Appendix I

Ecological Report

ASSESSMENT | PLANNING | MANAGEMENT

Ecological Assessment

Potts Hill Sydney Water Facilities Ecological Assessment
(Project No. 017-011)

Report prepared for
Sydney Water

DRAFT
June 2008

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1. Introduction

This *Ecological Assessment Report* has been prepared to support the proposed construction of new facilities for Sydney Water Corporation (SWC) at the Potts Hill Reservoirs site.

Approval for the project is sought under Part 3A of the *Environmental Planning & Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Major Projects) 2005*.

This document, and accompanying technical appendices, provide required supporting information with respect to the biodiversity of the site as specified by the in the Director General's requirements.

This report describes the natural environment of the proposed development site and considers the potential impacts of the project on threatened flora and fauna and their habitats. The potential for impacts is assessed, relevant mitigation measures are considered, and an assessment of the proposal against the 'maintain or improve' principle, as required under Part 3A of the EP&A Act, is provided.

This document broadly follows a structure and indicative content set out in the Draft Guidelines for Threatened Species Assessment under Part 3A prepared by Department of Environment and Climate Change, and Department of Primary Industries (DECC & DPI, 2005).

As per the Director General requirements, all threatened flora and fauna species in the immediate vicinity of the proposal are identified.

1.1 Study Site Location

The study site (Figure 1) is located in the northern part of the Bankstown Local Government Area (LGA). SWC infrastructure for delivery of water supplies, including Reservoir 1 (which is no longer utilised for water storage), and Reservoir 2 is present to the north and west of the site.

The suburb of Chullora, with heavy rail infrastructure, industrial, and waste recycling centres occurs to the east of Rookwood Road. The residential suburb of Yagoona occurs to the south.

The centre of the site is approximately at latitude 151.03, and longitude -33.89.

1.2 Site Description

The study site has a history of use for water supply to the Sydney metropolitan area since the late 1800s. It is owned and managed by Sydney Water Corporation (SWC). The study site is situated on a hilltop, at approximately 66m asl, and is approximately 14.3 ha in size.

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The site drains to the Cooks River, in an easterly direction, though there are no recognised rivers within the site. Acid sulphate soils do not occur within the site or immediate surrounds.

1.3 Description of Project

1.3.1 Relationship to Potts Hill Rezoning Investigations

For the broader Potts Hill Reservoir site, SWC conducted investigations to identify lands surplus to its needs. The boundary of the lands that were part of these investigations is shown in Figure 1. A rezoning application has been lodged for a portion of the broader Potts Hill Reservoir site.

The study area for proposed SWC facilities was part of the area investigated. This report therefore draws on the flora and fauna investigations that supported the rezoning application.

1.3.2 Works Proposed with Sydney Water Facilities

SWC propose to construct a combination of office, warehouse and storage buildings, with an indicative gross floor area of 11,000 sqm. Car parking, circulation, and landscaping is also proposed, with road access from Rookwood Road or Brunker Road.

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Figure 1. Proposed location of the Sydney Water facilities.

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2. Legislative and Policy Framework

This section provides a brief review of the legislation and policy framework relevant to the management and conservation of biodiversity on the site proposed for the Potts Hill Sydney Water facilities.

2.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The Commonwealth (EPBC Act) provides a national scheme for protecting the environment and conserving biodiversity values. Approval from the Commonwealth Environment Minister is required under the EPBC Act if the action (which can include a project, development, undertaking or activity) will, or is likely to, have a significant impact on matters considered to be of national environmental significance (NES matters). NES matters relevant to this proposal include migratory and/or threatened species are listed under the Act.

2.2 *Environmental Planning and Assessment Act 1979*

Development of the site will fall under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Under Part 3A, the proponent and consent authority must consider all aspects of the environment, including biological, physical, social and economic factors and the principles of ecologically sustainable development, when assessing the impacts of the project. Assessment under Part 3A of the EP&A Act includes consideration of threatened species, endangered populations and communities listed under the TSC Act, Matters of National Environmental Significance listed under the EPBC Act and requires a Maintain or Improve Outcome with respect to biodiversity values.

Part 3A of the EP&A Act negates the requirement to assess the significance of impacts on threatened species, populations and ecological communities or their habitat pursuant to Section 5A of the EP&A Act (the 7-part test). However, an assessment of the magnitude and extent of impacts and the significance of the impacts as related to the conservation importance of the habitat, individuals and populations likely to be affected is required (DECC DPI, 2005).

2.3 *Threatened Species Conservation Act 1995*

The *Threatened Species Conservation Act 1995* (TSC Act) aims to protect and encourage the recovery of threatened species, populations and communities listed under the Act. No Endangered Ecological Communities, and no threatened species listed under the TSC Act are known to occur on study site, though some threatened fauna species may potentially utilise the site. An Endangered Ecological Community is known to occur in the immediate vicinity of the study area. Potential impacts on these communities, species and their habitats are assessed as part of the Part 3A assessment process with reference to the Assessment Guidelines (DECC & DPI 2005) described above.

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2.4 *Sydney Water Act 1994*

This Act established the Sydney Water Corporation to provide for water supply to Sydney residents. The Act also defines the objectives of the Corporation under s.21, including the following principal objectives (shortened):

(a) To be a successful business
(b) To protect the environment
(c) To protect public health

2.5 Bankstown LEP 2001

The LEP is the principal planning document for the Bankstown Local Government Area. The LEP identifies a variety of landuse 'zones' with details of objectives and permissible actions with different zones.

2.6 Bankstown Biodiversity Strategy

This Biodiversity Strategy incorporates a detailed review of the natural environment of Bankstown Local Government Area (LGA), threats to the existing biodiversity values, and statutory and organisational context relevant to biodiversity management.

A list of strategies are provided for biodiversity management in the LGA, covering the areas of planning, ecological corridors, ground reserve management, education, participation and many others.

The objectives of this strategy will be addressed through the maintain or improve assessment in Section 6 of this document.

2.7 Bankstown City Council Tree Preservation Order

Development Control Plan (DCP) No 15 – Tree Preservation Order requires Council to consider the amenity provided by trees when considered applications to remove or prune trees (plants ≥5m in height). Certain tree species are excluded from this DCP. A condition of consent may be no action, or growing / planting other suitable replacement trees.

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3. Ecological Assessment Methodology

This assessment utilised survey and results of the Potts Hill rezoning study. The Sydney Water facilities study area was included in the rezoning investigation.

A summary of the rezoning investigation methods, which were applied to the Potts Reservoir Site study area, are provided below. Greater details for methods relevant to the Sydney Water facilities study area are provided in Appendix 1.

- *Literature Review*: Previous assessments of the ecological condition of the site were reviewed.
- *Database Audit*: A 10km radius search of Atlas of NSW Wildlife and EPBC database. Note that the previous database search was updated for this report.
- *Assessment of likelihood of occurrence:* Habitat assessment for threatened species based on previous studies, habitat on site, known distributions and professional opinion. Note that habitat assessment was updated so as to be relevant to the Sydney Water facilities study area.
- *Site Survey*: Eco Logical Australia staff conducted inspections, flora and fauna surveys in 2006 and 2007 (approximate total of 75 person-hours survey).
- *Vegetation Community Mapping*: Bankstown City Council mapping (2002) was utilised as a base layer, validated, and modified where necessary.
- *Targeted Survey for Threatened Species* (January 2007): Targeted surveys were conducted on site for two threatened species, *Acacia pubescens* and the Cumberland Plain land snail.
- *Supplementary targeted surveys for threatened species* (November 2007): Green & Golden Bell Frog (habitat assessment/call playback/diurnal and nocturnal habitat searches), and microchiropteran bats (anabat surveys).
- *Fauna Habitat*: Hollow bearing trees were mapped and notes taken on potential fauna habitat in development areas.

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4. Results

A summary of the results are provided below. Full details are provided in Appendix 2.

4.1 Literature Review

Previous assessments of the Potts Hill Reservoir site identified the presence of three endangered ecological communities (EECs), *Acacia pubescens,* the Grey-headed Flying Fox and Common Bent-wing Bat. None of the EECs or threatened species, however, was recorded within the study area for the proposed Sydney Water facilities.

4.2 Vegetation Characteristics

Vegetation on the study site is limited, with some planted trees in the north and east of the site. Regrowth dominated by exotic species also occurs on a batter in the southeast on the site, which is adjacent to the playing fields (Potts Park). Exotic grasses and weeds also occur in patches through the site.

No native vegetation communities occur within the study area. The highly disturbed vegetation within the study site is due to large quantities of fill, excavated during the construction of the reservoirs, being placed on the study site.

Three plant communities recorded within the broader Potts Hill site (Cumberland Plain Woodland, Cooks River/Castlereagh Ironbark Forest and Sydney Turpentine Ironbark Forest) are listed as endangered ecological communities under the TSC Act, but are not found within the Sydney Water facilities study area. Sydney Turpentine Ironbark Forest occurs in the immediate vicinity to the north of the study site.

4.3 Fauna Habitat

The SWC facilities study area has minimal fauna habitat. Little vegetation is present, though planted trees provide limited foraging resources for mobile fauna such as birds and bats. No drainage lines are present. No hollow bearing trees are present. No corridor linkages are identified over the study site in the Bankstown Biodiversity Strategy (BCC and ELA 2002).

4.4 Threatened Species

Of the threatened flora and fauna species previously recorded in the locality, and considered during the likelihood of assessment (Appendix 5), six highly mobile fauna, (the square-tailed kite and 5 bat species), are considered to have the potential to forage on the study site.

A threatened plant, *Acacia pubescens*, is known to occur within the Potts Hill Reservoir site, but no plants were found within the SWC facilities study area.

Searches for Cumberland Plain snail and green and golden bell frog were conducted within the Potts Hill Reservoir site, with no individuals of either species being detected.

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5. Mitigation

Mitigation measures appropriate to the proposal are:

- No stormwater or drainage is to be directed towards, or into, the Sydney Turpentine Ironbark Forest to the north of the study area.
- Locally indigenous native species be utilised as part of the proposed landscaping.

An Environmental Management Plan (EMP) and a Vegetation Management Plan (VMP) will be prepared by SWC for its retained lands, as part of the broader Potts Hill application. This will include consideration of the Sydney Turpentine Ironbark Forest to the north of the study area.

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6. Impact Evaluation

6.1 Assessment under Part 3A Criteria

The proposed Sydney Water facilities are assessed below against the key thresholds outlined in the Part 3A Threatened Species Assessment Guidelines:

- *Whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values.*

With the mitigation measures identified in this document, the proposal passes the 'maintain or improve' assessment for biodiversity values (see section 6.2).

- *Whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community*.

The proposal will involve the loss of a small amount of potential foraging habitat for six highly mobile threatened species. This is not likely to reduce the long-term viability of these species.

- *Whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction*.

The proposed development of the Potts Hill site will not accelerate the extinction of threatened species or ecological communities of relevance to the site.

- *Whether or not the proposal will adversely affect critical habitat*.

No critical habitat, as defined and listed under the TSC Act, is present.

Based on the assessment above, it is considered that there is unlikely to be a substantial adverse impact on threatened species, endangered ecological communities, or their habitat.

6.2 Assessment of proposal against Maintain or Improve Principles

No clearance of native vegetation communities is proposed. There will be removal of some planted trees, which provide limited foraging resources for mobile fauna. Once landscaping vegetation proposed as part of the development is established, it is anticipated that this will replace the minimal loss of foraging habitat for highly mobile fauna species.

With the mitigation measures proposed in this document (section 5), the proposed Sydney Water facilities will 'maintain or improve' biodiversity values, because no native vegetation communities are present, and the limited foraging resources for mobile fauna species to be affected will be replaced.

6.3 EPBC Matters

No vegetation communities, or species listed under the EPBC Act, were considered likely to occur on the study site.

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7. Conclusions

The site for the proposed replacement Sydney Water facilities has a long history of use for water management purposes. Placement of fill from the excavation of one, or both, of the Potts Hill reservoirs has occurred over much of the study site, which has resulted in the loss of the original soil profile.

Some planted trees are present within the study area. These do not constitute a native vegetation community. These planted trees provide some limited potential foraging habitat for potentially occurring threatened bats, and the square-tailed kite.

An endangered ecological community, Sydney Turpentine Ironbark Forest, is present to the north of, but not within, the study area.

It is recommended that:

- No stormwater or drainage is to be directed towards, or into, the Sydney Turpentine Ironbark Forest to the north of the study area.
- Locally indigenous native species be utilised as part of the proposed landscaping.

The proposed Sydney Water facilities will 'maintain or improve' biodiversity values, because no native vegetation communities are present, and the limited foraging resources for mobile fauna species to be affected will be replaced.

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8. References

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Appendix 1. Details of Ecological Methods

Relevant methods utilised during the Potts Reservoir Site study area, which formed the basis of the information utilised in this report, are provided below. Note that methods not relevant to the Sydney Water facilities site have been removed, and that the database search was updated during the preparation of this report.

Literature Review

Previous assessments of the ecological condition of the Potts Hill site, including habitat assessment, have been reviewed as part of this proposal, including:

- Flora and Fauna Study of Potts Hill Reservoir (SMEC 1997),
- Native Vegetation Maps of the Cumberland Plain Western Sydney Interpretation Guidelines (NPWS 2002),
- Bankstown Biodiversity Strategy (BCC and ELA 2002).

The information review was conducted to assess the ecological condition of the site, current level of ecological knowledge, and requirements for further survey work. We note that the surveys were undertaken at differing scales and levels of detail. Further, since the earliest surveys were completed changes have occurred in names and definitions of some vegetation communities on site.

Database Audit

A search of the Atlas of NSW Wildlife, for threatened flora and fauna within 10km of the central point 151.034333, -33.89404, was conducted on 17/06/2008 (10km radius search). The same search was conducted on 17/06/2008 using the EPBC database (Department of Environment, Water, and Heritage) for matters of national environmental significance.

Site Inspections/Field Surveys

Representatives from Eco Logical Australia, Sydney Water and Market Research undertook an inspection of the Potts Hill site in November 2005. The purpose of the visit was to become familiar with the site layout and features, and to note the condition of vegetation communities to assist in the review of previous vegetation mapping conducted on the site.

Fieldwork surveys were conducted by ELA staff, including:

- Vegetation community assessment within the main body of the site (excluding northeast section) over two days (approximately 40 person hours) on the 21st of February 2006 and on the 11th of January 2007.
- Targeted surveys for two threatened species: *Acacia pubescens* and the Cumberland Plain land snail on 25/01/07 (approximately 10 person hours).
- Additional targeted surveys on 28/11/2007 and 29/11/2007 for threatened species: Green and Golden Bell Frog (approximately 2 person hours of habitat assessment, and 10 person hours of frog survey over two nights), Grey-headed Flying Fox (spotlighting concurrent with frog survey over two nights), and Eastern Bent-wing Bat (Anabat survey over 2 nights).
- Bird surveys on 28/11/2007 and 29/11/2007 (approximately 2 person hours), as well as incidental observations during other surveys.
- Mapping of hollow bearing trees (in areas identified for potential development) on 25/01/07 (approximately 10 person-hours).

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Vegetation Community Mapping and Condition Assessment

Previous studies (SMEC 1997, NPWS 2002, Bankstown City Council 2002) had mapped different vegetation communities, with differing extents, over the site. The various vegetation map layers were compared, and one layer selected for use as base layer. This base layer was modified as necessary based on ground-truthing for vegetation in the development and retained lands (note that vegetation in the northeast of the site was not included as it was outside of the region of interest). Vegetation community type was determined by identifying diagnostic species at different structural levels (primarily the canopy, as lower layers were often highly modified), structural attributes of vegetation, and substrate condition (eg. soils) (NPWS 2002). An opportunistic list of plant species was used to assist in community identification, and weeds were noted (see Appendix 3).

Observations were made of vegetation condition throughout the site based on the structural integrity of vegetation at each floristic layer (canopy, understorey, and shrub and ground layers), the presence of native/exotic species, as well as disturbance levels. Condition was determined using guidelines developed by NPWS (2002).

Targeted Survey for Threatened Species

Targeted surveys were conducted on site on 25/01/07 for two threatened species: *Acacia pubescens* and the Cumberland Plain land snail.

The extent of *Acacia pubescens* populations on the site were quantified by counting the number of stems in locations where the plant was known to exist (location records supplied by Sydney Water). Systematic sweep searches for additional populations of *A. pubescens* within suitable habitat in the development area were performed by ELA ecologists (approximately 6 person-hours of search effort).

Searches were conducted for the Cumberland Plain land snail *Meridolum corneovirens* at 10 locations (Figure 2). Each search consisted of a three minute dig around the base of trees with abundant leaf litter and, where possible, targeting trees known provide habitat (*Eucalyptus tereticornis* and *Eucalyptus crebra*, pers. comm. Josie Stokes, Australian Museum).

Additional targeted surveys were conducted on site on 28/11/2007 and 29/11/2007 for threatened species: Green and Golden Bell Frog, Grey-headed Flying Fox, and Eastern Bent-wing Bat.

Surveys for the green and Golden Bell Frog (*Litoria aurea*) were conducted on two consecutive nights on 28/11/2007 and 29/11/2007. Potential habitat areas were located in the southwest of the Potts Hill site and consisted of an ephemeral creek/wetland and drainage channels (Figure 2). These areas were wet during the surveys as a result of rainfall earlier in the week (beginning Mon 26th Nov 2007). Survey techniques used were: diurnal habitat searches, nocturnal spotlighting, and call playback surveys.

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Microchiropteran bats were surveyed using Anabat echolocation call detectors. Anabat recorders were deployed on two consecutive nights (7pm to 10am) in potential bat flyways within the proposed residential development area of the site (see Figure 2). Call frequencies were analysed by Maria Adams at Wollongong University.

Incidental fauna surveys were also carried out throughout the site during the targeted searches (28/11/2007 and 29/11/2007). Sixteen bird species were recorded, along with the Common Garden Skink and several domestic cats (Appendix 4). None of the species observed during incidental surveys are listed on the *Threatened Species Conservation Act 1995*.

Hollow Bearing Tree Survey

Hollow bearing trees were mapped in patches of vegetation identified for potential development. A sweep search for hollow bearing trees was performed on 25/01/07 during the surveys for *A. pubescens.* It consisted of a search effort of approximately 10 person-hours (additional to *A. pubescens* search effort). Hollow-bearing trees were mapped and tree species, diameter at breast height (dbh) and hollow dimensions (size and likely fauna species that might utilise them) recorded.

Survey Limitations

The northeast portion of the Potts Hill site (lands to the north and east of reservoir 1) were not surplus to SWC's needs, were therefore outside of the brief for the area to be surveyed and assessed, and there was no detailed survey of these lands by Eco Logical Australia. These lands are outside of the study area for the proposed Sydney Water facilities.

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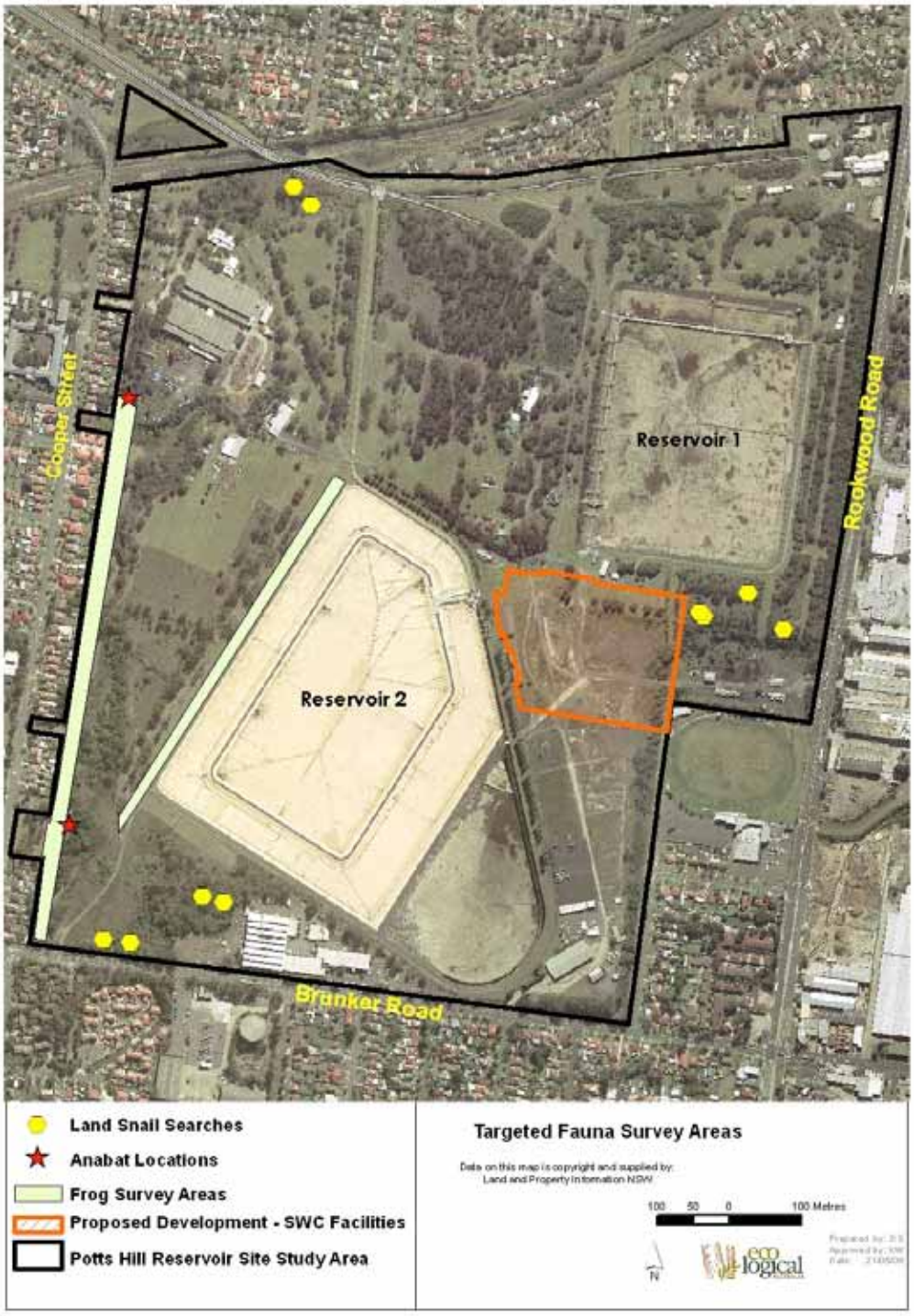

Figure 2. Location of targeted threatened species search areas.

Note: Two Cumberland Plain Land Snail searches in the east of the site were located close together.

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Appendix 2. Details of Ecological Results

Literature Review

SMEC Potts Hill Survey (1997)

This study recorded the following vegetation communities on the Potts Hill site:

- Grassland / planted trees
- Shale/Gravel Transition Forest
- Shale/Sandstone Transition Complex

The Grassland / planted trees were noted as being a combination of native and introduced grass species, with or without scattered planted trees. The grassland was generally mown, but some areas were left unmanaged.

The Shale/Gravel Transition Forest communities were described as having trees to 22m, understorey of grassland and scattered shrubs, and an average shrub height of 1.4 m, sparse to medium density, or with a mown understorey. The communities were noted as having varying degrees of disturbance and recovery. The area south of Reservoir 2 was noted as containing hollow bearing trees.

Dominant tree species were: *Eucalyptus fibrosa*, *Syncarpia glomulifera*, *E. moluccana, E. tereticornis* on drier sites, and *E. longifolia, Melaleuca decora, M. styphelioides* and *M. nodosa* often on low-lying sites. The shrub layer was found to be dominated by native species, with the ground layer dominated by introduced grasses and herbs.

Shale/Sandstone Transition Complex community was described as having trees to 18m, with an understorey consisting of grasses and scattered shrubs, mostly occurring on disturbed sites, with *E. punctata* common in north of site and *E. pilularis* dominant in the south of site.

Two ramets of the threatened shrub *Acacia pubescens* were noted as being present inside the site along batters for the water pipeline just north-west of Reservoir 1. The grey-headed flying fox (*Pteropus poliocephalus*) was observed along with regionally significant species, the White-winged Chough (*Corcorax melanorhamphos*) and Peregrine Falcon (*Falco peregrinus*).

Connectivity of the site to other remnant bushland was noted as being poor, as the site is surrounded by roads and a railway line. However, it was noted that the Potts Hill reservoir site may provide stepping stones for mobile fauna groups to move between remnant bushland.

Bankstown Biodiversity Strategy

The Bankstown Biodiversity Strategy (ELA and BCC 2002), noted that the Potts Hill Reservoir contains six discrete vegetation communities/types:

- Cumberland Plain Woodland
- Cooks River Castlereagh Ironbark Forest
- Sydney Turpentine Ironbark Forest
- Freshwater wetlands
- Grassland

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- Revegetated areas

The text also notes that Sydney Sandstone Gully Forest occurs on the site, on an unusual outcropping of sandstone, but is not shown on the relevant map [map A2-3]. It was thus unclear if this vegetation did or did not occur on site at the time of the survey.

Vegetation on the Bagdad Street site, which has been incorporated into the subject lands at Potts Hill, was identified as Cooks River/Castlereagh Ironbark Forest, Creek (riparian), and Grassland (Exotics) in the Biodiversity Strategy.

Several threatened species (*Acacia pubescens,* grey-headed flying-fox, and common bent-wing bat) were noted as having been recorded at the Potts Hill Reservoir site. *Acacia pubescens* is also identified outside and to the west of the site, within a RailCorp railway corridor (RailCorp 2000).

Two proposed biodiversity "stepping stone" corridors pass through the north and south of the Potts Hills Reservoir site. The first is along the "Sydney Water Pipeline corridor" along the northern boundary of the Potts Hills site. The second is the "Alternative east-west corridor" and occurs on the southern boundary of Potts Hills site. Neither biodiversity corridor passes through the study area for the proposed Sydney Water facilities.

NPWS Vegetation Mapping

Native vegetation mapping (NPWS 2002) mapped three vegetation communities within the site (some mapped as disturbed):

- Cooks River Castlereagh Ironbark Forest
- Shale Hills Woodland (a sub-community of Cumberland Plain Woodland)
- Shale Plains Woodland (a sub-community of Cumberland Plain Woodland)

Vegetation Community Mapping and Condition Assessment

The Bankstown City Council (2002) mapping was found to be the most accurate for the Potts Hill site, and hence was used as a base layer, with the classification and extent of some communities modified as a result of the fieldwork. After ground-truthing, a total of five remnant communities were identified as occurring within the Potts Hill site (Figure 3). Areas of grassland were mapped in the east of the site in the Council layer.

During site inspections it was noted that grasslands in the east occurred between rows of planted trees, and appeared to be dominated by an exotic grass species, and was therefore removed from the mapping as it did not appear to be a native vegetation community. It is noted that ground-truthing in this area was limited. The area of 'Grassland – Native' in the south of the site was noted as being dominated by *Themeda australis,* with some exotic species also present.

The proportion of the Potts Hill site with mapped vegetation, including exotic dominated grasslands, was low (9.8%). This is consistent with the site having a long history of water management usage. A number of areas contain planted, non-local trees, or some regrowth, usually heavily dominated by exotic species. This type of

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vegetation is common throughout the site, and is visible in Figure 3 as vegetation that has not been classified as a native community. These areas differed in plant density, with some areas maintained by periodic slashing or mowing [eg. plantings of Canary Island palms (*Phoenix canariensis*) and other non-local trees around the perimeter of Reservoir 2].

Table 1. Area of vegetation communities within Potts Hill site (see Figure 3 for distribution of communities).

Vegetation Community	Status *		Area (ha)
	TSC	EPBC	
Cooks River/Castlereagh Ironbark Forest	EEC	-	8.30 (67%)
Creek (Riparian)	-	-	0.11 (0.9%)
Cumberland Plain Woodland	EEC	EEC	1.04 (8.4%)
Grassland - Native	-	-	0.33 (2.7%)
Sydney Turpentine Ironbark Forest	EEC	CEEC	2.60 (21%)
Total			12.38 (100%)

* TSC = Threatened Species Conservation Act; EPBC = Environmental Protection and Biodiversity Conservation; EEC = Endangered Ecological Community; CEEC = Critically Endangered Ecological Community

In the north of the Potts Hill site, the Cooks River/Castlereagh Ironbark Forest, and Sydney Turpentine Ironbark Forest communities appear to have an understorey which is often slashed, or mown, with a moderate to high recovery potential. Areas close to Sydney Water buildings (in the east and northwest), and water supply infrastructure (mainly the water supply pipeline in the north) were more degraded, and were assigned a lower recovery potential.

No native vegetation communities were considered to occur within the Sydney Water facilities study area.

No 'drainage lines' for the Potts Hill study area appear on 1:25,000 topographic mapping, and hence requirements for approvals affecting 'rivers' under the *Water Management Act 2000*, do not apply.

Weeds

A number of weed species are present in the Potts Hill site, and may occur in the Sydney Water facilities study area, including:

- Green cestrum (*Cestrum parqui*)
- Lantana (*Lantana camara*)
- Blackberry (*Rubus fruticosus* (agg. spp.))
- Pampas grass (*Cortaderia selloana*)
- Prickly pear (*Opuntia* sp.)
- Rhus tree (*Toxicodendron succedaneum*)
- African Olive (*Olea europaea*)

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Threatened Species

An assessment of the likelihood of occurrence of threatened species has been undertaken based on the habitats present on site (see Appendix 5). On the basis of this assessment, 6 threatened species have the potential to occur on the site at least on occasion.

- Square-tailed Kite (*Lophoictinia isura*)
- Great Pipistrelle (*Falsistrellus tasmaniensis*)
- Eastern Bent-wing Bat (*Miniopterus schreibersii*) - Known to occur on Potts Hill
- Eastern Freetail-bat (*Mormopterus norfolkensis*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Known to occur on Potts Hill site
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)

The threatened plant species, *Acacia pubescens*, was recorded at six sites within the Potts Hill site (Figure 4). The total number of stems counted throughout the site was 138 with the number of stems at each site ranging from 4 to 47. The majority of plants are located in the north of the site with a more distant but relatively large population situated in the south. The size range of individual stems ranged from 0-4 m and estimated patch sizes for individual sites ranging from 16m^2 to 400m^2.

Further species of *Acacia pubescens* are reported by RailCorp as being within the rail corridor, immediately adjacent to the Potts Hill site. A 'mudmap' of known locations was received from RailCorp (RailCorp 2000) and indicative locations are included on Figure 4.

No *Acacia pubescens* plants were located with the study area for this report, and the disturbed soil profile means that the species is unlikely to be present in the soil seed bank.

Targeted searches for the Cumberland Land Snail (*Meridolum corneovirens*) within the proposed development lands did not result in any specimens or shells. The habitat within the development areas, including the study area for this report, was considered to be poor with limited leaf litter and ground debris to provide shelter for this species in most areas. Further, African Olive was present in some areas, and this plant is thought to be toxic to the snail. Substantial weed cover in other areas would likely prohibit the presence of the Cumberland Land Snail.

Targeted searches for the Green and Golden Bell Frog in the west of the Potts Hill site did not detect any evidence of the species (sightings or calls). No habitat for this species is present within the study area for this report.

Diurnal habitat searches and nocturnal spotlight surveys did not detect the presence of the Grey-headed Flying Fox on site or overhead. This species is known to occur on the Potts Hill site (SMEC 1997).

Anabat surveys conducted to detect the possible presence of microchiropteran bats did not detect ay threatened bat species on the Potts Hill site. Only five calls from two species were recorded during the 2-night survey period; *Tararida australis*

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and *Chalinolobus gouldii/Mormopterus sp2*. These species are not listed under the *Threatened Species Conservation Act 1995*.

The Eastern Bent-wing Bat (*Miniopterus schreibersii*) has been previously recorded on the Potts Hill site (SMEC 1997) and a number of other threatened micro bat species may potentially occur given the habitats present.

Other Fauna

A range of common and widespread fauna species have been recorded on the Potts Hill site (Appendix 4). The species recorded are generally more mobile species (eg birds and bats) that are commonly recorded in urban bushland remnants and are that utilise woodland/open forest and open grassland habitats.

Two species of regional significance, white-winged chough (*Corcorax melanorhamphos*) and peregrine falcon (*Falco peregrinus*) were noted in SMEC (1997).

Three species of frog were located on the Potts Hill site: *Crinia signifera* (Eastern Froglet), *Litoria caerulea* (Green Tree Frog) and *Litoria peronii* (Peron's or Emerald Spotted Tree Frog).

A numbers of cats were recorded on site during the recent targeted fauna surveys.

Hollow Bearing Trees

Assessment of trees for hollows of the Potts Hill site revealed the presence of 57 hollow bearing trees (Figure 5). Most of these trees (43) were exotic peppercorn trees (*Schinus areira*), with a mixture of planted and established natives accounting for the remaining 14 trees. The majority of hollows were of sufficient size to accommodate bats and small birds or gliders, but were not a sufficient size to be used as roosts by owls or other medium to large birds. No hollow bearing trees were located within the study area for this report.

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Figure 3. Vegetation communities.

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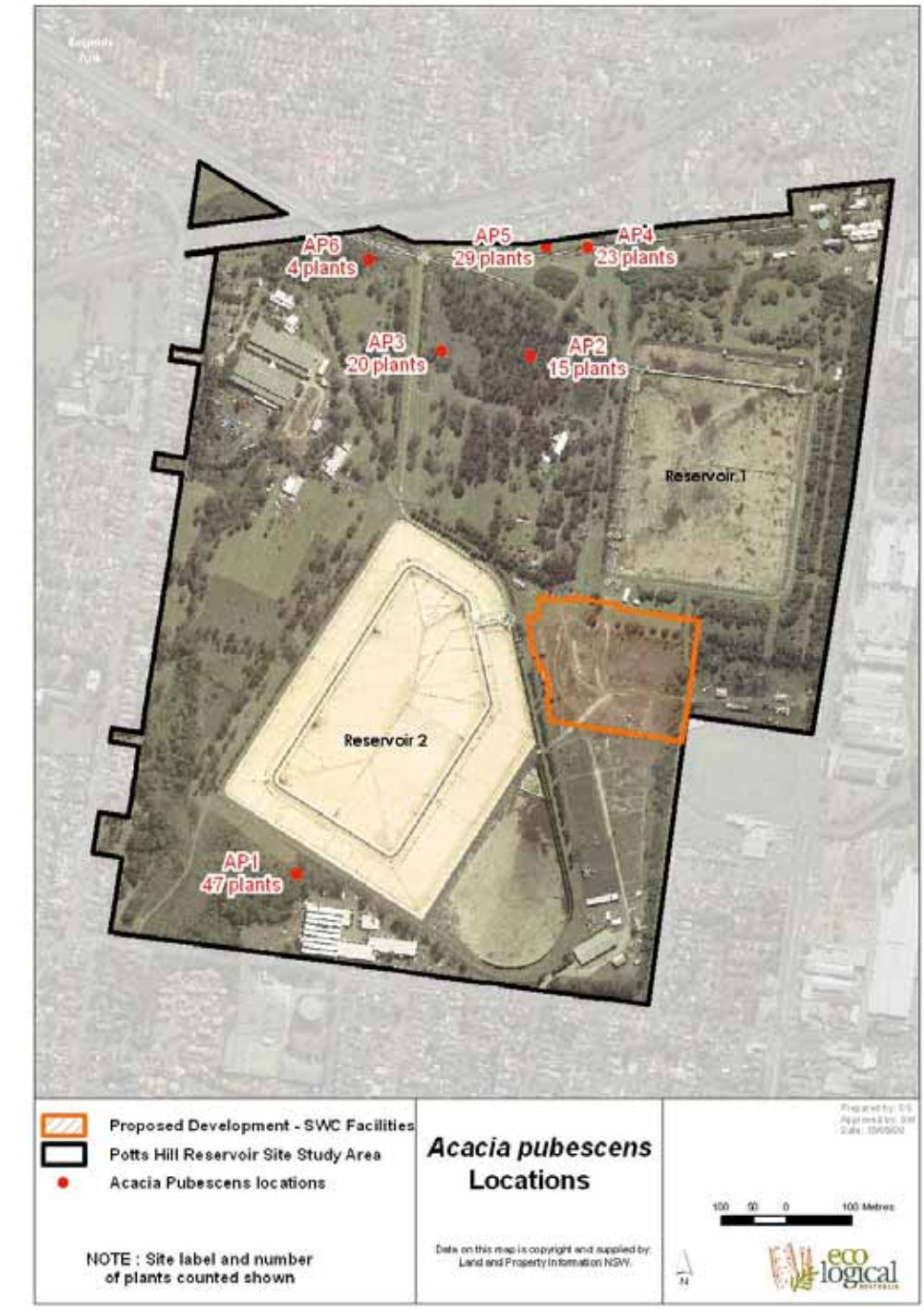

Figure 4. Occurrences of the threatened plant *Acacia pubescens*.

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Figure 5. Location of hollow bearing trees.

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Appendix 3. Flora opportunistically noted within the Potts Hill Reservoir Site during field surveys.

Scientific Name	Common Name	Native (Y/N)	Noxious Weed Class in LGA*
Ageratina adenophora	Crofton Weed	N	-
Chrysanthemoides monilifera	Boneseed/Bitou Bush	N	3
Cinnamomum camphora	Camphor Laurel	N	-
Cortaderia selloana	Pampas Grass	N	3
Erythrina X sykesii	Coral tree	N	-
Hardenbergia comptoniana	*Hardenbergia comptoniana*	N	-
Juncus acutus	Sharp Rush	N	-
Ligustrum lucidum	Large-leaved Privet	N	-
Olea europaea	Common Olive / African Olive	N	-
Paspalum dilatatum	Paspalum	N	-
Phoenix canariensis	Canary Island Palm	N	-
Rubus fruticosus (agg. spp.)	Blackberry	N	4
Acacia parramattensis	Parramatta Wattle	Y	
Acacia pubescens	Downy Wattle	Y	
Angophora floribunda	Rough-barked Apple	Y	
Aristida spp.	Grass	Y	
Asplenium flabellifolium	Necklace Fern	Y	
Breynia oblongifolia	Coffee Bush	Y	
Casuarina glauca	Swamp Oak	Y	
Dodonaea triquetra	Large-leaf Hop-bush	Y	
Eucalyptus crebra	Narrow-leaved Ironbark	Y	
Eucalyptus eugenioides	Thin-leaved Stringybark	Y	
Eucalyptus fibrosa	Red Ironbark	Y	
Eucalyptus longifolia	Woollybutt	Y	
Eucalyptus moluccana	Grey Box	Y	
Eucalyptus pilularis	Blackbutt	Y	
Eucalyptus tereticornis	Forest Red Gum	Y	
Glycine clandestina	*Glycine clandestina*	Y	
Kunzea spp.	Kunzea	Y	
Lomandra longifolia	Spiny-headed Mat-rush	Y	
Melaleuca decora	White Feather Honeymyrtle	Y	
Melaleuca styphelioides	Prickly-leaved Tea Tree	Y	
Pittosporum revolutum	Rough Fruit Pittosporum	Y	
Pittosporum undulatum	Sweet Pittosporum	Y	
Polyscias sambucifolia	Elderberry Panax	Y	
Syncarpia glomulifera	Turpentine	Y	
Themeda australis	Kangaroo Grass	Y	
Typha orientalis	Bullrush	Y	

Noxious Weed class taken from:
http://www.dpi.nsw.gov.au/agriculture/pestsweeds/weeds/noxweed/noxiousapp?sq_content_src=%252BdXJsPWh0dHAlM0ElMkYlMkZ3d3cuYWdyaWMubnN3Lmdvdi5hdSUyRnRvb2xzJTJGdmlld2NvdW5jaWwuaHRtbCZhbGw9MQ%253D%253D&council_id=5
*Legal Requirements under Noxious Weed Act
3 - The plant must be fully and continuously suppressed and destroyed
4 - The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority

Note: Species listed above may not occur within the Sydney Water facilities study area.

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Appendix 4. Fauna recorded on Potts Hill Reservoir Site.

(Sources: Field Survey 2007, SMEC (1997))

Common Name	**Scientific Name**
Amphibians	
Eastern Froglet	*Crinia signifera*
Green Tree Frog	*Litoria caerulea*
Peron's or Emerald Spotted Tree Frog	*Litoria peronii*
Birds	
Common Starling	*Sturnus vulgaris*
Eastern Rosella	*Platycercus eximius*
Grey Butcherbird	*Cracticus torquatus*
Indian Myna	*Acridotheres tristis*
Magpie	*Gymnorhina tibicen*
Noisy Myna	*Manorina melanocephala*
Peregrine Falcon	*Falco peregrinus*
Pigeon	*Columba livia*
Rainbow Lorikeet	*Trichoglossus haemotodus*
Raven	*Corvus coronoides*
Red Wattlebird	*Anthochaera carunculata*
Red-browed Finch	*Neochmia temporalis*
Spotted Turtle Dove	*Streptopelia chinensis*
Superb Fairy Wren	*Malurus cyaneus*
White-faced Heron	*Egretta novaehollandiae*
Willy Wagtail	*Rhipidura leucophrys*
Yellow Thornbill	*Acanthiza chrysorrhoa*
Reptiles	
Common Garden Skink	*Lampropholis guichenoti*
Mammals	
Grey-headed Flying Fox	*Pteropus poliocephalus*
Eastern Bent-wing Bat	*Miniopterus schreibersii oceanensis*
Gould's Chocolate Mottled Bat/Eastern Free-tail bat	*Chalinolobus gouldii/Mormopterus sp2*
White-striped Mastiff Bat	*Tararida australis*
Cat	*Felis catus*

Note: Species listed above may not occur within the Sydney Water facilities study area.

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Appendix 5. Likelihood of Occurrence Assessment.

This is a summary of an assessment to determine the likelihood of occurrence of threatened species on the proposal Potts Hill site. A search of the Atlas NSW Wildlife, for threatened flora and fauna within 10km of the central point 151.034333, -33.89404 was conducted on 17/06/2008 (10km radius search). The same search was conducted using the EPBC database (Department of Environment, Water, Heritage and the Arts) for NES matters (17/06/08).

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. Five terms for the likelihood of occurrence of species are used in this report:

- "yes" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
Birds					
Great Egret	*Ardea alba*	-	M	Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands	No
Cattle Egret	*Ardea ibis*	-	M	Grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor	Unlikely
Australasian Bittern	*Botaurus poiciloptilus*	V		Boggy marsh, wetland margins.	Unlikely
Bush Stone-curlew	*Burhinus grallarius*	E1		Open woodland, dry watercourses with fallen branches, leaf litter, sparse grass, coastal scrub, mangrove fringes.	Unlikely
Major Mitchell's Cockatoo	*Cacatua leadbeateri*	V		Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water.	Unlikely
Great Knot	*Calidris tenuirostris*	V		Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons.	No
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V		Occurs within a variety of forest and woodland types.	Unlikely
Greater Sand Plover	*Charadrius leschenaultii*	V		Almost entirely restricted to coastal areas on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	No

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
Lesser Sand Plover	*Charadrius mongolus*	-	V	Beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms..	No
Black-necked Stork	*Ephippiorhynchus asiaticus*	E1		Coastal wetlands, mangroves, tidal mudflats, floodplains, open woodlands.	Unlikely
Japanese Snipe	*Gallinago hardwickii*	-	M	Freshwater wetlands on or near the coast, generally among dense cover	No
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	-	M	Coasts, islands, estuaries, inlets, large rivers, inland lakes. Roost and nest on large platforms built in large Eucalypts.	Unlikely
White-Throated Needletail	*Hirundapus caudacutus*	-	M	Open space above canopy. Forages over large areas.	Unlikely
Black Bittern	*Ixobrychus flavicollis*	V	-	Well vegetated swamps, estuaries, wetlands.	Unlikely
Swift Parrot	*Lathamus discolor*	E1	E	Breeds in Tasmania, but winters on mainland in diverse timbered habitats, including forests, woodlands, plantations, banksias, street trees and gardens	Unlikely
Broad-billed Sandpiper	*Limicola falcinellus*	V	-	Estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat.	No
Black-tailed Godwit	*Limosa limosa*	V	-	Primarily a coastal species, usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	Unlikely
Square-tailed Kite	*Lophoictinia isura*	V	-	Diverse habitats from woodlands to timbered watercourses	Potential
Black-chinned Honeyeater (eastern subsp.)	*Melithreptus gularis gularis*	V	-	Drier eucalypt forests, woodlands, timber on water courses, often no understorey, scrubs. Favours ironbark woodlands on w. slopes.	Unlikely
Rainbow bee eater	*Merops ornatus*	-	M	The Rainbow Bee-eater is distributed across much of mainland Australia	Unlikely
Black-faced Monarch	*Monarcha melanopsis*	-	M	The Black-faced Monarch is found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating.	Unlikely
Satin Flycatcher	*Myiagra cyanoleuca*	-	M	The Satin Flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	No
Turquoise Parrot	*Neophema pulchella*	V	E	Open grassy woodland, with dead trees, near permanent water and forested hills.	Unlikely
Barking Owl	*Ninox connivens*	V	-	Open forests, woodlands, dense scrubs, other large trees near watercourses. Nest in tree hollow.	Potential for foraging, no hollows within study area

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
Powerful Owl	*Ninox strenua*	V	-	Pairs occupy large, probably permanent home ranges in forests to woodlands. Nest in large hollow.	Potential for foraging, no hollows within study area
Osprey	*Pandion haliaetus*	V	-	Coasts, estuaries, bays, inlets, islands and surrounding waters.	No
Pink Robin	*Petroica rodinogaster*	V	-	Drier eucalypt forests, with fallen logs	Unlikely
Pacific Golden Plover	*Pluvialis fulver*	-	M	Wetlands, shores, paddocks, saltmarsh, coastal golf courses, estuaries and lagoons	Unlikely
Superb Fruit-Dove	*Ptilinopus superbus*	V	-	Rainforests and fringes, scrubs, mangroves, wooded stream margins, lantana thickets, isolated figs, pittosporums, lilly pillies and blackberries.	Unlikely
Rufous Fantail	*Rhipidura rufifrons*	-	M	Rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. During migration, it may be found in more open habitats	Unlikely
Little Tern	*Sterna albifrons*	E1	-	Coastal waters, bays, inlets, saline or brackish lakes.	Unlikely
Freckled Duck	*Stictonetta naevosa*	V	-	Large permanent water bodies with well vegetated margins.	Unlikely
Grass Owl	*Tyto capensis*	V	-	Tall grass, swampy sometimes tidal areas, farm lands.	Unlikely
Masked Owl	*Tyto novaehollandiae*	V	-	Occurs in forests, open woodlands, farmlands with large trees.	Potential for foraging, no hollows within study area
Regent Honeyeater	*Xanthomyza phrygia*	E1	E, M	inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak	Unlikely
Invertebrates					
Cumberland Plain Land Snail	*Meridolum corneovirens*	E1	-	Primarily inhabits Cumberland Plain Woodland (an endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs.	Unlikely
Frogs					
Green and Golden Bell Frog	*Litoria aurea*	E1	V	Large permanent freshwater wetlands, with dense stands of reeds.	No
Red-crowned Toadlet	*Pseudophryne australis*	V		Hawksbury sandstone and may be found beside temporary creeks, gutters and soaks, and under rocks and logs.	No
Mammals					
Eastern Pygmy-possum	*Cercartetus nanus*	V		Eastern forests and woodlands.	No
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Occurs in wide variety of habitats in large remnants. Dens in tree hollows, hollow log or rock crevice.	No

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
Eastern Quoll	*Dasyurus viverrinus*	E1		Occurs in wide variety of habitats in large remnants. Dens in tree hollows, hollow log or rock crevice.	No
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	Usually roosts in tree hollows in the higher rainfall forests within its range.	Potential
Eastern Bent-wing Bat	*Miniopterus schreibersii oceanensis*	V	-	Forages above the canopy and eats mostly moths. Roosts in caves, old mines, road culverts.	Potential
Eastern Freetail-bat	*Mormopterus norfolkensis*	V	-	Evidence suggests that the species depends on hollows and tree fissures for roosting sites.	Potential
Large-footed Myotis	*Myotis adversus*	V		A range of habitats close to water from lakes, small creeks to large lakes and mangrove lined estuaries.	Unlikely
Koala	*Phascolarctos cinereus*	V	-	Swamp Mahogany and Tallowwood are of primary importance to this Koala population. Other local native tree species used by Koalas include Broad-leaved Paperbark, Blackbutt, Red Bloodwood, Flooded Gum and Smooth-barked Apple	No
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Roosts in large camps in Botanic Gardens.	Potential, though minimal foraging resources
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	In almost all habitats from wet and dry sclerophyll forests, open woodland, Acacia shrubland, mallee, grasslands and desert.	Potential
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V		Moist gullies in mature coastal forests or rainforests. Roosts in hollow tree trunks and branches.	Unlikely
Reptiles					
Broad headed Snake	*Hoplocephalus bungaroides*	-	V	Occurring under large exfoliating slabs of sandstone and rock crevices in areas of undisturbed bushland, usually on tops of cliffs. Commonly found in rock on rock situations in this context also includes crevices in cliff faces	No
Flora					
Bynoe's Wattle	*Acacia bynoeana*	E1		Found in heath and woodland on sandy soils. Scattered from coast to mountains, uncommon.	No
Gosford Wattle	*Acacia prominens*	E2	-	Grows mainly in wet sclerophyll forest and margins of rainforest, usually in moist, protected areas in loamy and clayey soils.	No
Downy Wattle	*Acacia pubescens*	V	V	Scattered throught the Cumberland plain where it grows on clay and clay-shale soils.	No
Sunshine Wattle	*Acacia terminalis subsp. Terminalis*	E1		Between Botany Bay to the northern foreshore of Port Jackson. Coastal scrub and dry sclerophyll woodland on sandy soils	No

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
-	*Allocasuarina glareicola*	E1		Grows in Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla* and *Melaleuca decora*.	No
Lobed Blue Grass	*Bothriochloa biloba*	-	V	Grows in woodland on poorer soils.	Unlikely
Small Pale-grass Lily	*Caesia parviflora var. minor*	E1		Found in Wollemi region of Hawkesbury/Nepean. Occurs in damp places in open forest on sandstone.	No
Thick Lip Spider Orchid	*Caladenia tessellata*	E1	V	Victoria and smaller patches of coastal NSW. Grassy sclerophyll woodland on clay loam or sandy soils.	No
-	*Callistemon linearifolius*	V		*Callistemon linearifolius* has been recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. There are currently only 5-6 populations in the Sydney area, of the 22 populations recorded in the past. Three of these are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve, and Spectacle Island Nature Reserve.	No
Leafless tongue orchid	*Cryptostylis hunteriana*	V	V	Favours swamp fringes, scrubby swamp fringes to steep bare hillsides in tall eucalypt forests.	No
-	*Darwinia biflora*	V		Occurs on the edges of weathered shale-capped ridges. Occurs in Sandstone Ridgetop woodland.	No
-	*Deyeuxia appressa*	E1	E	Recorded from the Georges River, south of Bankstown. Historical records only. May be extinct	No
	Dillwynia tenuifolia	V		in dry sclerophyll woodland on sandstone, shale or laterite.	No
-	*Epacris purpurascens var. purpurascens*	V		Found in a range of habitat types, most of which have a strong shale soil influence. Grows on poorly drained clay soils over sandstone or on shales in eucalypt forest among rocks or along creek banks.	No
Narrow-leaved Black Peppermint	*Eucalyptus nicholii*	E0		Confined to the New England Tablelands of NSW in wild. Grows in dry grassy woodland, on shallow and infertile soils, mainly on granite	No
Wallangarra White-gum	*Eucalyptus scoparia*	E1		In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park. Found in open eucalypt forest and woodland on well-drained granite hilltops, slopes and rocky outcrops	No
-	*Genoplesium baueri*	V		A saprophyte, *G. baueri* (midge orchid) is found in shady places in woodlands. Grows in sparse sclerophyll forests in moss gardens on sandstone.	No

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
-	*Grevillea parviflora subsp. parviflora*	V	V	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Often occurs in open, slightly disturbed sites such as along tracks.	No
-	*Grevillea parviflora subsp. supplicans*	E1		Endemic to N.S.W., occurring NW of Sydney at Berrilee near Arcadia, and in the Maroota to Marramarra Ck area.	No
-	*Hypsela sessiliflora*	E1		Grows in damp places, on the Cumberland Plain, very rare. NSW subdivisions	No
-	*Leptospermum deanei*	V		Found in woodland, *L. deanei* has only recently been recognised, it is known from a small area on Sydney's north shore, on either side of the Pymble-Hornsby ridge.	No
-	*Leucopogon exolasius*	V		Woronora Beard-heath is found along the upper Georges River area and in Heathcote National Park. In woodland on sandstone.	No
	Maundia triglochinoides	V		Grows in swamps or shallow freshwater on heavy clay; north from southern Sydney.	No
-	*Melaleuca deanei*	V	V	scattered populations between the far south-east of NSW and the Blue Mountains. Grows in wet heath	No
Hairy Geebung	*Persoonia hirsuta*	E1		Marshy heath on coastal sandstone plateaus.	No
-	*Persoonia nutans*	E1	E	Confined to aeolian and alluvial sediments and occurs in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland.	No
-	*Pimelea curviflora var. curviflora*	V		Confined to coastal areas around Sydney on sandstone	No
-	*Pimelea spicata*	E1	E	Range from the Georges River to Gosford. The species is found on open forest and heath, in sandy soils or very rarely on shales.	No
Pomaderris prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	*Pomaderris prunifolia var. prunifolia*	E2		Known from only three sites within the listed local government areas. At Rydalmere it occurs, among grass species on sandstone At Rookwood Cemetery it occurs in a small gully of degraded Cooks River / Castlereagh Ironbark Forest on shale soils	No
-	*Prostanthera marifolia*	E4		Woodland dominated by Eucalyptus sieberi and Corymbia gumnifera. In deeply weathered clay soil with ironstone nodules.	Unlikely

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Common Name	Scientific Name	TSC	EPBC	Habitat	Likelihood of occurrence
Sydney Plains Greenhood	*Pterostylis saxicola*	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines	Unlikely
-	*Pultenaea parviflora*	E1		Endemic to the Cumberland Plain. May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays.	No
Matted Bush-pea	*Pultenaea pedunculata*	E1		In NSW however, it is represented by just three disjunct populations, in the Cumberland Plains in Sydney. Largely confined to loamy soils in dry gullies in populations in the Windellama area.	No
-	*Syzygium paniculatum*	V		In NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State Forest. restricted mainly to remnant stands of littoral (coastal) rainforest	No
	Tetratheca glandulosa	V		Grows in sandy or rocky heath or scrub.	No
-	*Tetratheca juncea*	V		Confined to the northern portion of the Sydney Basin bioregion. It is usually found in low open forest/woodland with a mixed shrub understorey and grassy groundcover	No
Tadgell's Bluebell in LGAs of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta, and Strathfield	*Wahlenbergia multicaulis*	E2		There are 13 known sites, two of which are in northern Sydney (i.e. Thornleigh and Mt Ku-Ring-Gai) with the remainder in western Sydney In Western Sydney most sites are closely aligned with the Villawood Soil Series, which is a poorly drained, yellow podsolic extensively permeated with fine, concretionary ironstone	No
-	*Wilsonia backhousei*	V		In NSW Narrow-leaf Wilsonia is found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney	No

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APPENDIX 6. Assessment using Criteria provided in Draft Part 3A Guidelines (DEC & DPI, 2005).

This appendix identifies potential effects of the proposal on threatened species, populations or ecological communities, or their habitats of relevance to the Potts Hill site.

1. How is the proposal likely to affect the lifecycle of a threatened species and/or population?

Displaces or disturbs threatened species and/or populations
Limited potential foraging habitat associated with planted trees is present for threatened bats, and the square-tailed kite. The loss of these small potential foraging areas is not expected to displace or disturb these threatened species.

Disrupts the breeding cycle
The proposal is not likely to disrupt the breeding cycle of any of the threatened species on site, as the planted trees are considered to offer limited potential foraging habitat only.

Disturbs the dormancy period
No threatened species are likely to be dormant on the site.

Disrupts roosting behaviour
The planted trees present on the site are considered to offer limited potential foraging habitat only, and thus the proposal is not expected to disrupt roosting behaviour.

Changes foraging behaviour
Some limited potential foraging habitat for threatened bats and the square-tailed kite will be removed. This may lead to a change in foraging behaviour over the short term until the landscaping vegetation proposed is mature.

Affects migration and dispersal ability
The threatened species which may potentially use the site for foraging are all highly mobile, and thus migration and dispersal ability are not likely to be affected.

Disrupts pollination cycle;
No threatened plant species are likely to be present.

Disturbs seedbanks;
No threatened plant species are likely to be present.

Disrupts recruitment (ie. germination and establishment of plants);
No threatened plant species are likely to be present.

Affects the interaction between threatened species and other species in the community (eg. pollinators, host species, mychorrizal associations).
No native vegetation communities are present.

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2. How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

Disturbs any permanent, semi-permanent or ephemeral water bodies;
There are no permanent, semi-permanent or ephemeral water bodies within the study area.

Degrades soil quality;
The soil within the study area has previously been heavily modified through the introduction of large amounts of fill excavated from the Potts Hill reservoirs.

Clears or modifies native vegetation;
The proposal does not involve the clearing or modification of native vegetation communities.

Introduces weeds, vermin or feral species or provides conditions for them to increase and/or spread;
The proposal may increase the visitation of the site by domestic cats, but it is noted that this is already commonly occurring. Landscaping and ongoing maintenance is likely to reduce the amount of weeds.

Removes or disturbs key habitat features such as trees with hollows, caves and rock crevices, foraging habitat;
None of these key habitat features are not present within the study area.

Affects natural revegetation and recolonisation of existing species following disturbance;
No remnant vegetation is present, and the original soil profile has been covered by fill excavated from one, or both, of the Potts Hill reservoirs. The proposal is there fore not expected to affect site natural revegetation and recolonisation.

3. Does the proposal affect any threatened species or populations that are at the limit of its known distribution?
The potentially occurring threatened bats and square-tailed kite are found throughout the Sydney area and beyond, and therefore the study site is not at the limit of a threatened species known distribution.

4. How is the proposal likely to affect current disturbance regimes?

Modifies the intensity and frequency of fires;
The site is in an urban area and is not mapped as bushfire prone.

Modifies flooding flows.
Flooding is not an issue at the site.

5. How is the proposal likely to affect habitat connectivity?

Creates a barrier to fauna movement;
The proposal does not involve the removal of remnant vegetation, and is not part of a wildlife corridor, and therefore is unlikely to create a barrier to fauna movement.

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Removes remnant vegetation or wildlife corridors;
The proposed development does not involve the removal of remnant vegetation or wildlife corridors.

Modifies remnant vegetation or wildlife corridors.
The proposed development does not involve the modification of remnant vegetation or wildlife corridors.

6. How is the proposal likely to affect critical habitat?
No critical habitat is present.

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Appendix 7. Qualifications of Staff.

Qualifications

Staff Member	Title	Qualifications	Role
Michael Chilcott	Director	• Bachelor of Science, University of Sydney, 1979. • Graduate Diploma in Natural Resource Management, UNSW, 1980. • Master of Science, UNE, 1982.	Project Director and Quality Control.
Dr Steven Ward	Senior Environmental Scientist	• Bachelor of Science, University of Western Australia, 1992. • Honours, University of Wollongong, 1994. • Doctorate of Philosophy, UWS, 2002	Project Manager and Report Writing.
Bruce Mullins	Senior Ecologist	• Bachelor of Science, UTS, 1992. • Master of Science, UTS, 1999.	Field Work.
Simon Tweed	Ecologist	• Bachelor of Environmental Science (Honours), University of Wollongong, 2004.	Field Work.
Enhua Lee	Ecologist	• PhD in ecology and wildlife management, UNSW 2006. • Bachelor of Advanced Science (First Class Honours), UNSW 2003.	Field Work.
Dr Ailsa Kerswell	Ecologist	• PhD in Marine Biology: *Macroecology and biogeography of benthic marine algae*. • Bachelor of Science (Hons): majors in Zoology and Marine Biology • Bachelor of Arts: major in Statistics	Field Work.
David Sanegor	Environmental Scientist	• Bachelor of Science (Environmental Biology), UTS, 2000.	Report writing.

Licences

Licence	Description	Licence No.
Atlas of NSW Wildlife	Wildlife Atlas searches.	CON03008
Scientific Licence	Flora and fauna surveys.	S10805

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