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Assessment of Matters of National Environmental Significance

**Lot 5291 DP 824057
Long Bay Correctional Complex
Malabar**

Randwick LGA

For: Multiplex



**REF: RCC 06-023
March 2006**

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National Environmental Significance**

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Author:

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Cover: Aerial photo showing the subject site outlined in red. This demonstrates the urban nature of the site and the immediate vicinity.

Source:
Google Earth, 7th March 2006

1 INTRODUCTION

Keystone Ecological has been contracted by Multiplex to prepare an assessment of the likely impact on matters of National Environmental Significance of the proposed action at Lot 5291 DP 824057, Long Bay Correctional Complex at Malabar.

The Long Bay Gaol Hospitals Project has been declared a Major Project under Part 3A of the Environmental Planning and Assessment Act 1979 by the Minister for Planning on 16 February 2006 under Clause 6 of SEPP (Major Projects) 2005. The Director General's Requirements state that an Environmental Assessment must be undertaken and must address *inter alia* the impacts of the project, if any, on matters of National Environmental Significance under the Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act) (1999), as applicable.

This assessment is a component of the response to the Director General's Requirements.

The proposal includes the demolition of existing hospital facilities on the Long Bay site and construction of new hospital facilities in two discrete areas. A Forensic Hospital complex is proposed for construction in the western part of the site and the Long Bay Prison Hospital complex is proposed for construction in the south eastern part of the site.

The subject site and its surrounding areas are shown in Figure 1.



Figure 1: The subject site is indicated in red. The approximate extent of the hospital complexes are indicated in yellow. Note the highly developed nature of the site and its immediate surroundings.

The Long Bay Correctional Complex and its environment are described in detail in the Long Bay Master Plan (BBC Consulting Planners 2004). In summary, the facility has been in existence for over a century, with

construction of the Long Bay Complex beginning in 1898. It occupies almost 40 hectares and is surrounded by many other institutions (e.g. University of NSW Little Bay campus, the former Prince Henry Hospital), recreational uses (e.g. various Golf Courses, playing fields, Anzac Rifle range) and residential areas.

As can be seen from the recent aerial photography in Figure 1, the site is almost completely devoid of vegetation. The configuration of the woody vegetation in evidence indicates that none of this is naturally occurring.

The lack of natural vegetation on the site was also confirmed during the development of the Master Plan by BBC Consultant Planners, the Department of Commerce and Randwick City Council.

2 LEGISLATIVE BACKGROUND

Commonwealth legislation (EPBC Act 1999) requires that actions judged to significantly impact upon matters of National Environmental Significance are to be assessed via a formal referral process. This assessment report determines whether a referral is required to be made to the Department of Environment and Heritage for further assessment.

The EPBC Act (1999) is a nationally applicable Act that is administered by the Department of the Environment and Heritage (DEH). This Act requires approval for actions that are likely to have a significant impact on matters of National Environmental Significance (NES).

There are seven matters of NES that are triggers for Commonwealth assessment and approval. These are:

1. World Heritage properties;
2. National Heritage places;
3. Ramsar wetlands of international importance;
4. Nationally threatened species and communities;
5. Migratory species;
6. Nuclear actions; and
7. Commonwealth marine environment.

Threatened species and ecological communities are listed under Part 13, Division 1, Subdivision A of the EPBC Act (1999). Migratory species are listed under Part 13, Division 2, Subdivision A of the Act.

The Department of the Environment and Heritage identifies the following:

"Under the EPBC Act a person must not take an action that has, will have or is likely to have a significant impact on any of these matters of NES without approval from the Commonwealth Environment Minister. There are penalties for taking such an action without approval."

In general, an action that may need approval under the Act will involve some physical interaction with the environment, such as clearing native vegetation, building a new road, discharging pollutants into the environment, or offshore seismic survey.

If, following a referral, it is determined that an action is likely to have a significant impact, and approval is therefore required, the action is called a 'controlled action'. The proposal will then undergo a formal assessment and approval process, and cannot proceed unless approval is granted.

If it is determined that an action is not likely to have a significant impact, then the action is not a controlled action. Approval under the EPBC Act is not required and the action may proceed, subject to obtaining any other necessary permits or approvals."

A search of the EPBC Act (1999) database using the Protected Matters Search Tool on the Department of the Environment and Heritage website (www.deh.gov.au/erin) was completed. This identified species of conservation significance under the EPBC Act (1999) that may require assessment and these are further explored below.

3 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The EPBC Act (1999) database was interrogated for a search area of 1 kilometre radius around the subject site at -33.97305° S 151.2419° E - see Figure 2 below.



Figure 2: EPBC Act (1999) database search area.

The resultant Protected Matters Report, generated on 7th March 2006, indicated that the search area contained:

| | |
|---|------|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Significance (Ramsar Sites) | 1 |
| Commonwealth Marine Areas: | None |
| Threatened Ecological Communities: | 1 |
| Threatened Species: | 31 |
| Migratory Species: | 27 |

These results are detailed in Table 1 below.

| Protected Matter | Status | Type of Presence |
|---|--------------|--|
| Wetlands of International Significance | | |
| Towra Point Nature Reserve | Ramsar Sites | Known to occur within 10 km |
| Threatened Ecological Communities | | |
| Eastern Suburbs Banksia Scrub of the Sydney Region | Endangered | Community known to occur within area |
| Threatened Species - Birds | | |
| Antipodean Albatross | Vulnerable | Species or species habitat may occur within area |
| Gibson's Albatross | Vulnerable | Species or species habitat may occur within area |
| Swift Parrot | Endangered | Species or species habitat may occur within area |
| Southern Giant-Petrel | Endangered | Species or species habitat may occur within area |
| Northern Giant-Petrel | Vulnerable | Species or species habitat may occur within area |
| Orange-bellied Parrot | Endangered | Species or species habitat may occur within area |
| Kermadec Petrel (western) | Vulnerable | Species or species habitat may occur within area |
| Australian Painted Snipe | Vulnerable | Species or species habitat may occur within area |
| Buller's Albatross | Vulnerable | Species or species habitat may occur within area |
| Shy Albatross | Vulnerable | Species or species habitat may occur within area |
| Campbell Albatross | Vulnerable | Species or species habitat may occur within area |
| Salvin's Albatross | Vulnerable | Species or species habitat may occur within area |
| White-capped Albatross | Vulnerable | Species or species habitat may occur within area |
| Threatened Species - Frogs | | |
| Giant Burrowing Frog | Vulnerable | Species or species habitat likely to occur within area |
| Green and Golden Bell Frog | Vulnerable | Species or species habitat likely to occur within area |
| Threatened Species - Mammals | | |
| Large-eared Pied Bat, Large Pied Bat | Vulnerable | Species or species habitat may occur within area |
| Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) | Endangered | Species or species habitat likely to occur within area |

| | | |
|---|-----------------------|--|
| Southern Right Whale | Endangered | Species or species habitat known to occur within area |
| Humpback Whale | Vulnerable | Species or species habitat known to occur within area |
| Long-nosed Potoroo (SE mainland) | Vulnerable | Species or species habitat may occur within area |
| Grey-headed Flying-fox | Vulnerable | Species or species habitat likely to occur within area |
| Threatened Species – Ray-finned fishes | | |
| Australian Grayling | Vulnerable | Species or species habitat likely to occur within area |
| Threatened Species – Reptiles | | |
| Green Turtle | Vulnerable | Species or species habitat may occur within area |
| Leathery Turtle, Leatherback Turtle, Luth | Vulnerable | Species or species habitat may occur within area |
| Threatened Species – Sharks | | |
| Grey Nurse Shark (east coast population) | Critically Endangered | Species or species habitat likely to occur within area |
| Great White Shark | Vulnerable | Species or species habitat may occur within area |
| Whale Shark | Vulnerable | Species or species habitat may occur within area |
| Threatened Species – Plants | | |
| Sunshine Wattle | Endangered | Species or species habitat likely to occur within area |
| Thick-lipped Spider-orchid, Daddy Long-legs | Vulnerable | Species or species habitat likely to occur within area |
| Leafless Tongue-orchid | Vulnerable | Species or species habitat may occur within area |
| Austral Toadflax, Toadflax | Vulnerable | Species or species habitat likely to occur within area |
| Migratory Terrestrial Species – Birds | | |
| White-bellied Sea-Eagle | Migratory | Species or species habitat likely to occur within area |
| White-throated Needletail | Migratory | Species or species habitat may occur within area |
| Black-faced Monarch | Migratory | Breeding may occur within area |
| Satin Flycatcher | Migratory | Breeding likely to occur within area |
| Orange-bellied Parrot | Migratory | Species or species habitat may occur within area |
| Rufous Fantail | Migratory | Breeding may occur within area |
| Migratory Wetland Species – Birds | | |
| Latham's Snipe, Japanese Snipe | Migratory | Species or species habitat may occur within area |
| Painted Snipe | Migratory | Species or species habitat may occur within area |
| Migratory Marine Birds | | |
| Antipodean Albatross | Migratory | Species or species habitat may occur within area |
| Gibson's Albatross | Migratory | Species or species habitat may occur within area |
| Southern Giant-Petrel | Migratory | Species or species habitat may occur within area |
| Northern Giant-Petrel | Migratory | Species or species habitat may occur within area |
| Buller's Albatross | Migratory | Species or species habitat may occur within area |

| | | |
|--|-----------|---|
| Shy Albatross | Migratory | Species or species habitat may occur within area |
| Campbell Albatross | Migratory | Species or species habitat may occur within area |
| Salvin's Albatross | Migratory | Species or species habitat may occur within area |
| White-capped Albatross | Migratory | Species or species habitat may occur within area |
| Migratory Marine Species – Mammals | | |
| Bryde's Whale | Migratory | Species or species habitat may occur within area |
| Pygmy Right Whale | Migratory | Species or species habitat may occur within area |
| Southern Right Whale | Migratory | Species or species habitat known to occur within area |
| Dusky Dolphin | Migratory | Species or species habitat may occur within area |
| Humpback Whale | Migratory | Species or species habitat known to occur within area |
| Killer Whale, Orca | Migratory | Species or species habitat may occur within area |
| Migratory Marine Species – Reptiles | | |
| Green Turtle | Migratory | Species or species habitat may occur within area |
| Leathery Turtle, Leatherback Turtle, Luth | Migratory | Species or species habitat may occur within area |
| Migratory Marine Species – Sharks | | |
| Great White Shark | Migratory | Species or species habitat may occur within area |
| Whale Shark | Migratory | Species or species habitat may occur within area |

Table 1: Protected Matters search results

Only three listed matters are **known** to occur in the area as opposed to those others that have the **potential** to occur. These are the Towra Point Nature Reserve RAMSAR wetland, Eastern Suburbs Banksia Scrub and the Humpback Whale. Towra Point Nature Reserve is distant from the subject site. The Humpback Whale is a marine mammal and the subject site is a terrestrial environment with no likely impact on the marine environment. Therefore, these two matters are not further considered for assessment.

However, Eastern Suburbs Banksia Scrub or its habitat is known to occur in the immediate vicinity of the subject site and is further considered and assessed here according to the procedure detailed in the EPBC Act (1999).

4 INFORMATION BASE

In addition to the Protected Matter Search tool results, the following information was relied upon for this study.

4.1 Taken for Granted: The Bushland of Sydney and Its Suburbs (Benson and Howell 1990)

This seminal work inferred that, before clearing, the Eastern Suburbs Banksia scrub did not occur on the Long Bay Gaol site as it is restricted to

deep sand sheets. Such underlying geology is restricted to the west of the site with outliers to the north of Long Bay and near La Perouse to the south.

4.2 The natural vegetation of the Sydney 1:100,000 map sheet (Benson and Howell 1994)

This work identified map unit 21g Coastal Sandstone Heath as occurring near, but not on, the subject site. The subject site is shown to be cleared of vegetation and fully developed.

4.3 Final Determination Eastern Suburbs Banksia scrub in the Sydney Basin Bioregion - endangered ecological community listing (NSW Scientific Committee 2002)

The NSW Scientific Committee determined Eastern Suburbs Banksia scrub in the Sydney Basin Bioregion as an endangered ecological community under the Threatened Species Conservation Act (1995).

In that determination, it is stated that the community occurs on nutrient poor sand deposits and is distinguished from similar coastal heaths by being taller and by the absence of a maritime element amongst its species. The community occurs on areas of sand deposits in the local government areas of Botany, Manly, Randwick, Waverley and Woollahra.

The Committee reported that less than 1% of the original area of the community currently exists in the form of a number of remnants. Threats to the survival of the community include fragmentation, development, increased nutrient status, inappropriate fire regimes, invasion by exotic plants, grazing by horses and rabbits, erosion from use of bicycles, motorcycles and from excessive pedestrian use.

4.4 Endangered Ecological Community Information - Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion NSW (NPWS 2004)

This paper claims that Eastern Suburbs Banksia Scrub once occupied around 5,300 hectares of land between North Head and Botany Bay but that today, less than 3% of the original distribution of this community remains, making it one of the most critically endangered communities in NSW. It occurs in a number of isolated remnants, ranging in size from 0.06 to 69 hectares. Surviving stands totalling approximately 146 hectares have been recorded from the local government areas of Botany, Randwick, Waverley, and Manly. Seed bank is stored in the soil for this community and it reportedly has been observed to regenerate naturally on cleared sand where the soil profile remains intact.

4.5 Eastern Suburbs Banksia Scrub Endangered Ecological Community Recovery Plan (NSW DEC 2004)

This plan advocates the following objectives and recovery actions for this community:

- map, assess and monitor the condition of all remnants;
- ensure that remnants are not destroyed and that an increased level of legislative protection is provided over land that provides habitat for this community;
- favour in-situ protection and the management of threats at sites;
- raise public awareness of this community and encourage active community participation in its conservation; and
- examines the community's ecological aspects that will inform management decisions regarding its long term conservation.

All of the known remnants are mapped in the recovery plan and described in detail. None of these are within or adjacent to the subject site.

4.6 Recommendation for the Identification of Critical Habitat for the Eastern Suburbs Banksia Scrub Endangered Ecological Community (NSW DEC 2006a)

This draft document is an extension of the recovery plan and it nominates all of the remaining remnants as critical habitat, plus an area of land surrounding each remnant as a buffer zone. None of these core areas or their buffers are mapped as being on or adjacent to the subject site.

4.7 Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion – profile (NSW DEC 2006b)

This resource document summarises the biology and conservation issues associated with this community and also details a number of recommended management actions. These include:

- Implement feral animal control programs;
- Determine and apply appropriate fire management practices;
- Consider off-site impacts in the assessment of nearby developments;
- Prevent stormwater run-off from entering sites;
- Install fencing, gates, formal tracks (where appropriate) and signs to manage access and prevent rubbish dumping;
- Implement weed control programs;
- Protect remnants from clearing and further fragmentation;
- Restore degraded habitat using bush regeneration techniques; and
- Prepare site specific management plans.

5 COMMONWEALTH ASSESSMENT

The EPBC Act Administrative Guidelines on Significance outline the procedures that must be followed when assessing likely impacts, and the significance of those impacts upon matter of National Environmental Significance (NES).

The criteria set out by the guidelines vary slightly according to the specific NES matter (i.e. wetlands, threatened species, endangered ecological communities, and migratory species).

Some of the criteria for threatened species and endangered ecological communities refer to the concept of 'habitat critical to the survival of a species or ecological community'. The guidelines indicate that the absence of a recovery plan or the fact that an area may not be listed on the Register of Critical Habitat does not mean that there is no habitat critical to the survival of the species or community.

Habitat critical to the survival of a species or ecological community may include areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal,
- for succession,
- to maintain genetic diversity and long term evolutionary development, or
- for the reintroduction of populations or recovery of the species / community.

Habitat critical to the survival of a species or ecological community will depend largely on the particular requirements of the species/community in question. For example, areas only incidentally used by a vulnerable species, and which the species is unlikely to be dependent upon for its survival or recovery, are not areas of habitat critical to the survival of a species or ecological community.

Some of the criteria refer to actions likely to lead to a "long-term decrease" in the size of a population or a "long-term adverse affect" on a community. Depending on the level of endangerment and the nature of the action, not all actions which create an immediate decrease in the population of a nationally listed threatened species or impact on a community will have long-term consequences. For example, an action which causes injury or death to only one or a very small number of a species will not, except in the case of the most endangered of species, generally lead to a long-term or irreversible decrease in the population that normal processes, rates of mortality and recruitment could not buffer.

Each criterion has been considered and a response provided below in regard to Eastern Suburbs Banksia Scrub.

An action has, will have, or is likely to have a significant impact on a critically endangered or endangered ecological community if it does, will, or is likely to:

i) lead to a long-term adverse affect on an ecological community, or

Response: The proposal is to redevelop parts of the Long Bay Correctional Complex that does not and probably never did contain Eastern Suburbs Banksia Scrub. The nearest examples of this community are at least 1.5 kilometres to the south, distant enough not to be impacted by the demolition and construction works.

ii) reduce the extent of a community, or

Response: As the site does not contain Eastern Suburbs Banksia Scrub or its habitat, the proposal cannot be regarded as reducing the extent of the community.

iii) fragment an occurrence of the community, or

Response: There is no natural vegetation on the site and the site has been alienated by development for over a century. The nearest remnant is at least 1.5 kilometres distant and it is already separated from other remnants by development right across the coastal zone of the Randwick LGA.

The demolition of existing buildings and the construction of new ones in their place will not further fragment the occurrence of the community on a local or regional scale.

iv) adversely affect habitat critical to the survival of an ecological community, or

Response: Critical habitat for this community has been mapped (NSW DEC 2006a). It includes all extant remnants of Eastern Suburbs Banksia Scrub plus surrounding buffer zones. None of the areas so mapped are within or adjacent to the subject site. The area to be impacted upon by the proposal does not provide habitat that is critical to the survival of this community.

iv) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the community's survival, or

Response: This community is restricted to the deep aeolian sand sheets that occur along the coastal parts of Sydney. The subject site is not on such geological features, thus it will not destroy any soils necessary for the survival of Eastern Suburbs Banksia Scrub. The nearest example of this community is 1.5 kilometres away and the site is currently developed and is to be redeveloped with similar but upgraded facilities. It is therefore unlikely that indirect impacts shall be wrought on water or nutrients for these distant remnants.

v) result in invasive species that are harmful to the critically endangered or endangered community becoming established in an occurrence of the community, or

Response: There is no naturally-occurring vegetation on the site at present. The entire area is to be redeveloped with the building surrounds and open spaces landscaped according to the Landscape Design Report (Site Image Landscape Architects 2006). Although the species and layout of landscaping in a correctional facility are constrained by the special nature of the site, in general, it has been recommended that locally-native plant species are to be used wherever

it is appropriate and that a long term maintenance schedule be implemented.

The proposed development is likely therefore to reduce the threat of invasive species to this community.

vi) interfere with the recovery of an ecological community.

Response: The recovery plan for this community (NSW DEC 2004) relies largely on in-situ management and protection. As the site does not support this community or its habitat, and the proposal is to redevelop an already developed area, it is unlikely to interfere with the recovery actions for this community.

In conclusion, it is considered that a significant negative impact is unlikely to occur in accordance with the criteria as set out by the Department of the Environment and Heritage. A referral to the Department is therefore not required.

6 CONCLUSION

The proposal is to demolish the existing current buildings and construct two new hospital complexes at Long Bay Correctional Complex, Malabar. This is within an area that is already completely developed.

In consideration of Matters on National Environmental Significance pursuant to the EPBC Act (1999), the potential impact on the endangered ecological community Eastern Suburbs Banksia Scrub has been assessed.

The subject site supports only small areas of planted gardens that do not constitute Eastern Suburbs Banksia Scrub. Also, the site's disturbance history is such that it could no longer provide potential habitat for this community, if indeed it ever did. The required underlying geology and resultant soil type have not been mapped as occurring on this site.

While the subject site is within the extent of the past distribution of this community and in close proximity to areas of extant remnants, none of the maps, profiles or recovery planning documents produced by NSW Department of Environment and Conservation show this community as being on this site. Moreover, the draft statement of critical habitat for this community (NSW DEC 2006a) does not nominate any part of the subject site as containing critical habitat (either core or buffer) for this community.

The nature of the subject site will change little with further development in terms of potential value to Eastern Suburbs Banksia Scrub. As the site does not support this community, the proposal will not adversely affect the community, reduce its extent or fragment an occurrence of it. While critical habitat has been identified on nearby properties, no such habitat is identified on the subject site. The site has been fully developed for some time and therefore is already alienated from natural processes. Its redevelopment will not exacerbate this situation.

It is concluded that the development proposal will not impact upon the endangered ecological community of Eastern Suburbs Banksia Scrub and therefore no further ecological assessment or referral to the Department of Heritage is required.

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Site Image Landscape Architects (2006) Landscape Design Report, Forensic and Prison Hospitals, Long Bay Correctional Facility. Number: LA 550 Issue 2

THE AUTHOR

Elizabeth Ashby
Principal Consultant, Keystone Ecological

PROFESSIONAL QUALIFICATIONS:

Bachelor of Science,
University of Sydney, 1983,
Double major in Zoology and Botany
Master of Science (Preliminary),
University of Sydney, 1984,
Distinction by coursework
Cert IV Workplace Assessment & Training,
North Sydney TAFE, 2002

PROFESSIONAL AFFILIATIONS:

Ecological Consultants Association of NSW, President
Birds Australia, member
Royal Zoological Society of NSW, member
Ecological Society of Australia, member
Australian Mammal Society, member

AREAS OF SPECIALTY:

Environmental impact research; forest, woodland,
heath and grassland flora; forest fauna; flora and
fauna survey methodology, Geographic Information
Systems and data management; advocacy.

Elizabeth Ashby has extensive experience in ecological research and assessment, performed in wide-ranging environments for leading conservation and land management organisations. She has co-authored many scientific papers and reports, booklets and vegetation maps. She is a recognised authority on forest conservation issues and has refereed many papers for Australian scientific journals. Her standing in the consulting industry has been acknowledged by her recent election as President of the Ecological Consultants Association of NSW. She has also served on a small committee, reporting to the Director-General of the Department of Conservation and Conservation regarding the accreditation of ecological consultants, pursuant to the Threatened Species Legislation Amendment Act (2004). Elizabeth has undertaken research and conducted surveys on forest fauna; performed vegetation survey and modelled coastal and inland environments; researched fire effects in coastal heathland and forest; produced vegetation maps of tablelands and inland ecosystems; and developed and maintained a Geographic Information System. She has applied these significant scientific and analytical skills to the environmental assessment industry in providing expert assessments, technical support and specialist advice for major development works and has provided expert evidence at the Land and Environment Court. Her time working in the field of industrial relations has honed her communication, negotiation and problem-solving skills. She co-founded Keystone Ecological in 2004 and is a Principal Consultant at this specialised ecological consultancy.

RELEVANT PROFESSIONAL EXPERIENCE:

| | |
|-----------------------|---|
| 2004 – present | Principal Consultant Keystone Ecological |
| 2001 – present | Industrial Relations Consultant Company Director cc WorkPlace Solutions Pty Ltd |
| 2002 – 2004 | Senior Ecologist Conacher Travers P/L Environmental Consultants |
| 1999 – 2001 | Organiser Public Service Association |
| 1993 – 1999 | Senior Technical Officer Royal Botanic Gardens |
| 1983 – 1993 | Technical Officer NSW National Parks & Wildlife Service |
| 1982 – 1983 | Volunteer Field Assistant Forestry Commission of NSW |

PUBLICATIONS:

- Daniel Lunney, **Elizabeth Ashby**, Jan Grigg & Michael O'Connell (1986). Food availability and habitat selection of *Sminthopsis leucopus* (Gray) (Marsupialia:Dasyuridae) in logged forest on the south coast of New South Wales. *Australian Mammalogy* 9:105-110.
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ENVIRONMENTAL ASSESSMENT PROJECT HISTORY:

The following projects were undertaken for Keystone Ecological:

▪ **Flora and Fauna Impact Assessments**

Empire Bay Drive, Empire Bay
Mangrove Mountain Retreat, Mangrove Mountain
Kincumber Crescent, Davistown
Fagans Road, Lisarow
The Scenic Road, MacMasters Beach
'The Oaks' Ranch and Country Club, Batemans Bay
Decker Place, Huntingwood
Boundary Road, Kincumber
Ocean Parade, Blue Bay
Tuggerawong Road, Wyongah
Beachview Esplanade, MacMasters Beach
Glen Road, Ourimbah
Lyn Parade, Prestons
Manns Road, Fountaindale
George Bass Drive, Mossy Point
Baloo Road, West Gosford
Tor Close, Umina Beach
View Street, Manly
Galston Road, Dural
Pacific Highway, Kanwal
Perry Road, Arcadia
Erina Valley Road, Erina
The Sanctuary, Umina Beach
Pacific Highway, Niagara Park
Wisemans Ferry Road, Lower Mangrove
Evans Road, Glenhaven

▪ **Expert Critique**

Draft Eastern Creek Stage 3 Precinct Plan
Davistown SEPP 14 Wetlands, Davistown
Boral Sand Quarry, Calga
North West Metropolitan Strategy Draft SEPP, Kellyville
Owen Close, Terrigal

▪ **Expert Opinion for Land & Environment Court Appeal**

Proposed SEPP 5 development, East Maitland

▪ **Management Plans**

Ocean Parade, Blue Bay
The Wahroonga Estate, Wahroonga
The Scenic Road, MacMasters Beach
Galston Road, Dural

▪ **Rehabilitation Plan**

The Scenic Road, Killcare Heights

- **Species Impact Statements**

- Annangrove Road, Rouse Hill
 - Pomona Road, Empire Bay

The following projects were undertaken prior to Elizabeth's affiliation with Keystone Ecological:

- **Flora and Fauna Assessment Reports**

- Barkala Road, Bayview
 - Camden Valley Way, Prestons
 - Ash Road, Prestons
 - Roseberry Road, Kellyville
 - Leo Road, Tuncurry
 - Dickson Road, Dooralong
 - The Scenic Drive, MacMasters Beach
 - The Lakes Way, Pacific Palms
 - Beaumont Road, Ku-ring-gai
 - Orama Road, Hazelbrook

- **Species Impact Statement**

- Roseberry Road, Kellyville

- **Ecological Assessment Reports**

- Environmental and Ecological Validation, Lake Sector Wallarah Peninsula
 - Flora and Fauna, Lake Sector, Wallarah Peninsula
 - Temperate Grasslands of Bredbo

- **Hazard Reduction Program and Environmental Assessment**

- Lake Sector, Wallarah Peninsula

- **Expert Evidence for Land & Environment Court Appeals**

- Beaumont Road, Ku-ring-gai
 - Bernera Road, Prestons
 - Coopernook
 - Orama Road, Hazelbrook

- **Weed Management and Rehabilitation Plan**

- Orama Road, Hazelbrook

- **Ecological Plan of Management**

- Jenolan Caves Conservation Area