land affected by the proposal that have been consulted include:

- Territory and Municipal Services (Parks, Conservation & Land)
- Department of Disability, Housing and Community Services
- Land Development Agency
- The National Capital Authority
- Conservation Council of the South East Region and Canberra
- Natural Resource Management Council
- Molonglo Catchment Group
- Birrigai Outdoor School – through Territory and Municipal Services
- Canberra Ornithologists.

Category Three Stakeholders

Private lessees consulted during preparation of the draft EIS include:

- Molonglo Group Pty Ltd
- Canturf Lawns Pty Ltd
- Kurrumbene Agribusiness Pty Ltd (Block 40 Section 34 Narrabundah)
- Australian Rail Track Corporation Pty Ltd.

Type of Consultations

Letters notifying stakeholders of the proposed EIS process were sent to all organisations listed above. Face-to-face discussions were held between the consultant team and the following stakeholders:

- Actew Corporation Ltd concerning the use of the Fyshwick sewerage treatment plan
- TAMS concerning implications of proposed subtransmission lines and substation/switchyard on wildlife, traffic noise and pedestrian/cyclist amenity, ornithological activities and other implications for management of the Jerrabomberra Wetlands
- Molonglo Group concerning potential impact on the Wetlands Foreshore Business Park (WFBC)
- National Capital Authority regarding impacts on main avenues, designated areas and other aspects of the National Capital Plan
- Land Development Agency regarding economic impact on future land sales
- DEWHA concerning implications under EPBC legislation.

Community consultation will continue during the draft EIS public notification period.

The Territory assessment contact is the ACT Planning and Land Authority.

2.5 Consultation with Indigenous stakeholders

A heritage assessment was completed by Navin Officer Heritage Consultants in April 2009. This involved consultation with Indigenous stakeholders. The relevant stakeholders were:

- Buru Ngunawal Aboriginal Corporation
- Consultative Body Aboriginal Corporation
- Little Gudgenby River Tribal Council
- Ngarigu Currawong Clan

Consultations are complete, with mitigation measures recommended by the registered aboriginal organisations incorporated into the draft EIS (Attachment L) and is available on the ACTPLA website.

2.6 A staged development or component of a larger project

It is intended to construct the proposed development in one stage. However, if staged, it is likely that the new substation (E4) and associated cable connection back into the existing electricity grid (R11) would occur first, followed by other elements of the proposed development (new switching station and associated subtransmission lines, as well as decommissioning of existing assets).

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description
No world heritage properties will be impacted by this project (DEWHA Database Report)

Nature and extent of likely impact

Not applicable

3.1 (b) National Heritage Places

Description
No national heritage places will be impacted by this project (DEWHA Database Report)

Nature and extent of likely impact

Not applicable

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description
The Jerrabomberra Wetlands, located in the study area, are not Ramsar listed. Fivebough and Tuckerbil Swamps are located within the same Murray Darling Basin catchment as the works. These swamps are listed as Ramsar Wetlands of International Significance.

Nature and extent of likely impact

The Fivebough and Tuckerbil Swamps will not be impacted by the works due to the extended distance between the sites (over 200km).

3.1 (d) Listed threatened species and ecological communities

Description

Searches of the EPBC Act Protected Matters Search Tool, ACT Territory and Municipal Services (TAMS) Integrated Nature Conservation Plan mapping, and TAMS Threatened Species Action Plans/draft Plan of manageemnt 2006 were conducted to determine if any threatened fauna species listed under the Nature Conservation Act or EPBC Act are likely to occur in the vicinity of the proposed works.

The EPBC Act protected matters search and examination of INCP mapping revealed that there are a number of threatened fauna species recorded in the region. Of these species only two have been recorded on the site. Table 2 refers.

There was one recorded observation of the *Painted Snipe* in 2007, and *Murray Cod* finglings (juvenile fish) have been added to Lake Burley Griffin regularly as part of fish stocking plan. This species has the potential to occupy lower Jerrabomberra Creek but it is unlikely to breed around the area because of unsuitable habitat. This conclusion is based on observations during ground survey works as well as the highly modified and disturbed state of the vegetation of the study area.

There are a number of threatened flora species recorded in the proximity of the proposed development. Table 3 refers. Of the ecological communities or species found in the searches, only the Australian Painted Snipeand Murray Cod are considered to have a significant chance of occurring on the site on the basis of distribution and habitat requirements.

Nature and extent of likely impact

The overall impact of the proposed works is likely to be beneficial from a biological perspective, particularly for bird species, over the long term due to the relocation of overhead powerlines to a less sensitive part of the nature reserve. However, there are potentially detrimental impacts which need to be considered.

The previous land use within the area, along with the artificial wetland environment that dominates the reserve makes the existence of any threatened ecological communities or threatened flora species in the project area, unlikely. This was confirmed during a literature review and subsequent site investigations with highly modified vegetation communities observed throughout.

Despite the largely artificial nature of the vegetation and landform of the reserve, the presence of a range of bird species, including threatened species listed under state and commonwealth legislation, indicates that the reserve is a functional ecological system and as such any impacts to the existing environment, including the trees and groundcover which occur within the potential routes should be minimised.

Species of Significance

Further detail regarding impacts of the proposed works can be found in the draft EIS Appendix K (Biodiversity Assessment).

Tables 4 and 5 below provide an impact assessments for the Australian Painted Snipe and Murray Cod.

Australian Painted Snipe

A single specimen of the vulnerable Australian Painted Snipe has been observed during October 2007, within Kelly's Swamp of the Jerrabomberra Wetlands Nature Reserve (COG, 2007, Bird Notes). Prior to this, the species had not been observed within the entire ACT since 1978.

In order to address the issue of the potential significance of the proposed action on the Australian Painted Snipe, the significant impact guidelines in EPBC Act Policy Statement 1.1 are discussed in Table 4 in relation to the study site:

Murray Cod

Lake Burley Griffin is currently stocked and has been previously stocked with large numbers of juvenile Murray Cod for recreational purposes. It is apparent that the existing population is artificial with the species is unable to maintain a self replacing population within the lake with the regular addition of juvenile fish required to maintain the population. Table 5 refers.

Ultimately, provided that the potential impacts listed are effectively mitigated, it is expected that the project, including relocation works will have a net benefit with regards to native flora and fauna, especially birds, within the reserve and would reinforce the primary objectives listed in the Jerrabomberra Wetland Nature Reserve.

3.1 (e) Listed migratory species

Description

Table 6 lists migratory fauna species recorded or predicted to occur in the vicinity of the proposed development. Information has been based on searches of the EPBC Act Protected Matters Search Tool and the darft Jerrabomberra Wetlands Nature Reserve Plan of Management 2006.

Nature and extent of likely impact

An assessment of the potential impact of the project on EPBC Act listed threatened and migratory species is provided in Table 6 below. Refer Appendix K (Biodiversity Assessment) of draft EIS for further information.

3.1 (f) Commonwealth marine area

Description
Not applicable

Nature and extent of likely impact

Not applicable

3.1 (g) Commonwealth land

Description
Not applicable

Nature and extent of likely impact

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

3.2 (a)	**Is the proposed action a nuclear action?**	NO	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment
Not applicable

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	NO	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment
Not applicable

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	NO	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))
Not applicable

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	NO	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))
Not applicable

3.3 Other important features of the environment

3.3 (a) Soil and vegetation characteristics

The Jerrabomberra Wetlands cover 174 hectares of land at an altitude of 555–563 m. Most of the wetlands are formed on an alluvial terrace of the Molonglo River as a result of flooding after construction of Lake Burley Griffin. Traces of former river channels and levee banks are visible on the surface of the floodplain. These are connected on their western ends by a dredged channel. A small elevated area exists in the south-west corner of the reserve. Part of this area was previously used as a landfill and has subsequently been remediated and revegetated to form part of the reserve's public access area.

Soils in the floodplain component of the reserve are clay-dominant, formed from alluvial material deposited by the Molonglo River and Jerrabomberra Creek. A large quantity of building spoil has been introduced along the south-western edge of the reserve to enable the development of a dry eucalypt habitat. This material consists of a mix of topsoil, subsoil, boulders and building materials. Refer 3.3(g) for information on vegetation.

3.3 (b) Water flows, including rivers, creeks and impoundments

The headwaters of Jerrabomberra Creek rise in NSW above the former Royalla Station. From Royalla the Creek flows through broad-scale agricultural land, rural residential subdivisions, suburban estates, rural leasehold and agistment land. The Hume, Fyshwick and Symonston Industrial Estates and the Mugga Lane landfill are also situated in the catchment. The Creek in part serves as an urban stormwater channel and this has completely changed its character from that which pertained prior to development.

The following water resources form part of the wetlands (refer Figure 5):

- **Jerrabomberra Creek** - Woden and Four Mile Creek tributaries flow into the Jerrabomberra Creek and it then flows into a silt trap within the wetland reserve, before emptying into Lake Burley Griffin's East Basin via the wetlands, Jerrabomberra Pool and Jerrabomberra Reach.
- **Molonglo River** - Dammed in 1964 to form Lake Burley Griffin. This resulted in formation of the wetlands.
- **Fyshwick Sewerage Treatment Ponds** – Supplements the reserve habitat as a water source for birds and aquatic species.
- **Kellys Swamp** – Semi-permanent water resource filled from Jerrabomberra Creek.
- **Jerrabomberra Billabongs** – Filled during high-flow periods.
- **Shoveler Pool** – Filled during high-flow periods.

The wetlands, which receive flows from Jerrabomberra Creek, are not a naturally formed water resource, but now harbour significant environmental value in relation to both flora and fauna. It is now a significant waterbird habitat being an overwintering site for the Latham's Snipe, which migrates from Japan and arrives here during August each year. The wetlands are listed on the Register of the National Estate and the International Migratory Bird Agreement. The waters drain from the wetlands into East Basin, Lake Burley Griffin, and then into the Murrumbidgee River below the ACT.

The wetlands are recognised as a significant refuge for waterbirds during drought periods and provide an important breeding ground for fish, frogs and turtles.

3.3 (c) Outstanding natural features, including caves

The Jerrabomberra wetlands provide habitat for a number of threatened and migratory species making the wetlands an important natural feature. Figures 1 and 5 show the Wetlands in relation to the proposed works.

There are no caves in the study area.

3.3 (d) Gradient (or depth range if action to be taken in a marine area)

The Jerrabomberra Wetlands are a low-lying area within the Canberra region at around 557 m ASL and little variation in elevation. Jerrabomberra Creek, backwaters, and the silt trap have an elevation of 556m ASL. The highest area is west of the Wetlands visitors' car park at 559m ASL.

Between Jerrabomberra Creek and The Causeway Residential area there is also little variation in elevation from 556m ASL at the Creek to 559m ASL. Towards the east, the area is slightly higher to 562m to 564m ASL.

The significant topographical feature of the Wetlands is their low lying nature and isolation which provides a unique scenic perspective from which to view the city and surrounding hills. The watercourses and filled paleochannels form part of this landscape.

In the built environment, the Causeway Switching Station is on a small rise at 558m ASL. The sewage ponds are at an elevation of 561m ASL. Site E4 is on flat terrain at 559m ASL.

3.3 (e) Buildings or other infrastructure

There are no buildings or other structures directly affected by the proposed development either during construction or once the proposed development is operational.

Infrastructure within the area of proposed works includes all utilities typical of an urban area, including gas, water, sewerage, electricity, and telecommunications.

The E4 site is directly accessible from Dairy Road via Monaro Highway and Newcastle Street, both of which are important transport route in Canberra. There is a CountryLink's southern rail service line to the south of the E4 site which terminates at Canberra Railway Station, Kingston. A series of walking and cycle tracks traverse the Wetlands with additional bicycle paths proposed for the area, subject to a future master plan for the Wetlands.

The northern extent of Dairy Road is closed to traffic. The southern end passes beneath the Monaro Highway and into Fyshwick Industrial Estate. Dairy Road is connected to Monaro Highway and traffic can enter or exit the Monaro Hwy to/from Dairy Road in all directions. The proposed development is expected to require temporary traffic management plans be developed and approved by TAMS prior to construction. There will be no significant disturbance to adjacent land uses during the construction of the proposed development.

Telecommunications infrastructure in the ACT is owned by a number of companies, including; Telstra, AAPT/PowerTel ACT, Transact, Optus, and Diverse Data Communications. Figure 8 shows Telstra optic fibre cables for broadband and telephone lines in the area of proposed works.

Other buildings in the area include residential properties in Kingston, Causeway and Narrabundah as well as the Royal Military College at Duntroon (Campbell). None of the existing residential areas will be adversely affected by the proposed development.

Commercial buildings are located in Fyshwick and south of Dairy Road – directly adjacent to the wetlands. The proposed works will not have any significant adverse impact on the activities at these sites.

3.3 (f) Marine areas

Not applicable

3.3 (g) Kinds of fauna & flora

Flora

The vegetation of the study area has been transformed almost completely to one of exotic species with some planted native species. Types of vegetation vary and include reed beds, riparian vegetation, grasslands, drowned grasslands and woodlands. Remaining areas consist of either open water or mudflats – depending on the water level of Lake Burley Griffin. Figure 6 shows the location of these vegetation types within the Reserve and in relation to the proposed development. No threatened plant species are known to occur in the reserve.

Most of the terrestrial parts of the reserve contain exotic grassland dominated by dense stands of Phalaris (Phalaris aquatica) accompanied by a wide range of other grasses such as Barley Grass (Hordeum spp.) and exotic forbs. Included amongst these are a number of declared pest plants such as Scotch Thistle Onopordum acanthium, St John's Wort Hypericum perforatum, Fireweed Senecio madagascariensis, Serrated Tussock Nassella trichotoma and African Lovegrass Eragrostis curvula.

Aquatic vegetation located at the interface between the grassland and open water is dominated by Common Reed (Phragmites australis), Bulrush (Typha spp.), rushes (Juncus spp.) and Water Couch (Paspalum distichum).

Exotic tree and shrub species dominate the banks of the Molonglo River and Jerrabomberra Creek, as well as the Lake Burley Griffin foreshore in the reserve. Main tree species include declared pest plants like willows (Salix spp.), poplars (Populus spp.) and alders (Alnus spp.) and shrubs such as false acacia (Robinia pseudoacacia) and fennel (Foeniculum vulgare).

Revegetation works were undertaken in the southern part of the reserve during the 1980's and 1990's on imported clay fill in an effort to remediate the area in and around the decommissioned landfill. Native tree species, mainly eucalypts, have been planted around Jerrabomberra Reach. Native shrub plantings also occur throughout this area and include species of Acacia, Banksia, Callistemon, Grevillea, Hakea and Leptospermum. However, as stated in the 2006 Jerrabomberra Wetlands Plan of Management, many of the plantings, particularly in the understorey and ground layer, appear to have died. The large openings have become weed dominated and carry thick Phalaris stands with only some parts of the plantings maintaining any significant structural complexity.

Investigation of the study area encompassed the entire range of vegetation communities within the reserve.

Fauna

At least 175 native bird species have been identified in the reserve. More than 80 of these are water birds with between 15 and 25 thought to use the wetlands for breeding. The wetlands are one of the most studied within the Canberra region and as a result there is a considerable amount of data available regarding bird species, numbers and locations. Total birds species observed throughout the reserve are shown in the draft EIS (Attachment K).

Species of particular significance include those listed as threatened under Commonwealth, state and territory legislation such as the Australian Painted Snipe (Rostratula australis), Blue-billed Duck (Oxyura australis), Freckled Duck (Stictonetta naevosa) and the Grey Falcon (Falco hypoleucos). Some of the species listed as threatened species under the NSW legislation are not listed as threatened species in the ACT. Given that populations of these species that occur within the ACT also utilise habitats within NSW, and are likely to be of at least regional conservation significance in the ACT, they are also a focus of the assessment.

Also of conservation significance are those species listed as migratory under the EPBC Act and protected under international bilateral migratory bird agreements including Latham's Snipe (Gallinago hardwickii), Common Greenshank (Tringa nebularia), Sharp-tailed Sandpiper (Calidris acuminata), Red-necked Stint (Calidris ruficollis) Bar-tailed Godwit (Limosa lapponica), Painted Snipe (Rostratula benghalensis), Cattle Egret (Ardea ibis) and the Great Egret (Ardea alba).

Total listed species observed throughout the area are shown within the attached EIS. The regulated nature of Lake Burley Griffin and thus the wetlands creates an important refuge for waterbirds during dry periods (especially when nearby Lake George and Lake Bathurst are dry) as the wetlands may be used by birds from quite distant areas (ACT Parks and Conservation Service 1994). The remaining bird species include those seeking out nectar and insect food sources which are found in planted shrub cover and along Jerrabomberra Creek, while the grassland areas are favoured hunting areas for raptors.

Other native fauna includes a number of, frog, reptile and mammal species such as Platypus (Ornithorhynchus anatinus), Eastern Grey Kangaroo (Macropus giganteus), Eastern Water Rat (Hydromys chrysogaster), Striped Marsh Frog (Limnodynastes peronii) and Eastern Snake-necked Turtle (Chelodina longicollis) (TAMS 2006). Lake Burley Griffin has also been regularly stocked with several native and exotic fish species, including the vulnerable (EPBC Act listed) Murray Cod (Maccullochella peelii peelii), (Territory and Municipal Services & ACT Parks Conservation and Lands 2009) which may potentially occupy waters in and around the wetlands.

With the exception of the Murray Cod, none of these species are listed as threatened under ACT or Commonwealth legislation. However, given the urban location of this highly utilised nature reserve, all native fauna species that occur here are considered to be important.

3.3 (h) Current state of the environment in the area

The wetlands formed after the Molonglo River was dammed to create Lake Burley Griffin in the 1960's. This activity had significant impacts on the landscape, changing the characteristics of vegetation, hydrology and faunal habitat. The wetlands have become degraded overtime with significant exotic species growth across the area. Significant populations of weed species listed under the Pest Plants and Animals (Pest Plants) Declaration 2008 (No 1) exists within the Jerrabomberra Wetlands. Woody weeds are prevalent in riparian areas and the planted woodland and adjacent areas west of Jerrabomberra Creek. Woody weeds of particular concern are:

- Willows (including White Willow Salix alba, Crack Willow S. fragilis and hybrids, all ACT declared pest plants). Under the Pest Plants and Animals Act 2005, all species of Willow except the permitted species Weeping Willow Salix babylonica, Pussy Willow S. x calodendron and Sterile Pussy Willow S. x reichardtii must be suppressed;
- Poplars (White Poplar Populus alba, Lombardy Poplar P. nigra 'Italica', both ACT declared pest plants);
- Black Alder Alnus glutinosa (ACT declared pest plant);
- False Acacia Robinia pseudoacacia (ACT declared pest plant).

Other woody weeds include Cootamundra Wattle Acacia baileyana*, Cotoneaster Cotoneaster spp.*, Fennel Foeniculum vulgare#, Hawthorn Crataegus monogyna*, Broad-leaf Privet Ligustrum lucidum*, Narrow-leaf Privet L. sinense*; Firethorn Pyracantha angustifolia*, Briar Rose Rosa rubiginosa*, Blackberry Rubus fruticosus (agg.)* and Gorse Ulex europaeus*. (* ACT declared pest plant, # major weed of the wetlands). Overall, the wetlands are dominated by exotic species, with very little remnant (chiefly aquatic) native vegetation.

Vertebrate pest species occurring in the reserve include the European Rabbit Oryctolagus cuniculus, European Red Fox Vulpes vulpes, Hare Lepus capensis, Common Myna Acridotheres tristis, Common Starling Sturnus vulgaris and House Sparrow Passer domesticus. Stray domestic dogs, feral or stray domestic cats and mallard ducks also occur. Mallard ducks are controlled as part of an ACT program to reduce their potential impact on the genetic integrity of the native Pacific Black Duck Anas superciliosa through inter-breeding (TAMS 2006).

These feral species degrade the quality of the wetlands. Management of feral species in the wetlands is ongoing.

3.3 (i) Other important or unique values of the environment

The Jerrabomberra Wetlands provide habitat for a number of threatened and migratory species making them an important environmental feature. The wetlands are listed in the directory of important wetlands for Australia due to their national significance.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The majority of the works will occur on Territory and Municipal Services 'Environment' lands, and privately leased territory land. Refer Table 1 and Figures 2 to 5.

The combined substation/switching station is located on Block 10 Section 59 Fyshwick which is leased to Actew Corporation and is outside the boundary of the Nature Reserve.

3.3 (k) Existing land/marine uses of area

Land uses in the study area include:

- Residential development at Kingston and The Causeway
- Electrical infrastructure at Causeway and across the study area
- Fyshwick Sewage Treatment Plant
- Nature reserve, wetlands of national significance
- Educational centre and recreational facilities
- Dairy pasture grazing on the Wetlands
- Historical landfills
- Turf production farm
- Main transport routes (road and rail)

Current Territory Plan Land Use Policy and Overlay Provision Zones are listed in Table 7 below.

3.3 (l) Any proposed land/marine uses of area

In addition to the proposed development, a number of land uses are being considered by other parties in the general study area as follows:

- Continued development of the Kingston Foreshore urban area
- Planning for the East Lake Urban Renewal project
- Ongoing management and development of the Jerrabomberra Wetlands Nature Reserve
- Possible expansion of the Fyshwick Sewage Treatment Works
- Possible redevelopment of the Wetlands Foreshore Business Park

All of the above land uses have been considered in planning for the proposed development.

4 Measures to avoid or reduce impacts

The proposed development is expected to have only minor negative impact on the adjacent land uses and environmental issues.

The draft EIS contains a wide range of recommended mitigation measures covering all aspects of the proposed development during and post-construction.

An extract of the mitigation measures recommended in the draft EIS is provided at Attachment B below.

The mitigation measures recommended for the *Proposed Development* cover all aspects of potential development impact associated with construction and on-going operation phases of the *Proposed Development* including:

Waste	Noise and vibration
Topography	Lighting
Adjacent land uses	Biodiversity
Visual amenity	Heritage
Erosion and sedimentation	Social
Climate change and air quality	Health
Oil spill	Economics
Climate and air	Hazard and risk.

More detailed network design studies may result in changes to elements of the *Proposed Development*, and these will be addressed in the Development Application (DA) stage of the project.

The draft EIS identifies the following key environmental management tools for the *Proposed Development*:

- Preparation of a **Construction Environment Management Plan** (CEMP) for the Proposed Development provided by the contractor and approved by the Territory in accordance with common industry practices prior to commencement of construction. This CEMP will include a range of matters relating to temporary traffic management, noise, air and water quality, as well as erosion/sediment control.

- The use of **monitoring programs** by ActewAGL, or its contractors, to occur regularly throughout the construction process to ensure compliance with parameters in the CEMP. The monitoring will include:
  - noise
  - erosion and sediment control
  - water quality
  - air quality.

- **Auditing** by ActewAGL of works undertaken by the contractor as part of their Environmental Management System (EMS) auditing program. Those undertaking the inspection roles for the programs outlined above will complete reports that will be forwarded to ActewAGL for review and approval of works and compliance.

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

N	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

The selection of the proposed development site and routes was the subject of a detailed strategic assessment and risk assessment prior to preparation of the draft EIS.

The proposed action is likely to have some localised impact during the construction and demolition phases of the project. Impacts will result from disturbance of habitat as the new infrastructure is built and decommissioned infrastructure is removed.

In its present state much of the wetlands are dominated by exotic flora species. Works may have some impact on vegetation, but this is unlikely to have any significant ecological effect in regards to vegetation.

Mitigation measures have been identified to reduce this impact and the impact to habitat will be temporary. No large structures are being built within the wetlands, and earthworks areas will be rehabilitated after works are complete, restoring habitat for any species that may rely on the areas of impacted habitat within the wetlands.

In the long term, the project is expected to provide a number of benefits to the environment. The locations of all major infrastructure (switching stations and substations) are outside areas of important habitat and outside or along the boundary of the nature reserve. Removal of twin overhead 132kV subtransmission lines from core habitat areas along the western side of the wetlands will be beneficial in terms of improved visual amenity in the area and reduced potential for bird strike.

New works associated with the proposed development will impact directly on the Wetlands as follows:

- A 480m length of overhead 132kV subtransmission line and two poles along the south east corner of the Wetlands
- A 1400m cable trench extending from E4 (Dairy Road) across the Wetlands to existing overhead subtransmission lines near Molonglo Reach
- An underground cable connection (960m) from Causeway switching station to E4

None of these actions traverse areas of sensitive habitat.

5.3 Proposed action IS a controlled action

Not applicable

	Matters likely to be impacted
	sections 12 and 15A (World Heritage)
	sections 15B and 15C (National Heritage places)
	sections 16 and 17B (Wetlands of international importance)
	sections 18 and 18A (Listed threatened species and communities)
	sections 20 and 20A (Listed migratory species)
	sections 21 and 22A (Protection of the environment from nuclear actions)
	sections 23 and 24A (Commonwealth marine environment)
	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
	section 28 (Protection of the environment from Commonwealth actions)
	Sections 27B and 27C (Commonwealth Heritage places outside the Australian Jurisdiction)

Not applicable

6 Environmental history of the responsible party

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** – ActewAGL is the major utility provider in the ACT and has maintained a good environmental track record over many years.	Y	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details** – Not applicable		N
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** - Refer list of mitigation measures in draft EIS for the project (Attachment B to this referral)	Y	
6.4	**Has the person proposing to take the action previously referred an action under the EPBC Act?** **Provide name of proposal and EPBC reference number (if known)** - Williamsdale to Theodore 132kV Subtransmission Line, ACT 2009 (ref EPBC 2008/4621)	Y	

7 Information sources and attachments

7.1 References

Much of the information presented in this referral has been taken from the EIS prepared for these works. A full reference list can be found within the EIS document. Key references used in preparation of this referral include:

- Navin Officer Heritage Consultants, 2009. East Lake Electrical Infrastructure Implementation Project, ACT – Cultural Heritage Assessment
- ACTPLA, 2007. East Lake Urban Renewal Draft Planning Report, ACT Government, Canberra.
- Territory and Municipal Services (TaMS). 2006. Jerrabomberra Wetlands Nature Reserve, Draft Plan of Management, ACT Government, Canberra
- Redbox Design Group. 2005. Tree Survey, Eastlakes Urban Renewal Study
- ACT Parks and Conservation Service. 1994. Jerrabomberra Wetlands Nature Reserve, Plan of Management, ACT Government, Canberra
- Australian Nature Conservation Agency. 1996. A Directory of Important Wetlands in Australia
- Territory and Municipal Services (TaMS) 2009. Fish Stocking Plan for the Australian Capital Territory 2009-2014, ACT Government, Canberra

7.2 Reliability and date of information

All of the information is considered to be current and reliable, and is generally consistent with previous assessments undertaken at various times during the past fifteen years.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	Yes	Figure 1 - 4
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	None	Fig 5 and above
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)	Extract of draft EIS attached	Draft EIS on public notification
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)	Refer above	Draft Environmental Impact Statement
	copies of any flora and fauna investigations and surveys (section 3)	Refer above	Draft Environmental Impact Statement

technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	Refer above	Draft Environmental Impact Statement
report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	Refer above	Draft Environmental Impact Statement

8 Contacts, signatures and declarations

Project title:

East Lake Electrical Infrastructure Relocation and Upgrade, ACT

8.1 Person preparing the referral information (if different from 8.1)

Name	Robert Purdon
Title	Director
Organisation	Purdon Associates Pty Ltd
Postal address	Unit 3/9 McKay Street, TURNER ACT 2612
Telephone	(02) 6257 1511
Email	Rob.purdon@purdon.com.au

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature Date: 08 December 2009

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

Hours	Minutes

8 Contacts, signatures and declarations

Project title:

8.1 Person proposing to take action

Name	Mr Stephen Devlin
Title	Group Manager Electricity Assets
Organisation	ActewAGL
ACN / ABN (if applicable)	76 670568688
Postal address	GPO Box 366, Canberra ACT 2601
Telephone	02 6293 5850
Email	
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature	S P Devlin Date 18/12/09.

8.2 Person preparing the referral information (if different from 8.1)

Name	Robert Purdon
Title	Director
Organisation	Purdon Associates Pty Ltd
Postal address	3/9 McKay Street Turner ACT 2612
Telephone	02-62571511
Email	Rob.prudon@purson.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature	Purdon Date 8/12/09

REFERRAL CHECKLIST

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than two megabytes (2mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?

East Lake Electrical Infrastructure Relocation and Upgrade

EPBC Referral

Dec 2009

Figures

Figure 1: Urban Context & Study Area

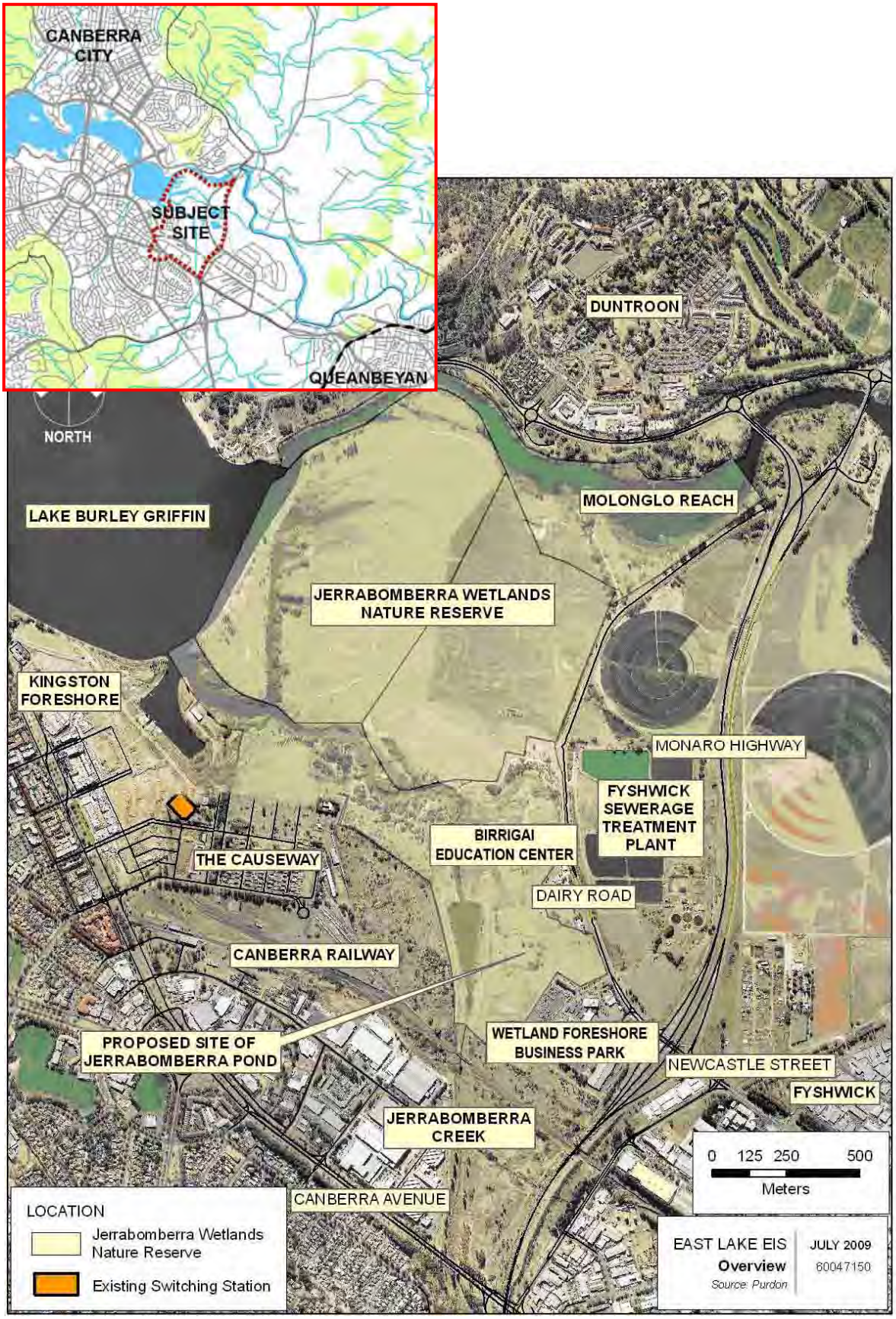
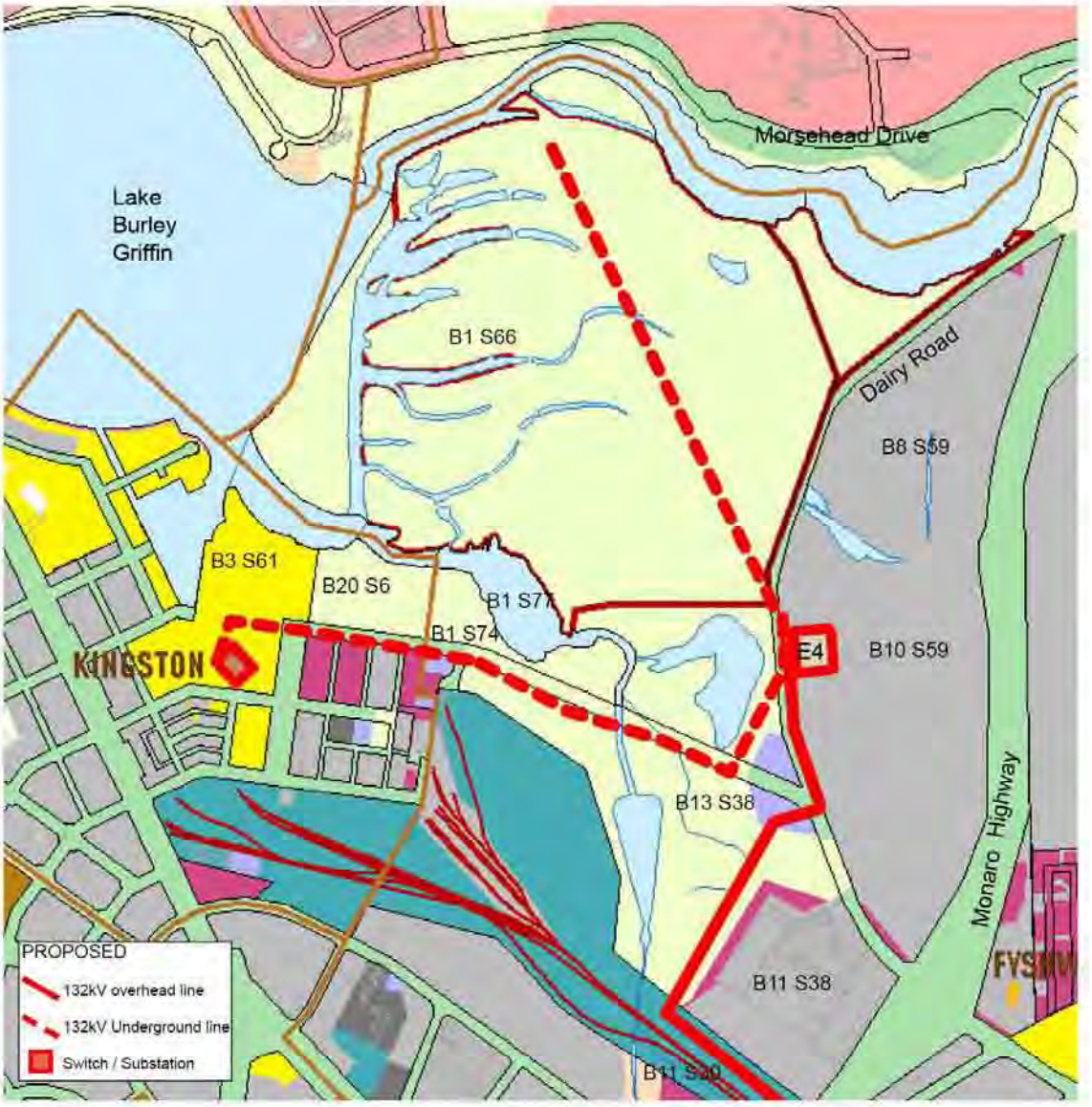


Figure 2: *Proposed Development* (E4) – Site and Routes

Figure 3: Proposed E4 Site at Dairy Road

Figure 4: *Proposed Development* and Land Custodianship



Land Custodianship

- LEASED TERRITORY LAND - Govt Lease - Public Land
- LEASED TERRITORY LAND - Govt Lease - Not Public Land
- LEASED TERRITORY LAND - Private Lease - Public Land
- LEASED TERRITORY LAND - Private Lease - Not Public Land
- NATIONAL LAND - Leased
- NATIONAL LAND - Unleased
- LAND DEVELOPMENT AGENCY - Unleased
- TAMS-PUBLIC LAND - Municipal - Unleased
- TAMS-PUBLIC LAND - Environment - Unleased
- OTHER ACT GOVERNMENT AGENCY - Public land - Unleased
- OTHER ACT GOVERNMENT AGENCY - Not Public Land - Unleased
- COMMONWEALTH AGENCY - Unleased
- TAMS-PUBLIC LAND - Forests - Unleased
- TAMS-PUBLIC LAND - Roads - Unleased
- TAMS-PUBLIC PLACES - Municipal - Unleased
- TAMS-PUBLIC PLACES - Environment - Unleased
- TAMS-PUBLIC PLACES - Roads - Unleased
- TAMS-OTHER UNLEASED ASSETS - Carparks, Public Transport and Depots - Unleased
- TAMS-OTHER UNLEASED ASSETS - Municipal - Unleased
- TAMS-OTHER UNLEASED ASSETS - Environment - Unleased
- TAMS-OTHER UNLEASED ASSETS - Forests - Unleased
- TAMS-VACANT (OTHER) - Environment - Unleased
- TAMS-VACANT (OTHER) - Municipal - Unleased

Figure 5: Water Resources

Figure 6: Wetland Vegetation Communities

East Lake Electrical Infrastructure Relocation and Upgrade

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Tables

Table 1: Land Tenure and Custodianship for Proposed Development (E4)

Element Item No.	Location	Land Description B	S	Suburb	Custodian/Lessee
Site E4	Dairy Road	10	59	Fyshwick	Leased - ACTEW Corp
Route 1	Common Causeway cable link to sites E2,E4 & B2	3	61	Kingston	Unleased – LDA
		6	20	Kingston	Unleased – TAMS (Environment)
		13	38	Fyshwick	Unleased – TAMS (Municipal)
		The Causeway			Unleased – TAMS (Roads)
		Spinifex St			Unleased – TAMS (Roads)
		Blueberry St			Unleased – TAMS (Roads)
		Newcastle St			Unleased – TAMS (Roads)
		Myrtle St			Unleased – TAMS (Roads)
Route 3	Causeway cable connection to Site E4	13	38	Fyshwick	Unleased – TAMS (Municipal)
		1	66	Fyshwick	Unleased –TAMS (Environment)
		10	59	Fyshwick	Leased – ACTEW Corp
		Newcastle St			Unleased – TAMS (Roads)
		Dairy Road			Unleased – TAMS (Roads)
Route 6	Canberra Ave to B2 (adj Monaro Hwy)	11	30	Fyshwick	Unleased – TAMS (Municipal)
		Canberra Ave			Unleased – TAMS (Roads)
Route 8	Site B2 to Site E2 (west of Wetlands Foreshore Business Park)	11	30	Fyshwick	Unleased – TAMS (Municipal)
		11	47	Fyshwick	Unleased – TAMS (Environment)
		13	38	Fyshwick	Unleased – TAMS (Municipal)
		10	59	Fyshwick	Leased – ACTEW Corp
		Dairy Road			Unleased – TAMS (Roads)
Route 10	Site E2 to Site E4	10	59	Fyshwick	Leased – ACTEW Corp
		Dairy Road			Unleased – TAMS (Roads)
Route 11	Site E4 to Molonglo Reach cable (northern wetlands)	10	59	Fyshwick	Leased – ACTEW Corp
		1	66	Fyshwick	Unleased – TAMS (Environment)
		Dairy Road			Unleased – TAMS (Roads)
#13	Causeway to Molonglo Reach via wetlands	3	61	Kingston	Unleased – LDA
		6	20	Kingston	Unleased – TAMS (Environment)
		1	66	Fyshwick	Unleased – TAMS (Environment)
		1	68	Kingston	Unleased – TAMS (Environment)
		1	77	Fyshwick	Unleased – TAMS (Environment)
#14	Causeway Switching Station	3	61	Kingston	Unleased – LDA
#15	Causeway to Canberra Ave	3	61	Kingston	Unleased – LDA
		6	20	Kingston	Unleased – TAMS (Environment)
		1	30	Kingston	Unleased – TAMS (Municipal)
		1	31	Kingston	Unleased – TAMS (Municipal)
		1	32	Kingston	Leased – (Private Lease)
		7	33	Kingston	Unleased – TAMS (Municipal)
		3	38	Fyshwick	Unleased – TAMS (Municipal)
		13	38	Fyshwick	Unleased – TAMS (Municipal)
		The Causeway			Unleased – TAMS (Roads)
		Spinifex St			Unleased – TAMS (Roads)
		Blueberry St			Unleased – TAMS (Roads)
		Newcastle St			Unleased – TAMS (Roads)
		Myrtle St			Unleased – TAMS (Roads)
		Canberra Ave			Unleased – TAMS (Roads)

Table 2: Threatened Fauna Species in Region

Species Name	Status	Habitat Requirements / Comment
Listed Species		
Lathamus discolor Swift Parrot	Endangered	Prefers habitat containing eucalypts which flower heavily in winter. Rare, non breeding migrant visitor to the ACT (Canberra Ornithologists Group 2003).
Polytelis swainsonii Superb Parrot	Vulnerable	Prefers habitat containing eucalypts which flower heavily in summer. The species arrives in the ACT region during August to breed, departing the following January. In the ACT region, Yellow Box–Red Gum Grassy Woodlands form the major habitat of the species, with E. blakelyi being the main source of nesting hollows. Critical habitat features for the Superb Parrot include clusters of large living and dead trees for nesting sites (Canberra Ornithologists Group 2003).
Rostratula australis Australian Painted Snipe	Vulnerable	Prefers habitat located near shallow inland waters. Nests in tall reeds next to water. (1 recorded in Kelly's Swamp during October 2007) The Painted Snipe is a Rare non-breeding summer visitor to the ACT (Canberra Ornithologists Group 2003).
Xanthomyza phrygia Regent Honeyeater	Endangered	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Large, heavily flowering eucalypts on fertile soils are a critical habitat features for the Regent Honeyeate (ACT Government 1999)
Litoria castanea Yellow-spotted Bell Frog	Endangered	Require large permanent ponds or slow flowing streams with plenty of emergent vegetation such as bulrushes. The species' distribution on the South Eastern Highlands was described by Osborne et al. (1996) as ranging from Lake George south to the Bombala area in an altitudinal range between 700 and 800 m AHD. There have been no confirmed records of the Yellow-spotted Bell Frog in the wild since 1973 (Mahony 1996). The species has not been recorded in close proximity to the site.
Synemon plana Golden Sun Moth	Critically Endangered	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses Austrodanthonia spp. No remnant native vegetetion communities are present on the site and there is minimal native understorey vegetation.
Dasyurus maculatus maculatus) Spotted-tail Quoll	Endangered	The species occurs in a wide range of forested habitats throughout its range. It appears to favour areas with a relatively complex understorey, often in association with complex rock formations, hollow-bearing trees, rocky escarpments and/or fallen logs. Habitat is small, isolated and of low structural complexity.
Pteropus poliocephalus Grey-headed Flying-fox	Vulnerable	Grey-headed Flying-foxes are found within 200 km of the eastern coast of Australia in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit

Species Name	Status	Habitat Requirements / Comment
		crops. Species is a vagrant in the ACT.
Aprasia parapulchella Pink-tailed Worm-lizard	Vulnerable	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). No remnant native vegetetion communities are present on the site and there is minimal native understorey vegetation.
Delma impar Striped Legless Lizard	Vulnerable	The species lives primarily in natural temperate grassland that is dominated by perennial tussock grasses, although it is also found in some areas dominated by exotic grasses. No remnant native vegetetion communities are present on the site and there is minimal native understorey vegetation.
Tympanocryptis pinguicolla Grassland Earless Dragon	Endangered	In the Canberra-Monaro region the Grassland Earless Dragon appears to be restricted to Natural Temperate Grassland that is dominated by perennial tussock-forming species. No remnant native vegetetion communities are present on the site and there is minimal native understorey vegetation.
Maccullochella peelii peelii Murray Cod	Vulnerable	The Murray Cod occurs naturally in the waterways of the Murray-Darling Basin (ACT, SA, NSW and Vic) and is known to live in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. (refer to Fish Stocking Plan document)
Macquaria australasica Macquarie Perch	Endangered	The preferred habitat is cool, shaded, upland streams with deep rocky pools and substantial cover. The species will also survive well in impoundments with suitable feeder streams in which to breed.

Table 3: Species Recorded in Proximoty to the Proposed Development

Species Name	Status	Habitat Requirements / Comment
Listed Migratory Species		
Apus pacificus Fork-tailed Swift	Migratory (EPBC)	Insectivorous bird which roosts in trees
Ardea alba Great Egret, White Egret	Migratory (EPBC, JAMBA, CAMBA)	Found in a wide range of wetland environments. Has a diverse diet including such biota as fish, insects
Ardea ibis Cattle Egret	Migratory (EPBC, JAMBA, CAMBA)	Often feeds around large grazing animals – sometimes in wet grassland. Roosts, nests in marginal trees.
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory (EPBC, JAMBA, CAMBA)	Found in long, wet grass near permanent water. Feeds in muddy, wet areas.
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory (EPBC)	Hunts fish and some birds. Nests in tall trees
Hirundapus caudacutus White-throated Needletail	Migratory (EPBC)	Insectivorous, can occur in variety of habitats containing sufficient food source. Roosts in trees
Merops ornatus Rainbow Bee-eater	Migratory (EPBC)	Insectivorous bird which occurs in a variety of habitats located close to permanent water
Myiagra cyanoleuca Satin Flycatcher	Migratory (EPBC)	Insectivorous species which roosts in trees
Rhipidura rufifrons Rufous Fantail	Migratory (EPBC)	Insectivorous species which inhabits densely vegetated areas such as swamp woodlands
Rostratula benghalensis s. lat. Painted Snipe (syn. *R. australis*)	Migratory (EPBC, JAMBA, CAMBA)	Wades in flooded or marshy areas, mudflats. Nests in long grass in marsh areas
Tringa nebularia Common Greenshank	Migratory (EPBC, JAMBA, CAMBA)	Feeds in muddy, wet areas in swamps and grasslands
Calidris acuminata Sharp-tailed Sandpiper	Migratory (EPBC, JAMBA, CAMBA)	Insectivorous species which prefers grassy edges of shallow inland waters
Calidris ruficollis Red-necked Stint	Migratory (EPBC, JAMBA, CAMBA)	Feeds in muddy wet areas in swamps and grasslands
Limosa lapponica Bar-tailed Godwit	Migratory (EPBC, JAMBA, CAMBA)	Feeds in shallow waters

Table 4: Threatened Species – Australian Painted Snipe

EPBC Act Assessment – Threatened species Australian Painted Snipe (*Rostratula australis*)	
Impact Assessment Criteria*	**Assessment of Impact**
Lead to a long-term decrease in the size of a population;	This species appears to only visit the area very occasionally and in small numbers during its non-breeding period. The snipe's movement patterns are not well known but the non-breeding period is between approximately May and September for other known populations interstate. Therefore, an established population cannot be considered to exist within the study area. Nonetheless, the proposed action will not have any significant direct impact on the areas of habitat that this species is known to occupy. Potential disturbance to the species through initial periods of construction noise associated with the proposed action will be minimised by staging works in the immediate vicinity of the species' habitat at a time when the species is not likely to occupy the area. It is not expected that there will be any significant impact on any population of the species.
Reduce the area of occupancy of the species;	The area of the Jerrabomberra Wetlands likely to be impacted by the proposed action does not occur within the area of known habitat. Critical habitat for this species includes shallow water bodies with adjacent tall reeds and mud flats. Kelly's Swamp contains the largest expanse of potential habitat. Potential disturbance to the species through initial periods of construction noise associated with the proposed action will be minimised by staging works immediate vicinity of the species' habitat at a time when the species is not likely to occupy the area. It is not expected that there will be any significant impact on these populations.
Fragment an existing population into two or more populations;	The species appears to only occupy the area very occasionally and in small numbers. Furthermore, the construction of the proposed infrastructure will not fragment any likely habitat of the species. Therefore, it is not expected that this action will fragment the existing population.
Adversely affect habitat critical to the survival of a species;	Critical habitat for this species includes shallow water bodies with adjacent tall reeds and mud flats. Kelly's Swamp contains the largest expanse of the components associated with the critical habitat. Depending on the ultimate alignment of the proposed action, a small area of reeds located near the adjacent Jerrabomberra Backwaters may be temporarily impacted. This impact will be minimal as it is expected that, because of the fast growing nature of this type of vegetation (*Typha* spp. and *Phragmites australis*), this area will recover relatively quickly. The small amount of irregularly and infrequently occupied habitat for the species on the site is not considered to be habitat critical to the survival of a species and would not be substantially impacted by the works.
Disrupt the breeding cycle of a population;	The Australian Painted Snipe is not thought to breed within the Jerrabomberra Wetlands Nature Reserve. The most recent observation recorded only one male specimen. Furthermore, the proposed action will not have any significant impact on potential habitat and any disruption to potential breeding (summer) will be mitigated through suitable timing of nearby construction activities. Based on this, it is expected that disruptions to the breeding cycle of this species are unlikely.
Result in invasive species that are harmful to vulnerable species becoming established in the vulnerable species habitat;	The Jerrabomberra Wetlands Nature Reserve is known to contain a number of feral animals as well as invasive weeds. The works associated with the proposed action will not result in any increase to the feral animal populations. Construction weed management strategies will be developed in support of the EIS. Jerrabomberra WetlandsNature Reserve is managed by the ACT government (PCL) and therefore invasive species will be managed as part of the normal asset management practices.
Introduce disease that may	The proposed action involves decommissioning existing electrical infrastructure

EPBC Act Assessment – Threatened species **Australian Painted Snipe (*Rostratula australis*)**	
Impact Assessment Criteria*	**Assessment of Impact**
cause the species to decline; and	and relocating the components to more suitable locations nearby. The measures to prevent the introduction of weeds and invasive fauna species would also serve to minimise the likelihood of the introduction of soil or water-borne pathogens (disease-causing organisms).
Interfere substantially with the recovery of a species;	The proposed action will not have a significant impact on any areas of potential habitat within the wetlands. Additionally, the proposed action will not result in any alteration to the current hydrology of the wetlands or create an impediment to the ongoing habitat restoration or other measures which are being implemented within the nature reserve to facilitate the recovery of native species. The relocation of the transmission lines from a core habitat area of the wetlands to a less sensitive location is considered likely to contribute to the recovery of waterbird populations. The works are thus considered unlikely to interfere substantially with the recovery of the species.

Table 5: Threatened Species -Murray Cod

EPBC Act Assessment – Threatened species Murray Cod (*Maccullochella peelii peelii*)	
Impact Assessment Criteria*	**Assessment of Impact**
Lead to a long-term decrease in the size of a population;	Lake Burley Griffin is currently stocked and has been previously stocked with large numbers of juvenile Murray Cod for recreational purposes (TaMS, 2009). The existing population is artificial with the species unable to maintain a self replacing population within the lake with the regular addition of juvenile fish required to maintain the population. Furthermore, the proposed action will not impact any areas of habitat that the species is likely to occupy within the deeper channels of the Jerrabomberra Creek and Molonglo River in the western section of the Jerrabomberra Wetlands nature reserve. Based on this information, it is not expected that there will be any significant impact on the population of Murray Cod in Lake Burley Griffin.
Reduce the area of occupancy of the species;	The area of the Jerrabomberra Wetlands likely to be impacted by the proposed action does not occur within an area of known habitat for a naturally-occurring population of the Murray Cod. Underground cabling associated with the proposed action will pass underneath Jerrabomberra Creek, with disturbance to riparian vegetation likely to be minimal and short-term. As a result, it is not expected that there will be any significant impact on the artificial population.
Fragment an existing population into two or more populations;	The proposed action occurs at the landward extent of the riverine habitat that the species occupies. Any impact to habitat in the area is expected to be minimal and short term. Therefore, it is not expected that this action will fragment the existing population.
Adversely affect habitat critical to the survival of a species;	The Murray Cod is generally associated with deep holes in rivers, the Murray cod prefers habitats with in-stream cover such as rocks, stumps, fallen trees or undercut banks. As the existing population is not a self replacing population the habitat and the habitat which it occupies does not contain appropriate breeding conditions, the area is not considered to be habitat critical to the survival of a species.
Disrupt the breeding cycle of a population;	The Murray Cod is not thought to breed within any water bodies of the Jerrabomberra Wetlands Nature Reserve and greater Lake Burley Griffin water body. Based on this, it is expected that disruption to the breeding cycle of this species is unlikely.
Result in invasive species that are harmful to vulnerable species becoming established in the vulnerable species habitat;	The Jerrabomberra Wetlands Nature Reserve is known to contain a number of feral animals as well as invasive weeds The works associated with the proposed action will not result in any increase to the feral animal populations. Construction weed management strategies will be developed in support of the EIS. Jerrabomberra Wetlands Nature Reserve is managed by the ACT government (PCL) and therefore invasive species will be managed as part of the normal asset management practices.
Introduce disease that may cause the species to decline; and	The proposed action involves decommissioning existing electrical infrastructure and relocating the components to more suitable locations nearby. The measures to prevent the introduction of weeds and invasive fauna species would also serve to minimise the likelihood of the introduction of soil or water-borne pathogens (disease-causing organisms).
Interfere substantially with the recovery of a species;	The study area is not thought to contain a self replacing population or habitat that would support such a population and hence recovery of the species in this location is unlikely. Furthermore, the proposed action will not have a significant impact on any areas of potential habitat within the wetlands. Additionally, the proposed action will not result in any alteration to the current hydrology of the wetlands or create an impediment to the ongoing habitat restoration or other measures which are being implemented within the nature reserve to facilitate the recovery of native species. The works are thus considered unlikely to interfere substantially with the recovery of the species.

Table 6: Impact on Listed Threatened and Migratory Species

EPBC Act Assessment – Migratory shorebirds and waders: Latham's Snipe (*Gallinago hardwickii*), Sharp-tailed Sandpiper (*Calidris acuminata),* Red-necked Stint (*Calidris ruficollis*), Common Greenshank (*Tringa nebularia*), Bar-tailed Godwit (*Limosa lapponica*), Curlew Sandpiper (*Calidris ferruginea*), Pectoral Sandpiper (*Calidris melanotos*), Wood Sandpiper (*Tringa glareola*), Marsh Sandpiper (*Tringa stagnatilis*).	
Impact Assessment Criteria*	**Assessment of Impact**
Important Habitat - substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	The habitat at Jerrabomberra Wetlands is considered to be important to the conservation of migratory shorebirds and waders in the ACT (COG 1989). The proposed works will not substantially modify the habitat of these species as the works will largely avoid wetland areas and would have minimal long-term impacts on the vegetation of the nature reserve. The powerlines to be removed are close to the core habitat of these species within the reserve whereas the new powerlines to be installed are chiefly outside these areas on the perimeter of the reserve. The removal of existing overhead powerlines, and the installation of new overhead/underground lines, is hence considered likely to have a positive net impact on waterbirds including migratory shorebirds and waders as a result of reduced risk of bird collision with powerlines. Whilst the installation of the underground cables and other earthworks will impact some (chiefly non-native) vegetation, this impact is likely to be short-term and is not likely to cause habitat fragmentation, alteration to fire regimes, nutrient or hydrological cycles or other impacts to habitat for these species.
Invasive Species - result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	A variety of invasive weeds are present within the nature reserve and it is inhabited by feral animals including European wild rabbit (*Oryctolagus cuniculus*), brown hare (*Lepus capensis*) and European red fox (*Vulpes vulpes*). The European wild rabbit and brown hare may degrade terrestrial habitat through a reduction in vegetation cover due to heavy grazing. The European red fox is a potential predator of migratory shorebirds, waders and other waterbirds in the reserve. The proposed works are not likely to contribute to the impact of these invasive fauna species and may reduce the available sheltering habitat of these species through the removal of weed thickets. Whilst there is some potential for the introduction of additional weed species that could result in the degradation of waterbird habitat, the proposed soil and vegetation management measures would minimise the likelihood of this occurring.
Lifecycle - seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	None of these bird species breed whilst in Australia. These species do however feed and rest within the habitat of the nature reserve. Construction activities in close proximity to feeding and roosting areas for these species may disrupt their behaviour to some degree. If the construction works in close proximity to habitat for these species are timed such that they chiefly occur when the species are absent from the reserve, the works are unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of any of these species.

EPBC Act Assessment – Resident and nomadic waterbirds listed as migratory: Painted Snipe (*Rostratula benghalensis*), Cattle Egret (*Ardea ibis*) and Great Egret (Ardea *alba*).	
Impact Assessment Criteria*	**Assessment of Impact**
Important Habitat - substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	The habitat at Jerrabomberra Wetlands Nature Reserve is considered to be important to the conservation of a wide variety of waterbirds in the ACT (COG 1989). The Painted Snipe has reported as occurring at Jerrabomberra Wetlands (POM). The species was not recorded at any site in the Molonglo River corridor in the 1989 study of the avifauna of this region (COG 1989). This species appears to be an occasional visitor to the nature reserve and this area is not considered to be an important habitat for the species. The nature reserve is considered to be a key habitat area for the Cattle Egret in the ACT and is also habitat for the Great Egret. Both of these species are considered to be rare visitors to the ACT (COG 1989), and have not been recorded as breeding in the nature reserve. This habitat may be particularly important to these species at times when other habitats are temporarily unsuitable. The proposed works will not substantially modify the habitat of these species as the works will largely avoid wetland areas and would have minimal long-term impact on the vegetation of the nature reserve. The powerlines to be removed are close to the core habitat of these species within the reserve whereas the new powerlines to be installed are chiefly outside these areas on the perimeter of the reserve. The removal of existing overhead powerlines, and the installation of new overhead powerlines, is hence considered likely to have a positive net impact on waterbirds as a result of reduced risk of bird collision with powerlines. Whilst the installation of the underground cables and other earthworks will impact some (chiefly non-native) vegetation, this impact is likely to be short-term and is not likely to cause habitat fragmentation, alteration to fire regimes, nutrient or hydrological cycles or other impact to habitat for this species.
Invasive Species - result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	A variety of invasive weeds are present within the nature reserve and it is inhabited by feral animals including European wild rabbit (*Oryctolagus cuniculus*), brown hare (*Lepus capensis*) and European red fox (*Vulpes vulpes*). The European wild rabbit and brown hare may degrade waterbird habitat through a reduction in vegetation cover due to heavy grazing. The European red fox is a potential predator of waterbirds in the reserve. The proposed works are not likely to contribute to the impact of these invasive fauna species and may reduce the available sheltering habitat of these species through the removal of weed thickets. Whilst there is some potential for the introduction of additional weed species that could result in the degradation of waterbird habitat, the proposed soil and vegetation management measures would minimise the likelihood of this occurring.
Lifecycle - seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	None of these species have been recorded as breeding in the reserve and all are considered to be occasional visitors. Construction activities in close proximity to feeding and roosting areas for these species may disrupt their behaviour. As the works are chiefly located away from the core wetland habitat of these species, they are unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of any of these species.

Table 7: Land Use Zoning of Proposed Development.

Division – Section – Block (address)	Land Use Policy Zones	Overlay Provision Zones	Information last updated
Kingston 61/2	**Approved Urban** PRZ1: Urban Open Space CZ5: Commercial – Mixed Use	S: Special requirements apply under NCP SC27 Kingston Foreshore Urban Open Space KFb: Kingston Foreshore Precinct "b" FUA: Future Urban Areas KFa: Kingston Foreshore Precinct "a" KFd: Kingston Foreshore Precinct "d" KFe: Kingston Foreshore Precinct "e" Pc: Nature Reserve PUBLAN: Public Land KFc: Kingston Foreshore Precinct "c"	28 Nov 2008
Kingston 6/20	**Approved Urban** PRZ1: Urban Open Space DES: Designated CZ5: Commercial – Mixed Use	S: Special requirements apply under NCP SC27 Kingston Foreshore Urban Open Space FUA: Future Urban Area KFd: Kingston Foreshore Precinct "d" Pc: Nature Reserve PUBLAN: Public Land	09 Feb 2003
Fyshwick 74/1	**Approved Urban** DES: Designated	Pc: Nature Reserve	1 Jun 1990
Fyshwick 66/1 (65 Dairy Road)	**Approved Urban** NUZ4: River Corridor DES: Designated	Pc: Nature Reserve PUBLAN: Public Land	7 Mar 1996
Fyshwick 59/10	**Registered Urban** NUZ4: River Corridor	SC14: Sewage Works and Majura Pumping Station, Fyshwick MAAR: Main Avenues and Approach Routes	29 Apr 1996
Fyshwick 38/13	**Approved Urban** NUZ4: River Corridor DES: Designated IZ1: General Industry	Pc: Nature Reserve	27 Mar 2002